12-2023

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Transition Programs to Facilitate Employment for Young Adults with Autism Spectrum Disorder

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Honors College Senior Project

Double Major: Human Development and Psychology

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December 1, 2023

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Abstract

It is well-documented in the literature that individuals with Autism Spectrum Disorder (ASD) have difficulty transitioning from school to the workforce. This group experiences challenges adjusting to the expectations of the workforce and a high unemployment rate is reported among adults with ASD. There are several notable barriers that inhibit adults with ASD from achieving gainful employment: inadequate preparation for the demands of the workforce, especially along vocational and social skill domains, are likely impacting this issue. Deficits in social skills and communication are reported as key factors that contribute to low employment and low employment skill retention among individuals with ASD. There is a need for school-based transitional programming to address both social and vocational skill deficits in order to adequately prepare students with ASD for success in the workforce, before they leave school. Transitional programming needs to address the challenges with skill generalization and retention that is often reported in this population and poses an additional barrier to the success of such programs. Research supports the efficacy of a combination of several program aspects, including supported employment programs, to meet the unique needs of this demographic and facilitate improvements in the various areas of deficit that impact employment. Directions for future research are discussed, including research into effective methods or combinations of methods to provide support through school-based programming.

Keywords: autism spectrum disorder, transition, vocational programs


Transition Programs to Facilitate Employment for Young Adults with Autism Spectrum Disorder

Employment provides not only a source of income, but independence (Martin & Marc, 2021). Finding employment can greatly impact an individual’s quality of life, make an individual feel valued and included (Martin & Marc, 2021), and promote healthy emotional development (Porthukaran et al., 2022). Being employed is often viewed as a vital and universal characteristic of adulthood and a way to measure a successful transition to adult life (Gerhardt et al., 2014). This achievement is equally important to adults with Autism Spectrum Disorder (ASD): Being able to maintain employment and sustain a degree of financial independence is an important developmental milestone for many autistic adults (Porthukaran et al., 2022). However, individuals with disabilities are eight times less likely to be employed than individuals without a disability, and those on the autism spectrum are among the least likely to be employed when compared to other disability groups (Westbrook et al., 2013). In addition, research indicates that even among the population of adults with ASD who are employed, many are underemployed, meaning that they are not employed full-time, not working as much as they would like, or not making a living wage: Only 6% of adults with ASD have full-time stable employment (Lauderdale & Haspel, 2021). Unemployment and underemployment may negatively impact the adult development of individuals with ASD (Martin & Marc, 2021).

This low rate of employment becomes more concerning each year as the number of children who are diagnosed with ASD continues to rise (Westbrook et al., 2013), and more children with ASD become adults each year. Although these children become adults and exit the public school system, the functional limitations associated with ASD typically continue into adulthood (Westbrook et al., 2013). This continually increasing population of individuals with
ASD are struggling to achieve competitive employment once they reach an age where they should be entering the workforce (Lauderdale & Haspel, 2021). These differences in functioning often impede independent living and limit the ability of adults with ASD to maintain stable, long-term employment (Westbrook, 2013). The complex and individual nature of ASD (Lynas, 2014) causes further difficulty designing programs to effectively address the difficulties this group faces with securing and sustaining employment (Lauderdale & Haspel, 2021). ASD falls on a continuum and presents differently from person to person; this creates a barrier that prevents many people with ASD from achieving independence in adult life.

This review addresses the core functional differences that are associated with ASD that impede employment and make the transition from school to the workforce particularly challenging: such as the cognitive executive functioning and social skill deficits that are core features of ASD diagnosis (Baker-Ericzen et al., 2018). These have been identified as major challenges to employment success for adults with AS and these skills are referred to as “soft skills” in vocational settings (Baker-Ericzen et al., 2018). It also addresses popular and evidence-based programs that aim to increase employment rates in adults with ASD and potential program additions to support employment skill generalization and employment retention. Finally, school-based programs that prepare students with ASD for the transition are reviewed.

**Autism Spectrum Disorder and Employment Challenges**

Many adults with ASD, including individuals with average or above-average IQ scores, struggle to maintain employment (Schall et al., 2015). In fact, recent research has suggested that individuals with ASD without intellectual disability have even worse employment outcomes than those with intellectual disability (Baker-Ericzen et al., 2018). For many reasons, inability to retain an employment position cannot be attributed to low intelligence or intellectual disability...
among this population. Furthermore, there is evidence that the main reason for this lack of employment is also not an inability to complete job tasks: Several studies indicate that adults with ASD are more likely to lose their employment for behavioral and social interaction reasons, rather than inability to perform the required work tasks (Westbrook et al., 2013). Nor do these low employment rates result from a lack of desire to work; people with ASD often want to work, but routinely lack appropriate social communication, complex interpersonal skills, and subtle emotion perception and are subsequently unable to secure and sustain employment but (Sung et al., 2019). Many factors contribute to this phenomenon.

One factor is that many people with ASD have deficits in critical interpersonal and communication skills that hinder them from succeeding in many workplace environments. Difficulties with social interaction are the main factor that hinders job search and job performance for adults with ASD (Martin & Marc, 2021). According to the American Psychiatric Association, the core deficits that are associated with ASD are social communication, social interaction across multiple contexts, and restricted and repetitive patterns of behavior, interests, or activities (American Psychiatric Association, 2013 as cited in Lauderdale & Haspel, 2021). These deficits may lead to miscommunication and misunderstandings in the workplace and relate to a negative or stressful work environment, especially if coworkers and supervisors are not educated and understanding regarding the differences associated with ASD. Symptoms of ASD may manifest in the workplace as difficulty with comprehending the emotions and social cues of others, understanding nonverbal communication, developing and maintaining relationships with coworkers, stereotyped or repetitive motor movements, rigid insistence on consistency, inflexible adherence to routines, highly fixated interests, or hypo or hyper-reactivity to sensory input (American Psychiatric Association, 2013). Ultimately, these behaviors may lead
to frequent conflict with supervisors and coworkers which could eventually lead to termination of employment, missed opportunities at work, and high levels of stress and anxiety at work for individuals with ASD.

Another factor that likely contributes to low employment rates upon leaving the school system is inadequate preparation for the expectations of the workforce (Morgan & Wine, 2018). Given that the research available on specific tactics and procedures that can be used to teach individuals with disabilities vocational skills is somewhat limited, inadequate preparation is a likely cause of unemployment for many highschool graduates with ASD. (Morgan & Wine, 2018). A major part of this underpreparedness is that topics and behaviors that are learned through traditional schooling are not always beneficial after graduation.

First, the goals that are outlined in Individualized Education Plans (IEPs) do not always translate to a vocational setting (Lauderdale & Haspel, 2021). Though subjects that are important during schooling (e.g., math and biology) are emphasized for student success; these areas of knowledge are not always directly helpful in the workforce or in adult life. In addition, some behaviors and social rules that are taught in school are not helpful in a work environment. For example, taking turns and sharing are commonly emphasized social skills for the classroom, but are not identified as particularly beneficial for a workplace (Lauderdale & Haspel, 2021). This means that students may adapt to succeed in school, but graduate and find that these hard-won skills do not serve them in a work environment.

Not only do students with ASD learn skills in school that are not directly applicable to life post-graduation, schools also do not teach many of the skills that are needed in a work environment. Many abilities like networking or interviewing have no relevance in a school-based setting and are neglected from school curriculum. However, these are skills commonly found to
be vital in acquiring and sustaining employment (Sung et al., 2018). In addition to learned behaviors, knowledge of social skills and expectations could be the difference between securing and losing employment. An example of a social expectation is one’s physical appearance in a work environment; appropriate school clothing is noticeably different than what conforms to a workplace dress code (Lauderdale & Haspel, 2021). Schools do not prioritize the skills that will be needed for students with ASD to effectively transition to a workplace after graduation. There is inadequate preparation in the typical school curriculum for the rules and behavioral expectations of a work environment, as well as how to conduct oneself, how to socialize and communicate with others, and other generally accepted workplace behaviors.

**The Necessity for School-Based Programs**

Many studies have confirmed the importance of beginning employability training at an early stage (Lynas, 2014), such as when an individual is still enrolled in the public school system. Commencing employability training while still in school is beneficial to helping students develop a range of skills and behaviors that will be required in a workplace setting (Lynas, 2014). This is also important to implement employability programs in schools because schools are able to come into contact and offer services to the majority of the population. Once a student leaves the school system, they will never again inhabit that space: While school-based transitional services are mandated for youths with ASD, adult ASD services are not necessarily an entitlement mandated by law (Gerhardt et al., 2014). It can be difficult to reach adults with ASD to provide beneficial services or research.

In addition, students with ASD are very likely to struggle with the transition from school to the workforce; transition-aged students with ASD very often experience difficulties in social interactions with others and often experience stress, anxiety, and depression in transition
situations (Westbrook et al., 2013). Research has shown that young people with ASD had the highest rate of inactivity upon leaving the school system compared to other disability groups (Lynas, 2014). Some studies have found that 12 – 24% of young adults with ASD are not committed to any “meaningful activities” such as employment post-graduation: This relates to the high risk of this demographic to struggle with securing and maintaining employment (Lynas, 2014). This provides further evidence that this is due to poor transitional planning and barriers to participation which are unique to this group of young people (Lynas, 2014).

**Regulations of School-based Transition Programs**

Due to the established difficulty with achieving stable employment that is observed among young adults with ASD, in the US it is mandated by the Individuals with Disabilities Education Improvement Act (IDEIA) that educators must provide transition training beginning no later than age 16 to prepare individuals for post-school life (Morgan & Wine, 2018). Transitional planning in the US is explicitly defined and regulated by IDEIA, which governs how states and public agencies provide transitional services to children with disabilities (Westbrook et al., 2013). Many school-based transition programs have been implemented in a variety of methods to prepare students with ASD for this shift to the workplace such as vocational education and integrated or supported employment (Westbrook et al., 2013).

There are certain requirements imposed on school-based transition programs to ensure that the needs of students are addressed and to facilitate the student's movement from school to post-school activities (Westbrook et al., 2013). These programs are often based on the individual student's strengths, preferences, and interests (Westbrook et al., 2013). A combination of several aspects of these different program types are often utilized to meet the individual needs of each student and to facilitate a smooth transition. There are typically three levels of support services
ranging from requiring some support to substantial support to secure and maintain competitive employment (Lauderdale & Haspel, 2021). Each individual with ASD will exhibit different behaviors and require support in the workplace (American Psychiatric Association, 2013). In recent decades, the number of people with ASD accessing services has increased (Westbrook et al., 2013). However, emerging data shows that many young adults diagnosed with autism spectrum disorder still have great difficulty finding employment (Morgan & Wine, 2018). More research is needed to determine what comprises an effective transition program and what aspects should be included to achieve the best results in securing employment for this demographic.

Types of Transitional Programs

Research typically focuses on three main areas related to employment for adults with ASD: interventions dedicated to transition-age youth or young adults to facilitate integration into the job market, interventions aimed at specific vocational or related skills, and comprehensive interventions where employment is the primary outcome that are typically represented as supported employment programs that help achieve and maintain employment (Martin & Marc, 2021). Several studies included in this review are primarily vocational rehabilitation programs which are a common method to address deficits in employable skills and seek the most efficient ways to introduce new employment-related skills to adults with ASD in order to improve outcomes in the labor force. These programs teach students with ASD job skills necessary to enter into a career path of their choosing. Among vocational programs, there are different strategies for attempting to convey these vocational skills with varying effectiveness and persistence of skills learned; several of these strategies will be covered in this review. Other studies involve transitional planning and preparedness: These programs recognize the specific needs of young adults with ASD attempting to transition from school to the workforce, and
subsequently provide additional support. This type of program would typically provide emotional support and a more individualized counseling experience to promote an easy passage from school to the workforce. Another category of transitional program employs a focus on social skills or soft skills, which are those skills that are not explicitly taught in a school curriculum. Soft skills are typically related to “people” skills or emotional intelligence, which often make career achievement possible. Many programs have attempted to address the deficits related to social skills in individuals with ASD to facilitate success in a work environment. Finally, studies have examined more comprehensive programs or long-term supported employment that are designed to support individuals in finding and maintaining employment (Martin & Marc, 2021). Supported employment is a model which involves an individual achieving competitive employment in an integrated work setting and receiving extended support in the workplace to facilitate job maintenance and retention (Westbrook et al., 2013).

**Vocational Training Programs**

Vocational programs provide instruction to help overcome barriers to accessing, maintaining, or returning to employment (Westbrook et al., 2013). These programs allow individuals the opportunity to build skills for a chosen career path. For people with ASD, they also often instruct on more general employment skills for the workforce. Skill learning for individuals with ASD may be less efficient due to difficulties with sensory processing and challenges with adjusting to new environments (Klorfeld-Auslender et al., 2022). This has resulted in the implementation of a variety of strategies to attempt to provide effective vocational training to individuals with autism spectrum disorder. Programs may rely on different methods and try to enhance vocational training and teach employment skills quicker, more effectively, and provide more enduring results for people with ASD. The Vocational Rehabilitation (VR)
program is a large federally funded organization and is widespread among all 50 states (Migliore et al., 2014). In the United States, vocational rehabilitation agencies are responsible for providing employment support services for individuals with ASD (Westbrook et al., 2013). These agencies are seeing an increase in the number of transition-age people with ASD accessing their employment support services (Westbrook et al., 2013).

**Applied Behavior Analysis (ABA)-Based Vocational Interventions**

Applied Behavior Analysis (ABA) has been described as the science of analyzing how the individual's environment influences their behavior and the interventions that apply these principles in order to change behavior (Eckes et al., 2023). It is based theoretically in operant conditioning and typically aims to change challenging behavior and promote more adaptive behavior (Eckes et al., 2023). ABA-based methods are used to target specific behaviors, but comprehensive ABA-based interventions almost always begin in early childhood, have a high intensity, are personalized to meet the individual needs of each child, address several skills at the same time instead of promoting just one specific skill, and use multiple behavior analytic methods (Eckes et al., 2023). Comprehensive ABA-based interventions are commonly thought to be more effective for younger children (Eckes et al., 2023).

Though there is a lack of research relating specifically to ABA-based interventions to improve vocational skill acquisition in individuals with ASD, principles of ABA are often the basis for such programs. One such study was conducted by Lattimore, Parsons, and Reid (Gerhardt et al., 2014) where they examined skill acquisition for job skills for clerical and cleaning tasks: It was found that vocational skills were acquired more effectively and quickly when training was administered both in the natural workplace environment and supplemented by a simulated training in a separate location (Gerhardt et al., 2014). Vocational instruction in the
natural environment with simulated training resulted in greater skill acquisition than instruction in the natural environment alone (Gerhardt et al., 2014).

In addition, there is also a small body of research that does not focus on applying principles of ABA, but still utilizes these principles and proves their effectiveness. For example, Hagner and Cooney (2005) studied the qualities of a supervisor that lead to employment success for individuals with ASD. It is clear that the strategies promoted by the results align with the principles of ABA: It was found that when supervisors provide consistent and predictable schedules, precise and clear job responsibilities, use organizers to structure job performance, and utilize direct and clear communication that employees with ASD were more successful in the workplace (Gerhardt et al., 2014). These are all principles that are utilized in ABA trials: use of activity schedules to increase predictability of tasks and clarity of expectations, task analysis, widespread use of visual supports in ABA trials for improving performance in people with ASD, direct and clear communication to facilitate the emergence of stimulus control (Gerhardt et al., 2014).

**Covert Audio Coaching (CAC)**

Another technique is covert audio coaching (CAC), which utilizes a two-way radio that allows a trainer or coach to use radio communications with a participant via an earpiece. This allows the trainer to deliver directions from a distance and be heard only by the participant (Westbrook et al., 2013). Bennett et al. (2013) observed the efficacy of CAC as a vocational training program and attempted to prove that CAC can be effective and helpful to address unfavorable post-school employment outcomes for people with ASD. This technique was previously found to be successful with individuals with other disabilities because it provided immediate feedback and taught the necessary skills with the supervisor at a distance, which
increased accuracy in completing tasks but did not encourage over-dependence on the supervisor (Bennett et al., 2013). Due to prior success with this method, the authors believed that in-ear coaching using a two-way radio can increase independence while providing effective vocational instruction in individuals with ASD as well. Bennett et al. (2013) employed the CAC technique to instruct three students with ASD on the skill of folding t-shirts using a folding board. All three students had a diagnosis of ASD and were attending high school at a charter school tailored toward students with this disorder.

**Behavioral Skills Training (BST)**

Another method applied Behavioral Skills Training (BST) to vocational training to be more effective with teaching novel vocational skills to individuals with ASD. BST typically consists of instructions, modeling, rehearsal, and feedback with several variations available within each section of the training (Morgan & Wine, 2018). Morgan and Wine (2018) evaluated the effectiveness of BST in teaching job skills to an 18 year old with ASD. To begin, BST treatments provide instructions to the participants, which can be oral or in the form of a checklist or task analysis; literature or other written materials may be presented as well to supplement instruction and aid participant understanding and acquisition (Morgan & Wine, 2018). Next, the second step of BST is modeling, where a model/example of the desired behavior is presented: This model is usually in the form of an experimenter, confederate, or video (Morgan & Wine, 2018). Learners will then rehearse desired behaviors and feedback may be given following this session or during sessions in the natural workplace environment. This training will be repeated until the participant has met a predetermined mastery criterion set by the experimenters or educators: Until the goal of skill acquisition is met.

This design focused on four job skills in a functioning restaurant environment. Four of
the most difficult-to-teach restaurant skills were selected based on a manager’s report (preparing and running the commercial dishwasher, polishing and rolling silverware, bussing a table, and cleaning the bathroom). To conduct a BST trial, a task analysis was conducted for each skill using input from restaurant staff, and each step was objectively defined; the task analysis for each skill ranged from 18 to 24 steps each. Observers recorded the steps that were correctly performed during each session and reported the data as a percentage of correct steps. A baseline was conducted where participants were provided with this task analysis and written instruction, as well as instruction on where necessary materials were located.

Use of Modeling Techniques to Shape Desired Vocational Behaviors

Several types of vocational programs employ the use of modeling techniques to shape behavior and present the desired result to participants. Typically, modeling strategies directed at youths with ASD involve a person engaging in a specified behavior while a child with ASD watches (Alhuzimi, 2022). A growing trend in research and literature has begun to study modeling techniques and their efficacy in encouraging the acquisition of vocational skills and behaviors of students with autism spectrum disorders. The basis of modeling intervention strategies is observational learning theory, which suggests that most human behavior can be learned by watching the behavior of other individuals (Bandura, 1997 as cited in Alhuzimi, 2022). In BST interventions, instructors model the steps of the tasks while providing oral instruction by reading the steps from the task list (Morgan & Wine, 2018). Other studies, such as one performed by Rigsby-Eldridge and McLaughlin (1992) found modeling with verbal reinforcement (praise) to be effective in shaping the work-related behaviors of young (20 year old) individuals with ASD and low IQ (Westbrook et al., 2013). This type of modeling involved adult staff members performing tasks or behaviors that study participants were to adopt, and
praising study participants when they approximately performed those tasks or behaviors (Westbrook et al., 2013). The use of live models (in vivo modeling) has been successful in demonstrating several behaviors and skills for children with ASD, such as suitable play behavior (Alhuzimi, 2022).

**Video Modeling**

Observational learning has also been promoted successfully through the use of technology, as in video modeling (Hine & Wolery, 2006 as cited by Alhuzimi, 2022). Video-based modeling interventions are also utilized as part of BST interventions (Morgan & Wine, 2018). Video Modeling (VM) is a method which involves demonstrating a specific behavior using a video representation of that behavior (Alhuzimi, 2022). VM has been shown to be effective in guiding and facilitating employment-focused skill acquisition by transition-aged youth with ASD (Westbrook et al., 2013). An intervention using VM involves two stages: first the participant watches a video presentation and then imitates the behavior modeled in the video (Alhuzimi, 2022). A VM intervention typically includes displaying an edited representation of a novel behavior to a participant on a screen, displaying repetitive excerpts of that same behavior or various examples of the behavior, distinct sessions of practice or role-playing of the behavior, evaluation of generalization of the behavior, and regular evaluation of the tapes, if required (Hine & Wolery, 2006 as cited by Alhuzimi, 2022).

Video modeling is regarded as a successful intervention approach that has favorable outcomes in different fields (e.g. societal communication, interactive functioning), different behaviors, age groups, and cultures (Alhuzimi, 2022). The VM method has proved especially effective when presenting isolated vocational skills to transition-aged (16-18) individuals with ASD and these skills were able to be generalized to a real work setting (Westbrook et al., 2013).
Several other advantages have been associated with video modeling, such as the ability to edit and remove information that is not relevant to the behavior intervention (Alhuzimi, 2022). Video modeling can also be implemented with minimal social contact, which is valuable to increase confidence in certain behaviors without causing excess stress or anxiety in participants (Alhuzimi, 2022). VM is also fairly inexpensive, easy to access, videos can be watched repeatedly, and such strategies have been found to increase attention and motivation of a participant to acquire the behavior or skill that is being modeled (Alhuzimi, 2022). Overall, video modeling strategies are useful and could be practiced alongside relevant vocational interventions to enhance the application of instruction within employment settings (Lauderdale & Haspel, 2021).

**Other Technology-Aided Vocational Intervention Strategies**

Technology-based interventions and technology-aided interventions have had positive results regarding efficacy of vocational interventions. Technological advances have resulted in a variety of devices that can be accessed to view videos for VM or other techniques, such as video cameras, televisions, laptops, computers, phones, and tablets (Alhuzimi, 2022). The use of technology in vocational interventions for people with ASD has been expanding at a rapid rate within the last decade (Sarri & Syriopoulou-Delli, 2022). Technology-aided interventions have been used to teach a range of vocational skills to adolescents and young adults with ASD (Sarri & Syriopoulou-Delli, 2022). Sarri and Syriopoulou-Delli (2022) performed a review of 18 vocational-skill focused technology-aided interventions: All 18 studies included at least one participant with ASD aged 12 to 25 years. In addition, the review showed that researchers employed a range of different applications of technology including tablets, computers, cameras, iPads, and iPods or a combination of them (Sarri & Syriopoulou-Delli, 2022). The skills that
were targeted in order to increase vocational outcomes for individuals with ASD described in the review include specific on the job skills (e.g., paper shredding, packing material, etc.) and more generic skills (e.g., job interview skills, social vocational skills, career decisions) (Sarri & Syriopoulou-Delli, 2022).

Participants enrolled in technology-aided interventions required fewer hours of vocational coaching, and were able to improve their interview skills, job performance, social skills, and self-confidence (Sarri & Syriopoulou-Delli, 2022). Participants who received the tech-aided intervention also showed a significant increase in their perceived self-efficacy to perform the targeted vocational task (Sarri & Syriopoulou-Delli, 2022). Overall the results indicated that technology-aided interventions have been useful in teaching on the job and generic vocational skills to adolescents and young adults with ASD and improving performance in a real work environment (Sarri & Syriopoulou-Delli, 2022).

**Efficacy of Vocational Programs**

The various vocational programs all rely on different techniques to develop employment skill acquisition and retention in individuals with ASD. There is promise for the practice of applying principles of ABA during vocational training and evidence that ABA-based interventions have potential to increase skill acquisition and the efficiency of vocational interventions (Gerhardt et al., 2014). CAC and BST methods also attempt to improve employment skill acquisition and retention: These vocational trainings were both able to report effective results. Along the dimension of skill acquisition, it was found that using CAC had a positive impact on the participants’ skills on measures of accuracy and fluency: During the intervention, they were able to fold the t-shirts acceptably with 100% accuracy (Bennett et al., 2013). Similar results were found in the study on BST. BST was also able to report an increase in
skill acquisition among its participants: Prior to the BST trial, the mean percentage of steps completed correctly was very low. However, following the BST trials, the mean percentage of correct steps for all 4 skills increased to 97-100% (Morgan & Wine, 2018).

Another important factor when judging the efficacy of vocational programs is the persistence and longevity of the skills gained during the intervention. The results of CAC were tested weekly for three weeks and the skills maintained, then again on a fourth week in a new location. The skills persisted and transferred well to the new environment (Bennett et al., 2013). BST was also retested to measure whether the skills endured; the four tasks were also attempted again approximately 23 weeks later in the same restaurant (Morgan & Wine, 2018). Next, the participant was taken to a new restaurant and asked to complete three of those original four tasks (Morgan & Wine, 2018). The authors reported that the skills were retained six months following the study and were able to be generalized to a new restaurant environment (Morgan & Wine, 2018). In addition, ABA-based interventions also offer techniques to improve workplace performance and employment maintenance for adults with ASD, such as by utilizing clear expectations and visual spreadsheets or schedules for employees with ASD (Gerhardt et al., 2014).

Issues with Vocational Programs

However, there is some doubt as to whether vocational skills gained during any of these programs persist long term. For each program that was used with the demographic of transition-aged individuals with ASD, the results were only retested and observed for a relatively short time following the program. Maintenance for CAC was only examined during four weekly maintenance probes including the probe in a new environment to test generalizability of the acquired skills (Bennett et al., 2013). From the information provided by this examination, we
cannot conclude whether longer-term maintenance occurred. Unfortunately, research has indicated that skills from vocational programs do not tend to persist long-term in individuals with ASD. Specifically, longitudinal research has indicated that employment for adults with ASD declines over the decade following participating in a vocational program, even if the program initially resulted in employment success (Battaglia & Nagler, 2022). Additional research regarding outcomes post-graduation from a vocational program indicate that only half of youths who exit these programs do so with an employment prospect, and this figure declined slightly even after one year (Migliore et al., 2013). It is possible that participants in the CAC trial would return to baseline levels of skill performance following long periods without the structured coaching provided by a vocational program (Bennett et al., 2013).

For ABA, there is also a gap in the research regarding the long-term persistence of skills acquired through this type of training. Morgan and Wine’s (2018) BST intervention included a retest at 23 weeks, which is a more substantial period of time to make inferences about the long-term efficacy of the procedure. For BST, all 4 skills remained 100% correct during maintenance 23 weeks later, and remained 90-100% correct when generalizing these skills to a new restaurant environment (Morgan & Wine, 2018). However, research indicates that employment achieved following a vocational program declines slowly over a decade without structured skill maintenance (Battaglia & Nagler, 2022). Due to this factor, further research beyond 23 weeks would be needed to infer the level of retention of vocational skills following participation in a BST intervention.

Vocational programs also do not always address whether these skills will generalize effectively to a novel environment. A poor ability to generalize skills or behaviors is associated with ASD (Gerhardt et al., 2014), which creates challenges for standard vocational programs that
aim to increase skill-learning (Klorfeld-Auslender et al., 2022). One reason is because these programs typically rely on extensive practice and repetition, which may create abnormally specific learning in people with ASD who struggle to generalize skills (Klorfeld-Auslender et al., 2022). This means that vocational programs may teach workplace skills, but participants may struggle to utilize skills in a novel workplace environment once they acquire employment. Especially in the case of vocational programs that teach skills on-site in a specific workplace, participants may struggle to generalize these skills and perform the skills effectively in subsequent work environments.

For the CAC intervention, Bennett et al. (2013) did examine skill proficiency during the fourth week post-intervention in a novel workplace environment, which displayed results that indicate successful skill generalization to new settings. Generalization was tested similarly for the BST intervention: The participant was retested 6 months after the initial intervention and at an unfamiliar restaurant environment. These results also indicated successful generalization. However, additional research has suggested that individuals with ASD do not demonstrate efficient learning and generalization patterns without memory reactivations (Klorfeld-Auslender et al., 2022). This may indicate that further interventions to provide maintenance of learned vocational skills is required to promote endurance of such skills: Continuous monitoring of vocational services and service-related outcomes of people with ASD is recommended to promote employment, economic self-sufficiency, and inclusion in society (Migliore et al., 2013). This also may indicate that vocational training alone is not enough to increase employment: Deficits may go beyond lack of employable skills and require further intervention addressing social and communication skills.

**Vocational and Socially-Focused Language Intervention**
Knowing how to do the physical skills of the job is not enough to secure and maintain employment long-term: Research has indicated that a deficit of social and communication skills impacts the employment rate of adults with ASD. Battaglia and Nagler (2022) conducted a systematic review of ten studies involving vocational programs, and all data reviewed showed positive outcomes of socially-focused language interventions on vocational skills. Combined vocational and language intervention was associated with improved abilities to communicate and function independently in a vocational setting (Battaglia & Nagler, 2022). Among the studies included for review, participants had an age range from 16 to 68 years and ranged from mild to moderately severe on the autism spectrum. Though the duration of the studies varied from a few days to many weeks, all involved weekly intervention, excluding the few which were conducted by survey.

### Inclusion of Language

Battaglia and Nagler (2022) operated under the idea that ASD can negatively impact language acquisition and development, as well as causing differences in the way individuals respond to their environment, both of which make it difficult to gain and maintain employment. Although highschool and college begin to prepare students for the workforce, we have established that students with ASD may struggle to generalize the skills they acquire, and therefore may need more explicit training in the expectations of a workplace (Battaglia & Nagler, 2022). For example, though students may learn to be prepared and on time to class, they may not generalize this requirement to be on time to work a job interview. The addition of a language and social-focused component to a vocational intervention addresses this deficit.

### Social Skills Interventions

In traditional schooling, there is a hidden, “soft skills” curriculum that is not emphasized
with structured lessons, but is instead taught through interaction and reinforcement. The explicitly stated and structured lessons are the “hard skills,” (e.g., math, language) while the soft skills are what are implied and learned through interaction with others, often in a school setting. Soft skills are often described as a cluster of executive functioning and social abilities that make someone a good employee and compatible with coworkers (Baker-Ericzen, 2018). These soft skills are vital to engaging and succeeding in a workplace and have been found to predict vocational outcomes, but are not explicitly taught and subsequently are often lacking in people with ASD (Baker-Ericzen et al., 2018). Impairment in social functioning is a central feature of ASD and has been well documented in the literature (Baker-Ericzen et al., 2018): This is shown when young adults with ASD do not acquire and implement social skills or social communication skills in the workplace.

Individuals with ASD may struggle to understand social situations, respect others’ personal space, with conversation skills such as speaking the appropriate amount (e.g., they may speak either too much or too little), relying too heavily on supervisors or coworkers to provide instruction in the workplace, or dressing and acting appropriately for a work setting (Westbrook et al., 2013). They may also have difficulty communicating with others, processing and integrating information from the environment, establishing and sustaining social relationships with others, participating in new environments, initiating interactions, maintaining reciprocity, sharing enjoyment, taking another person’s perspective, and inferring the interests of others (Baker-Ericzen et al., 2018). Though these skills are typically not taught explicitly, they are enforced through traditional schooling. These skills often become vital to succeeding and navigating a workplace, and are as necessary to adult life as task-specific vocational skills.

The Necessity for Soft Skills Interventions
There is some evidence to suggest that vocational programs may not be the most beneficial and effective option for transition-aged individuals with ASD. While the increase in vocational skills is a common focus for transition programs, research has found that many of the students who participate in vocational training are still unsuccessful at finding employment or remaining employed for long following graduation (Kamens et al., 2004). This research suggests that this trend of low employment is related to the evidenced deficits in social and interpersonal skills (Kamens et al., 2004), as well as deficits in appropriate social communication and subtle emotional perception which could lead to job loss as a result of repetitive strained social interactions and misunderstandings (Sung, 2019).

Students with ASD need more explicit instruction to acquire these skills and generalize them to a new environment in the workforce (Bennett et al., 2013). When young adults with ASD graduate from the school system and enter the workforce, they may not be able to obtain or maintain employment for long because they cannot effectively communicate with others. This also impacts their ability to complete their job tasks. Qualitative studies examining vocational outcomes report that employment success is highly contingent upon social abilities as opposed to completing job duties (Baker-Ericzen et al., 2018). Behavior management challenges that affect employment for adults with ASD need to be better understood in order to be addressed by employment support service providers, especially in order to enact programs that plan and facilitate school-to-work transition (Westbrook et al., 2013). Many programs attempt to provide a soft skills curriculum to address the deficit and promote generalization of social and communication skills.

Most importantly, social skills deficits heavily impede the ability of adults with ASD to establish meaningful social relationships (Bellini et al., 2007). Deficits in social and
communication skills too often lead to withdrawal and social isolation. Specifically, young adults with ASD have a higher rate of anxiety and depression when attempting to transition from school to the workforce (Westbrook et al., 2013). These psychological factors may be related to the core challenges with social and communication skills experienced by students with ASD (Westbrook et al., 2013). The degree of deficit related to social skills varies significantly across the range of the spectrum of autism.

A variety of factors ranging from hygiene issues to inappropriate co-worker communication are highly related to the difficulties related to transition to the workforce, ability to secure employment, and employment retention of individuals with ASD. Effective transition programs would need to address the varying social needs among students with ASD in order to promote increased employment (Westbrook et al., 2013). There is a need for further research examining this transition period to better inform current transition planning and practice and to suggest effective treatment options, especially due to the impact that these social skill deficits have upon psychological and employment outcomes of students with ASD (Westbrook et al., 2013).

The Necessity to Embed Soft Skills Interventions in School-Based Programming

Social skills are critical to successful social, emotional, and cognitive development: Effective social skills programming must be an integral component of educational programming for children with ASD (Bellini et al., 2007). There is a dire need for school-based programming that addresses social skill deficits (Lauderdale & Haspel, 2021). Lauderdale and Haspel (2021) investigated soft skills and recommended ways that school-based programming can meet this need. The results of this study indicate the need for programs that address social and communication skills such as the socially-focused language interventions that are explored by
Battaglia and Nagler (2022). Some applications of school-based programming do exist, but the current attempts to prepare students for the transition from school to the workforce have come up short. Recent research has suggested that there is a need for such programming to address social skills, as they are vital for employment and job retention.

Students with ASD need direct instruction in the development of social skills and opportunities to practice these skills (Kamens et al., 2004) in order to see increases in employment among this demographic. This type of direct instruction concerning social skills is often lacking in traditional schooling (Kamens et al., 2004), which creates the necessity to address these skills with transitional programs before students with ASD attempt to enter the workforce where social skills are often vital to employment success.

**Applied Behavior Analysis-Based Social Skills Interventions**

The principles of ABA have not been applied to social skills interventions with much success. Deficits in social skills are a hallmark of ASD (Gerhardt et al., 2014), which has created interest in addressing these deficits with behaviorist principles. However, it is difficult to put into practice because there is little agreement on the definition of “social skills” and what should be included in the definition, what should be treated/addressed/improved, etc. (Gerhardt et al., 2014). In addition, when improvements in social skills are observed in ABA-based studies, they are usually only moderate improvements and usually targeted at individuals with high-functioning ASD/Asberger’s (Gerhardt et al., 2014).

One example of ABA-based social skills intervention taught youth with ASD to get help from strangers in public (Gerhardt et al., 2014). This skill was able to be taught effectively, however, naive members of the community who were approached did not respond appropriately and cooperate. While this behavior was able to be taught, it did not improve “social skills” in a
way that was acceptable to community members.

Another study used reciprocal interval training (RIT), another type of ABA-based intervention. RIT uses a more naturalistic type of behavior training that teaches imitation/modeling in the natural setting. The basic components are context-based modeling, delayed prompting, positive reinforcement, and attention to individual language competencies and interest (Gerhardt et al., 2014). Walton and Ingersoll (2013) found RIT to cause improvements in social imitation and joint engagement in two out of four participants (Gerhardt et al., 2014).

**Video Modeling and Other Technology-Aided Social Skills Interventions**

Some studies have found evidence that technology-aided interventions or visual representation of skills or behaviors using video modeling (VM) are effective for individuals with ASD in understanding and practicing social skills for specific contexts (Lauderdale & Haspel, 2021). There is also support that VM has helped individuals with ASD to gain or improve novel social skills and master more complex social or communication skills (Lauderdale & Haspel, 2021). Alhuzimi (2022) reviewed the literature of several studies that utilized VM to improve social skills in interventions with children with ASD: Charlop and Milstein (1989) found that a VM could teach conversation skills to young children with ASD, increase these skills, and that the skills were generalizable and maintained for 15 months after the study (Alhuzimi, 2022). Charlop-Christy et al. (2001) also found that video modeling caused quicker acquisition of tasks and was also successful in supporting generalization of skills (Alhuzimi, 2022). Several additional studies indicated that VM has been effective in increasing initiation of play behavior in children with ASD (Alhuzimi, 2022).

**Interventions that Use Peer Interaction to Promote Social Skills**
To encourage social and interpersonal skills, studies by both Kamens et al. (2004) and Sung et al. (2019) built upon vocational transition programs to better address the needs of transition-aged individuals regarding social skills.

**Soft Skills Curriculum: “Skills to Pay the Bills”**

Expanding upon transitional programs to emphasize soft skills may seem daunting, but there are several established resources and strategies that could be used to enhance existing programs in schools, as well as provide effective instruction on workplace-related social skills (Lauderdale & Haspel, 2021). The U.S. Department of Labor’s Office of Disability Employment Policy (ODEP, 2012) published “Soft Skills to Pay the Bills: Mastering Soft Skills for Workplace Success” as a critical resource to guide soft skills development for adults with disabilities (Sung et al., 2019). This resource specifically identifies critical areas of support that are necessary to prepare individuals for employment and also describes activities that can be conducted to help participants acquire the six vital soft skills that were identified by ODEP (2012): communication, attitude, teamwork, networking, problem-solving and professionalism (Lauderdale & Haspel, 2021). Most of the activities are designed for facilitation in a group setting, making it a promising intervention to embed in school-based programs; they include explicit instruction, role-play exercises, and opportunities for performance and feedback (Lauderdale & Haspel, 2021). In addition, several lessons and activities from this program are available online, which makes it easy to access this information and continue practicing the curriculum at home (Lauderdale & Haspel, 2021).

A modified curriculum, ASSET (Assistive Soft Skills and Employment Training), based on “Soft Skills to Pay the Bills” was developed using structured weekly sessions (Sung et al., 2019). ASSET was run by facilitators, targeted toward the demographic of young adults with
“high-functioning” ASD. ASSET remained focused on the six soft skills identified above and used a structured learning approach (Sung et al., 2019). The lesson plan included activities with explicit instruction about the importance of using learned skills outside of the group. Participants were also given the opportunity to practice social skills and receive direct feedback from facilitators in an optional social hour following each weekly lesson to provide further practice and to promote generalization of the skills acquired during sessions (Sung et al., 2019).

**Vocational Training While Connecting With Peers**

Rather than through a structured curriculum like the one implemented by ASSET facilitators, Kamens et al. (2004) used on-site vocational training with hands-on social skills experience within a summer transition program. Kamens et al. (2004) implemented a program that combined vocational training with community involvement by pairing a class of highschool students with a group of college students. The high school students had a variety of disabilities including Down Syndrome, autism, Prader-Willi, and fragile x, and all were preparing to transition from highschool to the workforce, while the college students were all interested in working with disabled populations and were majoring in topics like psychology, education, or special education (Kamens et al., 2004).

The high school students were given brief training and explanation for each job and were paired with a college student for the day. Together, the high school and college students were given job assignments and coaching for each job, such as a mailroom assistant, office clerk, snack bar worker, bookstore employee, library assistant, or facilities worker (Kamens et al., 2004). Each student had the opportunity to experience each job placement and the college students were able to work with these highschool students and offer help at the job locations (Kamens et al., 2004).
One of the most important and impactful aspects of this program was the opportunity to form relationships and practice social skills in these workplaces (Kamens et al., 2004). The method of this program was based upon prior evidence that engaging in meaningful social interaction and having friends is key for social integration of people with disabilities (Kamens et al., 2004). There is also reason to believe that individuals with disabilities can learn behavior that is modeled by their peers, which has implications for both social and vocational behavior that could be learned through modeling in this intervention. Kamens et al. (2004) also noted that positive interaction between disabled and non-disabled peers is key to improving attitudes and promoting acceptance in society for disabled populations.

**Structured Social Skills Curriculum versus First-hand Experience**

Both the program implemented by Kamens et al. (2004) and by Sung et al. (2019) employed a combination of structured instruction with an opportunity to practice social skills. The Kamens et al. (2004) program provided structured vocational instruction for various jobs as an experience to be shared by high school students with disabilities and college students, which encouraged peer interaction and the formation of friendships. ASSET taught a structured employment-related social-skills curriculum and provided opportunities to socialize with other participants after each session (Sung et al., 2019).

Both programs embedded opportunities to practice social skills within the curriculum of the program; however, ASSET implemented an entirely social-skills-focused curriculum. The Kamens et al. (2004) approach did not include explicit social skills education within the vocational training aspect in the way that ASSET did, while the ASSET intervention did not include vocational training. Both the structured learning aspect and the opportunity for practice within the ASSET program were focused on social skills: Kamens et al. (2004) provided a focus
on practicing social skills first-hand and forming peer relationships, but within a vocational training experience.

The methods of both programs aligned with the vocational program strategies that were examined by Battaglia and Nagler (2022). Several programs that were found to be successful utilized structured language and communication aspects in addition to the vocational curriculum. Those programs taught many of the social skills that are identified as soft skills in a workplace or provided alternate avenues to improve social skills (Battaglia & Nagler, 2022). This is similar to the method employed by Kamens et al. (2004) because both programs combined social skills training with vocational training. However, Sung et al. (2019) implemented a social skills curriculum, which is similar to the socially-focused language aspects of the successful vocational programs recorded in Battaglia and Nagler’s (2022) examination.

Efficacy of Programs Focused on Social Skills

Both the ASSET intervention and the Kamens et al. (2004) interventions reported successful improvement in participants’ social functioning. Sung et al. (2019) indicated that ASSET graduates showed significant improvements, specifically in work-related social skills knowledge, social functioning, and social/empathy self-efficacy. Kamens et al. (2004) reported that many of the participating students found that they preferred or enjoyed the jobs they were taught and formed relationships with the college students they worked with. Kamens’ (2004) intervention was praised as a success toward building a learning environment based on community and providing opportunity for transition-aged students with disabilities to develop social skills and age-appropriate friendships (Kamens et al., 2004). Participants and group facilitators also had high reported satisfaction with the ASSET intervention. Sung’s (2019) findings suggest that ASSET can be implemented effectively, and has the potential to increase
social cognition and social/empathetic self-efficacy among high-functioning young adults on the autism spectrum.

**Issues with Programs Focused on Social Skills**

Overall, it seems that ABA-based training is more effective in conveying traditional vocational skills than social and communication skills. This may be due to the reported difficulty to define “social skills” in a way that makes it possible to target such skills with a behaviorism-based intervention. The results of attempted ABA-based social skills interventions seem to indicate that it is possible for this type of intervention to increase social imitation and behaviors, but it is not clear whether this is a satisfactory improvement in “social skills.” It is possible that social skills constitute more than behavior imitation.

The issue with addressing social skill deficits with ABA methods could also lie with skill generalization and application. It has been evidenced that individuals with ASD may struggle to generalize learned skills to novel situations or environments; social skills and social interactions are often complex and context-specific, which may make it difficult for individuals with ASD to generalize and apply behaviorism-based social skills to complex social situations.

Video modeling practices display a similar gap in research and intervention efficacy for adults on the autism spectrum. There are numerous studies to support use of VM practices to increase social behaviors and imitation in young children with ASD; however, there are far fewer studies demonstrating efficacy of this strategy in adults or transition-aged young adults. Sarri and Syriopoulou-Delli (2022) reviewed several studies regarding VM methods to increase vocational skills or job-related social skills and found some evidence of improvements, though one study did not show any significant increase in social skills contrary to the researchers prediction. VM techniques have been proven beneficial for efficiently teaching vocational skills in interventions,
but it seems that there is difficulty in conveying complex social skills through video-modeling.

Lastly, neither Kamens et al. (2004) or Sung et al. (2019) indicated generalizability of skills or whether the skills retained over time. Neither study provided follow-up to examine the endurance of positive results long-term, or employed a control group in order to definitively draw conclusions surrounding the efficacy of the intervention strategies. Furthermore, due to the nature of the ASSET intervention as a structured learning approach for social skills (not embedded within a vocational intervention), it is uncertain whether social skill gains will be generalized to workplace environments (Sung et al., 2019).

**Supported Employment**

Supported Employment (SE) is a model for workplace support that involves a counselor or service that provides personalized attention and assistance, typically to an individual with some nature of disability that is traditionally excluded from competitive employment and subsequently requires intensive supports in order to obtain initial employment followed by extended services to promote job maintenance (Westbrook et al., 2013). SE for individuals with ASD may include personalized support such as assistance during the job search process, instruction regarding application and interview process, facilitating a communicative relationship between the client, coworkers, and supervisor, and help resolving difficult workplace situations if they arise (Martin & Marc, 2021).

SE is not usually provided long-term by transition programs, though some programs that will be discussed in this review do involve an SE aspect; Transition programs tend to focus on facilitating the transition from school to the workforce for young adults with ASD and are not intended for long term employment support. A discussion of supported employment is included in this review because it is incorporated as a component of several transition-focused programs.
SE is also important to mention due to research that indicates that the skills or employment gained from vocational programs may not persist long-term. There is insufficient evidence to conclude whether social skill retention occurred following most of the social skills programs mentioned in this review. In either case, SE may be a necessary add-on to promote skill maintenance from transition programs.

**Efficacy of Supported Employment for Assisting Individuals with ASD**

The supported employment model is an established and evidence-based practice that is implemented to support adults with varying disabilities in acquiring, learning, and maintaining employment (Schall et al., 2015). An SE intervention commonly uses a four step process to assist job seekers in achieving stability in competitive employment: job seeker profile (JSP), job development (JD), job site training (JST), and long-term support or services (LTS) (Schall et al., 2015). SE is a highly individualized approach that meets the needs of the job seeker based upon an on-going data collection and on-site observation process (Schall et al., 2015), which is appealing to apply to adults with ASD due to the necessity for an individualized approach for this demographic. However, there is only sparse research to support the efficacy of this method for adults with ASD (Schall et al., 2015).

In a study conducted in Canada, Martin and Marc (2021) found support for the efficacy of an SE intervention toward maintaining employment for individuals with ASD, including individuals ranging in age from 19 to 49, many of whom had various comorbidities. Of the individuals who participated in this program, 62% secured paid employment by the end of the 12 month study; compared with the typical workforce participation rate of 38% for individuals with ASD (Martin & Marc, 2021). It was also found that the SE intervention was beneficial both to individuals that never had employment experience and to participants with higher educational
attainment (Martin & Marc, 2021). This SE intervention also allowed individuals to find a job related to their degree or specialized skills (Martin & Marc, 2021). Though job retention was a challenge for many participants, an SE approach provides individual support at the level and frequency that each client requires (Martin & Marc, 2021). The clinical implications of the results obtained by Martin and Marc (2021) provide support for the benefit of implementing SE interventions while searching for employment, and for the potential efficacy of SE interventions to provide maintenance for skills gained in transition programs.

**Integration of Multiple Models**

Several program types that are examined in this review implement multiple methods for transitional planning, preparation, and support. Combinations of vocational training, social-skill-focused interventions, and supported employment interventions seem to record positive results and are able to address several deficits or areas for improvement toward securing and maintaining employment.

**Vocational Training and Supported Employment**

The Project SEARCH with ASD Supports (PS-ASD) intervention was primarily a transition program intended to facilitate the passage of young adults with ASD into the workforce (Schall et al., 2015). This intervention was presented in the form of a 9-month vocational training program that was specific, intensive, and targeted at students with ASD during their last year of high school. (Schall et al., 2015). This intervention involved an internship assignment and placement within a community business during participants’ senior year of high school in order to learn vocational skills, where a behavior/autism specialist was also available on-site during these internship hours for consultation (Schall et al., 2015). Project SEARCH was able to report that 87.5% of individuals with ASD who participated in this
program were able to achieve competitive employment while a control group who did not participate in PS-ASD achieved employment at a rate of only 6.25% (Schall et al., 2015). These results were maintained for one year after entry into the study.

**PS-ASD with Supported Employment Intervention**

Next, Schall et al. (2015) compared the employment outcomes of individuals who received an SE program with individuals who received this SE program but also had participated in Project SEARCH with ASD supports (PS-ASD) beforehand. The SE program was found to result in increased job retention for all 45 participating adults with ASD (Schall et al., 2015). However, when Schall et al. (2015) evaluated and compared the outcomes of participants within the SE program with prior PS-ASD the results suggested that the 25 individuals who received PS-ASD before SE had achieved a higher mean wage, higher retention rates, and required less hours of intervention overall than the individuals who received only the SE intervention (Schall et al., 2015).

**Social Skills Intervention with Supported Employment**

The Autism Summer Employment Program (ASEP) was a transition program intended to provide vocational training to college students with ASD (Porthukaran et al., 2022). Like the program examined by Schall et al. (2015), ASEP also includes a supported employment aspect: This program employed two workplace specialists who were registered occupational therapists to deliver employment workshops, help participants search for jobs, attend job interviews with participants, facilitate a bond between participants and their employers, and provide ongoing job-related support (Porthukaran et al., 2022). This supported employment aspect was maintained for the duration of the summer program and was also offered in the form of text-based support or phone calls; the participants frequently utilized this support from ASEP specialists.
Of the 17 autistic adults who participated in this ASEP study, 12 obtained paid employment, 3 obtained volunteer positions, and 2 were unsuccessful in obtaining summer placements (Porthukaran et al., 2022). Many participants reported a significant increase in employment-related skills and knowledge from the pre-survey to post-survey (Porthukaran et al., 2022). Their employers rated these participants’ performance as “good” on average, though some had concerns (Porthukaran et al., 2022). Overall, these results suggest that if appropriate support is provided, summer vocational experiences with supported employment can be accessible for students with ASD, and can lead to success in obtaining employment.

Vocational and Soft Skill Training Interventions with Supported Employment Components

SUCCESS Intervention

Baker-Ericzén et al. (2018) evaluated the initial effectiveness of a new intervention, “Supported Employment, Comprehensive Cognitive Enhancement, and Social Skills” (SUCCESS), which implemented a “soft skills” curriculum aspect to vocational training. Though this program was not aimed at addressing transitional outcomes for young adults with ASD, it is included in this review because it was focused on employment for adults with ASD and had a subject group age range from 18 to 29. SUCCESS aimed to enhance both cognitive and social development and address the “soft skill” deficit in individuals with ASD, as well as more typical job skills that would be taught in a vocational program (Baker-Ericzen et al., 2018).

This program used a 6-month vocational training program that involved teaching the technical skills involved in software testing within a simulated work environment (Baker-Ericzen et al., 2018). The SUCCESS intervention also consisted of two main sections: The first focus was cognitive enhancement, such as executive functioning and memory skills (Baker-Ericzen et al., 2018). The second focus was social skills centered, which was primarily social cognitive and
communication skills (Baker-Ericzen et al., 2018).

The results of SUCCESS supported that adults with autism can improve both cognition and social cognition. In addition, employment rates more than doubled (from 22% to 56%) for the subject group, though this group was only 8 participants and would benefit from a repeated trial (Baker-Ericzen et al., 2018). SUCCESS provided evidence that the combination of a vocational and soft skill curriculum displays promising results. In addition, the SE aspect of SUCCESS may be beneficial to maintaining the results gained in vocational, cognitive, and social domains by participation in this intervention (Baker-Ericzen et al., 2018).

**Project ABLE**

Project ABLE (Autism: Building Links to Employment) was a summer transition program with vocational and social skills training and a supported employment (SE) aspect. Project ABLE was established as an employment service for adults with ASD in Belfast, Ireland which aims to help adults with autism secure and maintain employment but also pays special attention to young, transition-aged (16-19) individuals (Lynas, 2014). Project ABLE promoted employability/vocational training at an early stage, as well as transitional planning to prepare young people with ASD for the next stage after graduating secondary school: project staff developed a customized vocational program that incorporated each participants’ skills, interests, and abilities (Lynas, 2014). This vocational aspect also gave participants the opportunity to explore career options, attend vocational and employability training courses, acquire relevant work experience in various areas, secure full time or part time employment, and develop their independence and quality of life (Lynas, 2014). In addition, social and communication skill workshops and associated activities were provided (Lynas, 2014). This project also incorporated key aspects of the supported employment model of intervention that aimed to help people with
disabilities succeed in the workplace, once they have acquired a job.

Participants in Project ABLE also reported employment success (nearly half secured retail jobs, a fourth in administration, the remaining in other fields) or obtained work experience with at least one placement (more than half had at least two opportunities). Project ABLE participants also reported improvements in social skills, independence skills, confidence, communication, anxiety/stress, improved behavior, better use of time, vocational skills, and sleep/physical health (Lynas, 2014). Overall, participants of Project ABLE reported developments or improvements in their vocational, social, and communication skills and consequently became more independent in various aspects of their lives (Lynas, 2014).

Discussion

It is beneficial and necessary to provide school-based transition programs to students with ASD. There is a necessity to commence transitional planning at an early stage to develop a range of vocational skills that will be required in a workplace setting (Lynas, 2014). The need for school-based programming is dire: While current programming does exist, its attempts to prepare students for the transition from school to the workforce have come up severely short toward improving the bleak employment outcomes for individuals with ASD (Lauderdale & Haspel, 2021).

It is also important to implement transition programs in schools to prepare students for the workforce because the majority of children will pass through the school system. This places schools in a unique position of being able to offer services to the majority of the population. Furthermore, though school-based transitional services are mandated for youths with ASD; adult ASD services are not necessarily an entitlement mandated by law (Gerhardt et al., 2014). It can be difficult to reach adults with ASD to provide beneficial services or research once they have
left the school system.

Vocational Programs are Insufficient

Applied behavior analysis (ABA), covert audio coaching (CAC), and behavior skills training (BST) techniques all reported positive results that vocational interventions result in skill acquisition and retention. However, these programs do not tend to measure the persistence of results long-term. This is troubling because current research has indicated that skills from vocational programs do not tend to persist long-term in individuals with ASD: In longitudinal studies, a decline in employment for adults with ASD has been recorded over the decade following participating in a vocational program, even if the program initially resulted in employment success (Battaglia & Nagler, 2022).

In accordance with these findings, it is possible that participants in the CAC trial and other interventions would return to baseline levels of skill performance following long periods without the structured coaching provided by a vocational program (Bennett et al., 2013). If participants do not maintain the skill gains from vocational programs long-term, then vocational-skill-focused transition programs are not adequately addressing or resolving the issue of low employment rates for people with ASD, and cannot be relied upon as the primary method of school-based programming.

Necessity of Interventions Focused on Social Skills

Research has established that vocational skills are not the main barrier that prevent adults with ASD from gaining and maintaining employment: Social skills deficits are a more striking obstacle. Impairment in social functioning is a central feature of ASD and has been well documented in the literature (Baker-Ericzen et al., 2018). It has also been established that people with ASD are more likely to lose employment over social skills issues than because they lack the
job skills or are unable to perform the required tasks at work (Westbrook et al., 2013).

Vocational outcomes are highly dependent upon social abilities, rather than proficiency in traditional vocational skills (Baker-Ericzen et al., 2018). Vocational programs that teach job skills are not enough to improve the poor employment outcomes for adults with ASD: School-based transition programs must address social and communication skill deficits as well.

Transition programs must address social skills as they are vital for employment and job retention (Lauderdale & Haspel, 2021). Students with ASD need direct instruction in the development of social skills and opportunities to practice these skills in order to see increases in employment among this demographic. This type of direct instruction concerning social skills is often lacking in traditional schooling, which creates the necessity to address these skills with transitional programs before students with ASD attempt to enter the workforce where social skills are often vital to employment success.

**Efficacy of Social Skill-Focused Programs**

ABA (applied behavior analysis) techniques have been difficult to apply to interventions that target social skills in adults with ASD. This may be related to an established difficulty to create a definition of “social skills”: There is little agreement regarding what should be included in this definition, what aspects should be targeted for improvement, and how behaviorism-based methods like ABA could be used to address these behaviors (Gerhardt et al., 2014). In addition, when improvements in social skills are observed in ABA-based studies, they are usually only moderate improvements and usually were targeted at individuals on the “high-functioning” end of ASD (Gerhardt et al., 2014). Overall, ABA-based training may be more effective to teach vocational skills than social and communication skills since ABA-based vocational studies have noted at least an initial effect. However, there is still somewhat of a gap in research regarding the
long-term endurance of vocational skills learned from ABA-based vocational studies.

Video modeling (VM) practices display a similar gap in research as ABA-based studies involving intervention efficacy for adults on the autism spectrum. There are numerous studies to demonstrate that VM practices are effective to increase social behaviors and imitation in young children; however, there are far fewer studies supporting the efficacy of VM strategies for adults or transition-aged young adults with ASD. VM techniques have been proven beneficial for efficiently teaching vocational skills in interventions, but it seems that there is difficulty in conveying complex social skills through video modeling. Social skills seem to be difficult to teach effectively with modeling techniques.

Sung et al. (2019) utilized ASSET (Assistive Soft Skills and Employment Training) as a structured curriculum to teach social skills. This explicit social skills training was also paired with opportunities following each weekly lesson for first-hand social skills practice in a social hour between lesson facilitators and participants. Results of the ASSET intervention indicate that graduates showed significant improvements, specifically in work-related social skills knowledge, social functioning, and social/empathy self-efficacy (Sung 2019). These are promising results to support the efficacy of structured social-skills based curricula for adults with ASD.

ASSET was a structured learning approach centered fully on social skills; unfortunately, a lack of information regarding skill generalization was a specific weakness of the ASSET intervention. Though the importance of generalizing the skills was emphasized by project facilitators and participants were reminded to practice new skills during the social hour, there is some uncertainty regarding whether participants would generalize and apply newly-learned skills to a vocational setting (Sung et al., 2019). Since ASSET was implemented separately from vocational instruction, it could be harder for people with ASD to apply the skills to a workplace
environment, due to the documented difficulty among individuals with ASD to generalize skills to new environments. Also, there has not been a follow-up study to examine the endurance of positive skill gains long-term, or whether participation in this program resulted in increased employment.

The social-skill focused studies mentioned in this review do not typically test for generalizability or endurance, both of which are likely low, based on the observed results from similar methodology when applied to vocational studies. Further research would be needed to evidence whether interventions focused solely on improving social skills would note similar issues with skill endurance and generalizability that longitudinal vocational studies have reported. The current body of social-skill centered research examines mainly whether it is possible to teach social skills to adults with ASD, there is less research to draw conclusions on whether participation in a social skills program has an impact upon employment rates for this population. Future research could also examine the efficacy of structured social skills programs toward securing and maintaining employment for adults with ASD.

**Inclusion of Social and Vocational Skills**

There is evidence that both vocational skills and social skills are necessary to be addressed by transition programs for students with ASD, as both types of skills are important in order to achieve and maintain competitive employment after graduation. A curriculum which teaches both vocational skills and social skills could be explored by future research because it may be beneficial to improve employment outcomes for young adults with ASD. There is a necessity for further research to determine whether the outcomes of social-skills-focused programs are improved by the addition of a vocational agenda, and whether vocational program outcomes are improved by the addition of a social-skills aspect. Furthermore, future research
could investigate whether the combination of a social skills curricula within vocational programming addresses the low generalizability of social skills that may impede employment success following the program implemented by Sung et al. (2019). With the information that is currently available, it seems most sensible to incorporate both social and vocational skills within transition interventions, as there is evidence that both are necessary to ensure employment success of individuals with ASD.

**Results From a Combined Vocational and Social Skills Program**

One program that combined vocational and social skills aspects was implemented by Kamens et al. (2004). This program reported success overall, and many of the participating students found that they preferred or enjoyed the jobs they were taught and that they formed relationships with the college students they worked with. Kamens et al. (2004) did not tailor this program toward students with ASD and many different disability groups were included among the participants. This program was largely praised as a success toward building a learning environment based on community and providing opportunity for transition-aged students with disabilities to develop social skills and age-appropriate friendships (Kamens et al., 2004).

However, it has been established that individuals with ASD benefit from explicit social-skills-related instruction, which was not provided by this program. It may be possible to predict that Kamens et al. (2004) would not have enduring results regarding employment because they did not explicitly teach social skills. Although this study was based upon theory that behavior modeling is an effective model to teach behaviors to individuals with disabilities, for individuals with ASD specifically, explicit instruction may be more effective. Especially when involving social skills, explicit instruction may be necessary in order for individuals with ASD to successfully acquire and generalize such skills to the workforce (Bennett et al., 2013).
Explicit Social Skills Instruction May Be Beneficial

It has been demonstrated that students with ASD may struggle to generalize skills that they acquire (Gerhardt et al., 2014), and therefore may need more explicit training to meet the expectations of a workplace (Battaglia & Nagler, 2022). Individuals with ASD often require explicit instruction involving social skills in order to successfully acquire and generalize such skills to the workforce (Bennett et al., 2013).

Though Sung et al. (2019) did not measure employment outcomes, it seems that the structured social skills curriculum was beneficial because participants self-reported improvements in confidence and self-efficacy related to employment and social skill abilities. One participant who was interviewed post-intervention reported improvements in communication that facilitated greater success in the workplace: He reported that he was able to answer questions when approached by customers at work, while he would not have been able to communicate effectively pre-intervention (Sung et al., 2019). Other participants reported a greater understanding regarding the necessity of social connection within the workplace (Sung et al., 2019). This study would benefit from further research and repetition as well as the addition of a measure related to employment outcomes: This would be beneficial to determine the efficacy of ASSET toward increasing employment among young adults and students with ASD.

In the program implemented by Kamens et al. (2004), explicit instruction regarding social skills was not provided. Skill acquisition and resulting employment outcomes were not measured or observed following this program, but it is possible that the Kamens et al. (2004) program would not be able to report noticeably improved employment outcomes because they did not explicitly teach social skills. Due to the inclusion of explicit instruction, the employment outcomes observed by Sung et al. (2019) may have been more significant because ASSET
utilized an explicit curriculum based on social skills. The studies examined by Battaglia and Nagler (2022) that included a socially-focused language intervention may have similar results to ASSET concerning initial employment and skill acquisition because those studies also used an explicit social skills curriculum, though they were all implemented as one aspect within different vocational training programs.

It is unclear whether any gains in social skills were measured or observed through either ASSET or Kamens’ (2004) program. Maintenance probes of these programs, if they had been conducted, could also have found that participants from the program Kamens et al. (2004) implemented and from ASSET were not any more successful in securing employment than the general population of young adults with ASD. Further programming and support may be necessary to promote skill generalization to a workplace, secure employment, and maintain social and communication skill gains.

The Difficulty Regarding Skill Generalization and Endurance

Longitudinal or maintenance aspects, if they had been conducted, could also have found that participants from the program implemented by Kamens et al. (2004) and from ASSET were not any more successful in maintaining employment than the general population of young adults with ASD. There is no evidence that participants from either program experienced any increase in employment even initially, and this may have been partially due to difficulty generalizing skill gains to a workplace environment. In accordance with research that demonstrates that vocational skills do not endure long-term in individuals with ASD, it is likely that if any skills were gained and generalized from either program, they would decline following program termination. Further programming and support may be necessary to promote skill generalization to a workplace and maintain social and communication skill gains in order to sustain employment.
Inclusion of Supported Employment

It has been demonstrated that individuals with ASD may struggle to generalize learned skills to novel situations or environments and to maintain skill gains effectively over longer periods of time (e.g. years, decades). Due to evidence that vocational skills (and likely social skills) are not maintained effectively in individuals with ASD once they enter the workforce, there is a need to produce effective interventions to provide maintenance for these skills. Social skills and behaviors may also be particularly difficult to generalize because they are often complex and context specific. It may be necessary for programs to address this generalization issue in order to see improvement in employment rates among adults with ASD.

Supported employment (SE) programs are promising to improve skill generalization outcomes because these programs provide support while searching for and securing employment. For individuals with ASD, SE may include personalized support during the job-search process such as instruction regarding the application and interview process, facilitating a communicative relationship between the client, coworkers, and supervisor, and help resolving difficult workplace situations if they arise (Martin & Marc, 2021). If an individual with ASD has participated in a transitional program, the personalized support that is offered by SE programs may help the individual to begin applying skills gained from the transitional program into the workplace environment. Further research is needed to understand the efficacy of supported employment interventions toward promoting skill generalization when entering the workforce.

Supported employment (SE) may be able to provide skill maintenance and improve the long-term persistence of social or vocational skills that are gained through transition programs. SE is an individualized approach that meets the needs of each participant when providing long-term support. Martin and Marc (2021) found evidence that SE is effective in maintaining
employment for individuals with ASD. Schall et al. (2015) also found SE to be effective in securing employment for all 45 participants of a study. The long-term support aspect may be the key to maintaining the skills gained from participation in earlier programs. This could explain the high employment retention rate among individuals enrolled in SE programs compared to the population of adults with ASD who are not enrolled in SE. Continued research is necessary in this area to understand the success of SE programs and determine if they are effective much longer-term. The program by Martin and Marc (2021) that reported success with SE recorded the efficacy after a 12-month examination. Since longitudinal research has indicated a decline in skill retention over a decade, a longer follow-up of SE programs should be performed.

**Vocational Intervention with Supported Employment**

Schall et al. (2015) reported that an SE intervention following participation in a vocational intervention had better results than the SE intervention alone. While individuals with ASD enrolled in SE programs already achieve employment at higher rates than individuals with ASD who are not in SE programs (Martin & Marc, 2021), it is still necessary to investigate the integration of vocational and SE models. If the inclusion of vocational programs can cause a greater increase in gainful employment than SE alone, then the integration of these program models is preferable. In addition, since individuals who had prior vocational experience required less overall hours of SE intervention, integrating these program models may also be more cost efficient and a more effective use of resources.

Individuals who are enrolled in SE programs often still struggle with job retention (Martin & Marc, 2021). This makes the result significant that the adults with ASD who received the prior PS-ASD intervention had higher employment retention rates (Schall et al., 2015). Schall et al. (2015) have provided initial evidence that vocational training followed by an SE program
promotes higher wage, job retention and cost/time efficiency of intervention than an SE program alone. This suggests that a combination of vocational transition programs and an SE component results in more competitive employment acquisition and higher job retention. However, further research is still required to determine whether the reverse is true and that vocational programs are more effective when paired with SE. This study would also benefit from further research and repetition regarding the efficacy of SE as a method to provide maintenance to vocational skills that often decline in the decades that follow an individual with ASD’s participation in a vocational program.

**Social Skills Intervention with Supported Employment**

Porthukaran et al. (2022) implemented social-skills-focused workshops in the ASEP program along with an SE aspect. The majority of participants obtained employment after participating in ASEP and reported a significant increase in employment-related social skills and knowledge. These are promising results to support the efficacy of SE programs to promote the generalization and endurance of social skills from transition programs. This study would benefit from further research and repetition that measures whether social skills that were gained through participation in ASEP workshops successfully generalized and endured in a workplace setting, and whether there is a greater increase in social skill generalization and endurance in programs that include an SE aspect.

**Vocational and Social Skills Interventions with Supported Employment**

Project ABLE (Autism: Building Links to Employment) was a summer transition program with vocational and social skills training and a supported employment (SE) aspect (Lynas, 2014). Similarly, the “Supported Employment, Comprehensive Cognitive Enhancement, and Social Skills” (SUCCESS) intervention was designed to implement a “soft skills” curriculum
aspect to vocational training, which also included an SE aspect (Baker-Ericzen et al., 2018). The instruction (vocational and social) portion of Project ABLE was conducted over the summer, which was a shorter time frame than the SUCCESS intervention, in which intervention occurred twice a month for 6-7 months. However, the SE aspect of Project ABLE was comparable and included maintenance and goal reassessment at 6-month intervals for four years (Lynas, 2014).

Both Project ABLE and SUCCESS addressed the unique needs of individuals with ASD and provided a range of services, which is essential due to the individualized nature of ASD. The results of SUCCESS demonstrated that adults with ASD can improve both cognition, social communication, and soft skills (Baker-Ericzen et al., 2018). In addition, employment rates more than doubled (from 22% to 56%) for the subject group (Baker-Ericzen et al., 2018). Project ABLE reported similar results: nearly all of participants secured employment (half obtained retail jobs, a fourth in administration, the remaining in other fields) or obtained work experience with at least one placement (Lynas, 2014). This demonstrates the efficacy of a combination of vocational and social instruction followed by an SE aspect. Early evidence is encouraging that an SE aspect may be beneficial to maintaining the results gained in vocational, cognitive, and social domains by participation in these interventions.

The results of SUCCESS are limited by a small sample size of only eight individuals. Project ABLE was able to report 74 participants, which would have stronger implications for the efficacy of this combination of methods; however, it is unclear whether the majority of individuals were able to retain employment for long periods of time. The lack of sustained employment success reported by Project ABLE may have also been impacted by the high proportion of the sample who reported extreme learning disability (Lynas, 2014), while the majority of other studies in this review focused mainly on individuals with moderate to high-
functioning ASD, typically without learning disability.

While it is noted by Lynas (2014) that 97% of participants were able to experience at least one job placement and 66% were able to experience two, it seems that the majority of young-adult participants were not able to experience long-term success and job retention. It is revealed that all employment outcomes were among the 30 adults in the study rather than the remaining participants who were transition-aged young adults. Of these adult participants, 56% were able to achieve stable employment.

**Employment in Community-Oriented Organizations**

Though Project ABLE integrated vocational training, social skills workshops, and supported employment interventions, a low employment retention rate was still reported, especially among transition-aged young adults. The results of ASEP, a social skill and supported employment intervention, may have implications regarding another factor that is necessary to improve the likelihood of sustained employment: workplace culture and community. While the majority of participants in ASEP successfully obtained employment, most maintained their employment in small and medium-sized organizations of around 20 employees (Porthukaran et al., 2022). Porthukaran et al. (2022) theorized that this may have been because smaller job sites may be less intimidating, more friendly, and perhaps more flexible, which could have been beneficial to individuals with ASD and contributed to the successful employment retention.

The program that was implemented by Kamens et al. (2004) was based upon a similar theory: That social interaction and friendship is essential to the successful integration of people with disabilities in the workforce, including people with ASD. Kamens et al. (2004) utilized a program that matched high school students with disabilities and college students in order to facilitate social interaction between similar-age peers. Participants noted that they successfully
established friendships through the exercises and experiences of this program. Moreover, the findings from the ASEP intervention suggest that prioritizing employment at smaller, community-based organizations is another way to execute this theory and encourage employment retention through social interaction. Further research is needed in this area to examine whether individuals with ASD would experience higher rates of employment retention when operating within smaller businesses or community-oriented companies as opposed to larger or less amiable workplace environments.

**Conclusion**

There is evidence that indicates that a combination of several program models is beneficial toward improving employment rates of adults and transition-aged young adults with ASD. The study performed by Martin and Marc (2021) reported a significant improvement in the employment rate among the 37 participants enrolled in a supported employment intervention in Canada: 62% secured paid employment by the end of the 12 month study, which is significant compared to the typical workforce participation rate of 38% for individuals with ASD. Schall et al. (2015) reported similar results and reported that employment retention was increased for 45 individuals with ASD through participation in an SE program. However, the individuals who had engaged in a vocational intervention prior were observed to have a higher mean wage and higher job retention (Schall et al., 2015). ASEP combined a social skills curriculum with supported employment and reported that 12 adults out of 17 obtained paid employment and 3 obtained a volunteer position (Porthukaran et al., 2022).

Although two programs (e.g. SUCCESS, Project ABLE) integrated the three major aspects of transitional planning that are mentioned in this review, the results are unclear regarding whether this resulted in improvement of employment rates for transition-aged
individuals with ASD. The SUCCESS intervention integrated social and vocational training with supported employment and was able to report that employment rates were doubled among participants, but this study only comprised 8 participants (Baker et al., 2018). Project ABLE integrated these aspects similarly and reported that 56% of adult participants achieved employment, but the intervention did not result in sustained employment for any of participants who were young, transition-aged individuals (Lynas, 2014). This may suggest that the smaller sample size was beneficial to individuals in the SUCCESS intervention and impacted the improvement in employment rates. The findings reported by Lynas et al. (2014) would benefit from replication to evaluate whether smaller group sizes would be beneficial to improving employment outcomes for the transition-aged individuals enrolled in Project ABLE.

Furthermore, the high employment that was achieved and retained through ASEP may have been related to the placement of these individuals in small or medium-sized organizations. This indicates that smaller companies may be beneficial for individuals with ASD, though further research is needed to determine why this could be and how this finding can be utilized and applied effectively to facilitate employment for this demographic.

**Tailored Programming**

Several studies have recommended that a tailored or personalized approach is necessary to address the unique needs of individuals with autism spectrum disorder. A flexible approach seems necessary to maximize successful outcomes, but this is not generally a feature of mainstream ASD support (Lynas, 2014). This could be due to low funding or time constraints, which are mentioned in several studies as severe limitations.

**Necessity of Vocational, Social Skills, and Supported Employment Program Aspects**

It has been established that the transition from a more structured educational environment
to the workforce can cause a lot of anxiety for people with ASD. The transition to self-sufficiency is not always successful, which correlates with the high unemployment rate among individuals with ASD. Certain traits of ASD also make it difficult to thrive in a traditional workplace, such as difficulty with communication and social skills. Longitudinal studies show that adults with ASD display deficits across cognitive, social, and vocational domains, all of which affects their ability to be effectively employed (Baker-Ericzen et al., 2018). This indicates the necessity to address each area of deficit in order to improve employment outcomes. A strengths-based approach could be beneficial to make best use of individuals’ unique skills.

A combination of various methods and strategies may provide a tailored approach and increase employment rates by addressing the various differing and unique needs of adults and transitioning individuals with ASD. With programs that integrate many different methods, individuals have access to various strategies and may be able to utilize the services that they need the most.

Finding and maintaining employment is a vital developmental milestone for adults with ASD. Employment is often crucial to adult life and increases personal and financial independence, which reduces reliance on family members or government support programs. The lack of effective, personalized support for students and adults with ASD has resulted in competent, skilled, and highly educated individuals consistently failing at reaching personal goals of independent employment.

**School-Based Vocational Programming**

Vocational skills are necessary to address in order to give young adults with ASD the skills to enter the workforce and a career path of their choosing. Students need to be prepared for the workforce with school-based transition programs. Young adults with ASD may struggle to
generalize the skills they learn in school to the workforce and they may also struggle to adjust from the expectations of school to expectations of the workforce. It has been shown that youth with ASD have a high rate of inactivity after leaving the school system and a demonstrated difficulty transitioning into the workforce: Students with ASD need school-based vocational education and planning to facilitate their transition to the workforce and adult life.

**School-Based Social-Skill-Focused Programming**

Social skills deficits impede adults with ASD from securing and sustaining employment. Deficits in social and communication skills are a hallmark of ASD, and issues with social and communication skills are more often the barrier preventing individuals with ASD from maintaining employment than vocational deficits. Social skills and soft skills are vital to workplace success and should therefore be taught in school-based programming in order to prepare students with ASD for the expectations of the workforce. There are benefits to explicit, structured curricula regarding social skills, which has implications for the methods that school-based programs should utilize to teach social skills.

**Benefits Related to Supported Employment**

There is evidence that skills gained from vocational and social interventions decline over time: Supported employment is a promising intervention strategy to maintain the skills that are gained through participation in other program models. Supported employment has also been demonstrated to be effective on its own in facilitating employment success for individuals with ASD, but it may be more effective when combined with other methods.

**Future Research**

Whether a gradual decline in social skills would be observed over a long period has not been studied. A decline was found for vocation skills in a decade-long longitudinal study
(Battaglia & Nagler, 2022). Vocational skills were shown to decline following vocational program participation if skill maintenance was not provided. Moreover, the current body of social skills centered research examines mainly whether it is possible to teach social skills to adults with ASD, but there is less research to draw conclusions on whether participation in a social skills program has an impact upon employment rates. Future research could examine the efficacy of structured social skills programs toward securing and maintaining employment for adults with ASD.

Further research could examine curricula that teach both vocational skills and social skills and measure whether such programs result in improved employment outcomes compared with vocational or social-skill-based programming alone. There is a need for further research to determine whether the outcomes of social-skills-focused programs are improved by the addition of a vocational agenda, and whether vocational program outcomes are improved by the addition of a social skills aspect. Furthermore, future research could investigate whether the combination of a social skills curricula within vocational programming addresses the low generalizability of social skills that may impede employment success following programs like the one implemented by Sung et al. (2019).

It would also be beneficial to examine whether supported employment is an effective method to provide long-term maintenance to both vocational and social skills that could decline in the decades that follow participation in a transition program. Further research in this field could also indicate whether individuals who engage in a combined vocational and supported employment program have better employment rates long term than individuals in vocational alone. Further research is also needed to understand the efficacy of supported employment interventions toward promoting skill generalization when entering the workforce.
Continued research is necessary in this area to understand the success of supported employment programs to determine if they are effective longer-term. The program by Martin and Marc (2021) that reported success with supported employment reported the efficacy after only a 12-month evaluation period. Since longitudinal research has indicated a decline in skill retention over a decade, a longer follow-up of supported employment programs should be performed.

One of the vocational studies found success with small groups of transition-aged individuals (Baker-Ericzen et al., 2018), this is something that should be evaluated with other successful programs to determine whether smaller group sizes are associated with improved employment outcomes, specifically with transition-aged young adults with ASD. Finally, we should examine whether individuals with ASD would experience higher rates of employment retention and overall success when operating within smaller businesses or community-oriented companies as opposed to larger or less amiable workplace environments. It is possible that prioritizing the goal of employment within a smaller organization or one that emphasizes workplace cohesion and community would improve the resulting employment retention and social integration of adults with ASD.
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