Employment and Education Outcomes of Transition-Age Youth with Autism Spectrum Disorder: An Exploratory Study of Asian American Youth in the State/Federal Vocational Rehabilitation Program

by

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DEDICATION

This dissertation is dedicated to my two favorite people in the universe–

Ernest (my better half) and Hudson (my amazing son).

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ABSTRACT

As the demographics continue to shift in the U.S. with the increasing number of Asian Americans and the rise of xenophobic acts against Asian Americans (Le et al., 2020), it is important for vocational rehabilitation (VR) agencies and rehabilitation counselors to consider the unique barriers that Asian American transition-age youth (TAY) face in seeking employment and engaging in postsecondary education. The purpose of this exploratory study is to expand on the important topic of transition from school to the workforce by utilizing VR data to investigate the associations among individual-level variables (i.e., demographic characteristics and receipt of specific VR services), and the education and employment outcomes of Asian American transition-age youth with a primary or secondary disability of autism spectrum disorder (ASD) who applied for VR services during the 2017-2019 program year.

The sample consisted of 2,740 Asian American TAY-ASD. Descriptive, chi-square, and logistic regression analyses were utilized to examine the associations between individual-level variables and successful employment and education outcomes. Results indicated that age, cultural barriers, being an English language learner, significance of disability, job placement assistance, short term supports, transportation, and VR counseling and guidance were associated with competitive integrated employment and participation in postsecondary education. Findings from this study can help to implement the delivery of culturally sensitive and equitable VR programs in hopes of improving outcomes for Asian American TAY-ASD. Implications for practice and future research are discussed.

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CHAPTER ONE

Introduction

According to the 2019 U.S. Census Bureau population estimate, the Asian American population (i.e., excluding the mixed-Asian population) in the United States stood at 18.6 million and Asian Americans accounted for nearly six percent of the resident population. The number of Asian Americans in the U.S. grew 95% between 2000 and 2019, with the largest subgroups being Chinese Americans, Indian Americans, and Filipino Americans (Budiman & Ruiz, 2021). The results of the 2010 United Census also showed that the Asian American population grew at a faster rate than other populations in the United States with the population increasing by a minimum of 30 percent in most states apart from Hawaii (U.S. Census Bureau, 2010). The PEW Research Center indicates that Asian Americans are on target to be the biggest immigrant group by 2055, and estimated to exceed 46 million individuals by 2060 (Budiman & Ruiz, 2021).

As a result of the increase in the Asian American population, there has also been an increase of Asian American youth, with 23.4% of the Asian American population in 2019 being between 5-24 years old. The number of Asian American youth with disabilities served under the Individuals with Disabilities Education Act (IDEA) has increased over 50% since 2000, from 121,000 students in 2000-2001 to 193,000 students in the 2018-2019 school year, accounting for seven percent of the Asian American total school enrollment in the 2018-2019 school year (National Center for Education Statistics [NCES], 2020; NCES, 2021). Although the percentage of Asian American youth receiving services for specific learning disabilities was lower than that for students overall when compared for racial/ethnic differences in the 2018-2019 school year (19% vs. 33% for students overall), the percentage of Asian American youth receiving services for autism was highest (25%) compared to any other racial/ethnic group and to students overall

(11%; NCES, 2020). In 2013, the American Psychiatric Association made changes to the diagnostic criteria for autism and created the umbrella term of autism spectrum disorder (ASD) to include autistic disorder, Asperger syndrome, pervasive developmental disorder - not otherwise specified, and childhood disintegrative disorder (Hyman, 2013). This study uses the term ASD to indicate an individual who has been diagnosed with autism.

ASD is a developmental disability that includes the presence of repetitive patterns of behavior and activities with impairments in social interaction (Maenner et al., 2020). The Centers for Disease Control and Prevention [CDC] recently stated that ASD occurs in about 1 in 54 children and that it is four times more common in boys than in girls (Maenner et al., 2020). ASD is defined in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) in terms of two core diagnostic criteria. The first criterion involves persistent deficits in each of three areas of social communication and interaction and the second involves restricted, repetitive, or unusual sensory-motor behaviors. ASD is viewed on a spectrum ranging from mild to severe, and symptoms must be present in the early developmental period, cause significant impairment in functioning, and cannot be explained by an intellectual disability, as comorbid diagnoses often occur (Lord et al., 2018). Although the cause of ASD is unknown, risk factors include advanced maternal and paternal age and health factors such as preterm birth, low birth weight, and maternal metabolic conditions (Lord et al., 2018).

Racial and ethnic disparities have been found in ASD-related services among low-income children. In a study that utilized the 2012 Medicaid Analytic eXtract files (MAX) and identified 117,848 enrolled children with ASD, Black, Asian, and Native American and Pacific Islanders were found to receive fewer community-based outpatient services compared to White children,

with no differences found for Latinx children (Bilaver et al., 2020). The unique challenges to accessing services for Asian American immigrant parents of youth with ASD include cultural and language barriers, discrimination by providers, and a lack of support as they navigate service systems, often without family or community support (Kim et al., 2020; Shorey et al., 2020; Wei et al., 2015).

The number of Asian Americans who identify as having a disability has increased from 6.2% of the Asian alone population in 2010 to 7.2% of the Asian alone population in 2019 (U.S. Census Bureau, 2019). In 2010, 66.1% of the U.S. Asian population over the age of 16 identified as being employed and 76.9% of the population (five years and older) indicated that they spoke a language other than English, with 35.5% stating that they spoke English less than "very well" (U.S. Census Bureau, 2010). In 2019, 66.2% of the U.S. Asian population over age 16 identified as being employed and 73.5% of the population (five years and older) indicated that they spoke a language other than English, with 30.9% stating that they spoke English less than "very well" (U.S. Census Bureau, 2019). The results of these surveys demonstrate that although employment rates have remained steady in the past decade for the Asian American population there is still a need to address cultural and language barriers in learning English, as research has demonstrated that enhanced communication skills in English can contribute to increased job opportunities and enhanced community participation (Pandey & Pandey, 2014).

Wei and colleagues (2015) utilized sequence analysis and sample data from the National Longitudinal Transition Study-2 (NLTS 2) to look at the employment and postsecondary outcomes for youth with ASD in the six years after leaving high school, with the 120 participants being overwhelmingly male (87%) and White (84%). The outcomes varied by race/ethnicity, family income, and severity of disability, with White youth with ASD having a significantly

higher likelihood of participating in postsecondary education (Wei et al. 2015). Youth with ASD from higher income households were more likely to participate in postsecondary education and employment compared to lower income households, and youth with higher functional cognitive skills were significantly more likely to participate in postsecondary education than youth with more significant disabilities (Wei et al., 2015). Additional research is required that looks at the intersection of disability, race/ethnicity, age, gender, and socioeconomic status and how these factors play a role in education and employment outcomes for youth with ASD (Shattuck et al., 2020). Recent research highlights the need for health care professionals to be aware of cultural or environmental barriers that may impact services for youth with ASD, especially among minority and low-income families whose primary language is not English (Bilaver et al., 2020; Shorey et al., 2020).

Transition-Age Youth with Autism Spectrum Disorder

The term transition-age youth (TAY) refers to youth in the period from older adolescence to young adulthood, a period identified as a challenging developmental period in which the brain is not fully developed but youth are faced with adult-like tasks and challenges (Wilens & Rosenbaum, 2013). Although ASD is typically diagnosed during early childhood, this TAY period has also been recognized as a critical period for initiating interventions as many youth with ASD have significant functional impairments during this critical period and these may continue into adulthood, resulting in poorer health outcomes compared to their same-aged peers (Benevides et al., 2020; Blumberg et al., 2013; Smith et al., 2012; Wilens & Rosenbaum, 2013).

Statement of the Problem

Despite the rapid expansion of the Asian American population and the high prevalence rate of ASD in Asian Americans, little is known about the postsecondary education and

employment outcomes of Asian American transition-age youth with autism (TAY-ASD) as no study has specifically reviewed this group. In this study, I investigate the employment and education outcomes of Asian American TAY-ASD. A necessary step toward improving the outcomes for this population is to gain an understanding of the variables associated with outcomes within programs that are utilized by this population, such as the State/Federal Vocational Rehabilitation (VR) program, which provides comprehensive vocational services to individuals with disabilities and will operate on a budget of $3.7 billion dollars for fiscal year 2021 (Department of Education, 2020).

Authorized under the Rehabilitation Act, VR is the largest public vocational rehabilitation program, and celebrated 100 years of providing rehabilitation services in 2020 (Department of Education, 2020). The VR system is also the most successful program in helping individuals with disabilities achieve their employment goals, serving approximately one million individuals in the United States and its territories each year through a total of 78 VR agencies. The number of individuals with ASD utilizing VR services tripled between 2003-2008 and in 2014-2016, TAY-ASD accounted for almost 40% of TAY with intellectual or developmental disabilities (IDD) who received services across the nation (Butterworth et al., 2010; Ditchman et al., 2018; Martin et al., 2010; Roux et al., 2018). The growth in the size of this population in part reflects the increased focus on TAY instigated by the passage of the Workforce Innovation and Opportunity Act (WIOA) in 2014, which includes an emphasis on improving educational and employment outcomes for TAY with disabilities. WIOA, which included a reauthorization of the Rehabilitation Act, requires that VR agencies set aside at least 15% of their federal funds to provide pre-employment transition services to students with disabilities who are eligible, or potentially eligible, for VR services. These pre-employment transition services (Pre-ETS) for

students include job exploration counseling, work based learning experiences, counseling on enrollment opportunities, workplace readiness training, and instruction in self-advocacy. Pre-ETS are provided by state VR agencies in collaboration with secondary schools (Taylor et al., 2019).

Employment and Education Outcomes of TAY-ASD

The challenges of finding competitive employment can affect the long-term health, quality of life, and community participation outcomes for TAY-ASD. TAY-ASD are more likely to have anxiety, depression, and experience premature death compared to adults, and utilize emergency health services at high rates (Benevides et al., 2017). Employment has been identified as a health promotion intervention for TAY with disabilities, as the negative health effects of long-term unemployment are significant and may include a higher risk of stress and death compared to individuals who are employed (Ditchman et al., 2018; Kaya et al., 2016; Roelfs et al., 2011). Being unemployed has also been found to be associated with a higher risk for substance use and relapse following substance use disorder treatments, with a higher negative impact being observed among males as compared with females (Henkel, 2011; Roelfs et al., 2011).

Although the number of consumers with ASD accessing VR services has increased 571% from 2003-2012, the employment outcomes have not improved (Alverson & Yamamoto, 2017). Specifically, over the past 10 years, only one-third of TAY-ASD have achieved a successful employment outcome, and the overall percentage of those employed has decreased from 67% to 62% (Burgess & Cimera, 2014; Rast et al. 2020). The employment rate for TAY-ASD is currently lower than that seen in the general population and in comparison to other students with disabilities, especially after the initial years upon exiting high school (Newman et al., 2011;

Roux et al., 2015; Roux et al., 2020a). Similar to adults with ASD, TAY-ASD are underemployed and many of those who are working are employed in entry-level positions paying the minimum wage, which indicates the need for additional training and postsecondary education in order to promote employment in higher-paying jobs (Burgess & Cimera, 2014; Rast et al., 2020). VR services that were found to contribute to a positive employment outcome for TAY-ASD included transportation, assessment, counseling/guidance, job placement, on-the-job support, and job search support (Ditchman et al., 2018). Individuals who received at least two of these six services were employed at higher rates than those who received any one service in isolation (87.8% vs. 40.0%; Ditchman et al., 2018).

Recent estimates suggested that between 70,700 and 116,000 youth with ASD turn 18 years old each year. This translates to over one million youth with ASD entering young adulthood in the next decade (Shattuck et al., 2020). Despite the growing size of this population, TAY-ASD are less likely to have a job after high school than other youth receiving individualized education plan (IEP) services (Newman et al., 2011; Rast et al., 2020; Roux et al., 2015). However, Rast and colleagues (2020) found that TAY-ASD who received postsecondary education training were 1.5 times more likely to exit the VR program with employment than TAY-ASD who did not receive these services. In another study, postsecondary education was one of the strongest predictors of higher wages, but only 10% of youth with ASD received these services (Migliore et al., 2012). TAY-ASD who had higher conversation skills had a better chance of being enrolled in postsecondary education, which demonstrates the need to utilize communication services and reduce barriers in language (Shattuck et al., 2012; Wei et al., 2015).

Job placement services have proven to be effective for youth with ASD. Those receiving these services are four times more likely to exit with employment compared to youth who did not

receive these services; however, youth with ASD received these services at significantly lower rates compared to other comparison groups (Migliore et al., 2012; Roux et al., 2020b). Chun and colleagues (2018) pointed out that job placement services are one of the best predictors of competitive employment among youth with cognitive disabilities. Self-advocacy instruction was also found to be helpful in increasing postsecondary and employment outcomes by helping youth with disabilities understand their disability and advocate for workplace accommodations and supports needed at school (Wei et al., 2015). Wei and colleagues (2015) also emphasized the need to focus on self-determinations instruction and apply it to the IEP setting, job training, as well as the transition planning in order to increase education and employment outcomes for TAY-ASD.

Transition Planning for Asian American TAY-ASD

For Asian American TAY-ASD, the transition planning process can be a stressful time as they start to explore life after secondary school and consider career choices, job opportunities, and how these decisions may financially impact them and their families (Lo & Bui, 2020). Although active family and youth involvement has been shown to contribute to a successful life, this area continues to be a challenge for many schools and parents. Lo and Bui (2020) interviewed Chinese and Vietnamese parents of youth with ASD and intellectual disabilities and found that despite the desire to be involved with this important process, parents were often provided little information on this topic and did not understand their role, which prevented parents from being fully engaged, as they thought it was the school's responsibility to disseminate this information. In addition, Lo and Bui (2020) indicated that the schools did not discuss essential transition planning activities (functional independent living skills, work skills, voluntary or paid job opportunities, and recreation and social opportunities) with any of the

parents. These researchers recommended giving parents adequate time to communicate with the educational staff and professionals about their youth's progress, offering training for interpreters so that the translation services are effective and make sense for the parents whose primary language is not English, and collaborating with local VR and state agencies to create a community resource directory through which families are able to locate available services for youth while their TAY are in school and after graduation (Lo & Bui, 2020).

In another recent study, Kim and Morningstar (2020) looked at the perspectives of Korean American young adults (18-25) with IDD and their families in the transition planning process and similarly found that many parents felt that they were not equipped with the necessary information and were dissatisfied with the transition planning process and postsecondary outcomes of their child. Post-school outcomes of this small sample of Korean American parents demonstrated that nearly 98% of the young adults were living with their parents after high school, with most of the remainder living with siblings or relatives. Further, the postsecondary employment outcomes for Korean American young adults with IDD were the lowest of any other group of youth with IDD (Kim & Morningstar, 2020).

There is a critical need to ensure that Asian American families understand the concept of transition planning, find community resources, and create a plan that is useful in helping their child, as many Asian American parents may be hesitant to disagree with the teacher's opinion or express their own opinions due to the cultural influence to respect authority figures (Kim & Morningstar, 2020).

These studies demonstrate the need for rehabilitation professionals and educators to inform and involve Asian American students, parents, and families in the transition process, to address language or cultural barriers, and to give an opportunity for parents to be an active

member on the IEP team, as this can assist with a smoother transition and a more successful outcome for TAY.

Asian Americans in the Vocational Rehabilitation Program

There are relatively few studies that specifically address Asian Americans in the VR system. In one study, using the Rehabilitation Services Administration (RSA) Federal Fiscal Year (FFY) 2000 case service report (RSA-911) data set, Park et al. conducted a chi-square test on a sample of 500 Asian American and Pacific Islanders and 500 White Americans (Park et al., 2005). The results showed that Asian American were less likely to have a successful outcome and lower acceptance rates for VR services compared to White Americans (Park et al., 2005). Interestingly, compared to White Americans and controlling for other independent variables outside of race/ethnicity, Asian American applicants were less likely to be accepted for VR services while African Americans were two times more likely to be accepted (Wilson et al., 2002). This situation may be attributable in part to counselor biases, language and cultural differences, and the model minority myth that views Asian Americans as requiring fewer services than other applicants (Park et al., 2005).

In a more recent study, Chun and colleagues (2018) conducted a study of Asian Americans in the VR system by looking at four different types of disabilities (sensory/communicative, physical, cognitive, and psychiatric), VR services, and employment outcomes. In this study, which included 4,332 consumers, predictors of positive employment outcomes included job placement and on-the-job support, diagnostic services, VR counseling and assistive technology, while transportation expenses, interpreter services, job readiness training, and augmentative skills were associated with reduced rates of employment outcomes. For TAY with cognitive disabilities, however, work experience was found to be helpful in terms

of vocational outcome, especially if there is no postsecondary education or work experience (Chun et al., 2018). Chun and colleagues (2018) pointed out the need to conduct future research and to include additional contextual variables, such as poverty level and cultural factors, to see if these impact the use of VR services in Asian Americans with disabilities.

Finally, Lee et al. (2020) compared the postsecondary education and work experience outcomes of 1,268 Asian Americans with psychiatric disabilities who had utilized VR services to those of European Americans and all other races combined. The results suggested that postsecondary education and work experience were significant predictors of successful employment, while Asian Americans who received Medicare or Medicaid had a lower likelihood of a successful VR outcome. VR services that predicted a positive employment outcome included job placement and on-the-job support services, and maintenance training (Lee et al., 2020). Recommendations included addressing cultural factors, such as providing problem-focused and direct guidance and support for Asian American consumers and conducting further research that includes more individual-level variables (such as language proficiency, poverty level, and immigration status) in order to have more positive outcomes in Asian Americans.

Purpose of the Study

A review of the existing literature demonstrates that Asian Americans are often overlooked in VR and disability research. For example, despite the increased rates of Asian American TAY-ASD, the National Autism Indicators Report does not report Asian American youth in a separate category. Instead, it reports Asian/Pacific Islander in the “Other” category, along with American Indian/Alaska Native, other, and multiple races. Hispanic ethnicity is categorized separately along with White and Black, which is similar to most national surveys that are supposed to be representative of the U.S. population (Roux et al., 2015, 2016). The lack

of existing data makes it difficult for state and federal programs to meet the needs of the members of this growing population or to establish goals to increase services and positive outcomes for this population. The lack of research highlights the need to conduct critically sensitive research for all minority groups in the U.S. (Hasnain et al., 2020), but the Asian American population appears to have been overlooked in particular. Findings from this study can help to implement the delivery of culturally sensitive and equitable VR programs in hopes of improving outcomes for Asian American TAY-ASD.

The purpose of this study is to expand on this important topic of postsecondary transition by utilizing VR data to investigate the associations among individual-level variables (i.e., demographic characteristics and receipt of specific VR services), and the education and employment outcomes of Asian American TAY with a primary or secondary disability of autism who applied for VR services. The goals of this study are to (a) conduct an exploratory study of the profiles and outcomes of Asian American TAY-ASD in the VR system, relative to other groups; (b) evaluate and compare the efficacy of Pre-ETS and other VR services in promoting positive postsecondary education and employment outcomes; and (c) identify contextual factors that may contribute to group-based differences and outcomes.

Research Questions

Research Question 1

What are the education and employment outcomes for Asian American TAY-ASD who are enrolled in the VR program?

Research Question 2

How do these education and employment outcomes for Asian American TAY-ASD enrolled in the VR program compare with those for other groups, and particularly for the majority group (White Americans)?

Research Question 3

What demographic characteristics and VR services are associated with successful postsecondary education and employment outcomes for Asian American TAY-ASD?

Definition of Key Terms

Below is a description of key terms that are critical to understanding this study. Unless stated otherwise, the definitions were taken from the reporting manual for the RSA-911 Case Service code book (RSA, 2017, 2020).

RSA-911 database. Each year, the Rehabilitation Services Administration (RSA) of the United States Department of Education collects data from state VR agencies on consumers whose cases are closed. Data include demographic information, services provided, and employment status. The collection of this administrative data each program year is called the RSA's Case Service Report (RSA-911).

Program year. The program year (PY) begins in July and ends in June of the following year. For this study, data from PY 2017 through 2019 (July 1, 2017 - June 30, 2020) is used.

Asian. An individual having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.

Autism spectrum disorder. ASD is defined in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) in terms of two core diagnostic criteria. The first criterion involves persistent deficits in each of three areas of social communication and interaction and the second involves restricted, repetitive, or unusual sensory-motor behaviors. While ASD is viewed on a spectrum ranging from mild to severe, these two criteria are used to diagnose individuals, and symptoms must be present in the early developmental period, cause significant impairment in functioning, and cannot be explained by an intellectual disability by itself, as comorbid diagnoses often occur (Lord et al., 2018).

Transition-age youth. The term transition-age youth (TAY) refers to youth in the period from older adolescence to young adulthood (Wilens & Rosenbaum, 2013). For this study, transition-age youth is defined as youth who have a disability and are between 14-24 years of age, as this is the definition that WIOA used ("not younger than 14 years of age and not older than 24 years of age") when creating comprehensive programs to improve education and employment outcomes for young people with disabilities (RSA, 2021).

Employment outcome at exit. A successful employment outcome is defined as obtaining and maintaining part-time or full-time employment for a minimum of 90 days and the individual exiting after an individualized plan for employment (IPE) in competitive integrated employment.

1. Competitive Integrated Employment. This refers to work that (i) is performed on a full-time or part-time basis (including self-employment) and for which an individual is compensated at a rate that –

(A) Is not less than the higher of the rate specified in section 6(a)(1) of the Fair Labor Standards Act of 1938 (29 U.S.C. 206(a)(1)) or the rate required under the applicable State or local minimum wage law for the place of employment;

(B) Is not less than the customary rate paid by the employer for the same or similar work performed by other employees who are not individuals with disabilities and who are similarly situated in similar occupations by the same employer and who have similar training, experience, and skills; and

(C) In the case of an individual who is self-employed, yields an income that is comparable to the income received by other individuals who are not individuals with disabilities

and who are self-employed in similar occupations or on similar tasks and who have similar training, experience, and skills; and

(D) Is eligible for the level of benefits provided to other employees; and (ii) Is at a location—

(A) Typically found in the community; and

(B) Where the employee with a disability interacts for the purpose of performing the duties of the position with other employees within the particular work unit and the entire work site, and, as appropriate to the work performed, other persons (e.g., customers and vendors), who are not individuals with disabilities (not including supervisory personnel or individuals who are providing services to such employee) to the same extent that employees who are not individuals with disabilities and who are in comparable positions interact with these persons; and (iii) Presents, as appropriate, opportunities for advancement that are similar to those for other employees who are not individuals with disabilities and who have similar positions.

Participation in postsecondary education. This term refers to individuals enrolled in a postsecondary education program that leads to a credential or degree from an accredited institution or program. Postsecondary education may include any of the following:

1. Occupational or vocational training. This refers to occupational, vocational, or job skill training provided by a community college and/or business, vocational/trade or technical school to prepare students for gainful employment in a recognized occupation, not leading to an academic degree.
2. Junior or community college training. This refers to full-time or part-time academic training above the secondary school level leading to an associate degree, a certificate, or

other recognized educational credential. Such training is provided by a community college, junior college, or technical college.

3. Four-year college or university training. This refers to full-time or part-time academic training leading to a baccalaureate degree, a certificate, or other recognized less-than-postgraduate educational credential. Such training may be provided by a four-year college or university or technical college.
4. Graduate college or university. This refers to full-time or part-time academic training leading to a degree recognized as beyond a baccalaureate degree, such as a master's degree or Doctor of Philosophy (Ph.D.).

Type of recognized postsecondary credential attained post-exit. Diplomas and degrees must be attained either during participation or within one year of exit.

1. AA or AS Diploma/Degree
2. BA or BS Diploma/Degree
3. Graduate/Post Graduate Degree/Diploma
4. Occupational Licensure
5. Occupational Certificate
6. Occupational Certification
7. Other Recognized Diploma, Degree, or Certificate

VR Pre-Employment Transition Services. WIOA requires that VR agencies set aside at least 15% of their federal funds to provide pre-employment transition services (Pre-ETS) to students with disabilities who are eligible, or potentially eligible, for VR services. These services may include any of the following.

1. Job exploration counseling. These services are intended to provide counseling and guidance to help students explore career options.
2. Work based learning experiences. Work based learning is an educational approach that uses the workplace or real work to provide students with the knowledge and skills that help them connect school experiences to real-life work activities and future career opportunities.
3. Counseling on enrollment opportunities. This includes exploration of both post-high school transition programs at institutions of higher education**,** trade and vocational schools, as well as two and four-year colleges.
4. Workplace readiness training. This refers to training designed to develop independent living and social skills necessary to be successful in the workplace.
5. Instruction in self advocacy. This includes opportunities to learn about rights, responsibilities and how to request accommodations, services or supports that may be needed to successfully complete the transition from school to postsecondary education and/or the workforce.

Additional VR Services. These are services that were frequently provided by state VR agencies to consumers with ASD from 2003-2012, with many of them being identified as contributing to a positive outcome for TAY-ASD (Alverson & Yamamoto, 2017; Ditchman et al., 2018; Migliore et al., 2012; Roux et al., 2016; Roux et al., 2020b). The VR services examined in this study are the following:

1. Assessment. This means services provided and activities performed to determine an individual's eligibility for VR services, to assign an individual to a priority category of a

VR program that operates under an order of selection, and/or to determine the nature and scope of VR services to be included in the IPE.

2. Vocational rehabilitation counseling and guidance. This includes information and support services to assist an individual in exercising informed choice and is distinct from the case management relationship that exists between the counselor and the individual during the VR process.
3. Diagnosis and treatment of impairment. This includes: (a) corrective surgery or therapeutic treatment that is likely, within a reasonable period of time, to correct or modify substantially a physical or mental impairment that constitutes a substantial impediment to employment; (b) Diagnosis and treatment for mental and emotional disorders by qualified personnel who meet State licensure laws; (c) Dentistry: (d) Nursing services; (e) Necessary hospitalization (either inpatient or outpatient care) in connection with surgery or treatment; (f) Drugs and supplies; (g) Prescription of prosthetics and/or orthotics related to the individual's diagnosed disability and is necessary for the achievement of the employment outcome; (h) Prescription of eyeglasses and visual services, including visual training, related to the individual's diagnosed disability and necessary for the achievement of the employment outcome; (i) Podiatry; (j) Physical therapy; (k) Occupational therapy; (l) Speech or hearing therapy; (m) Mental health services; (n) Treatment of either acute or chronic medical complications and emergencies that are associated with or arise out of the provision of physical and mental restoration services or that are inherent in the condition under treatment; (o) Special services for the treatment of individuals with end-stage renal disease, including transplantation, dialysis, artificial kidneys, and supplies; (p) Other medical or medically related rehabilitation

services; and (q) Medical care for acute conditions arising during rehabilitation and constituting a barrier to the achievement of an employment outcome.

4. Job placement assistance. Job placement assistance is a referral to a specific job resulting in an interview, regardless of whether or not the individual obtained the job.
5. Short term job supports. This refers to support services provided to an individual who has been placed in employment in order to stabilize the placement and enhance job retention. Such services include short-term job coaching for persons who do not have a supported employment goal consistent with the employment goal on the IPE.
6. Job search assistance. Job search activities support and assist an individual in searching for an appropriate job. Job search assistance may include help in resume preparation, identifying appropriate job opportunities, developing interview skills, and making contacts with companies on behalf of the consumer.
7. Other services. This refers to other VR services that cannot be recorded elsewhere such as the provision of funds for occupational licenses, tools and equipment, initial stocks and supplies.
8. Transportation services. Transportation means travel and related expenses that are necessary to enable an applicant or eligible individual to participate in a VR service, including expenses for training in the use of public transportation vehicles and systems.
9. Job readiness training. Training provided to prepare an individual for work (e.g., work behaviors, getting to work on time, dress and grooming, increasing productivity, etc.).
10. Miscellaneous training. This refers to any training not recorded in one of the other categories listed, including GED or secondary school training leading to a diploma, or

courses taken at four-year, junior or community colleges not leading to a certificate or diploma.

11. Information and referral services. Information and referral services are provided to individuals who need services from other agencies (e.g., cooperative agreements).
12. On the job training. Training in specific job skills by a prospective employer.

Demographic Characteristics. Demographic characteristics for this study include cultural barriers, English language learning status, socioeconomic status, gender, severity of disability, and age.

1. Cultural barriers. An individual who perceives himself or herself as possessing attitudes, beliefs, customs, or practices that influence a way of thinking, acting, or working that may serve as a hindrance to employment.
2. English Language Learner. A person who has limited ability in speaking, reading, writing, or understanding the English language and also meets at least one of the following two conditions: (a) his or her native language is a language other than English, or (b) he or she lives in a family or community environment where a language other than English is the dominant language.
3. Low income. An individual is considered low income if he/she (a) receives, or in the six months prior to application to the program has received, or is a member of a family that is receiving or in the past six months prior to application to the program has received public assistance, such as Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Needy Families (TANF), Social Security Administration Supplemental Security Income (SSI), or other state or local assistance; (b) is in a family with total

family income that does not exceed the higher of the poverty line or 70% of the lower living standard income level; (c) is a youth who receives or is eligible to receive a free or reduced price lunch; (d) is a foster child on behalf of whom state or local government payments are made; (e) is a participant with a disability whose own income is at or below the poverty line but who is a member of a family whose income does not meet this requirement; (f) is a homeless participant or a homeless child or youth or runaway youth; or (g) is a youth living in a high-poverty area.

4. Sex. Sex may be indicated as male, female, or individual did not identify.
5. Severity of disability. The individual is classified by the agency as an individual with a significant disability or a most significant disability. An individual with a significant disability is an individual: (a) who has a physical or mental impairment that seriously limits one or more functional capacities (such as mobility, communication, self-care, self-direction, interpersonal skills, work tolerance, or work skills) in terms of an employment outcome; and (b) whose VR can be expected to require multiple VR services over an extended period of time; and (c) who has one or more physical or mental disabilities resulting from amputation, arthritis, **autism,** blindness, burn injury, cancer, cerebral palsy, cystic fibrosis, deafness, head injury, heart disease, hemiplegia, hemophilia, respiratory or pulmonary dysfunction, intellectual disability, mental illness, multiple sclerosis, muscular dystrophy, musculoskeletal disorders, neurological disorders (including stroke and epilepsy), spinal cord conditions (including paraplegia and quadriplegia), sickle cell anemia, specific learning disability, end-stage renal disease, or another disability or combination of disabilities determined on the basis of an assessment

for determining eligibility and VR needs to cause comparable substantial functional limitation.

6. Age. Age was identified based on date of birth provided at the time of application. TAY-ASD between 14 and 24 years of age were included in this study.

CHAPTER TWO

Literature Review

The purpose of this study is to investigate the associations among individual-level variables (i.e., demographic characteristics and receipt of specific VR services), and the education and employment outcomes of Asian American TAY with a primary or secondary disability of autism who applied for VR services during the 2017-2019 program year. This chapter first presents a brief overview of Asian Americans, the model minority myth, concerning health trends of Asian American youth, and cultural considerations that may serve as barriers to services. Next, the chapter presents the prevalence and characteristics of individuals with ASD and Asian American youth with ASD in the school system, employment and education outcomes for TAY-ASD, and employment and education challenges for TAY-ASD. Lastly, this chapter presents a brief history of legislation that assists TAY-ASD in transition services, the effects of the VR services on employment and education outcomes for this population, and gender, income, and racial/ethnic differences in the VR system.

Asian Americans

Asian Americans are often seen as a homogenous monolithic group (despite consisting of more than 30 ethnic groups) and have long been considered a danger to Western culture (Hsieh & Kim, 2020; Le et al., 2020). The Chinese Exclusion Act of 1882 was the first race-based law in U.S. history and simultaneously suspended immigration from China and deemed Chinese immigrants ineligible for citizenship until 1943 (Le et al., 2020). Le et al. (2020) point out that the Coronavirus pandemic (COVID-19) has brought a rise of xenophobic acts against Asian Americans, with over 1,700 documented cases of such acts in the U.S. within a two-month period from March to May 2020. Mar and Ong (2020) stated that about 31% of Asian Americans

have experienced slurs or jokes due to their race and ethnicity since the beginning of the pandemic.

According to the Pew Research Center (2020), the most recent reports, based on adjusted unemployment rates, have demonstrated that Asian Americans are unemployed at a higher rate (20.3%) than White and Black workers, and at a rate similar to the Hispanic population, noting that there were additional factors that were associated with higher unemployment rates among Asian American subgroups (e.g., being an immigrant or a female; Kochhar, 2020). Unemployment rates were also significantly higher for youth between the ages of 16 to 24 and workers who did not have a high school diploma compared to workers that had completed a college degree or higher (Kochhar, 2020). Current unemployment rates are at all-time highs for Asian Americans and self-employment rates have declined significantly, as over 200,000 Asian American small businesses closed in the two-month period between February and April 2020, demonstrating the need to look further into the barriers that Asian Americans encounter when obtaining and maintaining employment (Mar & Ong, 2020).

The Model Minority Stereotype & Health Trends of Asian Americans

In 2021 the CDC director, Dr. Rochelle Walensky, announced that racism is "a serious public health threat that directly affects the well-being of millions of Americans … and affects the health of our entire nation" (CDC, 2021). Racism can complicate and increase health disparities for Asian American youth with disabilities as racism is known to affect overall health and well-being. Asian American youth are at higher risk of being depressed than Caucasian peers, with the likelihood being higher if the youth was foreign-born or had low perceived parental involvement in their emotional lives (Song et al., 2011). Asian American youth have higher rates of peer discrimination and racial discrimination than other ethnic groups, which can

lead to poorer mental health outcomes. Self-esteem has been found to be negatively impacted by the effects of discrimination (Cooc & Gee, 2014; Fisher et al., 2000). The effects of discrimination for Asian American youth can lead to feelings of powerlessness, social avoidance, and a distrust of institutions (Cooc & Gee, 2014; Niwa et al., 2011). The model minority stereotype, speaking a different language or being an English language learner, and perceiving students as perpetual foreigners were found to be some of key factors for the discrimination experienced by Asian American youth (Cooc & Gee, 2014; Qin et al., 2008). For health professionals, it is important to note that the victimization of Asian American youth in school settings and the current rise in discrimination due to COVID-19 is in direct contrast to the model minority myth.

The model minority myth refers to the perception that Asian Americans are healthier, more submissive, and have a stronger work ethos than other minority groups (Hsieh & Kim, 2020; Le et al., 2020). This stereotype can affect how services are provided to Asian Americans as health professionals may believe that Asian Americans live longer than the general population and have fewer health concerns (Cheng et al., 2016; Sue et al., 1995). As a result, health professionals may be less likely to diagnose or recommend an appropriate treatment plan. However, counter to this myth, Asian Americans suffer from significant health disparities. For example, a high proportion of Korean Americans have no insurance, and Indian and Filipino Americans have higher rates of type 2 diabetes compared with other racial groups (Le et al., 2020). Furthermore, despite cancer being the leading cause of death for Asian Americans, the preventative screening rates are below the screening rates recommended by the U.S. Department of Health and Human Services and significantly lower than those for any other ethnic group,

which may be attributed to positive but erroneous stereotypes and implicit biases that health professionals may hold about Asian Americans (Ibaraki et al., 2014; Saw & Song, 2014).

Similarly, the model minority stereotype may affect the diagnosis and treatment of substance use disorders and mental health disorders if there is a belief that Asian Americans do not struggle with these issues (Fong & Tsuang, 2007; Ja & Aoki, 1993; Weerakoon et al., 2020). Researchers have demonstrated that alcohol abuse is on the rise for Asian American young adults between the ages of 18-29 and that Asian Americans students took part in heavy alcohol use in similar rates to Caucasian students who were placed in the high-risk category (Cheng et al., 2016; Iwamoto et al., 2010). Asian American young adults are also at higher risk to engage in tobacco use, opioid use, and risky sexual behaviors compared to their peers (Sabato, 2016; Weerakoon et al., 2020).

In addition, Asian American youth face unique stressors due to generational differences and acculturation, with Asian American youth having higher rates of anxiety and depression compared to peers and Asian American females having the highest suicide rate for those aged 15-24 (Africa & Carrasco, 2011). Despite these concerns, Asian American students had the lowest rates of accessing mental health services and were less likely to get help compared to their peers, which can be attributed to cultural barriers such as stigma, language barriers, and economic barriers to accessing and receiving health care (Africa & Carrasco, 2011; Sabato, 2016). Additional research is needed in this underrepresented group of Asian American youth (Weerakoon et al., 2020).

Cultural Considerations and Barriers to Services

Immigration Status and Acculturation

For some Asian Americans, coming to the U.S. was an involuntary decision and this can be connected to the self-efficacy that an individual may display in planning and receiving services. While some Asian Americans may have come as refugees, others may have been in the U.S. for several generations, and it is important to note that each situation is unique and challenges can vary with each circumstance (Wong et al., 2007). Research has demonstrated that Asian American immigrants face challenges and stressors that can lead to depression and identity conflicts as they encounter difficulties in securing employment, language barriers, loss of community or family and friends, unstable housing, and learning to build necessary survival and jobs skills – all of which can lead to family issues as parents may want to implement more traditional methods of discipline (such as shaming or scolding) to retain control, which may not be understood in the U.S. (Ja & Aoki, 2003; Owan, 1985; Takaki, 1990). In fact, there has been a rise in second-generation immigrants turning to substance use to avoid pressure to meet family expectations and to excel, and this is more apparent among more acculturated Asian American individuals and less acculturated parents, which can lead to conflicts within the family (Ahmmad & Adkins, 2020; Bhattacharya, 1998; Mercado, 2000; Niv et al., 2007). These experiences suggest that the unique experiences of immigration and acculturation can attribute to substance use in Asian Americans.

Asian American youth may embrace the individualistic nature of the U.S. and seek more autonomy, which parents may have difficulty understanding or perceive as being rebellious. The widening of the different culture gap between parents and youth can increase risk factors for the family as youth may rely more on peer support if parents are not able to communicate effectively due to language and cultural barriers or if parents are unavailable due to long work hours or parents holding multiple jobs (Ja & Aoki, 1993). These factors, along with the disconnect that

many second-generation Asian Americans state that they experience growing up, can lead to acculturation stress, which is seen as one reason for the increased substance use in Asian Americans (Ja & Aoki, 1993; Moloney et al., 2008). Moloney and colleagues (2008) describe how Asian American participants feel conflicted about choosing one culture over another or being stuck in between cultures, which can lead to drug use as a way to combat depression and loneliness.

Family Involvement

In many traditional Asian families, communication consists of traditional roles and a family hierarchy wherein youth are expected to listen to elders and collectivism and group harmony are important components of the culture, with saving face being regarded as a defense mechanism (Ja & Aoki, 1993; Kim et al., 2012; Kim et al., 2020). Topics like substance use and disability are often considered taboo, as they would affect the family's harmony negatively or bring the possibility of shame into the family, which may contribute to not seeking or delaying outside help, as seeking outside help could be considered an admission of failure to the world (Ja & Aoki, 1993; Kim et al., 2012). In Asian and Asian American families, because caregiving is typically assigned to women, mothers are blamed for having a child with ASD and these families can be stigmatized or isolated (Cheon & Chiao, 2012; Kim et al., 2012; Shorey et al., 2020).

Asian American parents have been found to have various reactions ranging from depression to confusion upon initial diagnosis of ASD, with mothers being more solution-focused and seeking resources about ASD while fathers seem to express denial or anger about the diagnosis of ASD and the need for services (Shorey et al., 20020; Zeleke et al., 2019). Many parents report limited knowledge about ASD, with some Chinese families believing that the disability could be fixed (Kim et al., 2020). Family life adjustment, parenting stress, and

financial and language constraints are difficulties that many parents face, demonstrating the need for more local resources and education to assist Asian American youth with ASD and their families (Kim et al., 2020; Padden & James, 2017; Shorey et al., 2020). It can become difficult for the Asian American families to receive outside help or services due to the shame and the stigma that is attached with a diagnosis of ASD, especially for low-income and immigrant Asian American families who can view the disability through a moral model and associate the disability with a punishment for past sins (Shorey et al., 2020; Zeleke et al., 2019). Indeed, Zeleke et al. conducted a study using a sample of 1,368 White children with ASD and 347 minority children from the 2011 Pathways survey, and found that minority families significantly delayed contacting health care professionals compared to White families and were less satisfied with the primary services received. Disparities in diagnosis and accessing services related to ASD can be attributed to cultural barriers and a distrust of the health care system (Zeleke et al., 2019). These studies highlight the need for health care professionals to be aware of cultural barriers that may impact services for families of youth with ASD, and especially among families whose primary language is not English (Bilaver et al., 2020; Shorey et al., 2020).

It is imperative for health professionals to incorporate a culturally sensitive approach and cultural humility when working with Asian Americans as language barriers and lack of Asian-language providers have been identified as additional barriers to service (Sue et al., 2012). Health professionals should also be aware of the acculturation and stigma issues that many Asian American youth face in their family and community. In addition, health professionals and educators should consider the family dynamics as well as the individual's needs as family harmony plays a large role for many Asian American youth and their success. The model minority myth and implicit biases can lead to significant social ramifications, as these can cause

health and school professionals to underdiagnose or misdiagnose legitimate concerns which can lead to Asian Americans not receiving appropriate services. This is suggested by the low rates of postsecondary education in California (just 55% of the Hmong population have a high school degree or beyond), high rates of suicide among Asian American females, and the delayed diagnosis of ASD in minority families nationally (Chang et al., 2010; Hsieh & Kim, 2020; Ibaraki et al., 2014; Leong & Lau, 2001; Noh, 2007; Zeleke et al., 2019).

Autism Spectrum Disorder

According to the Diagnostic and Statistical Manual of Mental Orders (DSM-5), which health care professionals use as a guide to diagnose mental conditions, Autism Spectrum Disorder 299.00 (F84.0) is defined by the following criteria:

A. Persistent deficits in social communication and social interaction across multiple contexts;

B. Restricted, repetitive patterns of behavior, interests, or activities;

C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities or may be masked by learned strategies in later life);

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning;

E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

Under the Individuals with Disabilities Education Act of 2004 (IDEA 2004), a federal special education law that provides free appropriate public education for all children, autism (300.8) is defined as follows:

> A developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, that adversely affects a child's educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences. Autism does not apply if a child's educational performance is adversely affected primarily because the child has an emotional disturbance, as defined in paragraph (c)(4) of this section. A child who manifests the characteristics of autism after age three could be identified as having autism if the criteria in paragraph (c)(1)(i) of this section are satisfied.

While ASD is viewed on a spectrum ranging from very mild to severe, the two main criteria of social communication and restricted and repetitive sensory-motor behaviors in both definitions often present at an early age and cause impairment in functioning for many individuals with ASD (affecting boys four times more than girls), often necessitating long-term supports and services (Lord et al., 2018; Maenner et al., 2020). In 2013, the American Psychiatric Association changed the autism criteria and created the umbrella term of autism spectrum disorder (ASD) to include autistic disorder, Asperger syndrome, pervasive developmental disorder - not otherwise specified, and childhood disintegrative disorder (Hyman, 2013). For this study, the term ASD is used to identify an individual who has been diagnosed with autism.

ASD currently affects 1 in 54 children, with 33% reporting a co-occurring intellectual disability (Maenner et al., 2020). The prevalence of ASD in Asian/Pacific Islander children is similar to that among Black and White children and exists across all racial, ethnic, and socioeconomic groups (Maenner et al., 2020). Given the growth in the number of Asian Americans diagnosed with ASD, it is not surprising that the number of youth with disabilities being served under IDEA has increased significantly in the U.S., with Asian American youth who received services under IDEA increasing over 50%, from 120,000 students in 2000-2001 to 193,000 students in the 2018-2019 school year (Goodwin, 2010; Hsieh & Kim, 2020; NCES, 2020, 2021; U.S. Census Bureau, 2010). Although Asian American youth were less likely than White youth to have a disability at both federal and state levels, autism was the one exception, with Asian American youth having the highest rate of receiving ASD-related services compared to all other racial/ethnic groups (25% vs. 11%; Foley, 2019).

Researchers state that Asian American youth are still consistently under-identified in special education in most Asian American subgroups, and special education services are delayed compared to White youth (Cooc, 2019; Sullivan et al., 2020). In a best-evidence synthesis, Morgan et al. (2018) reviewed 22 studies examining whether Hispanic, Asian, Native American, or English Language Learners are overrepresented in special education and found that Asian American youth who were also English language learners were found to be under identified in special education, and the disparity was larger for Asian American youth than for Hispanic youth. These studies show the need for educators and health professionals to learn more about acculturation and English language acquisition in speakers of Asian languages in order to give a correct diagnosis and not delay critical services to Asian American youth with ASD (Cooc; 2019; Foley, 2019).

Although the majority of youth with ASD are diagnosed in early childhood, the TAY period has also been identified as an important developmental period where youth engage in adult-like challenges while simultaneously facing critical functional impairments (Benevides et al., 2020; Blumberg et al., 2013; Smith et al., 2012; Wilens & Rosenbaum, 2013). 55% of TAY-ASD were found to be using psychiatric medications and 76% of TAY-ASD had a co-occurring condition with ADHD, anxiety, or depression (Shattuck et al., 2018). For TAY-ASD, this transition period includes the challenge of finding meaningful work and leaving high school, and this can affect long-term health and quality of life.

Employment and Education Outcomes for TAY-ASD

For many youth and their families, obtaining employment or postsecondary education after high school is considered a stepping-stone to a bright future, with 75% of youth in the general population attending postsecondary education (Roux et al., 2015). For TAY-ASD and their families, there are both tangible and intangible benefits of meaningful employment, the latter including social interaction, sense of purpose and belongingness, and increased independence (Anderson et al., 2021). Recent estimates suggest that between 70,700 and 116,000 youth with ASD enter adulthood each year (Shattuck et al., 2020). Despite the increasing number of TAY-ASD, this population was less likely to have a job upon exiting high school compared to other students with disabilities. Specifically, in recent research, only 32% of TAY-ASD had a job within the first two years post-high school, 58% worked between high school and their 20s, and only 37% received any VR services or job training after high school (Newman et al., 2011; Rast et al., 2020; Roux et al., 2015). Compared to all disability groups, TAY-ASD are less likely to have paid integrated employment and are at higher risk of being unemployed compared to adults with ASD (Chen et al., 2015b; Sanford et al., 2011; Wehman et

al., 2020). This may be due to the fact that adults with ASD who were 25 and older received supported employment services more frequently than youth (Chen et al., 2015b; Roux et al., 2016).

For TAY-ASD, there is a high correlation between having engaged in paid work experiences in high school and continuing to work in their 20s, with 90% of young adults with ASD who worked for pay during high school still working in their 20s, compared to 40% of those who did not have paid work experiences in high school (Roux et al., 2015). In a parallel group randomized clinical trial that included 156 participants at various Project SEARCH sites, TAY-ASD who participated in community-based internships and received ASD-related supports (such as behavior support and social communication training) were found to have a higher likelihood of finding competitive employment within one year of graduation (73%) compared to students who did not receive these supported employment services (17%; Wehman et al., 2020). These studies demonstrate that work experience in high school pays off for TAY-ASD and the importance of including these transition goals and services in the IEP.

According to the 2015 National Autism Indicators Report, 37% of young adults with ASD in their early 20s were disconnected, meaning that that they never held employment or continued postsecondary education (Roux et al., 2015). These disconnected rates are much higher than those seen for other disability groups (such as learning disability or emotional disturbance) where the disconnection rate was less than 8%. Disconnection was associated with low income and racial/ethnic differences, with TAY-ASD from low-income homes having twice the rate of disconnection and TAY-ASD from minority families experiencing twice as much disconnection compared to those from White families. Overall, young adults with ASD were less

likely to find a job independently, less likely to seek paid employment, and took longer than any other disability group to obtain employment (Wei et al., 2018).

Outcomes for postsecondary education are also very low, with only 36% of TAY-ASD attending postsecondary education and approximately 26% of TAY-ASD not being involved with any services that would assist them in finding employment or attending postsecondary education (Roux et al., 2015; Shattuck et al., 2012). The postsecondary outcomes for TAY-ASD are the lowest among disability groups, except for TAY with IDD (Roux et al., 2015). TAY-ASD with better communication skills have been found to have a higher likelihood of attending postsecondary education programs, and for TAY-ASD who have continued postsecondary education, 70% enrolled in community college with 30% of these students focusing on science, technology, engineering, or mathematics (STEM) fields (Roux et al., 2015; Shattuck et al., 2012; Wei et al., 2015). TAY-ASD who receive postsecondary education training appear more likely to successfully exit the VR program than those who do not receive services, with postsecondary education being an indicator of higher wages (Migliore et al., 2012; Rast et al., 2020).

TAY-ASD are often underemployed and underpaid, even compared to TAY with other disabilities (Newman et al., 2011; Roux et al., 2015; Roux et al., 2020a). Roux et al. (2015) found that young adults with ASD who worked part-time made $9.11 per hour while full-time employees made even less, at $8.08 per hour, with 79% of TAY-ASD working part-time jobs and 21% of TAY-ASD working full-time jobs. This, and related findings, underscore the need for postsecondary education and training in order to obtain employment in a higher-paying position (Burgess & Cimera, 2014; Rast et al., 2020). The importance of postsecondary education is critical as adults with a high school degree or less have the highest unemployment

rates and lower pay, and a postsecondary education is correlated with higher wages and better health outcomes (U.S. Bureau of Labor Statistics, 2020; Roux et al., 2015; Rast et al., 2020).

Employment and Education Challenges for TAY-ASD

According to the 2017 National Autism Indicators Report, only 14% of adults with ASD who received developmental disability services were successfully employed, with 27% being not employed, and 54% holding unpaid jobs, thus reflecting that disparities exist for this population even in comparison to other disability groups (Baldwin et al., 2014; Hayward et al. 2019; Roux et al., 2015; Roux et al., 2017). Employment has been shown to be a health promotion intervention for TAY-ASD, leading to lower stress levels, better psychological health, and contributing to financial independence (Anderson et al., 2021; Blustein, 2008; Ditchman et al., 2018; Kaya et al., 2016; Roelfs et al., 2011). Being unemployed has shown to be correlated with higher likelihood of substance use and higher risks of stress levels and death compared to individuals who are employed, with a bigger impact observed for males than females (Ditchman et al., 2018; Henkel, 2011; Kaya et al., 2016; Roelfs et al., 2011). Despite the benefits of employment, TAY-ASD continue to struggle to find and maintain employment for reasons that are not clear, and recent studies have shown that more than 50% of young adults with ASD were not employed or attending postsecondary education two years after leaving high school (Anderson et al., 2021; Chen et al., 2015a; Shattuck et al., 2012; Wilczynski et al., 2013).

Employment and postsecondary outcomes were not found to be better in young adults with high-functioning ASD and, despite some young adults completing postsecondary education and degrees, they were still underemployed, underpaid, and working in unskilled positions (Chen et al., 2015a; Howlin, 2000; Hurlbutt & Chalmers, 2004; Larsen & Mouridsen, 1997; Mawhood & Howling, 1999; Müller et al., 2003). The challenges in being successfully employed for TAY-

ASD include factors related to social communication and other social difficulties such as the interview process, challenging behaviors, comorbidity such as anxiety, educational level including reading level, employer initiatives in hiring individuals with ASD, inadequate VR services, disability-benefits and fear of losing them, and socioeconomic status (Anderson et al., 2021; Chen et al., 2015a).

Additional risk factors that were associated with lower employment and postsecondary education participation include more significant disability, lower levels of language functioning, and coming from a low-income household. TAY-ASD from low-income homes have been found to be less likely to be engaged in ASD-related services upon leaving high school, and less likely to attend postsecondary education compared to White TAY and those from higher income homes (Chen et al., 2015a; Shattuck et al., 2012). Shattuck et al., in the 2018 National Autism Indicators Report, stated that minority TAY-ASD were more likely to be from a low-income family compared to a White youth, and 14% of TAY-ASD lived in households where other languages were spoken. Wehman et al. (2020) identified barriers to employment outcomes and creating additional internship opportunities for TAY-ASD, which included staffing, cost, time, and business participation. Predictors associated with young adults with ASD being successfully employed included family support (i.e., monetary incentives or having a contingency plan), employer supports (i.e., modification of jobs and participation in educational programs), job characteristics (i.e., fixed vs. flexible schedules), and individual-level variables (i.e., communication and interpersonal skills; Burt et al., 1991; Chiang et al., 2013).

Several additional explanations for the low employment and education rates among TAY-ASD have been identified. These include cultural and language barriers and limited interagency collaboration and planning of transition services that are customized for TAY-ASD

to successfully transition from school to the workforce (Roux et al., 2018; Wehman et al., 2020). In Tennessee's FFY 2016 WIOA state plan, VR knowledge/awareness, cultural competence, and language barriers were listed as barriers to improving employment outcomes for underserved and unserved areas, including individuals with ASD and minorities with disabilities (Roux et al., 2019). Virginia's 2020 Comprehensive Statewide Needs Assessment included Asian Americans and individuals with ASD as the most underserved and unserved population in the state. These state reports reflect the need to look at improving transition outcomes for Asian Americans and TAY-ASD, with the first step often being the IEP transition planning process for youth and their families.

According to the 2018 National Autism Indicators Report, 25% of teens with ASD did not themselves participate in IEP meetings, with 45% of parents also not participating in these critical meetings, and low-income families being less likely to participate or have transition planning initiated in a timely manner (Shattuck et al., 2018). Approximately 34% of TAY-ASD stated that they wanted to participate in the transition process more actively (Roux et al., 2015). For Asian American TAY and other minority youth, this transition planning process can be extremely stressful and confusing, as families desire to be involved in this important process but do not understand their role and feel that little information is provided on essential transition planning activities, especially if their primary language is not English (Lo & Bui, 2020). More attention is required to disseminate information to parents and the community so that Asian American youth and their families can be active participants in exploring education and employment options after high school.

Disability Legislation

State Vocational Rehabilitation Services Program

The public VR program is a state and federally-funded program that is administered by 78 state agencies across the U.S. and its territories, with federal funds providing 78.7% of the program cost and individual states providing the remaining 21.3% (RSA, 2021). For fiscal year 2021, VR operates on a budget of $3.7 billion dollars (Department of Education, 2020).

The state-federal VR program is the largest and oldest public system for individuals with disabilities who are seeking employment and can be traced back to 1920 when the Smith-Fess Act (also referred to as The National Civilian Vocational Rehabilitation Act) was passed to establish vocational assistance and services for individuals with disabilities. The Rehabilitation Act of 1973 reauthorized this act with significant revisions, establishing the VR program that is currently utilized and prioritizing the needs of individuals with the most significant disabilities to receive VR services. The state-federal VR program is the most successful program in helping individuals with disabilities achieve their employment goals and serves approximately one million individuals in the United States each year, including individuals and TAY with ASD (Chan et al., 2014). However, ASD remains an underserved group in the VR system (Roux et al., 2016).

According to the Rehabilitation Services Administration (RSA, 2021), in order to be found eligible,

> individuals must have a physical or mental impairment that results in a substantial impediment to employment and who require and can benefit from VR services to achieve employment and maximize career goals … with priority being given to individuals with the most significant disabilities if a State VR agency is unable to serve all eligible individuals.

Once an individual is determined eligible by the VR agency, an individualized plan for employment (IPE) is created. The IPE is created with and specifically for the consumer in order to meet specific employment and career goals. The VR program provides various services including vocational evaluation, counseling, job placement, rehabilitation technology, postsecondary education, and pre-employment transition services can be provided to students who are found eligible, or potentially eligible, for VR services (RSA, 2021).

Individuals with Disabilities Education Act (2004)

IDEA is a special education law that provides for free appropriate public education for all children, including those with autism. IDEA requires that youth with disabilities have a transition plan that includes goals in the areas of postsecondary education, employment, and/or independent living. The goals are specific to the student and planning should include the youth, parents, and outside agencies in addition to the school team that can determine the students' strengths and interests in preparing for employment. This transition planning should happen no later than when the TAY-ASD turns 16, although some states start at age 14. Under IDEA, transition services are essential to free and public education (OSERS, 2020).

Workforce Innovation and Opportunity Act (2014)

In 2014-2016, TAY-ASD accounted for almost 40% of TAY with IDD who received VR services (Butterworth et al., 2010; Ditchman et al., 2018; Martin et al., 2010; Roux et al., 2018, 2019). This can be attributed to the increased focus on transition-related directives for youth with disabilities, which was initiated through WIOA in 2014. WIOA, which replaced the Workforce Investment Act (1998) and amended the Rehabilitation Act of 1973, requires that VR agencies set aside at least 15% of their federal funds to offer pre-employment transition services to students with disabilities who are eligible, or potentially eligible, for VR services.

Pre-Employment Transition Services (Pre-ETS)

Under federal regulations, §361.5(51), a student with a disability is defined as follows:

- (A)(1) Is not younger than the earliest age for the provision of transition services under section 614(d)(1)(A)(i)(VIII) of the Individuals with Disabilities Education Act (20 U.S.C. 1414(d)(1)(A)(i)(VIII)); or (2) If the State involved elects to use a lower minimum age for receipt of **pre-employment transition services** under this Act, is not younger than that minimum age;
- (B)(1) Is not older than 21 years of age; and
- (C)(1) Is eligible for, and receiving, special education or related services under Part B of the Individuals with Disabilities Education Act (20 U.S.C. 1411 et seq.); or (2) Is a student who is an individual with a disability, for purposes of section 504. (Authority: Sections 7(37) and 12(c) of the Rehabilitation Act of 1973, as amended; 29 U.S.C. 705(37) and 709(c)).

Educational programs can include secondary education programs, programs through the juvenile justice system, and alternative education programs (including homeschooling; RSA, 2021; Workforce Innovation Technical Assistance Center [WINTAC], 2016). The term “youth with a disability” differs from “student with a disability” in that there is no requirement for a “youth with disability” to be enrolled in an education program and the age range is wider, as it includes youth not older than 24 years of age. In addition, the terms “Pre-ETS” and “transition services” differs in that the “Pre-ETS” are only provided to students with disabilities while the “transition services” are available to all eligible youth and an application and IPE are required. In order to implement Pre-ETS, WIOA requires interagency collaboration between state VR agencies and schools, with state VR agencies in charge of arranging the services (Taylor et al., 2019).

There are five defined Pre-ETS activities, which can be provided in a group or individual setting and within a classroom or community setting (WINTAC, 2016; RSA, 2021). The first is job exploration counseling, which can include administering vocational interest inventories and discussing the results, information about various industry sectors and occupations and the labor market, and career pathways that may be of interest of students. The second Pre-ETS is work based learning experiences, which can include job shadowing, work-site tours to learn about necessary employment skills, and includes paid or unpaid apprenticeships, internships, on-the-job trainings in the local community, and other short-term employment. The third Pre-ETS is counseling on opportunities for enrollment in comprehensive transition or postsecondary educational programs. Activities include providing information on course offerings, career options, college applications, completing the Free Application for Federal Student Aid (FAFSA), and providing additional resources that can help the individual student succeed in education and the workplace. The fourth activity is workplace readiness training to develop social skills and independent living that is necessary to prepare to employment. Some examples that cover this Pre-ETS include teaching financial literacy, communication and interpersonal skills, soft skills, job-seeking skills, and learning to travel independently and other mobility skills. The final required Pre-ETS is instruction in self-advocacy where students learn how to request accommodations or supports, learn about their rights and responsibilities in school systems and in the workplace, participating in youth leadership activities in the community, mentoring with educational staff, and looking at peer mentoring opportunities. Pre-employment transition coordination for DVR includes working with schools to coordinate the Pre-ETS, attending IEP meetings and other person-centered meetings for students with disabilities, and working with the local workforce development boards and one-stop centers to create work opportunities for

students with disabilities. The federal funds set aside for Pre-ETS under WIOA were with the hope that earlier VR services would lead to better employment outcomes, however, the impact remains unknown at this time (Roux et al., 2016). In Alabama's FFY 2018 Rehabilitation Services Administration (RSA) monitoring report, the state VR agency inquired as to whether "RSA is collecting and analyzing data on the long-term effectiveness of Pre-ETS nationally and what impact this is having on other states and the national VR program … and requested comparable data reports for all VR agencies."

Outcomes for TAY-ASD Utilizing VR Services

Poppen et al. (2017) found that TAY with disabilities who participated in a collaborative transition program and received a higher number of VR services were found to have higher rates of successful of employment outcomes. Carter et al. surveyed 596 secondary educators in Tennessee who worked with youth with disabilities to examine the perspective of educators in employment preparation, barriers to adult outcomes, familiarity with Pre-ETS, and collaborative experiences with programs that provide Pre-ETS (Carter et al., 2020). The results demonstrated that over 90% of educators agreed that students required services in each Pre-ETS area, however, up to 32% of educators could not state best practices in each area and up to 41% of educators stated that they did not have any experience implementing the Pre-ETS, with many educators having difficulty being able to tell youth and parents how to access resources or engage with local agencies (Carter et al., 2020). The educators also stated that they were unhappy with the VR collaboration and wanted more support, as many of their students with disabilities were still not receiving Pre-ETS from agencies outside of the school and these services were essential to successful employment outcomes (Carter et al., 2020).

Similarly, Awsumb et al. surveyed 164 Pre-ETS VR providers serving individuals with disabilities in Tennessee to ask their perspectives on their knowledge of Pre-ETS, employment preparation, collaborations with schools, and barriers to adult outcomes (Awsumb et al., 2020). The results demonstrated that the majority of VR service providers felt that they understood best practices in each area and could implement these services, however, they had concerns such as how to best track and report outcomes or knowledge of local agencies providing these services (Awsumb et al., 2020). Collaboration with schools remained a challenge to providing Pre-ETS as educators and VR counselors found it difficult to distinguish their roles and desired more collaboration with schools in order to prevent duplicated services (Awsumb et al., 2020). In addition, 87% of VR service providers did not feel that youth with disabilities had realistic career goals and 77% of VR service providers did not feel that youth with disabilities were prepared to successfully transition from school to the workforce. As secondary teachers and transition counselors are the main providers for the transition from school to the workforce, the results of these surveys demonstrates the need for VR and secondary schools to collaborate more extensively and to provide Pre-ETS trainings in order to improve TAY-ASD outcomes.

Over the past 10 years, only one-third of TAY-ASD have achieved a successful employment outcome and the overall percentage in employment has decreased from 67% to 62% in this time period (Burgess & Cimera, 2014; Rast et al. 2020). This is concerning as over one million youth with ASD will be entering adulthood in the next decade (Shattuck et al., 2020). Roux et al. (2019) found that the number of TAY-ASD accessing the VR program has been increasing and identified 51,436 TAY-ASD during the RSA FFY 2014-2016 who noted autism as the primary or secondary disability type and were between 14-24 years of age when they applied for VR services. However, the employment rate for this population is still lower than for

the general population and lower compared to other students with disabilities, with TAY case closures in FFY 2014-2016 depicting 35.5% of all closed cases, and TAY-ASD making up 10.9% within the TAY group (Newman et al., 2011; Roux et al., 2015; Roux et al., 2019).

Students with ASD who used VR services had a 55% employment rate upon exiting VR, with the top five VR services being assessment, counseling, job placement services, job search assistance, and information and referral (Roux et al. 2016). Based on the RSA FFY 2014 data set, the 2016 National Autism Indicators Report stated that of the 45% of the students whose cases were closed with the student unemployed, 46% were closed due to the student refusing further services for reasons unknown, while others were closed due to the student going to another agency or being unable to be located. Only 4% left due to the disability being too significant (Rout et al., 2016).

VR services that have been found to be associated with a higher likelihood for employment for TAY-ASD include transportation, assessment, counseling/guidance, job placement, on-the-job support, and job search support. TAY-ASD who received some combination of these services were more likely to be employed than those who received one isolated service (87.8% vs. 40.0%; Ditchman et al., 2018). For TAY-ASD, job placement and other job-related services were shown to be extremely effective for those who received this VR service, with TAY-ASD being four-times more likely to achieve successful employment than those who did not receive these VR services (Migliore et al., 2012; Roux et al., 2020b). However, these services were provided to TAY-ASD at lower rates compared to other disability groups. Wei et al. (2015) found that self-advocacy and self-determination instruction were associated with increased postsecondary education and employment outcomes for TAY-ASD, as it allowed youth to better advocate for accommodations and supports needed at school and in the

workplace. Roux et al. (2016) reported that, for individuals with ASD, the average age of seeking VR services was 22 years of age, with 46% being high school students at the time of applying for VR services and 94% of these receiving special education services.

VR Outcomes for TAY-ASD Based on Demographic Characteristics

Research on VR Outcomes for Asian Americans

There is very limited research looking specifically at Asian Americans in the VR system, and only one study to date in which the researchers looked at youth with cognitive disabilities in comparison to other disability groups. Indeed, a comprehensive review of the literature and consultation with faculty at U-W Madison on this search identified only five studies specifically exploring the experiences of Asian Americans in the VR system.

Using the RSA FFY 2000 data set and the 2000 U.S. Census Bureau, Kim-Rupnow et al. (2005) found that out of a total of 617,102 cases, only 8,519 cases consisted of Asian Americans and Pacific Islanders (AAPI), and that the number of AAPI VR applicants were not consistent with the AAPI population as the AAPI population was over three times larger than the percentage of VR applicants (4.5% vs. 1.3%), revealing that Asian Americans continue to be underserved in the VR system. In looking at the RSA FFY 2000 data set and conducting a chi-square test, Park and colleagues also point out that AAPI are more likely to not be accepted for VR services compared to White Americans (21.4% vs 17.0%) and less likely to be accepted and have a successful employment outcome compared to White Americans (35.2% vs. 43.2%; Park et al., 2005). Lee et al. (2020) identified 6,817 Asian American consumers out of the 589,402 consumers that left the VR system in FFY 2013, which further demonstrates the need to reach out to Asian Americans as the number has decreased from the RSA FFY 2000 data set (1.3% to 1.2%) despite the population growth rate of Asian Americans.

Utilizing the RSA data set for years 2009-2011 and a sample of 2,472 Asian Americans with a primary disability of depressive/mood disorder that were then split into two equal groups for cross-validation, Schaller and colleagues (2013) found that although Asian American females with depressive/mood disorders had slightly better employment outcomes than males (59% vs. 56% in the first group and 55% vs. 53% in the second group), the males had significantly higher weekly earnings at closure than females ($351 vs $314 in the first group and $346 vs. $300 in the second group), demonstrating that there is a gender pay gap that requires further investigation.

In reviewing the RSA FFY 2013 data set, Chun and colleagues (2018) found that predictors of positive outcomes for TAY with cognitive disabilities included receipt of job placement and on-the job support services, VR counseling and assistive technology. Services that were found to reduce employment outcomes for this population included transportation expenses, interpreter services, and augmentative skills (Chun et al., 2018). For TAY with cognitive disabilities, work experience was found to increase the likelihood of an employment outcome (Chun et al., 2018). In the most recently published study on Asian Americans in the VR system, using the RSA FFY 2013 data set, Lee and colleagues (2020) found that postsecondary education and work experience increased the likelihood for employment for Asian Americans with psychiatric disabilities, while Asian Americans who were receiving government assistance (Medicaid or Medicare) had a lower likelihood for successful employment.

These few studies on Asian Americans in the VR system point to the need to address counselor biases, language and cultural barriers, and to include additional individual and contextual variables (such as language proficiency, poverty level, gender, acculturation, and immigration status) in future studies to see if these individual-level variables impact the use of VR services and outcomes for Asian Americans with disabilities (Chun et al., 2018; Kim-

Rupnow et al., 2005); Lee et al., 2020; Park et al., 2005; Schaller et al., 2013). In the following paragraphs I review existing findings based on these variables generally for TAY, including findings for Asian Americans where available.

Gender

Overall, TAY-ASD seeking VR services have been found to be less likely to have postsecondary education and are predominantly male (83%; Roux et al., 2016; Roux et al., 2020b). TAY-ASD who are male and older are more likely to be employed upon exiting the VR system (Roux et al., 2020b). In reviewing the RSA FFY 2015-2017 data sets for employment outcomes among high school students with ASD, Roux et al. (2020b) found that the likelihood of successful employment was lower for females. The RSA-911 data set for FY 2013 also demonstrated that gender was a significant predictor of employment, with male TAY-ASD holding an associate degree or higher having the highest rates of being successfully employed (Kaya et al., 2018).

Gender has also been associated with specific VR services and employment outcomes as reflected in the FY 2011 RSA-911 data set, with male TAY-ASD having a higher likelihood of successful employment with on-the job supports (2.96 times more likely), job placement assistance (2.54 times more likely), VR counseling and guidance (2.36 times more likely), job search assistance (1.57 times more likely), and other services (1.79 times more likely) compared to male TAY-ASD who did not received these services (Sung et al., 2015). Female TAY-ASD were more likely to be employed if they received on-the-job supports (3.84 times more likely) and job placement assistance (2.33 times more likely) compared to female TAY-ASD who did not receive these services (Sung et al. 2015). Male TAY-ASD who had co-occurring anxiety or

depression were significantly less likely to be employed while no effect was noticed in female TAY-ASD (Sung et al., 2015).

In looking at predictors of participation in employment before exiting high school, female TAY-ASD were more likely to participate than males (Chiang et al., 2013). Wei et al. (2018) pointed out that although employment outcomes were higher for males, females with ASD were more likely to be employed longer and males were more likely to be fired. However, several researchers found no differences between gender and employment outcomes for TAY-ASD utilizing VR services (Ditchman et al., 2018; Kaya et al., 2016). Additional research is needed to investigate the effects of gender on employment and postsecondary education outcomes.

Low-Income Households

Being from a low-income household has been associated with a lower likelihood of holding a job or attending postsecondary education (Chiang et al., 2013; Roux et al., 2015). In a study by Chiang and colleagues (2013), household income was the biggest predictor of TAY-ASD participation in employment before leaving high school, with TAY-ASD from a high-income household being over 17 times more likely to participate in employment compared to a TAY-ASD from a low-income household. Analyses of RSA-911 data have consistently shown that TAY-ASD who receive government assistance or cash benefits are also less likely to have successful employment, and TAY-ASD receiving SSI at the time of application are less likely to receive postsecondary education training services and job services (Kaya et al., 2016; Kaya et al., 2018; Rast et al., 2020; Roux et al., 2020a; Roux et al., 2020b). Roux et al. (2016) reported that SSI was associated with lower rates of employment and weekly earnings, which may be attributed to some individuals with ASD being concerned about losing benefits and choosing to work less. Using the RSA FFY 2009 data set and a sample of 2,129 TAY-ASD, Ditchman et al.

found that SSI was the one application status difference that was discovered when comparing TAY-ASD whose cases were closed successfully and those whose cases were closed unsuccessfully after receiving VR services, with a higher proportion receiving SSI having their cases closed unsuccessfully (Ditchman et al., 2018). Specifically, 26.1% of TAY-ASD who received SSI at the time of application were employed at closure compared to 34.4% among TAY-ASD receiving SSI who did not get a job (Ditchman et al., 2018).

Severity of Disability

Based on review of the RSA-911 data, Rast et al. (2020) found that TAY-ASD who had more significant disabilities were less likely to receive postsecondary education training services through the VR system. In reviewing the RSA FFY 2015-2017 data sets for employment outcomes among high school students with ASD, Roux et al. (2020b) found that the likelihood of receiving job services is lower for students with ASD who have a significant disability. Social communication barriers remain a challenge for TAY-ASD, with higher social, communication, and functional skills being predictors of TAY-ASD participating in employment (Chiang et al., 2013; Wei et al., 2018). In addition, co-morbidity can affect employment outcomes as Taylor and Seltzer (2011) found that young adults with ASD and IDD were less likely to participate in successful employment compared to young adults with ASD (4% vs. 12%). Chiang and colleagues (2013) reported similar findings, with TAY-ASD with IDD in high school being less likely to participate in employment before exiting school compared to TAY-ASD.

Racial/Ethnic Differences

The 2016 National Autism Indicators Report stated that individuals with ASD in the RSA FFY 2014 data set who received VR services consisted of mostly White consumers (87%), along with Black, (8%) Hispanic (6%), and Other races (5%; Roux et al., 2016). Between FFY 2003-

2012, individuals with ASD (49,623) made up less than one percent of the 6,048,847 cases closed between 2003-2012 (Alverson & Yamamoto, 2017). The majority of consumers served were White (ranging from 84% in 2003 to 88% in 2012), along with Black (from 11% in 2003 to 10% in 2012), Hispanic (from 4% in 2003 to 5% in 2012), Asian American (from 3% in 2003 to 2% in 2012), American Indian/Alaska Native (from 1% in 2003 to 1% in 2012), and Native Hawaiian/Pacific Islander (from 0% in 2003 to 0% in 2012; Alverson & Yamamoto, 2017). Alverson and Yamamoto (2017) used chi-square analyses based on 10 years of RSA 911 data (FFY 2003-2012) to look at associations between individual-level variables, total services received, and employment outcomes and found that White consumers had a considerably higher likelihood of employment than Non-White consumers (Alverson & Yamamoto, 2017).

In looking at RSA-911 data set for TAY-ASD who received services during FFY 2014-2016 (35,823 individuals were included in the sample), 83% identified as White, 11% as Black, 7.5% as Hispanic, and 6% as Other (Roux et al., 2020a). Roux et al. utilized the RSA FFY 2015-2017 data set and investigated the correlation of VR services received and demographic characteristics for a sample of 18,773 TAY-ASD who were students and between 16 and 21 years of age at the time of application (Roux et al., 2020b). The independent variables were the individual-level characteristics including race, age, gender, receipt of government assistance, and levels of educations completed (Roux et al., 2020b). The dependent variables were service receipt and employment outcomes, and chi-square tests and multivariable logistic regression analysis techniques were used to look at correlations between the variables (Roux et al., 2020b). The results showed that TAY-ASD who were White had a higher likelihood of successful employment compared to Black, Hispanic, and Other races, with the likelihood of receiving job search services to be lower in Black, female, SSI/SSDI recipients, or having a significant

disability (Roux et al., 2020b). The 2015 Autism National Indicators Report stated that race/ethnicity, significance of disability, and family socioeconomic status was correlated with a lower likelihood of TAY-ASD receiving transition services in a timely matter and having successful employment outcomes, with 46% of Black TAY-ASD receiving transition planning on time compared to 60% of White TAY-ASD (Roux et al., 2015).

Using the RSA FFY 2011 data set, Kaya et al. also looked at 4,322 TAY-ASD who had a primary diagnosis of autism and were between 16 and 25 years at the time of application (Kaya et al., 2016). 79.2 % were White, 10.1% were Black, 6.0% were Hispanic, 3.6% were Asian American or Pacific Islander, and 1.1% were American Indian or Alaska Native. While the dependent variable was competitive employment, the two predictor variables were consumer demographic variables and VR services (Kaya et al., 2016). The results from the multivariate logistic regression analysis demonstrated a significant association between race/ethnicity and successful employment outcomes, with all four TAY-ASD minority groups having a lower likelihood of employment compared to White TAY-ASD, and a chi-squared statistic of 11.718, p-value less than .05, and Cramer's V of .05 (Kaya et al. 2016).

Kaya et al. examined the RSA FFY 2013 data set and identified 3,243 consumers with ASD between the ages of 19-25 (Kaya et al., 2018). This data set consisted of 78.0% White, 10.8% Black, 6.8% Hispanic, 3.5% Asian American, Native Hawaiian or Pacific Islander, and 0.9% American Indian or Alaska Native. Kaya et al. (2018) used chi-squared automatic interaction detector (CHAID) analysis, multiple logistic regressions, and t-tests to look at associations between individual-level characteristics and VR services, and competitive employment outcomes for TAY-ASD. The results indicated that education level, gender, and cash benefits were the strongest predictors of successful employment outcomes, along with job-

related VR services, and TAY-ASD who received more services had better outcomes. This study did not indicate that any associations were found between race/ethnicity and employment outcomes despite the inclusion of various racial/ethnic groups including Asian Americans.

These studies demonstrate the need to investigate the effects of individual-level variables on employment outcomes for Asian American TAY-ASD as much remains unknown for this minority population as the majority of the evaluation studies that have utilized the RSA 9-11 data set do not include Asian American specific information.

Theoretical Framework

In earlier studies in which researchers investigated how Asian Americans and TAY-ASD are faring in the VR system, there has been a lack of attention to individual-level variables that have been researched for broader populations. While research exists examining gender, severity of disability, and socioeconomic status in relation to VR outcomes, the majority of the research is specific to White male TAY-ASD, and racial/ethnic differences often do not include Asian American TAY-ASD as a separate minority group. Prior research has revealed that Asian Americans have unique contextual variables, such as cultural barriers, language barriers, and socioeconomic status that need to be examined in order to understand employment and postsecondary outcomes for this specific population (Chun et al., 2018; Lee et al., 2020). I propose to use intersectionality as a theoretical approach to examining and exploring the associations that exist between Asian American TAY-ASD, individual-level variables (such as cultural barriers, English language learners, gender, age, income status, and severity of disability), receipt of VR services, and VR outcomes in order to identify interactions that may contribute to group-based differences and outcomes in obtaining successful employment.

Intersectionality looks at the areas where race and gender meet (in addition to social categories such as sexual orientation and socioeconomic status) and is credited to Kimberlé Crenshaw who coined this term in 1989 to explain the "double-discrimination" Black females faced in society based (Cole, 2009; Crenshaw, 1989). Crenshaw explained how multiple minority statuses and social categories could be held, and how this social identity can affect individual's outcomes and experiences (Crenshaw, 1989; Cole, 2009). Intersectionality theorizes that identities can overlap and interact with one another at the micro-level and that social inequalities are experienced due to socially constructed ideas of privilege and oppression at the macro-level (Bowleg, 2012). For researchers, the intersectionality approach encourages the inclusion of groups that are oppressed and generally overlooked in research (Bowleg, 2012; Cole, 2009). The strength of using this approach is that it acknowledges that social identities are multidimensional at the micro-level, and that these micro-level characteristics interact at the macro-level (i.e., racism and poverty), which reflects the real-life experiences and opportunities of individuals with multiple statuses (Bowleg, 2012: Cole, 2009).

In a study that looked at intersectionality and disability harassment, Shaw et al. (2012) initially reviewed ADA allegation of harassment charges and investigated the interaction between demographic characteristics including gender, age, race, and disability (the independent variable) and the filing of the discrimination (the dependent variable) in 25,411 allegations. Exhaustive CHAID was used to analyze the ADA Title 1 data set with the results indicating that women had higher rates of harassment allegations than men (13% vs. 11%), and Hispanics (17%), American Indians (17%), Mixed (16%), and Asian Americans (15%) having higher harassment allegation rates than European Americans (12%; Shaw et al., 2012). In addition, individuals with behavioral impairments had the highest rate of harassment allegation compared

to other disability types (neurological, physical, and sensory impairments; Shaw et al., 2012). This study demonstrates the existence of intersectionality in the workplace and how multiple identities can play a role in experiencing harassment, with more injurious attitudes displayed toward women, ethnic/racial minority groups, and persons with various disability types. As the demographics continue to shift in the U.S. with the increasing number of Asian Americans, it is important to consider the intersectionality of race, gender, age, socioeconomic class, and disability to identify characteristics that may increase successful postsecondary and employment outcomes for TAY-ASD.

Summary

Despite the WIOA-related increased funding for TAY-ASD and VR services since 2014 (estimated to be $7.5 million dollars over a 10-year period) and recent legislation that supports employment efforts for youth in transition, employment outcomes remain low for this group compared to other disability groups (Burgess & Cimera, 2014; Roux et al., 2020a). In addition, the number of Asian American TAY-ASD is on the rise, yet little information is available on the employment and education outcomes for this group as no study has specifically examined outcomes for this population. However, students with ASD who used VR services have been found to have a higher likelihood of achieving successful employment and receiving postsecondary education services, with a 55% employment rate upon exiting the VR system, demonstrating the importance of interagency collaboration between schools and state VR agencies (Roux et al., 2016).

Given that the Asian American population experiences unique barriers, including the model minority myth affecting health services, cultural factors (such as acculturation and stigma), and language barriers, it is important to gain a deeper-level understanding of VR

services that may affect education and employment outcomes for TAY-ASD. In this study, using the PY 2017-2019 RSA-911 data set and intersectionality as a theoretical approach, I provide an exploratory analysis of the profiles and outcomes of Asian American TAY-ASD in the VR system (relative to other groups), evaluate the efficacy of VR services in promoting positive employment and educational outcomes, and identify individual-level variables that may contribute to group-based differences and outcomes.

CHAPTER THREE

Methods

The purpose of this study was to expand on this important topic of transition by utilizing VR data to investigate the associations among individual-level variables (i.e., demographic characteristics and receipt of specific VR services), and the education and employment outcomes of Asian American TAY with a primary or secondary disability of autism who applied for VR services during the 2017-2019 program year. The goals of this study were to (a) conduct an exploratory study of the profiles and outcomes of Asian American TAY-ASD in the VR system, relative to other groups; (b) evaluate the efficacy of Pre-ETS and other VR services in promoting positive postsecondary education and employment outcomes; and (c) identify contextual factors that may contribute to group-based differences and outcomes.

Design

This study used a non-experimental, quantitative, descriptive, cross-sectional, and retrospective research design. Secondary data analysis was employed using an existing database to investigate the postsecondary education and employment outcomes of Asian American TAY-ASD in the VR system. Due to technological advances, various data sets are currently available for researchers, yet secondary data analysis remains an under-utilized research design despite the advantages that it provides researchers, including being cost-effective and timesaving, as the data has already been collected (Johnston, 2014). Secondary data analysis allows researchers to further examine questions that were created in the initial data collection and the flexibility to reassess or reconceive the current research (Johnston, 2014).

Research Questions

1. What are the education and employment outcomes for Asian American TAY-ASD who are enrolled in the VR program?
    a. What were the employment outcomes of Asian American TAY-ASD in PY 2017-2019?
    b. What were the postsecondary education outcomes of Asian American TAY-ASD in PY 2017-2019?
2. How do these education and employment outcomes for Asian American TAY-ASD enrolled in the VR program compare with those for other groups?
    a. Is there a difference in competitive integrated employment among Asian American TAY-ASD and White TAY-ASD?
    b. Is there a difference in engagement in postsecondary education among Asian American TAY-ASD and White TAY-ASD?
    c. Is there a difference in competitive integrated employment among Asian American TAY-ASD and other ethnic minority TAY-ASD?
    d. Is there a difference in engagement in postsecondary education among Asian American TAY-ASD and other ethnic minority TAY-ASD?
3. What demographic characteristics and VR services are associated with successful postsecondary education and employment outcomes for Asian American TAY-ASD?
    a. What individual-level variables (i.e., demographic characteristics such as age, income, gender, cultural barriers, English language learner, and severity of disability) and VR services predicted competitive integrated employment for Asian American TAY-ASD**?**

b. What individual-level variables (i.e., demographic characteristics such as age, income, gender, cultural barriers, English language learner, and severity of disability) and VR services predicted engagement in postsecondary education for Asian American TAY-ASD**?**

Hypotheses

Based on the literature review, the following hypotheses associated with the four primary questions were tested.

Research Question 1

1. Asian American TAY-ASD have a significantly lower rate of successful employment and postsecondary engagement compared to other TAY-ASD groups.

Research Question 2

1. Compared to the White TAY-ASD group, Asian American TAY-ASD have a significantly lower rate of successful employment outcome.
2. Compared to the White TAY-ASD group, Asian American TAY-ASD have a significantly lower rate of engagement in postsecondary education.
3. Compared to other ethnic minority groups, Asian American TAY-ASD have a significantly lower rate of successful employment outcome.
4. Compared to other ethnic minority groups, Asian American TAY-ASD have a significantly lower rate of engagement in postsecondary education.

Research Question 3

1. Asian American TAY-ASD who were provided VR services such as Pre-ETS (job exploration counseling, work based learning experiences, counseling on enrollment opportunities, workplace readiness training, and instruction in self-advocacy) have a

significantly higher rate of exiting in competitively integrated employment compared to Asian American TAY-ASD who do not receive these services.

2. Successful employment outcomes differ by age, gender, income, cultural barriers, English language learner, and severity of disability for Asian American TAY-ASD.
    a. Older TAY-ASD have better employment outcomes compared younger TAY-ASD.
    b. Males have a significantly higher rate of employment compared to females.
    c. TAY-ASD from lower income households have a significantly lower rate of employment compared to higher income households.
    d. TAY-ASD who identify as having cultural barriers have a significantly lower rate of employment compared to TAY-ASD who do not identify having cultural barriers.
    e. English language learners have a significantly lower rate of successful employment compared to native English speakers.
    f. TAY-ASD with the most significant disabilities have a significantly lower rate of employment compared to TAY-ASD with less severe disabilities.
3. Asian American TAY-ASD provided VR services such as Pre-ETS (job exploration counseling, work based learning experiences, counseling on enrollment opportunities, workplace readiness training, and instruction in self-advocacy) have a significantly higher rate of engagement in postsecondary education compared to Asian American TAY-ASD who do not receive these services.
4. Postsecondary education outcomes differ by age, gender, income, cultural barriers, English language learner, and severity of disability for Asian American TAY-ASD.

a. Older TAY-ASD have better postsecondary outcomes compared to younger TAY-ASD.
b. Males have a significantly higher rate of postsecondary enrollment compared to females.
c. TAY-ASD from lower income households have a significantly lower rate of postsecondary enrollment compared to higher income households.
d. TAY-ASD who identify as having cultural barriers have a significantly lower rate of postsecondary enrollment compared to TAY-ASD who do not identify having cultural barriers.
e. English language learners have a significantly lower rate of successful postsecondary enrollment compared to native English speakers.
f. TAY-ASD with the most significant disabilities have a significantly lower rate of engagement in postsecondary education compared to TAY-ASD with less severe disabilities.

Procedures

The RSA PY 2017-2019 data set was the source of data for this study. There is no fee to use the RSA-911 data set, and it is publicly available upon request with de-identified data. The student researcher consulted with the Institutional Review Board (IRB) at the University of Wisconsin-Madison and confirmed that if the data set is publicly available and de-identified, then there is no need to submit an IRB application for review and approval, and that there were no concerns from an IRB perspective. The PY 2017-2019 data set was obtained through the University of Wisconsin - Madison, Department of Rehabilitation Psychology and Special Education with permission from Dr. Timothy Tansey. The RSA-911 data set includes data from

all 50 states, Washington, D.C., and five U.S. territories, and includes detailed information on primary and secondary disability types, demographic information, VR services provided for each consumer, public support received, weekly earnings, and types of education and employment outcomes upon exiting VR (RSA, 2017).

Sample

Participants

To answer the research questions of this study, the following criteria were utilized: (a) consumers identified as Asian in the race/ethnicity category at the time of application for VR services or initial receipt of Pre-ETS; (b) had a primary or secondary disability of autism; (c) were between the ages of 14 and 24 at time of application; and (d) applied for services and exited in PY 2017-2019 (July 1, 2017 - June 30, 2020). Two thousand seven hundred and forty participants were identified in the RSA data set.

Variables

The following definitions were obtained from the RSA-911 Case Service code book (RSA, 2017). For each categorical variable, code values are listed on the right side.

Predictor Variables

The predictor variables in this study included individual-level variables and VR services received by Asian American TAY-ASD.

Individual-level Variables.

1. Age — Age was identified based on date of birth provided at the time of application. TAY-ASD between 14 and 24 years of age were included in this study.

2. Gender (1 = Male, 2 = Female)
3. Race (1 = Asian, 2 = White, 3 = Other minority groups including American Indian or Alaska Native, Black or African American, Native Hawaiian or Pacific Islander, and Hispanic or Latino)
4. Significance of disability (1 = Individual has a significant disability, 2 = Individual is most significantly disabled)

The individual is classified by the agency as an individual with a significant disability or a most significant disability. An individual with a significant disability is an individual: (a) who has a physical or mental impairment that seriously limits one or more functional capacities (such as mobility, communication, self-care, self-direction, interpersonal skills, work tolerance, or work skills) in terms of an employment outcome; and (b) whose VR can be expected to require multiple VR services over an extended period of time; and (c) who has one or more physical or mental disabilities resulting from amputation, arthritis, **autism,** blindness, burn injury, cancer, cerebral palsy, cystic fibrosis, deafness, head injury, heart disease, hemiplegia, hemophilia, respiratory or pulmonary dysfunction, intellectual disability, mental illness, multiple sclerosis, muscular dystrophy, musculoskeletal disorders, neurological disorders (including stroke and epilepsy), spinal cord conditions (including paraplegia and quadriplegia), sickle cell anemia, specific learning disability, end-stage renal disease, or another disability or combination of disabilities determined on the basis of an assessment for determining eligibility and VR needs to cause comparable substantial functional limitation.

When consumers are found eligible for DVR services, they are also assigned to a priority of service category that is based on the significance of the disability based on experiencing functional limitations in seven areas (mobility, communication, self-care, self-direction, interpersonal, work tolerance, and work skills). Individuals with functional limitations in four or more areas are defined as having most significant disabilities and are prioritized for services.

5. Low income (1 = Individual meets the definition of low income, 0 = Individual does not meet the definition of low income)

An individual is considered low income if he/she (a) receives, or in the six months prior to application to the program has received, or is a member of a family that is receiving or in the past six months prior to application to the program has received public assistance (SNAP, TANF, SSI, other State/local assistance); (b) is in a family with total family income that does not exceed the higher of the poverty line or 70% of the lower living standard income level; (c) is a youth who receives or is eligible to receive a free or reduced price lunch; (d) is a foster child on behalf of whom state or local government payments are made; (e) is a participant with a disability whose own income is at or below the poverty line but who is a member of a family whose income does not meet this requirement; (f) is a homeless participant or a homeless child or youth or runaway youth; or (g) is a youth living in a high-poverty area.

6. Cultural barriers (1 = Individual meets the definition for having cultural barriers, 0 = Individual does not meet the definition for having cultural barriers)

An individual having a cultural barrier is defined as an individual who perceives himself or herself as possessing attitudes, beliefs, customs, or practices that influence a way of thinking, acting, or working that may serve as a hindrance to employment.

7. English language learner (1 = Individual meets the definition of English language learner, 0 = Individual does not meet the definition of English language learner.

An individual is considered an English language learner if he/she is a person who has limited ability in speaking, reading, writing or understanding the English language and also meets at least one of the following two conditions (a) his or her native language is a language other than English, or (b) he or she lives in a family or community environment where a language other than English is the dominant language.

VR Services and Pre-ETS Variables.

1. Job exploration counseling (1 = Service was provided in whole or part by VR agency staff or through purchase by the VR agency, 0 = Service was not provided)

These services are intended to provide counseling and guidance to help students explore career options.

2. Work based learning experiences (1 = Service was provided in whole or part by VR agency staff or through purchase by the VR agency, 0 = Service was not provided)

Work based learning is an educational approach that uses the workplace or real work to provide students with the knowledge and skills that help them connect school experiences to real-life work activities and future career opportunities.

3. Counseling on enrollment opportunities (1 = Service was provided in whole or part by VR agency staff or through purchase by the VR agency, 0 = Service was not provided)

This includes exploration of both post-high school transition programs at institutions of higher education**,** trade and vocational schools, as well as two and four-year colleges.

4. Workplace readiness training (1 = Service was provided in whole or part by VR agency staff or through purchase by the VR agency, 0 = Service was not provided)

This refers to training designed to develop independent living and social skills necessary to be successful in the workplace.

5. Instruction in self-advocacy (1 = Service was provided in whole or part by VR agency staff or through purchase by the VR agency, 0 = Service was not provided)

This includes opportunities to learn about rights, responsibilities and how to request accommodations, services or supports that may be needed to successfully complete the transition from school to postsecondary education and/or the workforce.

6. Assessment (1 = Service was provided in whole or part

by VR agency staff or through purchase by the VR agency, 0 = Service was not provided)

This means services provided and activities performed to determine an individual's eligibility for VR services, to assign an individual to a priority category of a VR program that operates under an order of selection, and/or to determine the nature and scope of VR services to be included in the IPE.

7. VR counseling and guidance (1 = Service was provided in whole or part by VR agency staff or through purchase by the VR agency, 0 = Service was not provided)

This includes information and support services to assist an individual in exercising informed choice and is distinct from the case management relationship that exists between the counselor and the individual during the VR process.

8. Job placement assistance (1 = Service was provided in whole or part by VR agency staff or through purchase by the VR agency, 0 = Service was not provided)

Job placement assistance is a referral to a specific job resulting in an interview, regardless of whether or not the individual obtained the job.

9. Short term job supports (1 = Service was provided in whole or part

by VR agency staff or through purchase by the VR agency, 0 = Service was not provided)

This refers to support services provided to an individual who has been placed in employment in order to stabilize the placement and enhance job retention. Such services include short-term job coaching for persons who do not have a supported employment goal consistent with the employment goal on the IPE.

10. Job search assistance (1 = Service was provided in whole or part by VR agency staff or through purchase by the VR agency, 0 = Service was not provided)

Job search activities support and assist an individual in searching for an appropriate job.

11. Transportation services (1 = Service was provided in whole or part by VR agency staff or through purchase by the VR agency, 0 = Service was not provided)

Transportation means travel and related expenses that are necessary to enable an applicant or eligible individual to participate in a VR service, including expenses for training in the use of public transportation vehicles and systems.

Outcome Variables

The following two outcome variables for Asian American TAY-ASD were explored in this study.

Employment Outcome Variables.

Employment outcome at exit	(1 = Individual achieved successful employment and exited after an IPE in competitive integrated employment, 0 = Individual did not achieve successful employment after an IPE)

A successful employment outcome is defined as obtaining and maintaining part-time or full-time employment for a minimum of 90 days.

Competitive Integrated Employment. This refers to work that (i) is performed on a full-time or part-time basis (including self-employment) and for which an individual is compensated at a rate that –

(A) Is not less than the higher of the rate specified in section 6(a)(1) of the Fair Labor Standards Act of 1938 (29 U.S.C. 206(a)(1)) or the rate required under the applicable State or local minimum wage law for the place of employment;

(B) Is not less than the customary rate paid by the employer for the same or similar work performed by other employees who are not individuals with disabilities and who are similarly situated in similar occupations by the same employer and who have similar training, experience, and skills; and

(C) In the case of an individual who is self-employed, yields an income that is comparable to the income received by other individuals who are not individuals with disabilities

and who are self-employed in similar occupations or on similar tasks and who have similar training, experience, and skills; and

(D) Is eligible for the level of benefits provided to other employees; and (ii) Is at a location—

(A) Typically found in the community; and

(B) Where the employee with a disability interacts for the purpose of performing the duties of the position with other employees within the particular work unit and the entire work site, and, as appropriate to the work performed, other persons (e.g., customers and vendors), who are not individuals with disabilities (not including supervisory personnel or individuals who are providing services to such employee) to the same extent that employees who are not individuals with disabilities and who are in comparable positions interact with these persons; and (iii) Presents, as appropriate, opportunities for advancement that are similar to those for other employees who are not individuals with disabilities and who have similar positions.

Education Outcome Variables.

Engagement in postsecondary education	(1 = Individual is in a postsecondary education program that leads to a credential or degree from an accredited institution or program, 0 = Individual is not in a postsecondary education program that leads to a credential or degree from an accredited institution or program during program participation)

Consumer is enrolled in postsecondary education during VR program participation.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences software package from IBM (SPSS), Version 27. As categorical values were predicted for this study (employment and postsecondary education outcomes), descriptive statistics, chi-square tests, and logistic regression analysis were used to examine the associations between individual-level variables and VR services received, and education and employment outcomes for Asian American TAY-ASD.

Descriptive Statistics

Descriptive statistics were calculated for demographic variables and for employment and postsecondary outcomes at the time of case closure for PY 2017-2019 for the first research question. Descriptive statistics summarize the raw data collected for the study by giving the mean, median, mode, frequency, percentages, and standard deviation, and are produced by software such as SPSS to help the researcher gain a better understanding of the data (Woodrow, 2014). These statistics help to gain a better understanding of the employment and postsecondary education outcomes of TAY-ASD, and the relationship with VR services and demographic variables.

Chi-square Test of Independence

The chi-square test is a non-parametric statistic and significance test that is used to test hypotheses for categorical variables (McHugh, 2013). It is helpful in offering information on discrepancies found between the variables as well as providing information on specific categories that may account for these discrepancies (McHugh, 2013). Assumptions of the chi-square analyses include (a) data in the cells should be frequencies, (b) the categories of the variables are mutually exclusive, (c) each subject contributes to one cell in the chi-square, (d) the

variables consist of two or more independent groups, (e) variables are measured at an ordinal or nominal level, and (f) at least 80% of the cells should have expected frequencies of 5 or greater (McHugh, 2013). The RSA data set consists of cases from mutually exclusive responses that contribute one cell to the chi-square. The sample also consist of independent study groups with variables measured as categories (race and ethnicity, employment, and education outcomes) and the sample size from the RSA data set exceeds the minimum requirement required for this chi-square analyses.

Four chi-square tests were conducted to test the hypothesized relationships between variables in the second research question, including to investigate: (a) whether there was a statistically significant difference among Asian American TAY-ASD and White TAY-ASD in employment and education outcomes, and (b) whether there was a statistically significant difference among Asian American TAY-ASD and other ethnic minority TAY-ASD groups in employment and education outcomes. The null hypothesis for these tests was that there was no statistically significant difference in education and employment outcome among Asian American and White TAY-ASD and among Asian American and other ethnic minority TAY groups. The alternative hypothesis was that there was a statistically significant difference among Asian American and White-TAY in education and employment outcomes, and that there was a statistically significant difference among Asian American and other ethnic minority TAY groups.

Logistic Regression

Logistic regression analysis was conducted to answer the third research question, investigating associations and hypotheses about the relationship between the independent and dependent variables. This was an appropriate test for this study as logistic regression can be used to explore the relationship between independent variables that are categorical and quantitative

and a dichotomous categorical dependent variable (Seltman, 2018). Logistic regression allows numerous independent variables to be examined at the same time and thus lowers the risk of confounding variables, which can affect the internal validity of studies (Sperandei, 2014). The logistic regression analyses demonstrated whether there was a statistically significant association between the predictor and outcome variables, with the odds ratio statistic determining the strength of the association (Sperandei, 2014).

Assumptions for logistic regression analyses include (a) multicollinearity should not exist, (b) no specification errors meaning that relevant predictors are included and irrelevant ones are excluded, and (c) the independent variables need to be measured at the summative response scale, interval, or ratio level (dichotomous variables are accepted; Meyers et al., 2006). With respect to multicollinearity, the tolerance statistics are presented in Table 3.1. In general, a tolerance of less than 0.1 is indicative of a multicollinearity issue while a score that is around 1 indicates that there is little threat of multicollinearity (Hair et al., 2010; Senaviratna & Cooray, 2019). The tolerance statistics for each value ranged from .340 to .990 and indicated that there is little correlation between the variables. In addition, multicollinearity was examined using variance inflation factors (VIF). Hair et al. (1995) suggested that values over 10 demonstrate multicollinearity, while other researchers have claimed that VIF values should not be above 2.5 for weaker models (Senaviratna & Cooray, 2019). The VIF values for the logistic regression analyses was under 10 and ranged from 1.010 to 2.937 (two values were over 2.5). The small VIF values indicated very low correlation among the independent variables. With respect to specification errors, individual-level characteristics and VR services were considered and selected as relevant predictors for the logistic regression analyses. Finally, all independent

variables were measured as dichotomous or ratio level in this study and classified as continuous or categorical variables.

Table 3.1

Multicollinearity Statistics

Variables	**Tolerance**	**VIF**
Age	.882	1.134
Gender	.990	1.010
Cultural barriers	.877	1.140
English language learner	.900	1.111
Income	.881	1.135
Significance of disability	.966	1.035
Job exploration counseling	.415	2.411
Work based learning experience	.597	1.674
Counseling on enrollment opportunities	.376	2.657
Work readiness training	.435	2.299
Instruction on self-advocacy	.340	2.937
Job search assistance	.843	1.186
Job placement assistance	.816	1.226
VR counseling and guidance	.942	1.062
Transportation services	.922	1.084
Assessment	.949	1.054
Short term job supports	.845	1.184

In this study, there were two options pertaining to the dependent variables - employment and postsecondary outcomes. Regarding the employment outcome variable, the participant exited with a successful employment outcome in competitive integrated employment after an IPE or did not exit with a successful outcome after an IPE. Regarding postsecondary degree attainment, the participant engaged in postsecondary education that led to a credential or degree from an accredited institution or program while receiving VR services or did not engage in postsecondary education while receiving VR services.

For the third research question, four logistic regression models were fitted to test the relationship of 22 predictors with the outcomes of exiting in competitive integrated employment and engagement in postsecondary education. In looking at successful employment outcomes, two logistic regression models were used, as presented in Table 3.2. The first model included individual-level characteristics of Asian American TAY-ASD (age, gender, income, cultural barriers, English language learner, and severity of disability) as predictors and successful employment as the outcome variable. The second model added VR services (job exploration counseling, work based learning experiences, counseling on enrollment opportunities, workplace readiness training, instruction in self-advocacy, assessment, VR counseling and guidance, diagnosis and treatment of impairment, job placement assistance, short term job supports, job search assistance, other services, transportation services, job readiness training, miscellaneous training, information and referral services, and on the job training) as predictors while controlling for the effects of the individual-level characteristics.

Table 3.2

Logistic Regression Equations for Question 3a

Model	Regression Equation
1.	*p^ (competitive integrated employment=1) = β_0 + age + male + low income + cultural barriers + English language learner + severity of disability*
2.	*p^ (competitive integrated employment=1) = β_0 + age + male + low income + cultural barriers + English language learner + severity of disability + job exploration counseling + work based learning experiences + counseling on enrollment opportunities + workplace readiness training + instruction in self-advocacy + assessment + VR counseling and guidance + job placement assistance + short term job supports + job search assistance + transportation services*

In looking at postsecondary enrollment, two logistic regression models were used, as presented in Table 3.3. The first model included the individual-level characteristics of Asian American TAY-ASD (age, gender, income, cultural barriers, English language learner, and severity of disability) and engagement in postsecondary education. The second model added VR services (job exploration counseling, work based learning experiences, counseling on enrollment opportunities, workplace readiness training, instruction in self-advocacy, assessment, VR counseling and guidance, job placement assistance, short term job supports, job search assistance, and transportation services) while controlling for the effects of the individual-level characteristics.

Table 3.3

Logistic Regression Equations for Question 3b

Model	Regression Equation
1.	*p^ (engagement in postsecondary education=1) = β_0 + age + male + low income + cultural barriers + English language learner + severity of disability*
2.	*p^ (engagement in postsecondary education=1) = β_0 + age + male + low income + cultural barriers + English language learner + severity of disability + job exploration counseling + work based learning experiences + counseling on enrollment opportunities + workplace readiness training + instruction in self-advocacy + assessment + VR counseling and guidance + job placement assistance + short term job supports + job search assistance + transportation services*

For both models, predictor variables included (a) receipt of the following VR services as a binary (received/not received) variable: Job exploration counseling, Work based learning experiences, Counseling on enrollment opportunities, Workplace readiness training, Instruction in self-advocacy, Assessment, VR counseling and guidance, Job placement assistance, Short term job supports, Job search assistance, and Transportation services; and (b) individual-level variables, including age (TAY-ASD between 14 and 24 years of age), gender (0 = Male, 1 = Female), significance of disability (0 = Individual has a significant disability, 1 = Individual has most significantly disability), income (0 = Individual meets the definition of low income, 1 = Individual does not meet the definition of low income), cultural barriers (1 = Individual meets the definition for having cultural barriers, 0 = Individual does not meet the definition for having cultural barriers), and English language learner (1 = Individual meets the definition of English language learner, 0 = Individual does not meet the definition of English language learner).

CHAPTER FOUR

Results

The purpose of this study was to investigate the associations among individual-level variables (i.e., demographic characteristics and receipt of specific VR services), and the education and employment outcomes of Asian American TAY with a primary or secondary disability of autism. Descriptive statistics (including chi-square analysis) and logistic regression analyses were used to examine the research questions.

Descriptive Analysis

Sample Characteristics

The sample for this study consisted of 2,740 Asian American TAY-ASD as shown in Table 4.1. These youth represented approximately 3.5% of the 77,396 TAY-ASD consumers in the PY 2017-2019 RSA data set. The following criteria were utilized to select the sample: (a) consumers identified as Asian in the race/ethnicity category at the time of application for VR services or initial receipt of Pre-ETS; (b) had a primary or secondary disability of autism; (c) were between the ages of 14 and 24 at time of application; and (d) applied for services and exited in PY 2017-2019 (July 1, 2017 - June 30, 2020).

The mean age at the time of application was 20 years old (19.62). Two thousand two hundred and thirty-three consumers (81.5%) identified as male, 500 consumers (18.2%) as female, and seven consumers (0.3%) did not self-identify. Approximately 30% of participants identified as being low income (30.2%). 81.4% identified as having a significant disability. One thousand and thirty-seven consumers (37.8%) exited in competitive integrated employment while 332 (12.0%) were enrolled in postsecondary education. In terms of the type of recognized

credential attained during their time in VR or within one year of exit, 15 consumers (0.5%) received a postsecondary diploma or equivalency (associate's, bachelor's, or graduate degree).

9.2% of Asian American TAY-ASD consumers identified as having cultural barriers to employment while 9.6% of participants identified as being an English language learner. These are higher rates compared to the White TAY-ASD consumers where 3.3% of consumers identified as having cultural barriers to employment and 5.9% identified as being an English language learner. The rates are also higher compared to Other minority TAY-ASD where 6.4% identified as having cultural barriers to employment and 8.2% identified as being an English language learner.

Table 4.1

Frequency and Percentage of TAY-ASD in PY 2017-2019

Race/Ethnicity	***n***	**%**
American Indian or Alaska Native	1,442	1.9%
Asian American	2,740	3.5%
Black or African American	10,202	13.2%
Hispanic or Latino	7,838	10.1%
Native Hawaiian or Pacific Islander	451	0.6%
White	64,380	83.2%

The number of Asian American TAY-ASD exiting the VR system each quarter and program year is shown in Table 4.2. The number of consumers exiting has increased over the years from 184 participants in the first quarter of program year 2017 (July 1, 2017 – September

30, 2017) to 278 participants in the second quarter of program year 2019 (October 1, 2019 – December 31, 2019), with an average increase per quarter of 10.4%. The last two quarters (January 1 – June 30, 2020) reflect significantly lower exit rates, and it should be noted that the first case of COVID-19 in the United States was reported in January 2020 and led to many VR and educational services being significantly disrupted.

Table 4.2

Frequency and Percentage of Asian American TAY-ASD VR Exit Rates in PY 2017-2019

Program Year and Quarter	***n***	**%**
2017 – Q1	184	6.7
2017 – Q2	184	6.7
2017 – Q3	242	8.8
2017 – Q4	214	7.8
2018 – Q1	244	8.9
2018 – Q2	252	9.2
2018 – Q3	258	9.4
2018 – Q4	241	8.8
2019 – Q1	272	9.9
2019 – Q2	278	10.1
2019 – Q3	225	8.2
2019 – Q4	146	5.3
Total	2,740	100.0

In reviewing the Pre-ETS that were provided to Asian American TAY-ASD consumers through VR agency staff or VR agency purchase, Table 4.3 shows that consumers most frequently received work based learning experiences (7.3%), job exploration counseling (7.2%), or work readiness training (6.9%). A relatively smaller percentage received instruction on self-advocacy (4.6%) or counseling on enrollment opportunities (4.2%). These rates are, overall, lower compared to the rates at which White TAY-ASD consumers received work based learning experiences (8.9%), job exploration counseling (9.5%), work readiness training (8.0%), but similar with respect to White TAY-ASD in terms of instruction on self-advocacy (4.7%) and counseling on enrollment opportunities (4.1%). Additionally, these rates are lower compared to Other minority TAY-ASD who received job exploration counseling (8.5%), work readiness training (7.8%), instruction on self-advocacy (5.0%), and similar rates to Other minority TAY-ASD in work based learning experiences (7.4%) and counseling on enrollment opportunities (4.3%).

VR services that were provided through VR agency staff or VR agency purchase are shown in Table 4.4. Over one-quarter (27.2%) of consumers received assessment services, 19.9% received job search assistance, 19.0% received job placement assistance, 17.0% received VR counseling and guidance, 14.7% received transportation services, and 11.6% received short term job supports. Fewer than 10% received job readiness training (8.2%), other services (6.0%), information and referral services (5.1%) miscellaneous training (4.5%), or diagnosis and treatment of impairment (3.7%). Finally, under 1% of the Asian American TAY-ASD received on the job training (0.9%).

Table 4.3

Pre-ETS Vocational Rehabilitation Services Provided to TAY-ASD

VR Pre-ETS	**Asian**		**White**	**Other minority groups**
	n	%	*%*	%
Job exploration counseling	196	7.2	9.5	8.5
Work based learning experience	198	7.3	8.9	7.4
Counseling on enrollment opportunities	115	4.2	4.1	4.3
Work readiness training	190	6.9	8.0	7.8
Instruction on self-advocacy	125	4.6	4.7	5.0

In comparison, 30.2% of White TAY-ASD consumers received assessment services, 17.3% received job search assistance, 16.6% received job placement assistance, 13.8% received VR counseling and guidance, 11.0% received transportation services, and 13.3% received short term job supports. Fewer than 10% received job readiness training (7.7%), other services (5.4%), information and referral services (4.8%) miscellaneous training (4.8%), or diagnosis and treatment of impairment (4.1%). Finally, under 1% of the White TAY-ASD received on the job training (0.6%).

Additionally, in comparison, 30.2% of Other minority TAY-ASD consumers received assessment services, 16.9% received job search assistance, 15.0% received job placement assistance, 13.5% received VR counseling and guidance, 14.4% received transportation services,

and 10.7% received short term job supports. Fewer than 10% received job readiness training (7.8%), other services (5.7%), information and referral services (3.8%) miscellaneous training (3.7%), or diagnosis and treatment of impairment (6.0%). Finally, under 1% of the Other minority TAY-ASD received on the job training (0.4%).

Table 4.4

Vocational Rehabilitation Services Provided to TAY-ASD

VR Service Category	**Received Services**			
		Asian	**White**	**Other minority groups**
	n	%	%	%
Assessment	745	27.2	30.2	30.2
Job search assistance	545	19.9	17.3	16.9
Job placement assistance	523	19.0	16.6	15.0
VR counseling and guidance	466	17.0	13.8	13.5
Transportation services	402	14.7	11.0	14.4
Short term job supports	319	11.6	13.3	10.7
Job readiness training	224	8.2	7.7	7.8
Other services	163	6.0	5.4	5.7
Information and referral services	140	5.1	4.8	3.8
Miscellaneous training	124	4.5	4.8	3.7
Diagnosis and treatment of impairment	100	3.7	4.1	6.0
On the job training	25	0.9	0.6	0.4

Chi-Square Analysis

Four chi-square tests were conducted to test the hypothesized relationships to investigate: (a) whether there was a statistically significant difference among Asian American TAY-ASD and White TAY-ASD in employment and education outcomes, and (b) whether there was a statistically significant difference among Asian American TAY-ASD and other ethnic minority TAY-ASD groups in employment and education outcomes.

Table 4.5 demonstrates the results of the first chi-square test in which associations among Asian American and White TAY-ASD and employment outcomes were evaluated. The chi-square test of independence showed that there was no significant association between groups on employment outcome, χ^2 (1, n = 67,120) = .406, p = .524. As the p-value is higher than the designated alpha level (.05), we fail to reject the null hypothesis and the results indicate that there is not a statistically significant association among Asian American and White TAY-ASD. This means that race/ethnicity and exit rates in competitive integrated employment are not related for Asian American and White TAY-ASD

Table 4.5

VR Exit Rates in Competitive Integrated Employment (CIE) among Asian and White TAY-ASD (N=67,120)

	Exit in CIE		**Non-CIE Exit**	
Race/Ethnicity	*n*	%	*n*	%
Asian	1,037	37.8%	1,703	62.2%
White	24,755	38.5%	39,625	61.5%
Total	25,792	38.4%	41,328	61.6%

Note. VR = Vocational rehabilitation.

Table 4.6 demonstrates the results of the second chi-square test in which associations among Asian American and White TAY-ASD and postsecondary education outcomes were explored. The chi-square test of independence showed that there was a significant association between groups on postsecondary education outcome, χ^2 (1, n = 67,120) = 33.153, $p < .001$. As the p-value is lower than the designated alpha level (.05), we reject the null hypothesis, and the results indicate that there is a statistically significant association among Asian American and White TAY-ASD. This means that there is an association among race/ethnicity and participation in postsecondary education among Asian American and White TAY-ASD.

Table 4.6

Participation in Postsecondary Education (PSE) among Asian and White TAY-ASD (N=67,120)

	Engagement in PSE		**No Engagement in PSE**	
Race/Ethnicity	*n*	%	*n*	%
Asian	330	12.0%	2,410	88.0%
White	5,688	8.8%	58,692	91.2%
Total	6,018	9.0%	61,102	91.0%

Table 4.7 demonstrates the results of the third chi-square test in which associations among Asian American and Other minority TAY-ASD and employment outcomes were examined. The chi-square test of independence showed that there was a significant association, χ^2 (1, n = 22,673) = 29.014, $p < .001$. As the p-value is lower than the designated alpha level (.05), we reject the null hypothesis, and the results indicate that there is a statistically significant

association among Asian American and Other minority TAY-ASD. This means that there is an association among race/ethnicity and exit rates in competitive integrated employment among Asian American and Other minority groups of TAY-ASD.

Table 4.7

VR Exit Rates in CIE among Asian and Other minority groups (N = 22,673)

	Exit in CIE		**Non-CIE Exit**	
Race/Ethnicity	*n*	%	*n*	%
Asian	1,037	37.8%	1,703	62.2%
Other minority groups	6,513	32.7%	13,420	67.3%
Total	7,550	33.3%	15,123	66.7%

Note. VR = Vocational rehabilitation.

Table 4.8 demonstrates the results of the fourth chi-square test in which associations among Asian American and Other minority TAY-ASD and postsecondary education outcomes were examined. The chi-square test of independence showed that there was a significant association, χ^2 (1, n = 22,673) = 16.765, $p < .001$. As the p-value is lower than the designated alpha level (.05), we reject the null hypothesis, and the results indicate that there is a statistically significant association among Asian American and Other minority TAY-ASD. This means that there is an association among race/ethnicity and participation in postsecondary education among Asian American and Other minority groups.

Table 4.8

Participation in Postsecondary Education (PSE) among Asian and Other minority groups (N = 22,673)

	Engagement in PSE		**No Engagement in PSE**	
Race/Ethnicity	*n*	%	*n*	%
Asian	330	12.0%	2,410	88.0%
Other minority groups	1,905	9.6%	18,028	90.4%
Total	2,235	9.9%	20,438	90.1%

Logistic Regression Analysis

Employment Outcomes for Asian American TAY-ASD

To answer the third research question (3a, Model 1), a logistic regression analysis was conducted to investigate the individual-level variables as predictor variables and competitive integrated employment as the outcome. The predictor variables (age, gender, cultural barriers, being an English language learner, income status, and significance of disability) were tested a priori to verify that there was no violation of the assumption of the linearity of the logit. The Omnibus Tests of Model Coefficients χ^2 (6, n = 1,779) = 50.694, $p < .001$ was statistically significant and demonstrated that there was a significant relationship between one or more of the individual-level variables and successful employment. The results of the Hosmer and Lemeshow Test, a goodness of fit test, was χ^2 (8, n = 1,779) = 4.140, p = .844. As the p-value is larger than the designated alpha level (.05) and not statistically significant, this indicates that the model is appropriate for the data set. The model explained 3.8% (Nagelkerke R^2) of the variance in

successful employment outcomes and correctly classified 55.5% of cases.

For this equation, as shown in Table 4.9, the predictor variable, age, was found to contribute to the model. The unstandardized Beta weight for the constant was B = -3.370, SE = .502, $Wald$ = 45.012, p < .001. The unstandardized Beta weight for age was B = .156, SE = .023, $Wald$ = 47.552, p < .001. The estimated odds ratio favored an increase of 17% [OR = 1.169, 95% CI (1.118, 1.222) for competitive integrated employment for every one unit increase in age.

Table 4.9

Question 3a Model 1 – Logistic Regression Analysis Result for CIE

							95% C.I. for Odds Ratio (OR)	
Variables	***B***	***S.E.***	***Wald***	***df***	***Sig.***	***OR***	***Lower***	***Upper***
Age	.156	.023	47.552	1	**.000**	1.169	1.118	1.222
Gender	-.016	.124	0.16	1	.899	.984	.771	1.256
Cultural barriers	.043	.147	.086	1	.769	1.044	.783	1.391
English language learner	-.033	.164	.041	1	.840	.967	.702	1.334
Income	.187	.105	3.183	1	.074	1.206	.982	1.482
Significance of disability	-.106	.134	.626	1	.429	.899	.692	1.170
Constant	-3.370	.502	45.012	1	.000	.034		

Note. CI = confidence interval. Nagelkerke = .038; Hosmer and Lemeshow χ^2 (8, n = 1,779) = 4.140, p =.844.

To answer the third research question (3a, Model 2), a logistic regression analysis was conducted to investigate the VR service variables (job exploration counseling, work based learning experience, counseling on enrollment opportunities, work readiness training, instruction on self-advocacy, assessment, job search assistance, job placement assistance, VR counseling and guidance, transportation services, and short term job supports) and competitive integrated employment outcomes while controlling for the individual-level characteristics of Asian American TAY-ASD. The results are presented in Table 4.10. The Omnibus Tests of Model Coefficients χ^2 (17, n = 1,779) = 276.089, $p < .001$ was statistically significant and demonstrated that there was a significant relationship between one or more of the independent variables and successful employment. The results of the Hosmer and Lemeshow Test, a goodness of fit test, was χ^2 (8, n = 1,779) = 12.924, p = .114. As the p-value is larger than the designated alpha level (.05) and not statistically significant, this indicates that the model is appropriate for the data set. The Nagelkerke R^2 coefficient was .192 which suggests that approximately 19.2% of the variance in successful employment outcomes was explained by individual-level characteristics and VR services. The model explained 19.2% (Nagelkerke R^2) of the variance in successful employment outcomes and correctly classified 55.5% of cases.

For this equation, the predictor variables job placement assistance and short term job supports, were found to contribute to the model. Age was retained as a significant predictor. The unstandardized Beta weight for the constant was B = -.963, SE = .640, $Wald$ = 2.266, p =.132. The unstandardized Beta weight for job placement assistance was B = -1.042, SE = .139, $Wald$ = 56.066, $p < .001$. The estimated odds ratio favored a decrease of 65% [OR = .353, 95% CI (.268, .463) for competitive integrated employment when job placement assistance was received. The unstandardized Beta weight for short term job supports was B = -1.579, SE = .184, $Wald$ =

73.408, $p < .001$. The estimated odds ratio favored a decrease of 79% [OR = .206, 95% CI (.114, .296) for competitive integrated employment when short term job supports were received.

Table 4.10

Question 3a Model 2 – Logistic Regression Analysis Result for CIE (Controlling for Individual-level Variables)

							95% C.I. for Odds Ratio (OR)	
VR Service Variables	***B***	***S.E.***	***Wald***	***df***	***Sig.***	***OR***	***Lower***	***Upper***
Age	.115	.025	21.451	1	**.000**	1.122	1.069	1.178
Gender	-.059	.132	.201	1	.654	.942	.727	1.221
Cultural barriers	.034	.157	.046	1	.830	1.034	.760	1.408
English language learner	-.026	.175	.021	1	.884	.975	.692	1.374
Income	.223	.114	3.803	1	.051	1.249	.999	1.563
Significance of disability	-.125	.146	.730	1	.393	.883	.663	1.175
Job exploration counseling	.444	.304	2.127	1	.145	1.558	.859	2.828
Work based learning experience	-.166	.243	.466	1	.495	.847	.527	1.363
Counseling on enrollment opportunities	.251	.409	.377	1	.539	1.286	.576	2.869
Work readiness training	-.265	.304	.757	1	.384	.767	.423	1.393
Instruction on self-advocacy	.332	.425	.609	1	.435	1.393	.606	3.204
Job search assistance	-.093	.132	.493	1	.483	.912	.704	1.180
Job placement assistance	-1.042	.139	56.066	1	**.000**	.353	.268	.463
VR counseling and guidance	.045	.142	.101	1	.751	1.046	.792	1.381
Transportation services	.146	.147	.989	1	.320	1.157	.868	1.542
Assessment	-.059	.123	.226	1	.634	.943	.740	1.201

Short term job supports	-1.579	.184	73.408	1	**.000**	.206	.144	.296
Constant	-.963	.640	2.266	1	.132	.382		

Note. CI = confidence interval. Nagelkerke = .192; Hosmer and Lemeshow χ^2 (8, n = 1,779) = 12.924, p =.114.

Education Outcomes for Asian American TAY-ASD

To answer the third research question (3b, Model 1), a logistic regression analysis was conducted to investigate the individual-level variables and participation in postsecondary education outcomes. The predictor variables (age, gender, cultural barriers, being an English language learner, income status, and significance of disability) were tested a priori to verify that there was no violation of the assumption of the linearity of the logit. The Omnibus Tests of Model Coefficients χ^2 (6, n = 1,779) = 61.609, $p < .001$ was statistically significant and demonstrated that there was a significant relationship between one or more of the individual-level variables and engagement in postsecondary education. The results of the Hosmer and Lemeshow Test, a goodness of fit test, was χ^2 (8, n = 1,779) = 6.591, p = .581. As the p-value is larger than the designated alpha level (.05) and not statistically significant, this indicates that the model is appropriate for the data set. The model explained 6.6% (Nagelkerke R^2) of the variance in successful education outcomes and correctly classified 88.3% of cases.

For this equation, the predictor variables, age, cultural barriers, being an English language learner, and significance of disability were found to contribute to the model as shown in Table 4.11. The unstandardized Beta weight for age was B = -.096, SE = .035, $Wald$ = 7.383, p = .007. The estimated odds ratio favored a decrease of 9% [OR = .908, 95% CI (.847, .974) for participation in postsecondary education for every one unit increase of age. The unstandardized Beta weight for the constant was B = -.356, SE = .788, $Wald$ = .204, p =.651. The unstandardized Beta weight for cultural barriers was B = -.604, SE = .209, $Wald$ = 8.360, p = .004. The estimated odds ratio favored a decrease of 45% [OR = .547, 95% CI (.363, .823) for participation in postsecondary education when Asian American TAY-ASD identified as having a cultural barrier. The unstandardized Beta weight for English language learner was B = .748, SE = .312,

Wald = 5.749, p = .016. The estimated odds ratio favored an increase of 111% [OR = 2.112, 95% CI (1.146, 3.892) for participation in postsecondary education when Asian American TAY-ASD identified as being an English language learner. The unstandardized Beta weight for significance of disability was B = 1.079, SE = .167, *Wald* = 41.721, $p < .001$. The estimated odds ratio favored an increase of 194% [OR = 2.943, 95% CI (2.121, 4.084) for participation in postsecondary education for Asian American TAY-ASD with the most significant disability.

Table 4.11

Question 3b Model 1 – Logistic Regression Analysis Result for PSE

							95% C.I. for Odds Ratio (OR)	
Variables	***B***	***S.E.***	***Wald***	***df***	***Sig.***	***OR***	***Lower***	***Upper***
Age	-.096	.035	7.383	1	**.007**	.908	.847	.974
Gender	-.202	.185	1.195	1	.274	.817	.569	1.174
Cultural barriers	-.604	.209	8.360	1	**.004**	.547	.363	.823
English language learner	.748	.312	5.749	1	**.016**	2.112	1.146	3.892
Income	-.086	.162	.279	1	.597	.918	.667	1.262
Significance of disability	1.079	.167	41.721	1	**.000**	2.943	2.121	4.084
Constant	-.356	.788	.204	1	.651	.700		

Note. CI = confidence interval. Nagelkerke = .066; Hosmer and Lemeshow χ^2 (8, n = 1,779) = 6.591, p =.581.

To answer the third research question (3b, Model 2), a logistic regression analysis was conducted to investigate the VR service variables (job exploration counseling, work based learning experience, counseling on enrollment opportunities, work readiness training, instruction on self-advocacy, assessment, job search assistance, job placement assistance, VR counseling and guidance, transportation services, and short term job supports) and participation in postsecondary outcomes while controlling for individual-level characteristics (age, gender, cultural barriers, being an English language learner, income status, and significance of disability) of Asian American TAY-ASD as shown in Table 4.12. The Omnibus Tests of Model Coefficients χ^2 (17, n = 1,779) = 109.898, $p < .001$ was statistically significant and demonstrated that there was a significant relationship between one or more of the independent variables and successful employment. The results of the Hosmer and Lemeshow Test, a goodness of fit test, was χ^2 (8, n = 1,779) = 7.503, p = .378. As the p-value is larger than the designated alpha level (.05) and not statistically significant, this indicates that the model is appropriate for the data set. The model explained 11.7% (Nagelkerke R^2) of the variance in successful education outcomes and correctly classified 88.3% of cases.

For this equation, along with age, cultural barriers, being an English language learner, and significance of disability, the predictor variables transportation services and VR counseling and guidance, were found to contribute to the model. The unstandardized Beta weight for the constant was B = -.722, SE = 1.024, $Wald$ = .496, p =.481. The unstandardized Beta weight for transportation was B = -.912, SE = .180, $Wald$ = 25.792, $p < .001$. The estimated odds ratio favored a decrease of 60% [OR = .402, 95% CI (.282, .571) for participation in postsecondary education when transportation services were received. The unstandardized Beta weight for VR counseling and guidance was B = -.613, SE = .186, $Wald$ = 10.882, p = .001. The estimated odds

ratio favored a decrease of 46% [OR = .542, 95% CI (.376, .780) for participation in postsecondary education when VR counseling and guidance services were received.

Table 4.12

Question 3b Model 2 – Logistic Regression Analysis Result for PSE (Controlling for Individual-level Variables)

VR Service Variables	*B*	*S.E.*	*Wald*	*df*	*Sig.*	*OR*	95% C.I. for Odds Ratio (OR) *Lower*	*Upper*
Age	-.100	.038	6.941	1	**.008**	.905	.840	.975
Gender	-.250	.189	1.739	1	.187	.779	.538	1.129
Cultural barriers	-.441	.215	4.194	1	**.041**	.643	.422	.981
English language learner	.637	.315	4.086	1	**.043**	1.891	1.020	3.506
Income	.041	.169	.058	1	.809	1.042	.748	1.451
Significance of disability	.957	.174	30.140	1	**.000**	2.605	1.851	3.667
Job exploration counseling	-.229	.447	.263	1	.608	.795	.331	1.909
Work based learning experience	.235	.374	.393	1	.531	1.265	.607	2.634
Counseling on enrollment opportunities	.521	.685	.579	1	.447	1.684	.440	6.441
Work readiness training	-.037	.435	.007	1	.933	.964	.411	2.263
Instruction on self-advocacy	.824	.729	1.278	1	.258	2.279	.547	9.504
Job search assistance	-.293	.182	2.578	1	.108	.746	.522	1.067
Job placement assistance	.020	.205	.010	1	.922	1.020	.682	1.526
VR counseling and guidance	-.613	.186	10.882	1	**.001**	.542	.376	.780
Transportation services	-.912	.180	25.792	1	**.000**	.402	.282	.571
Assessment	.126	.194	.418	1	.518	1.134	.775	1.659

Short term job supports	.467	.258	3.282	1	.070	1.595	.963	2.645
Constant	-.722	1.024	.496	1	.481	.486		

Note. CI = confidence interval. Nagelkerke = .117; Hosmer and Lemeshow χ^2 (8, n = 1,779) = 7.503, p =.483.

CHAPTER FIVE

Discussion

Despite the rapid expansion of the Asian American population in the United States over the past 20 years and the high prevalence rate of ASD in Asian American youth enrolled in special education, little is known about the postsecondary education and employment outcomes of Asian American transition-age youth with autism (TAY-ASD) in the VR system as no study has specifically reviewed this group. The purpose of this study was to utilize VR data to investigate the associations among individual-level variables (i.e., demographic characteristics and receipt of specific VR services), and the education and employment outcomes of Asian American TAY with a primary or secondary disability of autism who applied for VR services during the 2017-2019 program year. The sample for this study consisted of 2,740 Asian American TAY-ASD. These youth represented approximately 3.5% of the 77,396 TAY-ASD consumers in the PY 2017-2019 RSA data set. The total number of TAY-ASD accessing VR services has increased from the FFY 2014-2016 RSA data set in which 51,436 TAY-ASD were identified who identified autism as the primary or secondary disability and were between 14-24 years of age at the time of application (Roux et al., 2019).

Summary of Findings

Descriptive Analyses

Sample characteristics. Similar to the prior analyses of TAY-ASD groups who participated in VR services (Roux et al., 2016; Roux et al., 2020b, Wei et al., 2015), the majority of this sample were male consumers (81.5%).The mean age at the time of application was 20 years old, which was younger than that seen in prior studies that indicated that for individuals with ASD, the average age of seeking VR services was 22 years old (Roux et al., 2016). Over

one-third (37.8%) of Asian American consumers exited in competitive integrated employment, which is slightly higher than in prior research that indicated that only 36% of TAY-ASD achieved a successful employment outcome over the past 10 years through the VR system (Burgess & Cimera, 2014) while 12.0% participated in a postsecondary education program that led to a credential or degree from an accredited institution or program. Despite the fact that 332 Asian American TAY-ASD enrolled in a postsecondary education program, only 15 consumers (0.5%) attained a postsecondary diploma or equivalency while receiving VR services or within one year of exit. There is limited research on the participation and postsecondary degree attainment rates for Asian American TAY-ASD utilizing VR services, but this study indicated a low number of postsecondary degree attainment rates during participation or within one year of exit compared to engagement in postsecondary education.

The number of Asian American TAY-ASD accessing VR services increased over the data period, as indicated by an over-10% mean increase in consumers exiting VR from the first quarter of PY 2017 through the second quarter of PY 2019. However, it is important to note that there was a decline in the third and fourth quarters of PY 2019, and this can be attributed to the COVID-19 pandemic, as VR and educational services were considerably disrupted. Nevertheless, the number of Asian American VR applicants in this study are not consistent with the Asian American population (3.5% vs. 6%), which is consistent with prior research that Asian Americans continue to be underrepresented in the VR system (Kim-Rupnow et al., 2005).

These rates of participation are significantly lower compared to other groups, with the exception of the Hispanic/Latino TAY-ASD population, which was also found to be underrepresented for PY 2017-2019 relative to the representation in the U.S. population. Hispanic/Latino TAY-ASD made up 10.1% in the VR system compared to 18.3% of the U.S.

population (U.S. Census Bureau, 2019). In comparison, Black or African Americans made up 13.2% of the TAY-ASD population in the VR system and 13.4% of the population while Whites made up 83.2% of the TAY-ASD population and 76.3% of the population (U.S. Census Bureau, 2019). Likewise, American Indian and Alaska Native represented 1.9% of the TAY-ASD in the VR system and made up 1.3% of the population, while Native Hawaiian and Pacific Islander represented 0.6% in the VR system and made up 0.2% of the population (U.S. Census Bureau, 2019). Results supported that a large number of male consumers continued to be served within the TAY-ASD population.

Asian American consumers had competitive integrated employment rates that were slightly higher than the average rates found for consumers who had exited the VR system (38% vs. 36%; Burgess & Cimera, 2014). These findings also confirmed that the mean age at the time of application was younger than observed in prior studies (Roux et al., 2016), and this can likely be attributed to the effects of the WIOA and improved outreach efforts to engage youth in employment between the ages of 14-24. Similarly, the growth in the size of this population can be reflected by the passage of the WIOA, which required that VR agencies set aside at least 15% of federal funding to provide pre-employment transition services to improve educational and employment outcomes for youth with disabilities. In the present study, 77,396 TAY-ASD were identified in PY 2017-2019, which is a substantial increase from the 51,436 TAY-ASD identified in Roux et al. (2019) for FFY 2014-2016.

Additional research is needed to understand whether the substantial increase in VR consumers from FFY 2014-2016 included Asian Americans. The present findings demonstrated that Asian American TAY-ASD consumers are still underrepresented in the VR system and that, of those who were engaged in postsecondary education, only 4.5% of consumers attained a

postsecondary degree. Despite an increasing number of youth with disabilities enrolling in college, students face many challenges that can lead to them dropping out. Some of the barriers that students expressed in a study that utilized reflective journaling over a ten-week period include lack of knowledge by academic advisors, poor quality support services, and negative interactions with faculty (Hong, 2015). As the transition from high school to a postsecondary education institution can be a difficult time for numerous youth, rehabilitation counselors can encourage Asian American TAY-ASD and their families to advocate for the supports and accommodations that may be required in order to promote positive postsecondary outcomes.

Chi-square analyses. The results from the chi-square analyses demonstrated that there were no associations found between race/ethnicity and employment outcomes among White and Asian American TAY-ASD consumers in PY 2017-2019 (38.5% vs. 37.8%), which was contrary to the hypothesis that compared to the White TAY-ASD group, Asian American TAY-ASD would have a significantly lower rate of successful employment outcome. The findings differ from the, albeit limited, prior research that indicated that Asian Americans overall were less likely to have successful employment outcomes compared to White Americans when controlling for other variables outside of race/ethnicity (Alverson & Yamamoto, 2017; Kaya et al., 2016; Park et al., 2005; Wei et al., 2015). This finding is consistent, however, with research that indicates there are no associations found between race/ethnicity and employment outcomes for TAY-ASD (Ditchman et al., 2018; Kaya et al., 2018).

The results from the chi-square analyses demonstrate that there were associations found between race/ethnicity and education outcomes among White and Asian American TAY-ASD consumers in PY 2017-2019. Asian American TAY-ASD had a 12.0% participation rate in postsecondary education compared to White TAY-ASD, who had an 8.8% participation rate.

Outcomes for postsecondary education for both groups in this study remained extremely low and the rates of participation in postsecondary education were lower than in prior studies that indicated that only 36% of TAY-ASD attended postsecondary education, which was one of the lowest rates noted among disability types (Roux et al., 2015; Shattuck et al., 2012).

Contrary to the hypotheses, these findings did not provide support that Asian American TAY-ASD have lower employment and education outcomes compared to other race/ethnicity groups and in fact, White and Asian American TAY-ASD had similar outcomes in competitive integrated employment (38.5% vs. 37.8%). Compared to Other minority groups, Asian American TAY-ASD had significantly better education and employment outcomes, which may suggest improvements for this population. However, this is based on limited research as much remains unknown about Asian Americans in the VR system. For instance, despite Asian American TAY-ASD participation in postsecondary education at higher rates than other TAY-ASD groups, less than 5% of students enrolled in higher education attained degrees. Further research is necessary to investigate the barriers to attaining a postsecondary degree. In terms of employment outcomes, an observation is that successful employment is defined as employment held for 90 days. Additional research is required to examine whether Asian American TAY-ASD are able to maintain their employment beyond the minimum requirement. Although the initial obtaining of employment and participation in postsecondary education appears to be at higher rates than other minority groups, further research is needed to see whether these rates remain the same upon exiting the VR system.

Logistic Regression Analysis

The results of the logistic regression analyses conducted for Question 3a Model 1 demonstrated that the individual-level variable age was associated with competitive integrated

employment. There was a 12% increase associated with employment for every one unit increase of age for Asian American TAY-ASD. This is consistent with research that demonstrated that older TAY groups are more likely to have better employment outcomes compared to younger TAY groups (Chen et al., 2015b; Sanford et al., 2011; Wehman et al., 2020), and this can be attributed to older TAY-ASD groups being more likely to seek paid employment compared to younger groups (Wei et al., 2018). For rehabilitation counselors, it is important to keep in mind that TAY-ASD are less likely to obtain employment independently compared to other disability groups (Wei et al., 2018). The mean age of application for VR services for Asian American TAY-ASD was 20 years old, which still remains elevated considering that youth are eligible for VR services at 14 years old. Rehabilitation counselors, educators, and families should encourage youth to apply for VR services upon turning 14 in order to help youth obtain and maintain employment at an earlier age.

Contrary to the hypotheses, no other individual-level variables (i.e., gender, income, cultural barriers, English language learner, and severity of disability) were found to be associated with employment outcomes in this study. Prior research had supported that additional risk factors, including these variables, were associated with lower employment outcomes (Chen et al., 2015a; Shattuck et al., 2012; Shattuck et al., 2018), however, these studies did not look specifically at the outcomes of Asian American TAY-ASD and there are currently no studies examining the effects of individual-level variables on Asian American TAY-ASD.

Nevertheless, more research is needed to investigate these variables as, in this study, 9.2% of Asian American TAY-ASD consumers identified as having cultural barriers to employment while 9.6% of participants identified as being an English language learner. These are higher rates compared to Other minority TAY-ASD, in which 6.4% identified as having

cultural barriers to employment and 8.2% identified as being an English language learner. These findings suggest that cultural barriers and being an English language learner are important variables for this population as they are higher than other race/ethnicity groups, but there is a lack of research exploring how these variables are identified and defined by consumers and counselors.

For instance, "an individual having a cultural barrier is defined as an individual who perceives himself or herself as possessing attitudes, beliefs, customs, or practices that influence a way of thinking, acting, or working that may serve as a hindrance to employment" (RSA, 2017). Additional research is needed to understand what these attitudes, beliefs, or customs look like and what multicultural counseling skills are necessary for rehabilitation counselors to effectively work with multicultural youth and their families. English language learner is defined as "an individual … who has limited ability in speaking, reading, writing or understanding the English language and also meets at least one of the following two conditions (a) his or her native language is a language other than English, or (b) he or she lives in a family or community environment where a language other than English is the dominant language" (RSA, 2017). More research is needed to address the language barriers in applying for and receiving VR services as it is probable that Asian American TAY-ASD have little knowledge of what VR is if educators and counselors are not informing students and their families. This research allows rehabilitation counselors to disseminate information that is easily accessible for Asian American youth and their families in order to increase VR participation and improve employment outcomes.

In investigating the VR services associated with competitive integrated employment while controlling for individual-level characteristics (Question 3a, Model 2), job placement assistance and short term job supports were found to contribute negatively to competitive

integrated employment. When job placement assistance was received, there was a 65% decrease associated with competitive integrated employment. When short term job supports were received, there was a 79% decrease associated with competitive integrated employment. These findings differed from prior research that showed that job placement and on-the job support services were found to contribute to positive employment outcomes for TAY-ASD (Ditchman et al., 2018; Migliore et al., 2012; Roux et al., 2020b). However, there are some likely explanations to why these services were correlated negatively for Asian American TAY-ASD.

Job placement assistance refers to specific job services that help consumers carry out their job search such as assistance in developing a resume or practicing interview techniques, which result in an interview. This service is recorded irrespective of whether the individual obtains the job (RSA, 2017). For individuals with ASD, research has indicated that the interview step is where the hiring process frequently ends, with employers being uninformed about these employment barriers and many service providers being unsure of how to address these issues (Chang et al., 2021). A meaningful IPE plan should seek to discover the consumer's preferences and interests where rehabilitation counselors and direct support professionals spend time with consumers and their families in order to find the best fit for employment (Callahan et al., 2009; Griffin et al., 2007; Hoff et al., 2000; Luecking et al., 2004; Migliore et al., 2014).

Research has indicated that even the most acculturated Asian American parents of children with developmental disabilities have worried about insulting health professionals by questioning them, and that the silent response can be due to various factors such as not wanting to take up more of the healthcare professional's time or that there is disagreement, but families do not want to appear rude or combative (Jegatheesan, 2009). If best practices and multicultural counseling skills are not utilized then, due to cultural barriers of obeying authority figures or

language barriers where youth and their families may want to save face and not ask questions of providers and counselors, Asian American TAY-ASD may feel that they should interview for positions that they have no interest in or that their families do not support.

Short term job supports refers to support services provided to an individual who has been placed in employment in order to stabilize the placement and enhance job retention (RSA, 2017). These services are short-term and provided for individuals who do not have a supported employment goal consistent with the employment goal on the IPE. Research has shown that a directive approach compared to a non-directive approach in counseling can be effective for Asian American young adults in addressing depression symptoms, enhancing coping strategies, and increasing working alliance, which can reduce dropout rates (Pan et al. 2019). For Asian American TAY-ASD, it is likely that the short-term supports are helpful initially, but then it may be difficult for consumers to navigate and self-advocate in the workplace when the supports are discontinued, and they are no longer able to rely on direct feedback from the job coach.

Contrary to the hypotheses, no other VR services (i.e., job exploration counseling, work based learning experiences, counseling on enrollment opportunities, workplace readiness training, instruction in self-advocacy, assessment, VR counseling and guidance, job search assistance, and transportation services) were found to be associated with employment outcomes in this study. Prior research had supported that VR services that contributed to successful employment outcomes included transportation, assessment, job placement, VR counseling/guidance, and job search support (Ditchman et al., 2018), with job placement services being the best predictor for TAY-ASD (Migliore et al., 2012; Roux et al., 2020b). However, these studies have not looked specifically at VR services for Asian American TAY-ASD, with previous studies demonstrating that race/ethnicity can have a significant association with

successful employment outcomes (Kaya et al., 2016). There is a lack of research explaining the effects of VR services on employment for Asian American TAY-ASD.

The results of the logistic regression analyses conducted for Question 3b Model 1 demonstrated that age, cultural barriers, being an English language learner, and significance of disability were individual-level variables associated with engagement in postsecondary education. Contrary to the hypotheses, gender and income were not found to be associated with postsecondary outcomes. There was a 9.2% decrease associated with participation in postsecondary education for every one unit increase of age for Asian American TAY-ASD. This finding is supported by research that demonstrated that TAY-ASD who received postsecondary education training services were younger and that generally, 50% of college students who were 23 years of age of younger attained their degree within 45 months compared to 162 months for college students who were 30 years or older (NCES, 2019; Rast et al., 2020). Moreover, postsecondary attainment was a predictor for successful employment outcomes for younger TAY consumers with ADHD (16-19 years of age) compared to older TAY consumers with ADHD who utilized VR services (20-24 years of age; Glynn & Schaller, 2017). Younger age has been associated with postsecondary degree attainment so rehabilitation counselors and educators should encourage Asian American TAY-ASD to receive counseling on enrollment opportunities as this study found that only 115 consumers (4.2%) received this VR service.

There was a 45% decrease associated with participation in postsecondary education for consumers who identified as having a cultural barrier. This is consistent with research that demonstrated that females in Asian families encountered societal obstacles in accessing higher education with the patriarch often prompting decisions on career pathways for sons and daughters (Olson-Strom & Rao, 2020). For Asian American TAY-ASD, it is possible that

parents and guardians may have concerns about what supports are in place in postsecondary education compared to high school. Immigrant or low-income families may have little knowledge of the higher education system so TAY-ASD would be expected to self-advocate or navigate this process independently, which would be challenging (Olson-Strom & Rao, 2020). Additionally, research has found that college students with ASD faced more challenges than peers without disabilities in terms of relationships, bullying, academic performance, and overall health (McLeod et al., 2019). Rehabilitation counselors should work with families to identify specific cultural barriers to support postsecondary education for Asian American TAY-ASD.

Asian American TAY-ASD who were English language learners were two times more likely to engage in postsecondary education. This is supported by research that found that an increasing number of immigrant language-minorities were accessing higher education, with 24% of students enrolled being first or second-generation immigrants (Arbeit et al., 2016; Saroughi & Kitsantas, 2021). For consumers who identified as English language learners, enhanced communication skills in English have shown to greatly increase job opportunities and community participation (Pandey & Pandey, 2014). Participation in postsecondary education may be a way to enhance English skills in the hopes of improving employment outcomes for TAY-ASD. However, higher dropout rates have been observed compared to non-immigrant students, with one in eight English language learners attaining a bachelor's degree compared to one in three monolingual English speaker, and poorer mental health compared to non-immigrant students (Kanno & Cromley, 2013; Saroughi & Kitsantas, 2021; Soria & Stebleton, 2013). As this study found that almost 10% of TAY-ASD identified as an English language learner (compared to 5.9% of White TAY-ASD and 8.2% of Other minority TAY-ASD), rehabilitation

counselors should collaborate with educators and TAY-ASD in order to address college retention rates and provide supports in order to improve education outcomes.

Consumers with the most significant disabilities were almost three times more likely to participate in postsecondary education. Severity of disability has been identified as the most important predictor or receiving VR services, with individuals with more functional limitations being significantly more likely to be found eligible and placed in a higher service category (93% vs. 45%; Chan et al., 2005). In this study, 81.4% of Asian American TAY-ASD identified as having the most significant disability as determined by VR agencies. Prior research has demonstrated that youth with higher functional cognitive skills were more likely to participate in postsecondary education compared to youth with significant disabilities (Rast et al., 2020; Wei et al., 2015). However, it is important to note that the seven areas where consumers are found eligible for DVR services is not based on cognitive assessments, but rather areas of functioning in everyday life due to the disability. These areas include mobility, communication, self-care, self-direction, interpersonal, work tolerance, and work skills. Individuals have the most significant disability if a mental or physical impairment exists that seriously limits functional capacities in four or more areas in terms of an employment outcome.

For many Asian American families and especially among first and second-generation families, great value is placed on academic achievement and educational programs so there may be a perspective that participation in a postsecondary education institution is essential for TAY-ASD to have better employment outcomes and become contributing members of society as the benefits of higher education have demonstrated that a postsecondary education is correlated with higher wages and better health outcomes (U.S. Bureau of Labor Statistics, 2020; Parette et al., 2004; Roux et al., 2015; Rast et al., 2020). Research has indicated that Asian American families

felt less stigma and shame after immigrating to the U.S. as they saw a brighter future for their child with a disability with the allowance of educational opportunities that would not otherwise be available in their home country (Parette et al., 2004). The model minority stereotype may play a role in the higher engagement rate of Asian American TAY-ASD with the most significant disabilities in postsecondary education as there may be a belief from educators and rehabilitation counselors that Asian American TAY-ASD are academically successful and have fewer health concerns despite Asian American youth demonstrating higher rates of anxiety and depression compared to peers (Africa & Carrasco, 2011). For rehabilitation counselors, it is essential to be aware of implicit biases and develop multicultural counseling competencies to understand the values of Asian American TAY-ASD and their families and the role that education has played in society.

Additional research is required to investigate the outcomes for Asian American TAY-ASD who engage in postsecondary education as the low education rates of the Hmong population in California (just 55% have a high school degree or beyond; Chang et al., 2010) reveal the need to explore individual differences that attribute to the educational outcome of Asian Americans. For instance, little is known about the experiences of TAY-ASD dropping out of higher postsecondary education and more research is needed to understand college attrition rates for this population (Cage & Howes, 2020). Overall, fewer supports and services are available to TAY-ASD in postsecondary education settings compared to high school settings, and TAY-ASD students have indicated a perceived lack of understanding regarding their disability, difficulties with mental health, and feeling isolated in the postsecondary education environment (Cage & Howes, 2020; Roux et al. 2015).

In investigating the VR services associated with engagement in postsecondary education while controlling for individual-level characteristics (Question 3b, Model 2), transportation services and VR counseling and guidance were found to contribute negatively to participation in postsecondary education. When transportation was received, there was a 60% decrease associated with participation in postsecondary education. When VR counseling and guidance were received, there was a 46% decrease associated with participation in postsecondary education. Contrary to the hypotheses, no other VR services (i.e., job exploration counseling, work based learning experiences, counseling on enrollment opportunities, workplace readiness training, instruction in self-advocacy, assessment, job placement assistance, short term job supports, and job search assistance) were found to be associated with postsecondary outcomes. There is a lack of research that examines the effects of VR services on postsecondary education participation for Asian American TAY-ASD. Prior research has indicated that postsecondary education training services continues to be considerably underutilized for this population (18.3% for TAY-ASD compared to 15.3% of TAY-IDD and 32.0% for all other TAY) despite these services demonstrating positive employment outcomes (Rast et al., 2020). Rehabilitation counselors should work with educators and families to inform them of educational accommodations that are available to increase employment and education outcomes.

Transportation refers to travel and related expenses that are necessary to enable an applicant or eligible individual to participate in a VR service, including expenses for training in the use of public transportation vehicles and systems (RSA, 2017). It is possible that TAY-ASD and their families may have additional constraints (i.e., financial and/or language) if consumers cannot transport themselves. For instance, consumers and their families may find it challenging to navigate different transportation systems due to being an English language learner, which may

affect postsecondary education participation. Indeed, for Asian American with disabilities, transportation and the need for transportation expenses has previously been found to be negatively correlated with VR outcomes (Chun et al., 2018). Taking paratransit or public transportation can be associated with shame and embarrassment for the family, as it becomes apparent that families need outside assistance (Ja & Aoki, 1993; Kim et al., 2012). In addition, despite the increasing need for transportation services for individuals with disabilities, many of these transport systems remain unreliable and this can be a structural barrier for TAY-ASD enrolled in postsecondary education (Lu et al., 2017).

VR counseling and guidance refers to information and support services to assist an individual in exercising informed choice and is distinct from the case management relationship that exists between the counselor and the individual during the VR process (RSA, 2017). Research has supported the increasing need for counselors to adapt multicultural counseling skills as counselors will be working with more minority consumers in the future, and worldviews can differ even within the same race/ethnicity group (Hampton, 2000; Mahalik et al., 1999; Sue et al., 1992; Wilson et al., 2002). Depending on the severity of the disability along with the counselor's continued observations and assessment reports, it is possible that a counselor would recommend for some Asian American TAY-ASD to pursue a goal toward employment that does not include postsecondary education participation. When the working alliance has developed, rehabilitation counselors may feel more confident about involving family members and assisting Asian American TAY-ASD in exploring alternative employment goals that may better reflect the consumer's strengths and abilities.

Overall, the findings from this study indicated that rates for competitive integrated employment were the same for the White and Asian American TAY-ASD and that Asian

American TAY-ASD had higher rates of employment compared to other minority groups. Asian American TAY-ASD also had the highest rate of postsecondary education participation among all race/ethnicity groups. However, it should be noted that for all groups, there were relatively low rates overall and that further discussion is required to better understand the Asian American TAY-ASD employment and education outcomes relative to other groups.

Implications

This study can help to inform the delivery of culturally sensitive and equitable VR programs in hopes of improving outcomes for Asian American TAY-ASD. Given that there is relatively limited research on Asian Americans on employment and education outcomes in the VR system, it is essential for rehabilitation counselors to address the unique challenges for Asian American TAY-ASD, especially among minority and low-income families whose primary language is not English (Bilaver et al., 2020; Shorey et al., 2020) and to create culturally responsive and relevant plans for Asian American TAY-ASD. These challenges may include cultural and language barriers, discrimination by providers, and a lack of a support system as youth and families often navigate service systems with little family or community support (Kim et al., 2020; Shorey et al., 2020; Wei et al., 2015).

The findings in this study indicated that Asian American TAY-ASD have higher rates of cultural barriers to employment compared to other race/ethnicity groups. Rehabilitation counselors should address cultural factors by providing problem-focused and direct guidance and support for Asian American TAY-ASD (Lee et al., 2020). Fong and Tsuang (2007) pointed out that the directive approach has been shown to be successful for Asian Americans patients who are seeking help for addictions, and they prefer that physicians create a specific treatment plan for them instead of creating a plan on one’s own or deferring help. Research has indicated that

55% of TAY-ASD were found to be using psychiatric medications while 76% of TAY-ASD had a co-occurring disorder with ADHD, anxiety, or depression (Shattuck et al., 2018). These high rates indicate that rehabilitation counselors should also consider collaborating with primary care physicians as Asian Americans have been found to be more open to seeking help from primary care physicians rather than a psychiatrist as there is less stigma associated with the former, and disparities in diagnosis and accessing services related to ASD are often delayed among minority families (Fong & Tsuang, 2007; Zeleke et al., 2019). Compared to other race/ethnicity groups, Asian American TAY-ASD identify as English language learners at higher rates than other groups. Additional recommendations for healthcare providers and rehabilitation counselors include communicating in plain language and providing quality interpreters for immigrant Asian American TAY-ASD and their families (Jegatheesan, 2009).

VR services that have been identified as significantly promoting positive outcomes for TAY-ASD (i.e., job placement, transportation, VR counseling and guidance, and short term supports) have not been supported by the findings of this study and more research is necessary to support Asian American TAY-ASD in promoting positive employment and education outcomes. Rehabilitation counselors should collaborate with secondary schools to discuss essential transition planning activities with family members as Asian American parents of TAY-ASD have reported that they feel that they were not provided with this information and were dissatisfied with the postsecondary outcomes of their child, with many of them living with their parents or other relatives after high school (Kim & Morningstar, 2020).

There is a need to ensure that Asian American TAY-ASD and their families understand the concept of transition planning that includes self-determination and adult services settings (i.e., functional independent living skills, work skills, voluntary or paid job opportunities,

healthcare transition, mobility and transportation, and social and recreational opportunities). Youth and their parents should be encouraged to give input in order to create a meaningful plan as Asian American TAY-ASD and their parents may be hesitant to express their own opinions or disagree with postsecondary or employment goals publicly due to the cultural values of respecting and obeying authority figures (Kim & Morningstar, 2020; Lo & Bui., 2020). When creating a plan, it would be beneficial for rehabilitation counselors to consider the concepts of family harmony and solidarity so that the Asian American TAY-ASD can be a productive member within the family (Naegle et al., 2002). For instance, if the consumer values family involvement, then rehabilitation counselors should try to engage family members in the IEP and IPE in order to increase the consumer's participation and retention. Due to the acculturation stressors, financial and language constraints, and family life adjustment that many youth with ASD and their families encounter, recommendations include a need for effective translation services and more local accessible resources, such as a community directory in numerous languages so families can locate available services for TAY-ASD while in school and after graduation (Kim et al., 2020; Lo & Bui, 2020; Padden & James, 2017; Shorey et al., 2020). Community asset mapping may be another invaluable tool to find and offer information about a community's assets by including individuals, associations, and local organizations in the hopes of improving VR participation and employment outcomes for Asian American TAY-ASD (Short, 2021).

Limitations

There were several limitations associated with this study. First, it utilized only three years of the RSA data set (PY 2017-2019) and only closed cases were reviewed. Another limitation of using this data set is that despite being found eligible for DVR services, consumers are also

assigned to a priority of service category that is based on the significance of the disability (in looking at the functional limitations in areas of mobility, communication, self-care, self-direction, interpersonal, work tolerance, and work skills), with the individuals with the most significant disabilities (if there are functional limitations in four or more areas) being placed in the highest and first category. This order of selection (OOS) can determine which service categories are open or closed, and this can vary between states with some states being open only to individuals in the first category with eligible consumers in lower categories being placed on a waiting list to receive VR services. This means that not all Asian American TAY-ASD, despite being found eligible to receive VR services, were able to participate in VR services as each state VR agency determines the OOS. Moreover, the number of participants for the logistic regression analyses were reduced as this study utilized listwise deletion to address missing data.

Another limitation was that, due to limited coding designations in the data set, multi-racial individuals were not included in the analysis, resulting in a presumption of homogeneity of racial/ethnic groups despite the growth of mixed-race individuals in the U.S. population. Related limitations include that the data set did not capture the consumer's age at diagnosis, or whether the ASD diagnosis was medical or educational. In addition, as a successful employment outcome is defined as obtaining and maintaining part-time or full-time employment for a minimum of 90 days in a competitive integrated employment, employment continuing beyond this minimum number of days is not indicated. Furthermore, the RSA data set is based on consumer responses that counselors manually input so response bias and counselor error input are additional limitations of using this data set. Finally, personal experiences and consumer input are not reflected in the RSA data set so there may be additional barriers to receiving VR services that are not reflected in employment and postsecondary education outcomes.

Directions for Future Research

The lack of existing data makes it difficult for state and federal programs to meet the needs of the members of this growing population or to establish goals to increase services and positive outcomes for this population. The lack of research highlights the need to conduct critically sensitive research for all minority groups in the U.S. especially within the Asian American population (Hasnain et al., 2020). Findings from this study demonstrated that individual-level variables and VR services significantly impact Asian American TAY-ASD. Age, job placement assistance, and short term job supports were shown to be significant predictors for competitive employment outcomes. Age, cultural barriers, being an English language learner, significance of disability, transportation services, and VR counseling and guidance were shown to be significant predictors of participation in postsecondary education.

Additional research is necessary to confirm this study's findings. For example, additional VR services can be included that may be found to be associated with education and employment outcomes. A larger sample size may be helpful investigating the effects of Pre-ETS on Asian American TAY-ASD, as fewer than 10% of students received these services. The lack of Pre-ETS delivered underscores the need to better implement these services by collaborating with VR agencies, educators, and families (Awsumb et al., 2020; Carter et al., 2020) and adult service settings (i.e., residential transition, transportation, and healthcare transitions). Future studies can include a qualitative component to look further into specific cultural barriers and additional barriers to successful employment and education outcomes.

Although employment rates have stayed steady over the past decade for the Asian American population, current unemployment rates are at all-time highs for Asian Americans, with the COVID-19 pandemic significantly impacting Asian American businesses this past year

(Mar & Ong, 2020), which may impact consumers and their families. Additionally, the recent acts of anti-Asian violence have heightened the need to investigate the health effects on Asian Americans who have experienced such incidents as there is little research that examines how anti-Asian racism affects the well-being of youth, families, and the community (Chen, 2021). As the Asian American population has grown significantly between 2000 and 2019 (95%; Budiman & Ruiz, 2021), more funding and recruitment is needed for Asian American research as quality data for this population is lacking, and underrepresentation continues to exist. This is evidenced by the National Institutes of Health (NIH) funding where Asian Americans (along with Native Hawaiian and Pacific Islanders) represented just 0.17% of the total NIH budget between 1992-2018 (Chen, 2021; Đoàn et al., 2019) and the PY 2017-2019 RSA-911 data set where the number of Asian American TAY-ASD applicants was significantly lower compared to the Asian American general population (3.5% vs. 6%).

Further research is necessary that includes the perspectives of Asian American TAY-ASD and their families in navigating the diagnosis of ASD and related services (Kim et al., 2020) as underserved and minority communities have revealed delayed diagnosis and services compared to White children (Zeleke et al., 2019). There is a need for culturally-sensitive outreach efforts to address health disparities for Asian American TAY-ASD and to create community partnerships to disseminate information to youth and their families, medical professionals, interpreters, the Asian American community, educators, VR counselors, and the general public. The findings of this study also indicate a need to further explore Pre-ETS to see how Asian American TAY-ASD are receiving these services and to what extent they are accessible for youth and their families. Finally, this study offers support that the intersectionality of race, age, cultural barriers, being an English language learner, and severity of disability needs

to be further examined to identify characteristics that may increase successful employment and postsecondary outcomes for TAY-ASD (Shattuck et al., 2020).

Conclusion

This study provided preliminary evidence of VR outcomes for Asian American TAY-ASD and the integration of the intersectionality framework. Findings from this study offer support for the role of individual-level characteristics and VR services as predictors of successful employment and education outcomes for Asian American TAY-ASD. The results demonstrated that age, cultural barriers, being an English language learner, significance of disability, job placement assistance, transportation services, and short term job supports were significantly associated with competitive integrated employment and participation in postsecondary education. This study demonstrates the existence of intersectionality in the VR system and how multiple identities can play a role in education and employment outcomes, with more challenges observed for Asian American TAY-ASD who identified as having a cultural barrier and thus perceiving themselves to possess attitudes and beliefs that influence a way of thinking that can interfere with employment (RSA, 2017). As the demographics continue to shift in the U.S. with the increasing number of Asian Americans and the rise of xenophobic acts against Asian Americans (Le et al., 2020), it is important that VR agencies and rehabilitation counselors consider the unique barriers that Asian American TAY-ASD face in seeking employment and engaging in postsecondary education in order to improve participation rates and increase VR outcomes. Rehabilitation counselors should also consider stereotypes and microaggressions that consumers may encounter in society as discrimination can have significant effects on the physical and psychosocial well-being of Asian American youth with disabilities.

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