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Interventions and Community Models That Lead to Successful Long-term Meaningful Competitive Integrated Employment for Individuals With Autism Spectrum Disorders: a Literature Review

Eileen Annette Baker
Bethel University

INTERVENTIONS AND COMMUNITY MODELS THAT LEAD TO SUCCESSFUL LONG-TERM MEANINGFUL COMPETITIVE INTEGRATED EMPLOYMENT FOR INDIVIDUALS WITH AUTISM SPECTRUM DISORDERS: A LITERATURE REVIEW

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Eileen Baker

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Thesis Advisor: Amie E. Lorence Grubidge, M.A.

Program Director: Lisa Silmser, Ed. D.

Acknowledgments

I started this journey to finally pursue a Master's in Education after putting off what I perceived as something beyond my capabilities. In truth, I was intimidated by the final thesis project, thinking that I would not be able to accomplish such a feat. Fortunately, it was something I was not willing to leave unfulfilled.

The world has changed since I began this pursuit last July 2019. This program has been a source of comfort as I adjusted to the Covid-19 imposed changes in my role as a Work Experience Coordinator. While I felt less useful as a teacher, I felt empowered in my role as a graduate student. I was able to devote much time to my studies that became sharply focused on improving my students' lives. This thesis has been an amazing process of discovery that was fueled by a passion for learning new things and researching best practices.

This experience at Bethel has been a blessing, and I am grateful to all the stellar professors from whom I had the privilege of learning. I am so thankful for the guidance and support from Dr. Lisa Silmser and Amie Lorence Grubidge, who made what I had once feared a smooth, enjoyable process.

I was never alone as I tackled each challenge because of supportive cohort members, professors, and beloved cats who snuggled and slept on my books and papers. I also discovered how much I learned years ago from my husband, an English major, and an exceptional writer who taught me how to edit my writing.

Abstract

This paper examines interventions and community models that lead to successful long-term, meaningful integrated employment for individuals with ASD. The literature review outlines the barriers to successful employment experienced by individuals with ASD, followed by strategies for success. The author suggests that promising research-based programs and interventions should be further examined through longitudinal studies and then implemented in secondary, post-secondary, and worksites. The current paucity of research addressing interventions and programs focused on adolescents and adults with ASD, combined with the high rate of unemployment and underemployment in adults with ASD, creates a necessity that sufficient studies be commenced.

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CHAPTER I: INTRODUCTION

Today, 1 in 59 children is diagnosed with ASD, a 15% increase over 2012, and the highest prevalence the Centers for Disease Control and Prevention (CDC) has reported since it began tracking the disorder in 2000 ("Data & Statistics," 2020). A meta-analysis completed by Loomes, Hull, and Mandy (2017), determined that the ratio of male to female children meeting criteria for ASD is 3:1. Much attention is paid to early interventions and supports for children with ASD, yet as they age, supports often decrease or disappear, and individuals with ASD and their families often struggle with accessing necessary accommodations and supports during the post-secondary transition period and beyond (Shattuck et al., 2012). A study conducted by Shattuck et al. (2012) found that the two years following high school are a critical period that require adequate planning so that individuals with ASD are actively involved in meaningful pursuits including employment. Further, the Individuals with Disabilities Education Act (IDEA) PL 108-446, Section 1400(c)(14) states: "As the graduation rates for children with disabilities continue to climb, providing effective transition services to promote successful post-school employment or education is an important measure of accountability for children with disabilities" (34 CFR § 300.43).

IDEA defines transition services as:

> (34) Transition services The term "transition services" means a coordinated set of activities for a child with a disability that— (A) is designed to be within a results-oriented process, that is focused on improving the academic and functional achievement of the child with a disability to facilitate the child's

> movement from school to post-school activities, including post-secondary education, vocational education, integrated employment (including supported employment), continuing and adult education, adult services, independent living, or community participation; (B) is based on the individual child's needs, taking into account the child's strengths, preferences, and interests; and (C) includes instruction, related services, community experiences, the development of employment and other post-school adult living objectives, and, when appropriate, acquisition of daily living skills and functional vocational evaluation (34 CFR § 300.43).

Multiple studies have documented that fewer than 50% of individuals with ASD are employed in any kind of job (Gotham et al., 2015; Hendricks, 2010; Shattuck et al., 2012). Chan et al. (2017) state that 14.3% of adults with ASD and intellectual disabilities achieve sustained employment. A longitudinal study conducted by Howlin (2013) found that only 53.4% of young adults with ASD had ever had paid work outside the home following high school, the lowest rate among the twelve disability groups. Additionally, adults with ASD are often in jobs that pay low-wages and receive limited hours. Such outcomes are unacceptable for the workers with ASD, their families, and the economy. We need to do better and increase the investment in our ASD population so that a better quality of life will be attainable.

Definitions

A job accommodation is defined by the Department of Labor as:

> An adjustment to a job or work environment that makes it possible for an individual with a disability to perform their job duties. Accommodations may include specialized equipment, modifications to the work environment or adjustments to work schedules or responsibilities
>
> ("Job Accommodations," n.d., p. 5).

Further, Under Title I of the Americans with Disabilities Act (ADA) accommodations may include:

> Modifications to the physical work environment, or to the way a job is usually performed, so an individual with a disability can perform the essential functions of that position
>
> ("Job Accommodations," n.d., p. 5).

Though several articles use the term "Asperger's Disorder," it should be noted that in 2013, the DSM-V replaced this with the umbrella diagnosis of autism spectrum disorder (ASD).

According to Wilczynski, Trammell, and Clarke (2013), "Supported employment involves a person with a disability working in a community-based setting with the range of supports including, but not restricted to, job development, job coaching, job retention, transportation, and individualized supports (e.g., assistive technology [AT])" (p. 877).

Competitive employment involves a person with disabilities being paid at least minimum wage, or an equitable wage to employees without disabilities.

History of The Workforce Innovation and Opportunity Act

The Workforce Innovation and Opportunity Act (WIOA) signed into law in 2014, was finalized in 2016 as an amendment to the Rehabilitation Act of 1998. The updated WIOA outlined a legal framework of state requirements for Vocational Rehabilitation (VR) agencies that provide people with and without disabilities services to attain and maintain employment (Roux, Garfield & Shattuck, 2019).

WIOA plan in Minnesota

A study conducted by Roux, Garfield, and Shattuck (2019) focused on state WIOA plans to identify the state-level differences in VR policies and practices utilized to address the needs of transition-age youth and adults with ASD. Minnesota's VR agency was included in this study as one of six states citing a need for long-term supported services for individuals with ASD. Additionally, Minnesota is one of seven states that uses ASD specialists (Roux, Garfield & Shattuck, 2019). Twelve states, including Minnesota, identified the following barriers to better serving individuals with ASD:

> Barriers included: lack of staff training and expertise to serve those with autism, inadequate resources for supporting individuals with multiple or complex disabilities (e.g., visual impairment and autism), lack of availability of supported employment for this population, a lack of service providers to meet increasing demands, and need for education of employers about hiring and accommodating people with autism (Roux, Garfield & Shattuck, 2019, p. 293).

Shattuck and Roux (2014) suggest that states create a common way of recording what innovations prove useful and share successful vocational service models at the community level to improve employment outcomes for individuals with ASD. Roux,

Garfield, and Shattuck (2019) identified the need to develop innovations focused on communicating available VR services for individuals with ASD to increase the participation rate for this under-served population. While the WIOA addresses the VR needs of individuals with ASD and visual impairment in several references, fewer address the higher occurrence of ASD with mental health comorbidities (Roux, Garfield & Shattuck, 2019). Additionally, the authors found that "No outreach strategies were tailored to reaching African American, Hispanic, or low-income" (Transition Age Youth) or adults with autism (Roux, Garfield & Shattuck, 2019, p. 295). Further, the authors emphasized a priority to establish partnerships with employers:

> This approach is vital for building capacity, as the ability to provide job opportunities to match the range of skills and interests inherent in the autism spectrum is contingent upon having a wide variety of job opportunities available via partnerships with community employers (Roux, Garfield & Shattuck, 2019, p. 295).

Lastly, the use of Assistive Technology (AT) to support individuals with ASD was not widely addressed in state plans despite evidence showing how AT increases production rates, organization, multiple-step task completion, work accuracy and quality, interviewing skills, and time management (Gentry et al., 2015; Morgan et al., 2014; Smith et al., 2014; Strickland, Coles, & Southern, 2013; Wehman et al., 2012a; Whetzel, 2013).

The WIOA addresses how the state VR agencies are to provide Pre-Employment Transition Services (Pre-ETS). Carlson, Thompson, and Monahan (2019) analyzed 38

state Pre-ETS policies. The authors found some consistencies in how states followed policy and specific policy areas that states did not address:

> Although state policies consistently addressed the topics of purpose, skills/activities/services, group or individual services, location of services, and responsible personnel the number of states addressing each topic varied widely. Most notably, very few states described location of services and responsible personnel (Carlson, Thompson, and Monahan, 2019, p. 56).

Minnesota was one of 37 states that described policies addressing Pre-ETS required services that included: "job exploration counseling, work-based learning experiences, post-secondary education counseling, workplace readiness training, and instruction in self-advocacy" (Carlson, Thompson, and Monahan, 2019, p. 47).

A literature review will seek to answer the question: What interventions and community-based vocational training models for youth and adults with ASD, with and without an intellectual disorder, have evidence-based success in achieving successful long-term meaningful competitive integrated employment? Subtopics will include business-led internship models, positive behavior supports, assistive technology, staff training, and interventions.

CHAPTER II: LITERATURE REVIEW

Literature Search Procedures

For this thesis, searches of Education Journals, ERIC, Teacher Reference Center, Academic Search Premier, and EBSCO MegaFILE were conducted for publications from 1997-2020. This list was narrowed by only reviewing published empirical studies from peer-reviewed journals that focused on the guiding question. Studies included community-based vocational training programs, effective training for employees with autism spectrum disorder (ASD), long-term supports for employees with ASD, behavior interventions for employees with ASD, and secondary planning for individuals with ASD. The keywords used in these searches included "long-term employment," "successful programs," "successful interventions," "long-term support," "post-secondary planning," "adults with ASD," and "youth with ASD."

This chapter aims to review the literature on the unique needs that employees with ASD present and the successful programs, strategies, and interventions that promote long-term community employment in twelve sections, first addressing barriers and then strategies for success.

Barriers to Successful Employment

Social Communication

Given that individuals with ASD experience difficulties with social interaction, this is another component that impacts successful, long-term employment. Communication difficulties in a work setting include trouble understanding multiple-step directions, interpreting facial expressions and tone of voice, asking excessive

questions, not understanding hidden meanings, missing social cues, and miscommunicating. More specifically, Chappel and Somers (2010) include the following skills to be taught, greetings, giving and receiving help, giving, and receiving compliments, and engaging in reciprocal conversations. The authors suggest strategies like role playing, video-modeling, and using social stories.

Individuals with speech and language impairments, along with ASD and Intellectual Disabilities (ID), face additional barriers to effective communication with others at a worksite. Pouliot et al. (2017) conducted a study of a tool designed to create electronic "Communication Stories" customized for sharing in the workplace as a means of empowering individuals with ASD and ID to communicate with co-workers and supervisors. The "Communication Story" is based on the functional communication domains to which an individual has deficits. Deficits of comprehension (e.g., difficulty understanding questions, verbal directions, and unfamiliar vocabulary), expressive language (e.g., limits on the ability to effectively share preferences, views, and feelings due to reduced intelligibility). The deficit of social language (e.g., understanding non-verbal communication, using appropriate workplace language, and adjusting behavior for the workplace), is also included (Pouliot et al., 2017). The electronic "Communication Story" is presented by the individual using a portable electronic device (PED) that shows co-workers and supervisors how the individuals with ASD and ID communicate and how best to communicate with them. Suggestions might include directions to speak slowly, provide wait time, and get the individual's attention before speaking (Pouliot et al., 2017). While Pouliot et al. (2017) argue that this tool is a cost and time-efficient mode of

training supervisors, co-workers, and others how best to communicate with the individuals with ASD and ID, this article focused on implementing a “Communication Story” for one individual and was descriptive and observational.

Gentry et al. (2015) conducted a randomized control trial to determine if using an Apple iPod Touch PED would increase work performance and decrease the need for job coaching support for 50 adults with ASD for 24 weeks at individual worksites. The participants were beginning competitive employment positions primarily in service-based jobs, including custodians, restaurant workers, grocery store clerks, baggers and stockers. The average age for participants was 24. The male to female ratio was 42:8, which is close to the ratio in the general ASD population, 30 participants were Caucasian, 15 were African American, three were Hispanic, and two were Asian. Fourteen participants were designated as selectively non-verbal, and two were non-speakers. It was estimated that 46 participants could read at least at a second-grade level. A team including an occupational therapist experienced in programming electronic devices as cognitive aids, the individual participant's job coach, and the employer worked together to determine what specific support needs that the iPod might provide. Employers agreed to allow participants to use the iPods as vocational aids at the worksite. The iPods provided task reminders, task lists, picture prompts, video-based task-sequencing prompts, behavioral self-management adaptations, tools to help navigate the worksite, and other supports based on individual needs. The iPods improved the organizational task skills of individuals, which resulted in a significant reduction in job coach hours (Gentry et al., 2015).

Chiang et al. (2013) determined that individuals with ASD who had higher social skills were 70% more likely to have a job following high school. Further, Roux et al. (2013) showed that individuals with ASD possessing stronger persuasive conversational skills and fewer social difficulties had a greater likelihood of having a paid job following high school. Sung et al. (2019) conducted a study using the Assistive Soft Skills and Employment Training (ASSET) intervention, an 8-week empirically based program to explicitly teach work-related social skills to young adults with high-functioning autism. This program was adapted from the U.S. Department of Labor's Office of Disability Employment Policy's program, "Skills to Pay the Bills: Mastering Soft Skills for Workplace Success." The Department of Labor's program consisted of six skills: communication, enthusiasm and attitude, teamwork, networking, problem-solving and critical thinking, and professionalism. The ASSET program added ASD-specific pedagogy to the six skills by including a structured-learning approach and social performance training. The training was held in a community site, and activities were completed in small groups of peers with facilitator support. Content-related visuals were used along with video modeling and feedback. Opportunities to generalize learning across contexts were provided throughout the training given that individuals with ASD struggle with this concept. Data analyzed changes in self-efficacy through participant surveys concluded that significant improvement was found across all items except for teamwork (Sung et al., 2019).

Hillier et al. (2007) recommended that professionals supporting adults with ASD in the workplace focus on social integration with co-workers. The authors note that

difficulties during job placements often were not the result of job performance concerns, but rather social factors. These factors included the individual with ASD's inability to read non-verbal communication cues, lack of understanding boundaries, and individual degrees of vulnerability (Hillier et al., 2007).

Gorenstein et al. (2020) reported on a pilot randomized controlled trial in New York, of the Job-Based Social Skills (JOBSS) curriculum, a manualized, 15-week, group delivered intervention for adults with ASD. The JOBSS curriculum was developed to address the employment gap impacting individuals with ASD by incorporating components from the interview skills curriculum (ISC) and JobTIPS programs. Topics from ISC included making a good impression, engaging in small talk, understanding non-verbal communication, and learning interview skills. Pedagogy from JobTIPS included step-by-step directions, video models, worksheets, and printable scripts to be used in a community setting. The JOBSS curriculum adds social skills training connected to interview-specific competency. Content covered listening skills, the theory of mind, personal space, hygiene and dress code, the intensity of emotions, physiological reactions, managing stress, conversation skills, and communication in the workplace hierarchy. Unlike JobTIPS, which is a computer program, JOBSS is group-led by a clinician directly with participants. A clinical psychologist facilitated JOBSS group lessons that covered the topics of emotion regulation, problem-solving, conversation skills, and hidden rules. The consistent agenda was followed, including transition time, brief reviews of homework and previous session content, interactive activities addressing

new content (e.g., role plays and video self-modeling), homework distribution, and a review of the session and evaluation.

Participants including twenty-two adults, 9.1% Asian, 9.1% Biracial, 9.1% Black, 36.4% Hispanic/Latinx, and 54% White, 19 males, and three females aged between 18 and 45 were placed into two cohorts, one receiving treatment and the other delayed treatment. Educational backgrounds included 36.4% high school diploma, 72.8% some college, 18.2% Associate degree, 54.6% bachelor's degree, and 18.2% advanced degree. Because JOBSS is language-based, all participants were required to have a Verbal IQ at or above 70.

Results revealed a significant increase in social cognition. Social cognition involves the ability to interpret social cues, recognize and respond to non-verbal communication, use, and understand humor, be overly literal, and see the whole picture and not just the details. Six months after treatment, 54% of participants reported employment gains. Three participants were hired in part-time jobs, one full-time, and one received ten additional hours per week. Weekly hours worked by participants post-treatment ranged from 6 to 40. Participants reported a favorable response to the curriculum citing that it was beneficial, and that knowledge was gained. It is interesting to note that the caregivers reported seeing improved social cognition skills, not the participants. Limits of this pilot study included a small sample size. For treatment fidelity, the JOBSS intervention was implemented by a clinical psychologist, although the program emphasizes easy accessibility to clinicians. Additionally, the caregivers who

indicated the significant improvement in social cognition in participants are not the intended stakeholders (Gorenstein et al., 2020).

The Walker social skills curriculum: Adolescent Curriculum for Communication and Effective Social Skills (ACCESS) program was evaluated for individuals with ASD preparing for employment in the study conducted by Walsh, Holloway, and Lydon (2018), in Ireland. The ACCESS program was created in 1988 to teach 31 social communication skills in three domains: peer, adult, and self-related social skills (Walker et al., 1988). Peer related social skills teach how to develop social networks with co-workers and maintain positive interpersonal relationships. Adult-related social skills cover the social behaviors necessary for navigating settings where adults supervise, such as work and classroom environments. Skills would include how to request help appropriately, deal with disagreements, and respond to correction and directions. Self-related social skills support the ability to manage daily life activities that include personal hygiene, following through with responsibilities, and coping with stressful situations (Walker et al., 1988). This study aimed to determine if the ACCESS program could increase the social communication skills necessary for employment in adults with ASD and Intellectual Disabilities (Walsh et al., 2018). Seven Caucasian individuals with ASD participated, including four males, three females, aged 19-22, all with mild to moderate Intellectual Disabilities (ID). The ACCESS with video modeling training was implemented across 20 weeks, with two weekly sessions on set days.

To best accommodate individuals with ASD, a video modeling component was added to the ACCESS program to be implemented during steps three, four, and seven of

the ten-step instructional process. The video modeling provided individuals with specific correct and incorrect sequences depicting the target social communication skill. Step eight provided individuals with the opportunity to practice the target skill in situational role-play with the teacher or a peer. During the scripted social skills training, corrective feedback was provided to individuals using least to most prompting, and descriptive praise (Walsh et al., 2018). ACCESS pre and post testing was used to measure levels of improvement in participants. ACCESS post testing revealed that all seven participants had significant improvements performing in all three social skill areas when the social skills training intervention was implemented. In addition, significant decreases were made in problem behaviors. A three-month follow-up showed that all participants maintained the skills. It is interesting to note that the participant that made the most gains in social skills across the three domains, was hired at an equestrian center. While this study represented a small sample size that was all Caucasian, the young adults with ASD and ID all showed significant gains and maintenance of increased social skills and decreased problem behaviors (Walsh et al., 2018).

Functional Independence

Studies have shown the relation of functional independence in individuals with ASD and employment outcomes (Chiang et al., 2013; Shattuck et al., 2012; Taylor & Malick, 2014). Shattuck et al. (2012) used eight items to measure daily living skills, including telling time on an analog clock, counting change, navigating outside the home, and using public transportation. The authors used an ordinal scale (1 = not at all well; 4 = very well); a total score was determined, ranging from 8 to 32. A one-point increase in

the overall score of functional independence corresponded with a 10% greater probability of having paid employment after high school.

Cognitive Impairments

According to the CDC (2020) cognitive impairment is when a person has trouble remembering, learning new things, concentrating, or making decisions that affect their everyday life ("Data & Statistics," 2020). Cognitive impairment ranges from mild to severe. Individuals with ASD and cognitive impairments often exhibit difficulties in task execution due to problems with maintaining attention, coordinating motor responses, response shifting as part of active listening, and short-term memory (Hendricks, 2010). Due to the frequent need for routines and predictability, acclimating to new job routines and coping with variables in the work setting can be challenging for employees with ASD (Keel, Mesibov, & Woods, 1997). Further, Hill (2004) emphasizes that the specific executive functioning defects of planning and flexibility impact individuals with ASD.

Baker-Ericzen et al. (2018) conducted a pilot study of the Supported Employment, Comprehensive Cognitive Enhancement, and Social Skills (SUCCESS) intervention, a manualized system curriculum targeting cognitive and social skills within a vocational context. The SUCCESS intervention model was created through collaboration with Active Collaborative Hub for Individuals with ASD to Enhance Vocation and Education (ACHIEVE) in California. An integrated curriculum is utilized in SUCCESS, incorporating concepts and vocabulary from Cognitive Compensatory Training (CCT) and *Social Thinking at Work: Why Should I Care?.* CCT is used with individuals who

have Serious Mental Illness (SMI), including schizophrenia or schizoaffective disorder, and mood disorders, including bipolar and major depressive disorder (Twamley et al., 2012). In *Social Thinking at Work: Why Should I Care?, a* semi-structured curriculum teaches hidden social rules and how to navigate the different mindsets and characteristics of co-workers (Winner & Crooke, 2011).

Twamley et al. (2012) defined CCT as:

> CCT is a 12-week, manualized intervention designed to target cognitive domains of prospective memory, attention/vigilance, learning and memory, and executive functioning/cognitive flexibility. CCT teaches skills and strategies for implementing the skills to compensate for cognitive difficulties commonly observed in SMI (Twamley et al., 2012, p. 42).

The participants included eight adults with ASD without ID, 78% male, 75% Caucasian, 100% high school graduates, 78% with some college attendance, and 22% college graduates, aged 18-29. The SUCCESS intervention was conducted at the National Foundation for Autism Research Technical Skills (NFAR Tech), a specialized program providing supported employment to teach software testing technical skills to adults with ASD interested in software testing careers. Participants attended the supported vocational training program during 25 sessions over six months, where they learned the technical skills used in software testing (Baker-Ericzen et al., 2018). None of the participants had current or previous full-time employment prior to the training. The SUCCESS intervention was delivered within the supported employment setting to small groups of individuals with ASD. SUCCESS training was provided for employment staff to

ensure that support strategies were implemented with the individuals with ASD working at the job sites. Additionally, executive functioning and social skills content was connected to the job search process and work tasks performed by participants with ASD.

Following the SUCCESS intervention, the participants with ASD showed improvements in communicating with co-workers and requesting time off. Parents reported increased personal hygiene skills in some participants that included showering, brushing teeth, and dressing more professionally. Five participants (56%) became employed post-intervention, with a mean of 20.2 hours worked per week. Improvements were reflected on self-report, parent-report, and performance-based measures of neurocognitive executive functioning and social cognitive skills. Positive results from this pilot study indicate that the SUCCESS intervention may be an effective and cost-efficient model that could be implemented within existing vocational training settings. The results showed that the manualized intervention program used in SUCCESS training improved cognitive executive functioning and social cognitive abilities within a supported vocational employment setting (Baker-Ericzen et al., 2018). Further studies should have more female participants, a larger sample size, participants from different racial and cultural backgrounds, and comorbidities, including ID.

Daily Living Skills

The self-directed routines of preparing meals and housekeeping management were deemed critical skills for sustained employment. They represented both an ability and a motivation on the part of the individual with ASD to develop independence (Chan

et al., 2017). The authors specified that these daily living skills utilized executive functioning to follow directions, recall the sequences for task completion, plan for meals, and organize spaces, all of which are valued in the workplace. Additionally, skills developed through meal preparation and housekeeping may transfer to job settings (e.g., preparing food at an eating establishment, organizing stock at a retail store).

Self-Care

In their longitudinal study, Chan et al. (2017) concluded that the ability of an individual with ASD to maintain good personal hygiene resulted in significantly higher odds of sustained community employment than other skills. The analysis from this study suggested that the ability to retain a clean appearance more substantially impacts the sustainability of employment than the individual's level of social skills.

Behavior

Individuals with ASD frequently experience high levels of stress and anxiety in the workplace that result in behaviors that significantly impact employment outcomes. Co-morbidity with depression, anxiety, and bipolar disorder is widely reported as well as the onset of epilepsy occurring in approximately one-third of the population. Any combination of these disorders may significantly interfere with employment outcomes and must, therefore, be addressed (Hendricks, 2010).

Job Placement

Given the challenges that individuals with ASD face in the workplace environment, finding and identifying a job placement that aligns with the interests, cognitive abilities, and level of education must be considered (Wehman et al., 2012a).

Further, individuals with ASD need to be taught how and where to search for jobs, determine if a job is appropriate, how to create a resume, and how and what to do during an interview (Hillier et al., 2007).

The Individual Placement and Support model, (IPS) is evidence-based supported employment initially designed for people with mental illness, another population of unemployed individuals. McLaren et al. (2017) examine the IPS approach in a pilot program to evaluate whether it is a valid model for young adults with ASD. The IPS program began at Dartmouth-Hitchcock Medical Center (DHMC) in Lebanon, New Hampshire in 2015. Participants pay a monthly fee for services that include rapid job searching, services addressing mental health and employment, focus on individual preferences, and job searches and support specific to the individual needs. The five participants all had moderate to severe ASD symptoms and no intellectual disability and included four males, one female, aged 19-28, with comorbid psychiatric disorders. The authors, located at DHMC, collectively evaluated the five participants over one year. All participants except one attended a post-secondary school for up to two terms and then dropped out. One participant had no work experience, and four had previous part-time stocking positions. By the end of the year, all participants gained competitive employment, obtained increased pay and hours from previous employment, one full-time and four part-time, based on specific job preferences. Jobs included major league baseball video scout, computer inventory data conversion, data analyst, construction worker, and retail worker (McLaren et al., 2017).

The results noted increased independence and broad psychosocial gains, as evidenced by using public transportation independently, moving out of the family home, returning to a four-year college, decreased anxiety, no longer socially isolated, and increased sociability. Benefits described by the participants, families, and employers included connections with co-workers, a sense of pride in work, improved personal hygiene, happier overall, trusted employee, great worker, and brings diversity to the worksite. The authors acknowledge the small sample size and that all participants were high functioning. The intention is to include participants with intellectual disabilities in future studies on IPS (McLaren et al., 2017).

Interview Skills

The dynamics of an interview involve a set of social skills that individuals with ASD often lack. These skills include interpreting facial expressions, staying on topic, not interrupting the interviewer, acceptable grooming, good hygiene, choosing appropriate interview clothing, shaking hands, and maintaining eye contact. Effective practices in teaching these skills include curriculums, mock job interviews, disclosing a disability, considering accommodations, and virtual reality job interview training (Morgan, Leatzow, Clark, & Siller, 2014; Whetzel, 2013; Smith et al., 2014).

Morgan et al. (2014) conducted a pilot random controlled trial in Tallahassee, Florida of the interview skills curriculum (ISC), a 12-week low-intensity, group-delivered intervention for young adults with ASD. The purpose of the intervention is to increase essential social-pragmatic skills necessary for successful job interviews. Participants included twenty-eight adults aged 18-36, 27 males and one female, all diagnosed with

ASD, that demonstrated a Verbal IQ above 70 and received a special or regular high school diploma or high school GED or equivalent. Twenty-four were White, two Hispanic/Latinx, 1 Black, and 1 Other. Twelve participants had or were pursuing professional degrees. Upon entering the study, four participants were employed full-time and one part-time. Three of the five reported an intention to improve their employment situation during the following year. The participants' occupations included a self-employed attorney, a computer analyst, an administrative secretary, and service positions involving food preparation or janitorial tasks. It is important to note that prior to the training, of the 16 participants reporting being employed, seven reported having lost jobs due to difficulties following company policies or practices, difficulty getting along with others, or difficulty keeping up with demands. All participants except one stated a desire to work, and 14 reported plans to improve employment situations.

Weekly 90-minute group sessions covered topics organized to mirror elements of the interview process in a logical, structured format. Key topics include character, attitude, persona, small talk, non-verbal communication, hygiene, interview questions, closing the interview, and follow-up. To address the social communication challenges experienced by the participants with ASD, additional topics, including non-verbal communication, emotional regulatory strategies, and self-advocacy, were included in the sessions. Role-play, video feedback, peer review, discussion, and games were used as formats for learning. Pre-and post-treatment mock interviews were conducted to provide participants with opportunities to practice interviewing skills, serving as the primary source of data collection. The mock interviews were conducted by five

volunteer professionals not familiar with the participants. The interviews were video-recorded and contained scripted questions matching participant career interests and were either specific to entry-level or professional positions. Each participant was given a copy of their recorded interviews to which they participated once treatment was completed.

The mock job interviews showed that the treatment group obtained more significant gains in social-pragmatic skills than the control group. As a result of this brief, low-intensity treatment, the authors concluded that individuals with ASD can improve job interview performances (Morgan et al., 2014). Since this study was short-term and evaluated participants shortly after the end of treatment, a future study involving long-term follow-up could determine if the gains in social-pragmatic skills were maintained or generalized. Further, a larger sample size representing more females, participants from other ethnic and racial groups, and participants with ASD and comorbid diagnoses would provide the opportunity to determine if this treatment is successful with a broader representation of individuals with ASD.

Strickland, Coles, and Southern (2013) evaluated the effectiveness of a treatment package with a web-based interviewing skills program (JobTIPS) and virtual reality practice on responses to employment interview questions by adolescents with high functioning ASD. Training included theory of mind-based guidance, video models, visual supports, and virtual reality practice. An Interview Skills Rating Instrument developed by the authors consisted of two scales. The first scale addressed Response Content and included a ten-item scale to measure the content of the participant's

responses to ten interview questions. The second scale addressed Response Delivery. This scale included 20 items that measured behaviors related to greetings and farewells (e.g., handshakes, eye contact, verbal greeting, verbal expression of appreciation at the end of the interview). The Response Content scale responses were rated using a Likert-type scale from one (poor) to four (excellent) based on specific descriptors. The Response Delivery scale rated seven behaviors in the "Introduction/Greeting section, and six in the "End of the Interview" section. Both were scored using a Likert-type scale from one ("Never or almost never") to four (Almost always"). Participants included 22 male individuals with ASD, aged 16-19, 72% White, 18.2% Black, and 9.1% other.

This study's results suggest that youth with ASD who completed the JobTIPS training program showed significant improvement in job interviewing skills compared to the control group. The program was more effective in teaching content rather than delivery skills. Participants were able to produce more appropriate verbal responses to interview questions following the intervention. However, the features that accompanied them (e.g., posture, eye contact, affect, or facial expression) did not improve to the same degree (Strickland et al., 2013). Some limitations of the study include that all participants were male, high functioning, and primarily White. Also, it is not clear how well the study effects would be maintained over time, or how participants would respond to novel conditions (e.g., different interviewer or slightly adjusted questions).

Strategies for Success

Supervisors and Co-Workers

Another contributing factor to long-term employment success for individuals with ASD relates to the degree of knowledge and understanding that the supervisors and co-workers have about autism. For example, being able to incorporate supports into the job and focusing on strengths that the employee with ASD brings to the workplace (Nesbitt, 2000). With the increasing chance of employees either having a family member, extended family member, child of a friend, or former classmate with autism may lead to the existence of a supportive co-worker or supervisor for the individual with autism. Chappel and Somers (2010) aptly summarized this as, "When employers and employees understand why a person may behave a certain way they are more likely to work with and support that person" (p. 123).

On-the-Job Training

Proper intervention and training create opportunities for individuals with ASD to work in various businesses and industries. Extensive long-term training incorporating unique methods for employees with ASD to learn job tasks and other skills while on-site allows for authentic learning to occur, which increases the probability of success (Hendricks, 2010). Project SEARCH is an example of a program that provides an internship model of supported employment through complete immersion in the workplace. Students in their final year of high school spend the entire school year at the designated workplace. Seamless integration of classroom instruction, on-the-job training, and high levels of skilled support is provided (Wehman et al., 2012a). Common training objectives include ensuring the employee with ASD has a full understanding of the job tasks assigned, what the supervisor's expectations are for job tasks, and

understands and follows the workplace rules. Also, the employee with ASD must know the exact start, end, and break time allotments; understand policies regarding absences; be aware of emergency procedures; navigate the workspace specific to the position; and set up consistent transportation (Hillier at al., 2007).

Project SEARCH was created in 1996 by Erin Riehle, Director of Cincinnati Children's Emergency Department, who collaborated with Susie Rutkowski, a special education director at Great Oaks Career Campuses in Cincinnati, Ohio. Project SEARCH is based at Cincinnati Children's Hospital Medical Center and has partnered with franchises in the United States, the United Kingdom in 2009, and Australia. Project SEARCH requires that the business involved in the partnership commit to hiring 60% of the interns following graduation. Another unique feature of the Project SEARCH model places the business in charge of developing the internships. Project SEARCH was initially designed for individuals with more complex disabilities requiring a higher level of supported employment. Individuals with ASD represent about 25% of the participants, and most participants without ASD have a learning disability (Kaehne, 2015).

The Project SEARCH plus ASD model includes an intervention to address the specific needs of individuals with ASD. The model utilizes applied behavior analysis principles to provide intensive systematic instruction at the worksite, on-site behavior and autism specialist support and consultation, and intensive training to all staff on ASD and the Project SEARCH model (Schall et al., 2015). The participants in Project SEARCH plus ASD were found through a randomized controlled trial to have higher job retention rates (89%), and a higher average wage than those receiving supported employment

alone (Wehman et al., 2014). While the Project SEARCH plus ASD model has shown successful outcomes, it is limited to a small number of participants per year (Schall et al., 2015).

Wehman et al. (2012b) conducted a randomized clinical trial to determine if Project SEARCH plus supports increased successful employment in individuals with ASD. This strengths-based study focused on ASD-related skills and abilities. The program was located within a suburban hospital in Richmond, Virginia, where two participants with ASD participated in a one-year internship through Project SEARCH. High school students with various disabilities, including ASD, can participate in Project SEARCH during their final year in high school. The full school year is devoted to the internship, usually located in large community businesses, and typically hospitals, allowing complete immersion at the worksite. This study followed an African American 19-year-old male with ASD (Participant A), and a Caucasian 20-year-old male with ASD and severe scoliosis resulting in pressure on his lungs (Participant B). Both participants rotated through three internships: radiology, environmental services, infection control, for Participant A, and the coronary care unit, durable medical equipment, and the Intensive Care Unit (ICU) for Participant B.

Participant A required more significant support with social interactions and worked on behaving professionally by not touching others, respecting personal space, and not cursing. To address the social challenges, the job coach provided visual aids to help Participant A deal with embarrassment following confrontations. The visual aids, frequent reminders, role-playing, and family support resulted in Participant A learning

coping skills and becoming a highly valued colleague. Participant B worked on improving productivity and work quality, preferring to rush through work, and then reading or watching television in the break room. The job coach created a structured daily schedule for Participant B incorporating the job expectations and requirements, which provided consistency. Through a collaboration between the job coach and behavior specialist, a self-monitoring task list was created requiring Participant B to complete a set number of tasks before receiving a break. Most of the time, this resulted in increased productivity and work quality. In the final internship round, Participant B received job performance ratings at 96%, and behavior ratings at 92%. Following graduation from Project SEARCH, Participant A was hired to work in the infection control department for 20 hours per week. Because of writing difficulties, the job coach found a rubber stamp to put the date on charts. Participant B was hired to work in the ICU for 20 hours per week and is supported by the job coach to follow the schedule and to complete work carefully and accurately. Additionally, the participant uses an iPod Touch containing bedside cart supply checklists, photos showing properly stocked carts, and reminder alarms. The job coach also works with ICU staff to determine if supports are adequate or if updates are needed (Wehman et al., 2012b).

The results showed that both participants with ASD successfully transitioned into competitive employment in atypical jobs for individuals with disabilities. The Project SEARCH model provided intensive training to the participants within the workplace setting along with long-term supports. The authors point out that this level of intensity

is like the model of intensity that is provided to young children with ASD in school but not to transition-aged youth with ASD (Wehman et al., 2012b).

The Autism Academy for Software Quality Assurance (AASQA) is a short-term integrated work experience program created at Curtin University in Australia. Lee et al. (2019) conducted a study of the AASQA CoderDojo strength-based, extra-curricular program for students with ASD, aged 12 to 18 years old with interests in Science, Technology, Engineering, Arts and Mathematics (STEAM) areas. The study used a grounded theory approach that utilizes inductive reasoning. The CoderDojo program pairs the participants with ASD with trained facilitators and mentors who collectively teach computer-based skills, including coding. In addition to developing technical skills, the participants develop workplace-specific social skills within a supportive environment. The participants consisted of 17 individuals, five male adolescents with high-functioning ASD, six female parents, and six supervisors from four host organizations. Subjects participated in the short-term work experience placement program for an average of five days and worked an average of seven hours per day. Two focus groups comprising separately of youth with ASD and parents were interviewed to understand the participants' work experiences by using open-ended questions that addressed the impact of the placement, the challenges and difficulties experienced during the placement, and improving the placement.

Results determined three key factors that led to successful work placement experiences for the participants. These key factors included preparing both the youth participants, supervisors, and staff for the work experience. Parents prepared youth

with locating public transportation and appropriate workplace attire. Work experience supervisors and staff were educated about working with individuals with autism and how to communicate effectively. Another factor was harnessing the youth participants' strengths and interests, which provided the opportunity to recognize and realize potential. The final factor was developing work-related skills, including those directly related to information and communication technology, and social and personal skills essential for the workplace (Lee et al., 2019). While this study had positive results for all participants, it was limited to only five high-functioning males with ASD, and only five days at the worksite. The employee participants with ASD reported feeling well integrated into the employer site, increased social relationships, positive changes to mental and physical wellbeing, developing skills and networks, and financial and personal independence (Lee et al., 2019).

Flower et al. (2019) conducted a case study of RISE at Department of Health and Human Services (DHHS) in Australia, an autism employment program developed to remove many of the barriers faced by individuals with ASD seeking employment. To meet the needs of participants with ASD, DHHS collaborated with Specialisterne, Australia. Specialisterne is a non-profit that originated in Denmark and specializes in training, assessing, and promoting employment opportunities best suited for employees with ASD. Ten participants with ASD completed a three-week training and assessment component to prepare for the transition to employment. During the training and assessment, the participants gained a realistic preview of the responsibilities, working environment, and supervisory team members (Flower et al., 2019).

Additionally, the participants learned job-relevant tasks and had the opportunity to demonstrate skills. The assessment period allowed job coaches the time to determine specific workplace supports needed by each participant. A half-day transition to work course for the participants was created by the two job coaches. The course was facilitated during the first week of employment and taught personal hygiene, workplace communication practices, and other workplace-related skills. The job coaches supported the participants and employers through onsite meetings, emails, and phone calls during the first three months to facilitate the transition phase. The job coaches also provided autism awareness training for employers, co-workers, and management. Three months after employment, individual interviews were conducted with successful employees with autism, and ten co-workers comprised of six males and four females without ASD. The findings suggest that to facilitate an effective transition into the workplace for employees with ASD, extensive onsite vocational training, preparation, and support may be beneficial elements to successful employment of individuals with ASD (Flower et al., 2019). It is important to note that this study was limited to five individuals with ASD and ten co-workers without ASD. Additionally, the Rise@DHHS program did not require participants to engage in a job interview, but rather a three-week training with a built-in opportunity for individuals with ASD to demonstrate skills. Studies have shown that job seekers with ASD prefer to demonstrate skills over talking about skills due to social communication deficits (Morgan et al., 2014; Smith et al., 2014; Smith et al., 2015; Wehman et al., 2017).

Hillier et al. (2007) conducted one of a few studies evaluating behavior skills training (BST) to address vocational skills in individuals with ASD. The study focused on ASD-related skills and abilities in employment by incorporating the strength-based abilities of individuals with ASD during the job matching process. Nine adults with ASD comprising eight males and one female aged 18-36, with average to above-average cognitive skills, were followed through a period of two years while completing a vocational support program. The program provided an intervention focused on pre-placement skills, including completing applications and interviews and the post-placement skills of completing tasks and understanding workplace rules. During this study, participants spent up to six months engaged in BST with job coaches for up to 20 hours per week. The goal for the pre-placement component was to secure employment for each of the participants. Individual instruction provided directions on effectively conducting job searches, interpreting job descriptions and expectations, creating resumes, completing an application, and creating a positive impression during job interviews. Once a potential job was located, a program coordinator completed a job site evaluation checklist to determine if this was an appropriate job match. The work environment was evaluated for possible sensory concerns, equipment used, required job tasks of the position, potential for current employees to function as a support system, and degree of experience employing individuals with disabilities. The coordinator assisted the employer with job development and negotiated changes to required tasks to best serve the individual with ASD. Autism awareness training was offered to the employers and co-workers to teach the staff the strengths that

employees with ASD bring and how to interact and communicate with people with ASD. Once employed, the individual with ASD continued to be supported by a job coach to integrate and engage with co-workers and supervisors, learn strategies for effective communication, and learn the job tasks. Based on individual levels of endurance that were considered during the job search process, the hours worked per week ranged from 4 to 40. Following the two-year evaluation period, seven participants remained in the original employment positions. Job placement for participants took an average of 4.5 months. Entry-level jobs included food service, retail, and clerical positions. The authors noted that as the participants increased work experience and skill development, placements in more challenging and higher-paying positions became an option (Hillier et al., 2007).

An evaluation of a training program in Omaha, Nebraska, involving two instruction methods was completed by Burke et al. (2010). All participants were Caucasian males with ASD, ages 20-27, with relatively good receptive and expressive language skills, borderline to typical cognitive functioning, and poor practical adaptive skills. Both groups were trained to be Walkaround inflatable Firepal mascots that stood ten feet tall to accompany fire department personnel during elementary school assembly presentations on fire prevention. A minimum of 80% criterion job performance was expected, and due to a limited amount of time available for training, an efficiency criterion was included. The target behaviors consisted of the same 63 scripted responses to perform fire assembly tasks. The vocational training program included a performance cue system (PCS) that utilized a proprietary iPhone application

adapted for the study to teach social, vocational, and behavioral skills training (BST). The PCS was attached to the inside of the costume at the participant's eye level. During a performance, the participants receiving PCS training were taught to follow the instructions on the iPhone screen as soon as they appeared. The instructions were electronically communicated by a trainer positioned out of view. The BST training included direct modeling showing participants how to correctly perform the required steps and additional rehearsal by the participants to learn steps that were missed or incorrectly performed. The six participants were divided into two groups. The first group was trained using BST, followed by PCS, if criterion was not met by the fifth session. The second group started with PCS, and if the participants did not meet the criteria by the end of the second session, BST was introduced. Five out of six participants achieved criterion upon the introduction of PCS in addition to BST and executive functioning skills training. The sixth participant reached a criterion level with BST alone. This study was limited by the focus solely on Caucasian males without intellectual impairments. A future study should include more females, participants from other ethnic and racial groups, and participants with ASD and comorbid diagnoses (Burke et al., 2010).

A longitudinal follow-up study by Howlin, Alcock, and Burkin (2005) focused on the Prospects program pilot evaluation completed in 1997, in London, UK. Prospects is The National Autistic Society's specialist employment service located in the United Kingdom. Data covering the number and types of jobs were collected from April 1995 to March 31, 2003. Participants interviewed included 89 individuals with high functioning ASD from the original two-year pilot study, 63-line managers, 61 senior managers, and

15 Prospects support staff. The individuals with ASD had mean non-verbal and language skills in the average range. The mean range of age was 31.1, 20% of clients held a degree, and the male to female ratio was 9:1. The Prospects staff include service coordinators, employment consultants, job-finding/marketing consultants, and administrator/employment consultants. Over 45 participants with ASD received assistance in work placements or job-site training, 28 participated in work preparation or personal development programs, and 46 in the job-seeking program. Over 50% of the individuals were employed in administrative, technical, or computer-related work, 20.5% in office-based work, 10% in catering, cleaning, or factory work, and 8% in retail. Forty-seven percent of jobs were in large private companies, 32% in government and private sectors, 11% in small/medium companies, and 10% in charitable organizations. Fifty-eight percent of the jobs were full-time, 6% were part-time, and 36% were temporary. A follow-up with 19 individuals who were hired during the pilot study eight years earlier found 13 still employed full-time. Five of which had their original positions. The Prospect staff reported that organizational concerns, including time management, concentration, task completion, low productivity, socially inappropriate behaviors, poor hygiene, transitions, and unplanned changes, were frequently encountered at the worksites. Role-play techniques were implemented to address social difficulties, and clear expectations with time frames provided a structured daily plan for the participants with ASD. Strategies implemented at the sites involved disability awareness training for staff, consulting with staff about individuals with ASD lacking social skills, requesting

modifications, and sharing management strategies with employers. Prospects have maintained an employment rate of 63% to over 70% (Howlin et al., 2005).

Workplace Modifications

Given that individuals with ASD experience difficulties managing the abundance of stimuli presented in the workplace, accommodations, and modifications may be required for more effective functioning in the work environment. Hillier et al. (2007) recommend conducting assessments to evaluate noise level, interruptions, crowding, lighting, and space navigation as a starting point while considering the individual's unique needs. Additionally, job predictability can be achieved by providing a consistent schedule for task completion, and structure can be created by adjusting job assignments or ways a job could be performed (Hendricks, 2010).

Long-Term Support

While the high degree of individualized training provided by a job coach should be carefully and thoughtfully reduced over time, employees with ASD may require extended support to maintain successful long-term employment. Long-term support services would be in place to help employees with ASD manage unexpected changes, process social interactions, and develop appropriate coping strategies at work (Hendricks, 2010).

Keel, Mesibov, and Woods (1997) conducted a retrospective cohort study on Division Treatment and Education of Autistic and related Communication Handicapped Children and Adults (TEACCH) founded in the mid-1960s and expanded to a statewide program in 1972. In 1989, TEACCH began providing supported employment services.

This study involved 96 individuals, ages 16 to 48, the vast majority with a primary diagnosis of ASD, 42% having intellectual disabilities, and 31% entering the program from sheltered work settings. TEACCH utilized three models of supported employment with an emphasis on using the participants' strengths and interests to identify appropriate jobs with extensive long-term support. The models included individual placement (72%), dispersed enclave (21%), and mobile crew (7%). Job placements included food service (38%), clerical (15%), stocking (11%), custodial (11%), lab/technical (9%), manufacturing (4%), and other (12%). The factors impacting successful placements were predictable routines and schedules to follow, level of acceptance by employers and co-workers for individuals with ASD, the level of stimuli in the work environment, clearly defined job tasks, and the flexibility to make accommodations. Participants worked an average of 28.6 hours per week at minimum wage, with an 89% job retention rate (Keel et al., 1997).

The TEACCH program implements site visits, phone calls to the employer, contact with families and residential staff, and any required retraining. Extensive long-term support is provided indefinitely by TEACCH support staff both in and out of the workplace (Keel et al., 1997). Other long-term supports may extend beyond the workday and take a holistic approach to the individual with ASD by considering the daily life experiences that might impact job performance (Hendricks, 2010). Home living, social engagements, and medical components would be included.

Project Autism: Building Links to Employment (ABLE), established in Belfast, Ireland, utilizes a supported employment model to assist individuals with ASD, aged 16

and over, with developing employability skills. Lynas (2014) conducted a longitudinal observation cohort study without a control group. The 72 participants included 68 males, four females, 35 with a severe learning disability, 18 requiring individual support in the worksite, 14 with mild to moderate learning disabilities, 23 high functioning, four non-verbal, and 28 adults. All the participants had been unemployed between six months to over six years. Customized programs were created based on individual interests, aptitudes, and needs, and incorporated career exploration, work experience, social communication skill-building, and vocational training. A flexible approach was used, allowing participants to progress at an appropriate pace, and the staff did not have strict deadlines. Employment was secured by participants within a time frame of 11 to 30 months. Work placements were determined based on each participant's skills and career aspirations in the following vocational areas based on the order of interest; administrative, retail, catering, industrial, animals, horticulture, information, and communications technology, and others. Project ABLE provided training on autism awareness to the employers in 80 businesses before the participants started employment. The training goal was to increase the level of understanding of autism and the strengths and talents that individuals with ASD contribute to the worksites (Lynas, 2014).

At the end of the fourth year, 95% of the participants had experienced at least one community job placement, and 66% had more than one placement. Job placement durations ranged from six weeks to six months or longer. Specific job placements included working in a zoo, with tropical fish, sorting mail, and assisting a funeral

director. Stakeholder feedback attained through structured questionnaires included significant benefits of increased social, vocational, communication, and independent skills, sleep and physical health, time management, and self-confidence. Ninety-seven percent of participants developed or improved vocational, social, and communication skills (Lynas, 2014). Future studies should include more female participants, and follow-up to determine if participants from this study were able to maintain job placements. Additionally, a focus on long-term support and specific individual needs would provide further data to show the validity of this intervention model.

CHAPTER III: DISCUSSION AND SUMMARY

Summary of Literature

Few youth and adults with ASD achieve sustained meaningful competitive employment connected to individual strengths and interests (Gotham et al., 2015; Hendricks, 2010; Shattuck et al., 2012). Instead, following high school, individuals with ASD are faced with unemployment and underemployment. Individuals who are employed often receive low wages and limited hours, resulting in no benefits and a low standard of living (Gorenstein et al., 2020; Howlin, 2013; Roux et al., 2013). Additionally, individuals frequently lose jobs due to a lack of support and understanding from supervisors and co-workers (Hillier et al., 2007). Employers are often unaware of or unwilling to provide the reasonable accommodations required by employees with ASD to succeed.

Most jobs demand a level of sociability, communication skills, flexibility, understanding and following social norms, understanding the group norm specific to the worksite, and a willingness to adjust to frequent changes, also known as soft skills (Pouliot et al., 2017; Roux et al., 2013; Sung et al., 2019). Job interviews and navigating the first social encounters with unfamiliar people poses another challenge for individuals with ASD (Morgan et al., 2014). Individuals with ASD often prefer to show skills over talking about skills (Morgan et al., 2014; Smith et al., 2014; Smith et al., 2015; Wehman et al., 2017). RISE at DHHS provided a three-week training with a built-in opportunity for individuals with ASD to demonstrate skills in place of an interview (Flower et al., 2019). ASD is a severe developmental disorder that impairs the ability of

individuals to communicate and interact. Individuals with ASD are therefore deemed unqualified for most jobs given the typical expectation employers have of employees. Excluding individuals who do not understand how people connect and relate to others or how they experience the world around them is discrimination. Most neurotypicals can no better interpret what individuals with ASD think or feel than individuals with ASD being able to interpret what neurotypicals are thinking or feeling. Further, most employers, co-workers, and supervisors are not aware of the complex ways that individuals with ASD experience the world and are not prepared to work effectively and support employees with ASD (Hillier et al., 2007).

Each year, 50,000 youth with ASD transition to adulthood in the United States, requiring support and services to help plan for and meet the individual needs of this population during this critical time (Shattuck et al., 2011). Effective transition services must be identified and provided for all individuals with disabilities as outlined in the federal law, IDEA Act PL108-446, Section 1400(c)(14); 2004. A further need cited by all authors in this paper is for more focus on effective interventions and programs to assist Individuals with ASD successfully transition to adulthood and throughout adulthood. Most research and early interventions are for children with ASD, and as numerous authors contend, there is a paucity of research addressing how to best meet the needs of youth and adults with ASD during life transition activities, including employment (Brooke et al., 2018; Shattuck et al., 2011).

Research on employment interventions for individuals with ASD is primarily impairment-focused (Scott et al., 2018). If the view of individuals with ASD is

impairment focused, the result is an imbalanced view of ASD that fails to recognize the strengths and abilities of this population (Armstrong, 2010). Most individuals with ASD want to be employed, and with appropriate supports in place, they can become valued employees who possess a variety of talents and abilities and bring a diverse perspective to places of employment (Wehman et al., 2012b). Several interventions and programs have been described in this paper, offering evidence-based strategies that promote successful long-term, meaningful integrated employment for individuals with ASD.

Promising interventions that address social communication challenges include utilizing electronic "Communication Stories" created with and about the individual with ASD to share with co-workers and supervisors to support communication. The stories communicate preferences and suggestions on how best to interact with individuals with ASD (Pouliot et al., 2017). Gentry et al. (2015) showed how an Apple iPod Touch improved the organizational task skills of the participants with ASD at their worksites, reducing job coach time, and increasing independence. The ASSET program showed significant increases in work-related social skills following training individuals with ASD (Sung et al., 2019). The JOBSS intervention resulted in participants demonstrating a significant increase in social cognition following intensive 15-week group-based sessions (Gorenstein et al., 2020). Walsh et al. (2018) conducted a study of the ACCESS with video modeling program to teach 31 social communication skills to young adults with ASD. The results of the 20-week program showed significant improvements in social skills and decreases in problem behaviors. A three-month follow-up found that all participants maintained their skills (Walsh et al., 2018).

Cognitive and social skills were the focus of the pilot study conducted by Baker-Ericzen et al. (2018). The study indicated that following the cost-effective manualized intervention, the participants with ASD demonstrated increased communication with co-workers, and requesting time off, while parents reported improved personal hygiene, and dressing professionally. IPS is an evidence-based supported employment model that provides services including rapid job searching, job searches that focus on individual preferences, and individualized supports addressing mental health and employment. Following a year, all participants gained competitive employment in fields of interest, with increased pay and hours. Additionally, participants demonstrated increased independence and broad psychosocial gains (McLaren et al., 2017).

Interview skills were addressed in a pilot study conducted by Morgan et al. (2014) consisting of a 12-week low-intensity, group-delivered intervention for young adults with ASD. Weekly 90-minute sessions covered essential social-pragmatic skills and ASD-specific social communication topics, and mock interviews were recorded and reviewed for practice. Results showed significant gains in social-pragmatic skills. JobTIPS, a web-based interviewing skills program, was studied by Strickland et al. (2013). Individuals with high functioning ASD practiced interviewing using virtual reality-based interview scenarios. The training also included the theory of mind-based guidance and video models. Results showed significant improvement in job interview skills, specifically in providing appropriate verbal responses (Strickland et al., 2013).

Project SEARCH is an internship-based supported employment model implemented through complete immersion in a community-based business. Seamless

integration of classroom instruction, on-the-job training, and high levels of skilled support is provided to participants (Wehman et al., 2012b). Project SEARCH requires that the partner business commits to hiring 60% of the interns following graduation. The Project SEARCH plus ASD model was studied by Wehman et al. (2012b) within a suburban hospital setting. Following the one-year high-intensity internship, participants were hired in the ICU and infection control, both atypical jobs for individuals with disabilities (Wehman et al., 2012b). The AASQA CoderDojo is a short-term strength-based, extra-curricular integrated work experience program for students with ASD, aged 12 to 18, with interests in STEAM areas, studied by Lee et al. (2019). The Coder-Dojo program pairs the participants with ASD with trained facilitators and mentors who collectively teach computer-based skills, including coding and workplace-specific social skills. All participants reported feeling well integrated into the employer site, increased social relationships, positive changes to wellbeing, developing skills and networks, and financial and personal independence (Lee et al., 2019).

Rise at DHHS is an autism employment program developed to remove barriers faced by individuals with ASD seeking jobs (Flower et al., 2019). Participants with ASD completed a three-week training and assessment component to prepare for the transition to employment, which provided a realistic preview of the responsibilities, working environment, and supervisory team members. Job-related tasks were learned, and participants had the opportunity to demonstrate skills. Personal hygiene and workplace communication practices were taught. Job coaches supported participants, employers, co-workers, and management. Three months following employment, results

showed that the extensive onsite vocational training, preparation, and support were beneficial elements that lead to the successful employment of individuals with ASD (Flower et al., 2019).

One of the few studies evaluating BST to address vocational skills in individuals with ASD was conducted by Hillier et al. (2007). Strength-based skills and abilities of individuals with ASD in employment were considered during the job matching process. The two-year vocational support program focused on pre-placement skills, including completing applications and interviews. Post-placement skills of completing work tasks and understanding workplace rules were also provided. Participants spent up to six months engaged in BST with job coaches for up to 20 hours per week. Job site evaluation checklists were completed to determine if potential jobs were a good match for individual participants. Autism awareness training was offered to employers and co-workers to teach staff the strengths that employees with ASD bring and how to interact and communicate with people with ASD. Following employment, individuals continued to be supported by job coaches. The results showed that participants remained in the original employment positions. Further, as the participants increased work experience and skill development, opportunities for more challenging and higher-paying positions became an option (Hillier et al., 2007).

Individuals with ASD were trained to be Walkaround inflatable Firepal mascots requiring 63 scripted responses in the study conducted by Burke et al. (2010). The vocational training program included a performance cue system (PCS) that utilized a proprietary iPhone application adapted to teach social and vocational skills and BST. The

PCS was attached at eye-level inside the costume and provided electronically communicated directions from a trainer out of view. BST included direct modeling that showed participants how to correctly perform the required steps and additional rehearsal when steps were missed or incorrectly performed. Eighty-three percent of participants achieved criterion once PCS was introduced in addition to BST. The rest of the participants learned with BST alone (Burke et al., 2010).

Howlin et al. (2005) conducted a longitudinal follow-up study on Prospects, an employment service provided by The National Autistic Society in the United Kingdom. Participants received work placement assistance, job-site training, work preparation and personal development, and job-seeking programs. Prospects have maintained an employment rate of 63 to over 70 percent (Howlin et al., 2005). Keel et al. (1997) studied the TEACCH program, which utilizes three models of supported employment with a focus on participant interests and strengths to identify appropriate jobs and provide extensive, long-term support. Participants worked an average of 28.6 hours per week, at minimum wage, with an 89% job retention rate (Keel et al., 1997). Project ABLE uses a supported employment model to assist individuals with ASD in developing employability skills, as studied by Lynas (2014) in a longitudinal observational cohort study. Customized programs were created based on individual interests, aptitudes, and needs while incorporating career exploration, work experience, social communication skill-building, and vocational training. A flexible approach allowed participants to progress at their own pace. Project ABLE provided autism awareness training to all employers and staff before participants began employment. At the end of the fourth

year, 95% of participants had experienced at least one community job placement, 66% had more than one placement ranging from six weeks to six months or longer. Additionally, 97% of participants developed or improved vocational, social, and communication skills (Lynas, 2014).

Limitations of the Research

The focus of this literature review was limited to the most current research on successful programs and interventions specific to individuals with ASD that promote successful long-term, meaningful integrated competitive employment. Given the high rate of unemployment and underemployment for individuals with ASD, it is clear that new programs and interventions need to be created, researched, and implemented. While this paper covered several promising programs and interventions, few were implemented regularly or on a large scale. Project SEARCH is one of the few programs utilized by VR services in Minnesota.

Implications for Future Research

Future studies need to include larger sample sizes, more female participants, individuals from different racial and cultural backgrounds, and comorbidities, including ID. Additionally, more studies, in general, need to be conducted to focus on how best to meet the needs of youth and adults with ASD to successfully navigate the many steps and challenges leading to long-term, meaningful integrated competitive employment. Programs and interventions showing positive results need to be expanded or have longitudinal studies conducted to determine long-term success for individuals with ASD. Project SEARCH is an example of a successful program that has many studies attached

including longitudinal (Ham et al., 2014; Kaehne, 2015; Wehman et al., 2012a; Wehman et al., 2012b; Wehman et al., 2014; Wehman et al., 2017). As Scott et al. (2018) discussed in their scoping review of studies addressing the employment of individuals with ASD, future studies need to adjust from a deficit lens to a focus on ASD-related skills and abilities as implemented by Hillier et al. (2007) and Ham et al. (2014). Further, Morgan et al. (2019) stated an overall need for more rigorous research designs.

Additional studies should continue to investigate PEDs and other technological advancements that have the potential to function as support for individuals on the job and thereby rely less on job coaches, supervisors, or co-workers (Gentry et al., 2015; Pouliot et al., 2017). Further studies need to be conducted of PEDs that assist individuals with ASD preparing for interviews, including longitudinal (Morgan et al., 2014; Strickland et al., 2013).

Implications for Professional Application

The studies included in this literature review provide promising interventions with applications for both secondary and post-secondary programs. Research shows that early interventions addressing and teaching essential soft skills required in obtaining and maintaining employment are crucial to individuals with ASD. Further, research shows that youth with ASD who have work experience before graduating from high school have a better chance of being employed after graduation during the first two critical years following high school.

Studies from the United Kingdom and Australia show the same high rate of unemployment and underemployment rates in adults with ASD. Project SEARCH has

franchises in Australia and the U.K. that have shown similarly high rates of long-term, meaningful competitive integrated employment for individuals with ASD (Kaehne, 2015). Project ABLE (Lynas, 2014) and ACCESS (Walsh et al., 2018) took place in Ireland. AASQA (Lee et al., 2019) and RISE at DHHS (Flower et al., 2019) took place in Australia.

Standard practices cited in successful interventions and programs included teaching employability skills, providing autism awareness training to job coaches, employers, supervisors, and co-workers at worksites, long-term support at the worksites, and assessing worksites before placement. Additionally, providing individuals with ASD brief, regular feedback that is honest, constructive, and consistent at the worksite, clear instructions, and task analysis to break large tasks into steps. Furthermore, using technology, such as iPods, help individuals complete job tasks requiring multiple steps, problem-solve, follow schedules, and task organization.

Conclusion

The current rate of unemployment and underemployment in individuals with ASD must be addressed through rigorous research methods, including longitudinal, to determine successful interventions and programs that lead to successful long-term, meaningful competitive integrated employment. There are many evidence-based, successful programs and interventions that need to be studied further through longitudinal studies and implemented into secondary, post-secondary, and job settings to ensure inclusive, integrated, and prosperous long-term employment for individuals with ASD.

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