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An Apprenticeship-Model Employment Program for Adults with Developmental Disabilities: An
Exploratory Study

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

by

Benjamin Chaim Schwartzman

2015

ABSTRACT OF THE DISSERTATION

An Apprenticeship-Model Employment Program for Adults with Developmental Disabilities: An
Exploratory Study

by

Benjamin Chaim Schwartzman

Doctor of Philosophy in Education

University of California, Los Angeles, 2015

Professor Connie L. Kasari, Co-Chair

Professor Jeffrey J. Wood, Co-Chair

Most of the current developmental disability research focuses on childhood prevention and intervention. However, there is a substantial need for more research to focus on practical adaptation issues for adults with developmental disabilities. Working age individuals with developmental disabilities exhibit significantly lower employment, higher underemployment, higher “malemployment,” and higher job switching rates as compared to the general population. The current study aimed to investigate: (1) the past and current vocational and support experiences of the participants according to parent report (2) the participant outcomes as a result of engaging in an apprenticeship model employment program, and potential factors associated with outcomes (3) whether the novel “Secret Shopper” observational assessments are able to measure change in vocational skills. Data from the current study suggests that the apprenticeship model of employment as well as the Secret Shopper observational assessment are both

promising, and in need of further study with a larger sample size. Parent interview data regarding past and current experiences of the participants in the program suggest 6 major themes: (1) With the right supports, difficulties associated with disabilities may be fostered into great benefits (2) Fierce and prolonged advocacy from parents (3) Greater independence in daily living activities (4) Previous positive work experience (5) Collaboration occurring between educational and vocational service systems, and (6) Unprompted negativity. Information gained from the current study provides this population, in desperate need of better supports, with preliminary information regarding the effectiveness of the apprenticeship model of employment for the greatly underserved population of adults with developmental disabilities.

The dissertation of Benjamin Chaim Schwartzman is approved.

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University of California, Los Angeles

2015

For Joey and his friends trying to navigate the world of employment, for my parents, and for Jessica, my fiancé and Secret Shopper.

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CHAPTER ONE: INTRODUCTION

Most of the current developmental disability research focuses on childhood prevention and intervention (Howlin, 2013). However, there is a substantial need for more research to focus on practical adaptation issues for adults with developmental disabilities (Shattuck et al., 2012; Hurlbutt & Chalmers, 2004). A major focus in the transition to adulthood is employment, a socially normative activity that most often occupies the bulk of one's adult life (Fussell & Furstenburg, 2005). Earning wages contributes to both social and economic well-being, as well as being related to good health, which are all factors in achieving positive quality of life (Roux et al., 2013). Achieving employment is especially important for this population given that the lifetime cost of supporting an individual with a developmental disability is estimated to range from 1.4 to 2.3 million dollars (Buescher et al., 2014), with some even suggesting that the cost may be in excess of 3 million (Ganz, 2007).

As noted in several studies, working age individuals with developmental disabilities exhibit significantly lower employment, higher underemployment (i.e., overqualified based on intelligence and skill-level), higher "malemployment" (i.e., not at all suited for a particular job) and higher job switching rates as compared to the general population (Muller et al., 2003; Hurlbutt & Chalmers, 2004; Seltzer et al., 2011). Further, adults with autism spectrum disorder (ASD) are also much more likely to be unemployed as compared to individuals with other disabilities (Roux et al., 2013). Research also suggests that it is more common for individuals with developmental disabilities to lose employment due to social and behavioral difficulties than inability to perform their specific work tasks (Dew & Alan, 2007; Homles, 2007; Hurlbutt & Chalmers, 2004; Westbrook et al., 2012). Holmes (2007) also goes on to state that it is specifically the inability to determine and provide the proper supports needed that is the key

reason for the unemployment, underemployment, and malemployment discrepancies this population experiences.

Legislation

The Rehabilitation Act of 1973, specifically Section 504, extends civil rights to individuals with disabilities. This federal regulation, enforced by the Office of Civil Rights (OCR) within the US Department of Health and Human Services, states that:

“No otherwise qualified individual with a disability in the United States[...]shall[...]be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance” (29 U.S.C. 794(a)). The Americans with Disabilities Act of 1990 stresses similar regulations prohibiting discrimination and ensuring equal opportunities for individuals with disabilities in employment, state and federal services, transportation, and public accommodations (ADA; 1990).

Under the Individuals with Disabilities Education Act (IDEA; 2004), preparation for employment is the primary purpose of public education. Clearly outlined in this law, achieving employment upon graduation is the main measure of accountability for disabled individuals (Hendricks, 2010). Article 27 of the United Nations Convention on the Rights of Persons with Disabilities (CRPD) also states that individuals with disabilities are entitled employment that is equivalent to those without disabilities (CRPD, 2006). Specifically, CRPD “recognizes the right of persons with disabilities to work, on an equal basis with others; this includes the opportunity to gain a living by work freely chosen or accepted in a labor market and work environment that is open, inclusive and accessible to persons with disabilities” (CRPD, 2006). CRPD also prohibits employment discrimination of any kind, while promoting access to vocational training, workplace accommodations, and self-employment for individuals with disabilities. Though, the

United States signed the CRPD on July 30th 2009, when ratification of the treaty was put to vote in the US Senate on December 4th 2012, it fell 5 votes short of the required super majority vote (www.disabilitytreaty.org, 2014).

Together, Section 504, ADA, and IDEA protect the rights and equal participation of individuals with disabilities in employment, in education, and in the community. These 3 laws apply to any organization receiving federal funding, and thus have important implications for individuals with ASD and their participation in various employment settings (i.e., any employer who receives federal funding must also abide by the mandates of Section 504) (Snyder et al., 2013).

However, evidence from multiple studies suggest that anti-discrimination laws have had mixed success in increasing the number of employed individuals with disabilities (Bruyere et al., 2011; Stapleton & Burkhauser, 2003). These laws seem to have had more success in decreasing discrimination amongst already employed adults with disabilities, as early research on the American with Disabilities Act (ADA, 1990) suggests that the ADA actually caused a decrease in employment of disabled people (Acemoglu & Angrist, 2001; Schwochau & Blanck 2000). This may be due to the fact that the definition of “qualified” in Section 504 differs from the education setting to the employment setting. In the employment realm, in order to be “qualified” an individual with a disability must be able to perform the essential function of the job with “reasonable accommodation” (US Department of Health and Human Services, Office of Civil Rights, 2006). Because the law requires employers to reasonably accommodate for employees with disabilities, historically, many employers have been dissuaded from hiring individuals with disabilities as an attempt to avoid potential lawsuits and litigation as well as the additional costs involved with providing a variety of accommodations (Bruyere et al., 2011). And, even though a

variety of incentives were introduced for employers of individuals with disabilities, such as tax breaks and government funding, the employment of individuals with disabilities is still on the decline (US Department of Labor, 2015).

While the current employment statistics may not reflect this decline in employment for individuals with disabilities, a recent review conducted by Ju and colleagues (2013) indicates that employer attitudes may be beginning to change. This study identified a new trend that the majority of employers are increasingly recognizing that the insurance and accommodation costs associated with hiring individuals with disabilities are reasonable, especially when compared to the costs of high turnover rates by workers without disabilities (Ju et al., 2013). In certain situations, workplace accommodations for individuals with disabilities can be somewhat intuitive (i.e., providing a wheelchair ramp, sign language interpreter, etc.). However, in regards to employees with ASD, workplace accommodations can be less obvious for employers to implement. And Ju and colleagues' review reflected this concern in that employers are more likely to hire individuals with physical disabilities than with disabilities falling under mental health diagnoses (Ju et al., 2013).

Past and Present Employment Statistics for Adults with Developmental Disabilities

As recently as 15 years ago, Capo (2001) stated in her review that she was unable to find any research that provided statistics for the number of individuals with ASD who were competitively employed. To this day, few nationally representative findings exist which characterize vocational and employment experiences of young adults with ASD. A study consisting of a national survey of typically developing young adults found that 98.6% the sample reported ever having at least 1 job between 18 and 25 years old (Taylor et al., 2012). Similar findings were discovered in young adults with disabilities with 91% of 11,270 youth nationwide

having some form of paid employment within the first 8 years after high school (Newman et al., 2011). However, according to Shattuck and colleagues' (2012) study, only 55% of young adults with ASD had ever worked outside the home for pay at least once. This rate happened to be the lowest across disability groups, lower than the rates for individuals with intellectual or learning disabilities (Shattuck et al., 2012). According to results from the same NLTS2 survey, as of 2009, the percent of young adults (aged 18-24) with autism who were employed was nearly half that of all young adults with disabilities (33% vs. 59%) (Newman et al., 2011). In addition, NLTS2 data also show that individuals with ASD have lower rates of participation in employment, vocational or technical education, and post-secondary education in 2 or 4-year programs than their peers with intellectual disabilities, learning disabilities, or speech language impairments for as long as 7 years post high school (Shattuck et al., 2012). Cimera and Cowan (2009) reported, in their study of vocational rehabilitation services for adults with ASD, that only 40.8% of adults with ASD were employed by the time their cases were officially closed. These adults only worked an average of 18.6 hours per week, earning an average of \$146.65 (Cimera & Cowan, 2009). Further, the mean hourly wages of \$8.10 are often lower for individuals with ASD than in the other groups (Howlin, 2013). Compared with adults with ASD, the odds of having full-time employment is almost 4 times higher for adults with intellectual disabilities (Howlin, 2013).

The comparatively low rates of employment as compared with other disability groups are particularly striking due to the expectation that many of the individuals in the ASD group would be of at least average intelligence (Howlin, 2013). However, the overall low employment rates for adults with ASD are not surprising based on findings from other studies of adults with ASD, though the sample sizes in these studies were much smaller (Burke et al., 2010). For example

Engstrom, Ekstrom, and Emilsson (2003) found that only 2% of 42 Swedish adult participants with ASD were employed. Results from a longitudinal study of 120 individuals with ASD indicated that less than 10% were employed (Billstedt, Gillberg, & Gillberg, 2005). Another study conducted by Barnard and colleagues (2001) found that only 6% of adults with ASD were employed full-time and 4% were employed part-time. Hendricks (2010) estimates a higher, but still comparatively low, percentage of between 25-50% of adults with ASD having been employed at the time of her review. A more recent investigation found that competitive employment rates ranged from 4.1 to 11.8% for 66 young adults (19–26 years) with ASD (Taylor & Seltzer, 2011). In addition, Burgess and Cimera (2014) found that the number of adults with ASD seeking vocational rehabilitation services increased by 792% from 2002 to 2011. Taylor and Mailick's ten year longitudinal study of the vocational activities of adults with ASD aged 18 to 52 years old found that engagement and level of independence in vocational activities significantly decreased over the study period (Taylor & Mailick, 2014).

Not much is known regarding employment statistics for other developmental disabilities; the majority of the little research conducted on this topic has focused on adults with ASD. Braddock and colleagues (2008) reported that in 2005, 76% of adults with intellectual or developmental disabilities were served in facility-based settings. It is evident based on a multitude of studies that generally poor employment outcomes exist for adults with developmental disabilities and that more focused research needs to be conducted in this area in order to determine what types of supports should be provided (e.g., Roux et al., 2013; Hurlbutt & Chalmers, 2004; Barnhill, 2007).

Barriers to Employment That Are Unique to Individuals with ASD

Although the prevalence of autism spectrum disorder (ASD) in adults is unknown, the prevalence rate in children has dramatically risen over the last two decades (Mazefsky & White, 2014). Affecting as many as 1 out of every 68 children, ASD is a lifelong neurodevelopmental condition characterized by core deficits in social communication and restricted, repetitive patterns of behavior (Centers for Disease Control, 2014). ASD occurs in all racial, ethnic, and socioeconomic groups. Autism is referred to as a “spectrum disorder” due to the heterogeneity of symptoms and symptom severity that these individuals experience (American Psychiatric Association, 2013; Wing, 1997). Some individuals may demonstrate physical limitations and may not be able to speak or relate socially to others, while others may lead relatively independent lives, graduate from academic institutions, but may also be awkward in their social interactions and have difficulty developing friendships. Males are four to five times more likely than females to have ASD (Centers for Disease Control, 2014).

The social and interactional difficulties associated with ASD account for substantial challenges in the workplace (Hillier et al., 2007; Hagner & Cooney, 2005). Studies that interviewed adults with ASD have consistently found communication and social difficulties with coworkers and supervisors as the primary impediment to job performance (Muller et al., 2003; Hendricks, 2010), with such challenges often leading to job termination (Hendricks, 2010). Examples of these workplace communication challenges may involve “reading between the lines,” understanding directions, interpreting facial expressions or tone of voice, asking too many questions, communicating effectively with coworkers, or deciding whether to disclose disability disclosure (Hurlbutt & Chalmers, 2004; Baldwin et al., 2014). Social challenges, which are sometimes tough to tease apart from communication difficulties in ASD, may include issues such as poor hygiene and grooming skills, difficulty understanding social cues and rules, working

alone, talking in an inappropriate manner or at inappropriate times with coworkers or individuals of the opposite sex (Hendricks, 2010). These social and communicative challenges often come up during the interview process, before ever achieving employment (Muller et al., 2003).

Restricted, repetitive patterns of behaviors, inability to control these behaviors, and difficulty with managing sensory sensitivities also lead to major challenges in attaining and maintaining employment (Capo, 2001; Baldwin et al., 2014; Hughes & Rush, 1996). Restricted, repetitive behaviors may distract the employee from completing job tasks and prevent the employee from responding flexibly to changes in routines, schedules, or tasks (Baldwin et al., 2014). Challenging behaviors such as aggression, tantrums, property destruction, hyperactivity, and self-injury are associated with poor employment outcomes (Capo, 2001; Hendricks, 2010). Sensory sensitivities which employees with ASD may experience include noise (i.e., loud noises as well as particular, subtle noises), crowding (i.e., the number of people in the workplace and space between coworkers or work stations), or visual stimuli (i.e., brightness of lights or amount of light) in the workplace (Hillier et al., 2007). These challenges and behaviors in the workplace are often complicated and misinterpreted, requiring behavior management strategies or other additional supports (Hendricks, 2010). Such behaviors are not always tolerated by employers and co-workers and may lead to segregation in the workplace, or even employment termination (Smith, 1990).

Executive functioning difficulties are also well documented in ASD (Landa & Goldberg, 2005; Lopez et al., 2005) and may affect areas of work that involve filling out complex job application materials, task execution, motor planning, response shifting, and working memory (Hume & Odom, 2007; Muller et al., 2003). In addition to previously mentioned behavior challenges, these cognitive difficulties may compound the struggles with adapting to new job

routines or changes in the work environment (Keel et al., 1997). Previous research has shown that individuals with ASD have difficulties with problem-solving and staying organized, regardless of intelligence level (Barnhill, 2007). Individuals with ASD who have low IQs or develop epilepsy also may have difficulty achieving employment due to deterioration of executive functioning skills that occur in early adulthood (Howlin, 2000).

Individuals with ASD also exhibit a high rate of comorbid psychiatric disorders. Based on numerous descriptive studies of comorbidity in samples of youth with ASD published over the past decade, comorbid disorders have been found to occur at much higher rates in youth with ASD than typically developing youth as well as youth with other mental health conditions (e.g., de Bruin et al., 2007). For example, as compared to the 1-5% of typically developing youth that experience symptoms of social anxiety, results from a number of studies indicate 20-57% of children and adolescents with high functioning ASD exhibit clinical levels of social anxiety (e.g., Kuusikko et al., 2008; Muris et al., 1998; Simonoff et al., 2008). Also, among youth with ASD, other anxiety disorders, attention deficit problems, disruptive behavior, and depressive disorders are very common and often increase even more during adolescence (Wood & Gadow, 2010). Research shows that these comorbid disorders continue to cause difficulties in adulthood, especially in regards to employment. Hurlbutt and Chalmers (2004), when interviewing adults with ASD, found that these individuals report high levels of anxiety caused by social interactions and trying to fit in socially with the neurotypical world. Similarly, Burt and colleagues (1991) found that sensitivities to various workplace stimuli (i.e., noise) led to increased anxiety for adults with ASD. Camarena and Sarigiani (2009) found, after interviewing parents of 21 adolescents with ASD regarding what they envision their children doing after high school graduation, that these parents considered anxiety as a major obstacle to their children's future

due to their fear of the unknown and difficulties with social interactions. In Schaller and Yang's (2005) study of the 2001 Rehabilitation Services Administration database of employment of 815 individuals with ASD, absence of a comorbid, or secondary, disability significantly correlated with successful competitive employment. The lack of a secondary disability was also related to successful case closures (i.e., the individual achieved competitive employment and no longer needed employment support); with 63.8% (157 out of 246) of individuals without a secondary disability and 52% (106 out of 204) of individuals with a secondary disability achieving successful closure (Schaller & Yang, 2005).

In sum, the specific challenges faced by adults with ASD in the context of job seeking and employment are complex and varied. ASD may encompass the most diverse range of characteristics of any disability, due to its nature as a spectrum disorder, which directly affects a myriad of factors involving employment for these individuals with ASD.

Barriers to Employment That Are Common to All Developmental Disabilities

Difficulty achieving employment for this population should not be a burden placed solely on the individual; it is a social problem (Shattuck & Roux, 2014). Shattuck & Roux (2014) state, in a recent editorial commentary, that these problems cannot be solved entirely through focusing on modifying the behaviors and abilities of particular individuals. More research and focus needs to go in to examining workplace environment factors such as level of understanding in management and co-workers, and the impact of interventions targeting a community or policy level. Indeed, a primary component of existing supported employment programs such as TEACCH, Project Search, and the Prospects program is in training employers and co-workers to change negative perceptions and increase understanding (Hendricks, 2010).

Studies of employers' attitudes towards employees with disabilities have found fairly consistent results. Firstly, employers were more likely to hold more positive attitudes towards employees with disabilities in general, but seem to hold more negative attitudes when asked more specifically (Hernandez et al., 2000; Ju et al., 2013). For example, employers exhibited positive attitudes towards the statement "individuals with disabilities should be equally employed," while holding negative attitudes towards actually hiring an employee with a specific disability. Secondly, employers who had previous positive experiences with employees with disabilities were more likely to continue to hold positive attitudes towards these individuals (Hernandez et al., 2000; Unger, 2002; Ju et al., 2013). Thirdly, discrepancies arose between actual hiring of employees with disabilities and expressed willingness to hire these individuals (Hernandez et al., 2000). One of the most consistent findings was that employees with physical disabilities were viewed more favorably than employees with intellectual or psychiatric disabilities when providing ratings of their overall employability (Hernandez et al., 2000; Unger, 2002; Ju et al., 2013). Also, most employers exhibit positive attitudes towards employees with disabilities who have been placed there by supported employment or other vocational programs (Hernandez et al., 2000; Ju et al., 2013). Many employers express concerns over general employability and job skills of individuals with disabilities (i.e., productivity, punctuality, safety, social skills, etc.) (Unger, 2002; Ju et al., 2013). However, both Unger (2002) and Ju and colleagues (2013) found that employers' attitudes might result from misconceptions as opposed to direct experience, and that few of the participants in the study had actual direct experience with employees with disabilities. Lastly, these studies found that employers were becoming more aware of the benefits of hiring employees with disabilities (i.e., increasing diversity and

enhancing the company's social image) (Unger, 2002; Ju et al., 2013), and that employers were beginning to exhibit more willingness to accommodate these individuals (Ju et al., 2013).

In studies involving employer attitudes towards ASD specifically, Nesbitt (2000) found in her interviews of employers that differences between those who did or did not employ an individual with ASD were related to levels of awareness and understanding of the disorder. Muller and colleagues (2003) found similar results. When asking adults with ASD about their employment experiences, they described facing significant difficulties in the workplace due to co-workers' and managers' insufficient knowledge of ASD (Muller et al., 2003). These same adults went on to recommend providing ASD awareness training to co-workers and employers to help foster a more understanding environment in regards to what ASD is and why they might behave in certain ways (Muller et al., 2003).

Socioeconomic status (SES) is another factor that has been shown to clearly affect employment outcomes for adults with developmental disabilities (Chen et al., 2014). Previous research has found that adults with developmental disabilities the most at risk of being unemployed after exiting the school system were those whose families earned lower incomes (Shattuck et al., 2011; Shattuck et al., 2012; Taylor & Mailick, 2014; Taylor & Seltzer, 2010). This is most likely the case due to the fact that a family with lower SES typically has fewer resources and less access to services (Shattuck et al., 2012; Taylor & Seltzer, 2010).

These barriers experienced by individuals with developmental disabilities directly results in these individuals' aforementioned challenges of underemployment, frequency of job switching, difficulty adjusting to new job settings, making less money than neurotypical peers, being less employed than both typically developing and disabled peers (Hendricks, 2010; Westbrook, 2012). The main factor being that it is impossible to establish one all-encompassing

intervention, support, or accommodation that can benefit all employees with developmental disabilities, as opposed to, for example, making a workplace wheelchair-accessible for all individuals in wheelchairs. Holmes (2007) indicated that a major reason for underemployment, unemployment, and job loss of individuals with developmental disabilities is the failure to determine and provide the supports needed. Each employment environment and employee with developmental disabilities requires unique accommodations depending on the environment, the individual, and the combination of the particular environment and individual.

Employable Skills of Adults with Developmental Disabilities

Many potential employers are aware of the difficulties associated with employing individuals with disabilities (Nesbitt, 2000). However, these same employers are often not aware of the unique strengths that these individuals possess (Hillier et al., 2007), and are not able to see how these skills could allow an individual with developmental disabilities to potentially be a better employee than someone without developmental disabilities (Muller et al., 2003). When Rebbholz (2012) interviewed 9 employed adults with ASD regarding their experiences, they all shared the belief that, in comparison to adults without ASD, they are more loyal to their companies and managers, they pay more attention to detail, are better able to analyze complicated information to solve specific problems, they will not give up on difficult assignments, and that they get more work done because they do not waste time socializing. Previous research on the work skills that adults with ASD possess support these adults' insights in that once individuals with ASD are employed, they often demonstrate specific strengths such as attention to detail (Smith et al., 1995; Gonzalez et al., 2013); high levels of math, computer, memory, and other technical abilities (Mawhood & Howlin, 1999; Baldwin et al., 2014); honesty, reliability, and persistence (Mawhood & Howlin, 1999); their increased productivity

due to their decreased likelihood of unnecessary social interaction with coworkers (Smith et al., 1995); strict adherence to rules (Hillier et al., 2007); and low absenteeism (Howlin et al., 1995). In addition to these particular skills, jobs that include social isolation, repetitiveness, or predictability often appeal more to employees with ASD than to employees without ASD (Van Bourgondien & Woods, 1992; Smith et al., 1995).

Other research has demonstrated the capacity of adults with developmental disabilities to learn vocational skills when they are directly taught (Walsh et al., 2014). In their review of vocational skill interventions for adults with ASD, Walsh and colleagues (2014) synthesized a wide variety of research in which participants exhibited success learning skills such as cover letter writing (Pennington et al. 2014); interview skills which were taught via a multimedia employment training program “JobTIPS” (Strickland et al. 2013); how to request assistance for a work related problem while in an employment setting (Dotto-Fojut et al., 2011); wearing a “WalkAround” costume to promote business while receiving live prompting via an iPod application (Allen et al., 2010b; Allen et al., 2012; Burke et al., 2010); photocopying skills (Bennett et al., 2013, Bereznak et al., 2012); using a washing machine and making noodles (Bereznak et al., 2012); t-shirt folding (Bennett et al., 2013b); general clerical skills (Bennett et al., 2013a; Dotson et al. 2013); shipping materials (Burke et al., 2013); newspaper route (Robinson & Smith, 2010); cleaning (Kellems & Morningstar, 2012); recycling (Bennett, 2013); stocking inventory (Kellems & Morningstar, 2012); and sorting mail (Alexander et al., 2013). All studies used reinforcement in motivating participants to learn and complete the tasks, along with video-modeling procedures in many of the studies (Walsh et al., 2014). However, in most cases, the majority of these studies included small sample sizes, predominantly male samples, very little follow-up data reflecting maintenance of learned skills (Walsh et al., 2014). A more

recent study which was not included in Walsh and colleagues' (2014) review demonstrated the successful use of personalized iPod applications (e.g., task reminders, schedule, relaxation techniques, etc.) as vocational supports (Gentry et al., 2014). Adults with ASD (N=50) were randomly assigned to either receiving an iPod at the start of the program or receiving an iPod 12 weeks into the program, and those who received the iPod at the start of the program required significantly less hours of support from job coaches during the first 12 weeks on the job (Gentry et al., 2014).

It is clear that with the right support, some of the difficulties this population experiences with employment may be fostered into great benefits, even for those with more severe disabilities (Smith & Coleman, 1986). However, employers and job coaches must be careful to not stereotype the vocational interests and abilities of individuals with developmental disabilities (Baldwin et al., 2014). Research has shown that, even though the majority are underemployed or unemployed, adults with developmental disabilities that are employed hold jobs across a broad range of fields and types of employment such as sales, creative arts, and military (Hagner & Cooney, 2005; Muller et al., 2003; Westbrook et al., 2012). Hagner and Cooney (2005) conducted interviews with 14 supervisors of employees with ASD. They found that supervisors gave overwhelmingly positive evaluations of these employees, with most receiving “outstanding” grades. One supervisor stated that supervision of an employee with ASD was more attitudinal than technical in that supervision did not require anything “other than patience, respect, and understanding of people who are different than you are” (Hagner & Cooney, 2005).

Employment of Adults with Developmental Disabilities Outside of the Research World

Many innovative employment programs and opportunities for adults with developmental disabilities are happening outside of academia (Shattuck & Roux, 2014). Tim's Place, a

sandwich shop owned by an adult with Down Syndrome was featured on the front page of America Online in February of 2013 (Tim's Place, 2013). In a June 2014 CBS News piece, SAP, the 3rd largest technology company in the world announced a pilot program called "autism at work," in which they aim to specifically hire adults with ASD. So far, over 40 adults with ASD have been hired at 6 different SAP offices around the world (*CBS News*, 2014). Two different computer debugging and software testing companies called ULTRA and Aspiritech, specifically hire employees with ASD (*Autism Speaks*, 2014). Freddie Mac, through a partnership with the Autistic Self Advocacy Network (ASAN), has started an internship program for hiring recent college graduates with ASD who work in IT, Finance, and Investments and Capital Markets divisions (*Freddie Mac*, 2014). Specialisterne is a technology company out of Denmark which looks to hire and train adults with ASD or other challenges (i.e., OCD, ADHD, etc.) and has hired 234 adults with ASD since 2004 (*Specialisterne*, 2015). Specialisterne has locations and training programs all over the world and has specifically aimed to create 100,000 jobs in the United States for adults with ASD (*Specialisterne*, 2015).

In these real-world settings, the problem is more about measuring outcomes of programs in order to decipher what works and what does not (Chen et al., 2014). The ability to properly evaluate these programs is inadequately developed (Shattuck & Roux, 2014). Job satisfaction, quality of life, and level of economic self-sufficiency should also be taken into account when interpreting successful outcomes for this population (Walsh et al., 2014; Chen et al., 2014). Partnerships need to be made between these programs and members of academia in order for sufficient program development and evaluation. Lastly, because the majority of these new programs are in the technology sector, expansion to other employment fields is needed.

Recently, in an episode entitled “On the Brink,” Dateline NBC followed two adults with ASD as they were aging out of the education system (Bergacs & McAfee, 2015). The costs to the families were high (ranging from \$40,000-90,000 per year) for services after the individuals graduated high school. One of the families likened the experience to being suddenly “pushed off a cliff,” transitioning from all the resources they received in high school to the current difficulty finding appropriate programs and resources.

Types of Employment and Employment Supports

Competitive employment. Competitive employment refers to the average daily job in the workforce. Workers who are competitively employed do not receive any support, accommodations, or intervention on the job. Salaries and benefits should be equivalent to those of non-disabled coworkers (Capo, 2001).

Self-employment. Self-employment, depending on the number of hours worked and wages earned, can be considered competitive employment. The self-employment rate is growing by 20% annually and microenterprise small businesses (i.e., businesses that employ one to five people) are generating 64% of all new jobs in the United States (Griffin et al., 2014). Self-employment holds promise for more successful outcomes for employees with ASD in that it can function as somewhat of a hybrid between supported employment and competitive employment due to its ability to be customized (McDonough & Revell, 2010). In this model, individuals with developmental disabilities have the opportunity to develop a community-based or home-based business that capitalizes on their personal strengths (Griffin et al., 2014). These individuals can then, develop their own businesses and can define both their own job tasks as well as the time they will devote to that job (Schall, Wehman, & McDonough, 2012). For example, Joe, a young man with Down syndrome and ASD, owns and operates a very successful kettle popcorn

business in Louisburg, Kansas with support from his family (<http://www.poppinjoes.com>). As of 2013, self-employment and business ownership are recognized in the newly revised U.S. Department of Labor's Office of Disability Employment Policy (ODEP). Owning a business or being self-employed can be some of the least stigmatizing forms of employment for individuals with disabilities because it can be tailored to their personal situation, degree of mobility, skills, health, and accommodation needs. (Griffin et al., 2014).

Sheltered Workshops. Sheltered workshops provide employment in separate facilities or in segregated parts of a regular enterprise. They are intended for potential employees who are thought of being not yet ready for competitive employment (Bruyere et al., 2011). Also known as community rehabilitation facilities, sheltered workshops were originally developed as a long-term, eventually transitional, placement for workers with disabilities (Wysocki & Neulicht, 1998). These programs offer skill training, subminimum wage work, and work adjustments to prepare disabled workers for paid employment (Cimera et al., 2012). As of 2008 in the United States, approximately 7000 sheltered workshops serve over 500,000 adults with all types of disabilities (Braddock et al., 2008). Individuals with disabilities are often referred to sheltered workshops as the first step in their vocational rehabilitation process due to the premise that these individuals need to learn certain skills before they can become competitively employed (Cimera et al., 2012). However, many of the job tasks taught at sheltered workshops are often repetitive, remedial, and routine (e.g., assembly lines, packaging, or sorting) and are not applicable to competitive employment (Wysocki & Neulicht, 1998). In addition, Cimera and colleagues' (2012) results from their study of 215 sheltered workshop employees with ASD and 215 non-sheltered workshop employees indicate that the sheltered workers earned significantly less and had significantly higher service costs. However, aside from the economic disadvantages,

sheltered workshops provide other potential values such as safety, socialization, and structure for those who have the most difficulty securing competitive employment in the community (Migliori et al., 2008; Capo, 2001).

Supported Employment. The supported employment model, originating in the 1980's in the United States, assumes that all individuals, regardless of disability nature or extent, should have the opportunity to obtain meaningful work in the community with proper support (Maybee & Swain, 2009; Capo, 2001). In supported employment, employees with disabilities work for a minimum of 20 hours per week in an integrated workplace environment which provides regular support services (Capo, 2001). The model also posits that individuals do not have to be fully ready for these jobs, instead, the goal is to locate and modify meaningful jobs while providing live, on the job, training (Lutfiyya et al., 1988). This model has enabled people with disabilities to successfully enter competitive employment by providing employees the added support necessary to learn real skills in the specific environments those skills need to be used (Capo, 2001; Maybee & Swain, 2009).

A common supported employment accommodation involves receiving one-to-one support from an employment specialist, commonly referred to as a job coach (Wysocki & Neulicht, 1998). Job coaches are responsible for a variety of skills and tasks involved in the employment process such as, finding job options, assisting in filling out job applications, conveying the skills needed for the job to the individual with whom they are working, and practicing these skills with the individual. Then, if the individual achieves employment, the job coach is also responsible for assisting that individual in the workplace with certain tasks, work schedule, and communicating with co-workers. Lastly, the job coach gradually fades support, once the individual has become sufficiently acclimated to his or her work role and environment (Capo, 2001). The job coach can

then decide whether to maintain contact with the individual and with the job site as needed (Capo, 2001).

Occupational therapists can provide other types of supported employment supports for employees and potential employees with disabilities such as vocational interest assessments, job skill assessments, cognitive skill evaluation, motor skill assessment, identification of environmental adaptations, applications of technological supports, social skills training, and arrangement of other on-the-job supports to be provided by the workplace (Smith, 1990; Capo, 2001). An occupational therapist's main goal may be making sure the employer and the individual with disabilities are on the same page in terms of employer expectations and the particular client's work skills (Capo, 2001).

There are other types of supported employment such as enclaves and mobile crews. An enclave is a clustered placement approach at one particular job site that involves a group of employees with disabilities and a job coach who helps each member of this group work together with other non-disabled workers (Capo, 2001). The job coach can then rotate between each person when support may be needed, then gradually integrate these workers into their various roles in the workplace, and fade support (Capo, 2001). Enclaves have shown some efficacy for employees with developmental disabilities (Wysocki & Neulicht, 1998), but need to be researched further. A mobile crew is an enclave that works together and travels throughout the community completing a variety of tasks (e.g., landscaping, janitorial work, house cleaning, etc.) (Capo, 2001). This approach allows for the enclave to be better supervised because the enclave stays together as its own independent unit and is not integrated into the existing workforce (Wysocki & Neulicht, 1998), and provides opportunities to interact with a variety of individuals in the community.

Supported employment for adults with ASD. Based on a handful of studies of supported employment, which have mostly been conducted with samples of adults with ASD, it appears that with the proper support, employment outcomes for this population drastically improve (Lawer et al., 2009; Wehman et al., 2012). In general, the outcomes of competitive and supportive employment, in terms of socialization, finances, and job satisfaction, have proven to be far superior to sheltered workshops for adults with ASD (Cimera, 2008; Hillier et al., 2007; Keel et al., 1997; Nesbitt, 2000; Howlin et al., 2005). Supported employment is the approach that has allowed individuals with ASD to have the most success achieving and maintaining competitive employment (Wehman et al., 2012).

Although promising, very few studies have been conducted regarding supported employment for adults with ASD and they are often of weak quality (Wehman et al., 2012; Taylor et al., 2012; Westbrook et al., 2012). Keel and colleagues (1997) conducted one of the first studies of supported employment for adults with ASD. In their creation of the Treatment and Education and Related Communications Handicapped Children Program (TEACCH) in 1989, they were able to help 96 individuals with ASD gain and maintain employment using individual placement, enclaves, and mobile crews based on the individual skills and interests of each participant. It was reported that these 96 individuals who achieved employment worked an average of 28.6 hours per week and earned about \$5.29 per hour, which was minimum wage at the time the study took place (Keel et al., 1997). However, limited causal conclusions can be drawn due to the fact that no control group was included, number of participants was not specified, duration of the program was not provided, and there was a general lack of details regarding the implementation of the program (Westbrook et al., 2012). Hillier at colleagues (2007) conducted a two year study of the TEACCH program and evaluated the outcomes of 9

participants 18-36 years old. Participants were provided job preparation, job placement, and job coaching services individually. Prior to beginning the program, each participant completed questionnaires assessing daily functioning, communication, cognitive, social, and behavioral skills, as well as demographic information. Job preparation services consisted of job search instruction (e.g., using the internet or newspaper to find job listings), information about particular jobs, positions for which participants may be qualified, resume preparation, assistance with job application completion, and mock job interview practice (which were videotaped so performance could be reviewed by both the participant and the support staff). This support and skill practice continued until a job was attained, which varied from 1 to 8 months. Once a potential employment option was discovered, program staff conducted a job site evaluation assessing factors such as noise level, number of employees in a work space, type of equipment used, if this company had previously employed an individual with disabilities, what potential support systems may look like, or tasks that the individual would be required to complete. The program staff then discussed these aspects with participants and negotiated tasks and supports with the employer when needed in order to provide the most appropriate job match for each participant. Once a job was attained, program staff then offered information to employers and coworkers regarding ASD and what the particular participant's strengths and challenges were, as well as providing the participant with additional support needed for communicating and interacting with coworkers. Job support for each participant varied from 4 to 20 hours per week and lasted for 1 day to 6 months depending on the individual. Support was then faded to every two weeks, then eventually to monthly, once each participant was able to operate independently, and additional support could be provided as requested. Most participants, 6 out of 9, achieved paid employment within 4.5 months of enrolling in the program and held their jobs for more than

a year. Employers rated overall job performance highly and social integration lowly. Participants rated job satisfaction highly at first, but this gradually decreased over time which the authors attribute to the job potentially being too easy after gaining more work experience through the program. Though this study provided a high level of detailed information about how the program operated, the few participants, lack of control group, and unblinded assessors has led to this study's unfavorable reviews (Westbrook et al., 2012). However, a great amount can still be gained from this study and the supports provided by the program are intriguing for future, larger-scale, research.

Mawhood and Howlin (1999) compared a group of 30 (27 males and 3 females) adults with ASD who were aided by a job coach in finding jobs, work preparation, and communication with the employers to a control group of 20 adults (all male) that received no support. These job coaches also were responsible for informing and educating bosses and coworkers about ASD. When employment was identified and secured, on-the-job support was provided full time for the first 2-4 weeks of the job, then gradually faded to monthly, scheduled meetings after 4 months. After two years, the authors found that the supported employment group achieved significantly higher paid employment, with 19 individuals in the supported employment group as compared to 5 in the control group (Mawhood & Howlin, 1999). Additionally the supported employment group achieved significantly higher wages, averaging \$8.80 as compared to \$6.38 in the control group (Mawhood & Howlin, 1999). The design of this study has been reviewed much more favorably than the previously mentioned study in that there was a control group and more details about the program were provided (Westbrook et al., 2012), however, groups were not randomly assigned and assessors were not blind (Taylor et al., 2012). Lastly, because the study listed the actual job finding process and being one of the most difficult and time consuming aspects of the

program (Mawhood & Howlin, 1999), it would be helpful if more information could be provided regarding how these jobs were identified and secured. This program was then expanded, renamed “Prospects,” and evaluated in an 8-year follow up study conducted by Howlin and colleagues (2005). Data from this study revealed that 68% of the 89 participants found employment, primarily in professional, administrative or technical jobs. Also, participants, employers, and Prospects Staff reported generally high levels of satisfaction (Howlin et al., 2005). However, the comparison group was not followed and it was not reported whether these individuals were receiving any other interventions while in the Prospects program or during the follow up period (Taylor et al., 2012).

García-Villamizar and his colleagues have illustrated the variety of positive impacts supported employment can have on cognitive performance, ASD symptoms, and quality of life for individuals with ASD (García-Villamizar & Hughes, 2007; García-Villamizar et al., 2000; Garcia-Villamizar et al., 2002). In their first study (García-Villamizar et al., 2000), they evaluated the effects of supported employment for 25 adults with ASD in comparison to employment in a sheltered workshop for 26 adults with ASD in Spain. Each individual in the supported employment group was given a job coach and placed in a job within the community. Jobs were mostly in service sectors (e.g., food services, recycling, delivery, retail, gardening, etc.) and all subjects worked between 15 and 30 hours per week while receiving competitive wages. ASD symptoms were measured before the study and 3 years after the study began. Results showed that, though no group differences appeared before the study began, the individuals in the sheltered workshop exhibited higher ASD symptomology than those in the supported employment group at follow up. However, the groups were not randomly assigned and the processes involved with job placement and the roles the job coaches played were not

specified. In their 5 year follow-up of the original study, Garcia-Villamisar and colleagues (2002) found that quality of life scores were higher for individuals in the supported employment group than those in the sheltered workshop group. Groups were equivalent at the start of the program. Lastly, in a separate study Garcia-Villamisar and Hughes (2007) randomly selected a sample of 56 adults from the Spanish Program of Employment for Autistic People (a supported employment program) and a group of adults on the waitlist (number of adults in this group was not provided). The supported employment group significantly outperformed the group on the waitlist on a variety of computerized and non-computerized cognitive tasks from pre to post-intervention.

Recently, Wehman and his colleagues (2012) developed a modified supported employment model for adults with ASD called Project SEARCH. In this study, 33 adults with ASD were enrolled in the program and 3 job coaches, referred to as employment specialists, were responsible for situational assessment, job discovery, job development, job customization, on-site training, positive behavioral supports, and job retention techniques (Wehman et al., 2012). The employment specialists also tracked the amount of time spent working with or for each adult with ASD. Before the program began, participants work skills and interests were gathered through interviews and situational assessments that involved performing work tasks in real work environments in the community (Inge, 2007). Once skills were assessed, the employment specialist provided an intensive level of support working with each individual to identify employment options in order to find the best potential match of participants to jobs. Few individuals in the study knew what was involved in seeking out jobs, with some individuals requiring scripts and role-playing scenarios in order to properly prepare for the job interview process. After the participants secured employment, the employment specialist became

responsible for assisting the participant in adjusting to job routines, culture, and responsibilities, utilizing a variety of strategies (e.g., self-management, memory aids, support strategies, direct instruction, etc.) All participants in the program were given access to an iPod Touch containing applications that provided supports such as checklists, audiovisual cues, and timers. Lastly, participants were also provided with more long term supports, both on the job and outside of the job, which aimed to assist with employment stability (e.g., employer and co-worker, personal living, transportation, and social supports). After 9 months in the program, 27 out of 33 participants achieved competitive employment, with most participants achieving an employment match to their particular field of interest. Across all participants, the average number of intervention hours (i.e., hours of job seeking, job training, and follow up supports) given to each participant was 163 hours, with the intervention time decreasing each week. Lastly, 23 participants were still employed at the time the study ended, 1 to 2 years after receiving the intervention (depending on the participant). This particular study did not include a comparison group due to its exploratory nature and therefore was not included in recent evaluative reviews (Westbrook et al., 2012).

Following up on this study, Wehman and colleagues (2014) published the first supported employment-focused randomized clinical trial (RCT) for adults with ASD comparing 24 adults receiving Project SEARCH to 16 adults receiving “business as usual” transitional resources from their home high schools. ASD-specific supports were provided for the Project SEARCH participants while they rotated through 3 10-12 week internships at 2 different hospitals. Jobs consisted of assisting with cleaning equipment, organizing materials, scanning documents and items into the computer, filing paperwork, delivering mail, and disposing of medical waste. A team of support specialists were provided at each hospital site consisting of a special education

teacher, instructional assistant, two full time employment specialists, and a business liaison. Results showed strong evidence supporting Project SEARCH with 88 % of the Project SEARCH participants and only 6 % of the control group participants achieving employment after 9 months. In addition, the Project SEARCH group from baseline to 3 months post completion of the program exhibited much lower support needs than the control group whose support needs remained stable from baseline to post as measured by the Supports Intensity Scale (SIS; Thompson et al., 2004). Results from this study are promising, though, in future replications, it seems necessary to expand the size of the RCT and the job types to specific fields of interest to the participants.

In sum, supported employment model success appears dependent on a wide variety of individualized factors including appropriate job placement, appropriate job training, appropriate job accommodations and supports, long-term support to ensure job retention, advocacy, and proper training for co-workers and employers (Capo, 2001; Westbrook et al., 2012).

Apprenticeships. The apprenticeship model, which is much more common outside of the United States, often starts in teenage years and involves a combination of classroom-based learning and part-time paid employment while working under an experienced person in a specific profession (Bailey, 1993). For example, each province in Canada has its own apprenticeship program. The Youth Apprenticeship Program of Brazil (YAP) is a federal program that assigns participating youth to a current employee of a particular company at their job location, and the employee is then responsible for mentoring and coaching the youth in work tasks and activities (dos Santos Rodriguez et al., 2013). Dos Santos Rodriguez and colleagues (2013) demonstrated the capability of this program to be successfully adapted to youth with disabilities by providing more staff support and having that support last longer for a deaf individual who was trained to work as

an office assistant. A study conducted by Ball and David (2005) of an Australian apprenticeship program found equal employment rates for high school graduates with and without disabilities who participated in the apprenticeship program. **Studies on apprenticeships for individuals with developmental disabilities in the United States have yet to be conducted.** Further research into this topic is much needed, given that the apprenticeship model may be a promising one for workers with developmental disabilities in that these individuals would receive one-on-one support and more specified training from an experienced worker in a particular field.

Current Study

In previous research in which adults with developmental disabilities were interviewed regarding their employment experiences, adults themselves highlight their own lack of exposure to job training and experiences before adulthood (Henry, 2013; Baldwin et al., 2014; Muller et al., 2003). These hands on vocational experiences that individuals can gain via the apprenticeship model are particularly important for youth with developmental disabilities, especially given that previous research has shown that holding a paid job during high school is a powerful predictor of adult employment outcomes (Carter et al., 2012). Essentially, the best way for an individual to become “job ready” is to get them into a job (Wakeford & Waugh, 2014). Programs for this population need to be developed to employ these individuals as early as possible so they can receive individualized experience related to specific interests or strengths, much like the apprenticeship programs that already exist in other parts of the world. Considering that research shows that 1 in 3 adults with ASD even attends a 2 or 4 year college (Shattuck et al., 2012), adults with developmental disabilities need to be better prepared, and prepared earlier, for employment. These programs can also assist with teaching teens and adults job searching strategies (i.e., where to look, what to look for, what requirements are needed, etc.), which is a

part of the employment process that almost all of the studies failed to adequately address (as reviewed above).

Once adults with developmental disabilities are able to become more familiar with employment types and environments from an earlier age, they and their caregivers will be better able to identify and advocate for appropriate work settings and supports.

After identifying an appropriate job match, job training needs to be individualized to the employee with ASD and provided on the actual job site (Hendricks, 2010). Providing the training in the natural setting of the job has shown to increase chances of success (Wehman et al., 2014; Wakeford & Waugh, 2014). This training should also involve skills outside of specific work-related tasks such as communication and interpersonal skills (i.e., interacting with coworkers, hygiene, workplace attire, etc.), behavior management and self-advocacy (i.e., taking a short break if upset, relaxation skills, and how to ask for help or a break) and could involve technological supports if applicable (i.e., mobile device applications such as calendars, task lists, and reminders) (Hendricks, 2010).

Long-term support is another critical component of successful employment for individuals with ASD (Hendricks, 2010; Muller et al., 2003). Because apprenticeship models have a built-in job coach, there is no need for job coaches or employment specialists to be involved in the actual on-site training. Job coaches should be able to fade their support once a job is found by transferring it to employers and supervisors (Hendricks 2010).

The current study seeks to evaluate the effectiveness of a local apprenticeship model employment program for adults with developmental disabilities. The employment program aims to remove obstacles and support innovation in order to foster empowerment and sustainability for the employment of individuals with developmental disabilities based on each individual's

unique skills and interests. This program develops and operates small businesses (e.g., a holiday shop, an ice cream truck, a hot dog cart, etc.) with 80% of their employees consisting of individuals with disabilities. Aside from these social enterprises, this program offers a 4 month apprenticeship model employment program which directly teaches vocational skills in addition to related interpersonal skills such as effective workplace communication, emotion regulation, self-advocacy, and problem solving skills through role play and other hands-on exercises. This program is taught by two credentialed special educators with decades of experience with this population and meets 3 times per week: for 2 hours on Tuesdays and Thursdays and for 4 hours on Fridays. Upon graduation, participants will either be placed in one of the small businesses created by the program or in a job outside of the program.

Overall, the current study aims to investigate: (1) the past and current vocational and support experiences of the participants according to parent report (2) the participant outcomes as a result of engaging in an apprenticeship model employment program, and potential factors associated with outcomes (3) whether the novel “Secret Shopper” observational assessments are able to measure change in vocational skills.

CHAPTER TWO: METHOD

Participants

Participants were recruited by the employment program for the first cohort which consisted of 11 participants: 5 with ASD, 3 with Down Syndrome, and 3 with other developmental disabilities not otherwise specified; 7 males and 4 females. The second cohort consisted of 10 participants: 5 with ASD, 5 with other developmental disabilities not otherwise specified; 7 males and 3 females. One male participant with ASD dropped out of the program part way through and was replaced by another male participant with ASD. Participants were determined to be eligible by the employment program instructors based on the following criteria: a minimum age of 18 years old, possess a developmental disability, and current employment status of either unemployed (i.e., currently out of a job) or underemployed (i.e., in a job for which they are overqualified or not a good match).

A comparison group of 11 participants, 5 females and 6 males, of similar age (19-38 years old) and diagnoses (4 with ASD, 2 with ADHD, and 5 with other developmental disabilities not otherwise specified) was recruited from a nearby program which did not follow the apprenticeship model. This program did not utilize a curriculum; instead the program opted for an open forum, supportive group style. They had daily, 30-minute group meetings in which they took turns talking about their jobs or their process of looking for jobs. The leader of the group, who was a specialist in vocational rehabilitation, asked them for updates on how their job searches or jobs were going. Demographics for each group listed in Table 1.

Procedure

For the second cohort of participants, measures were administered prior to the start of the program (Pre-intervention; Week 0), halfway through the program (Mid-intervention; Week 8),

and after the last day of program (Post-intervention; Week 16). In addition, for the first cohort of participants, because the program started before our collaboration was solidified, only mid-intervention and post-intervention measures were collected. Thus, pre-intervention data was collected only from the second cohort, while mid- and post-intervention data was collected from both cohorts.

During the post-intervention phase for the first cohort, and the pre-intervention phase for the second cohort, parents or guardians of participants were interviewed about their son's or daughter's employment history, current employment, interests, strengths, "dream job," "realistic job," current support needs, and past service and support history.

Participants in both cohorts were also administered a brief intelligence test in order to establish basic cognitive functioning levels in the study sample. Parent-report questionnaires were administered at pre-, mid-, and post-intervention to assess participants' vocational, emotion regulation, and problem solving skills, and the parents' expectations for and satisfaction with the program. Self-report questionnaires were also administered at Pre-, Mid-, and Post-interventions to assess participants' views of their own vocational skills. Some of the emotional regulation and problem solving skills questions proved to be too difficult for the participants to answer about themselves, so only the questionnaire regarding vocational skills was administered to the participants as it was deemed to be the most essential to the goals of the study and the employment program.

In addition, vocational skills were measured observationally using a novel, "Secret Shopper" protocol using a mock flower shop created for the study in an office at the employment program. In the secret-shopper protocol, once the participant was given an orientation to the flower shop and his/her job tasks, a secret shopper (e.g., a graduate student) entered the flower

shop and engaged in various situations with the participant. These situations included asking for more information about a particular flower, telling the participant she wanted one type of flower and then claiming that she actually said a different type of flower, pretending to accidentally drop flowers on the floor that were just purchased, and asking for a refund after changing her mind about buying the flowers. The secret shopper, the participant, and the principal investigator then rated the experience on a variety of different factors (e.g., quality of greeting, participant's ability to regulate emotions, eye contact, appropriateness of participants' answers, and overall quality of performance).

Participants in the comparison group were observed at the same time that the second cohort started (Pre-intervention; Week 0), and then again at the same time the second cohort finished (Post-intervention; Week 16). Only demographics, diagnostic information, and current employment status at each time point were collected.

Measures

Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997). The ERC is a 24-item measure that targets affective lability, intensity, valence, flexibility, and situational appropriateness of emotional expressions (e.g., "Is easily frustrated"). The ERC has been previously used to study the relationship between aggression, attention, and emotion regulation in children who have been maltreated (Shields & Cicchetti, 1998), and more recently in a sample of children with ASD (Nader-Grosbois & Mazzone, 2014). The ERC was designed to be completed by a parent or other adult who knows their child well. This measure has been adapted to the current study by adjusting the language to be more applicable to parents of adults. Parents were asked to report on their son or daughter's emotion regulation skills. Total scores were used

for the analyses and range from 24 to 96, with low scores indicating poor emotion regulation and high scores indicating better emotion regulation.

Interview Questions. Ten parents from the first cohort and 5 parents from the second cohort agreed to participate in semi-structured interviews. The interviews lasted between 15 and 30 minutes. Parents were asked about their son's or daughter's strengths, interests, current and past supports and services, positive and negative employment experiences. Parents were also asked in what profession they could realistically see their son or daughter working, what their son or daughter's "dream job" would be, and any additional comments they might have about the apprenticeship program. These interviews were recorded using an audio recorder, transcribed, and then coded for themes using thematic analysis (Braun & Clark, 2006).

Parents were also asked to name the "Best 3" supports or services their sons or daughters received while growing up that were the most positively impactful on their lives. These were coded qualitatively by types of services codes specific to that question, but also were analyzed quantitatively to determine the types of services most often named. Some of these answers were also coded using the major qualitative themes previously determined when applicable; for example, a parent mentioned the support that her daughter received in college from someone in the disabled student services office was coded as "*With the right supports....*"

My Vocational Situation (MVS; Holland et al., 1980). The MVS is an 18-item measure assessing job confidence, job anxiety, and self-assessment of vocational skills (e.g., "I don't know what my major strengths and weaknesses are," "I am uncertain about the occupations I could perform well"). Participants were asked to respond "True" or "False" to each item based on how much they felt that statement applied to them. This questionnaire was given to all participants, regardless of their employment status. This measure was also given to parents to

assess their perspectives on their son or daughter's vocational skills. Total scores were used for analyses and ranged from 0 to 18. Previous studies indicate that full-time working adults without disabilities average a score of 16 (Holland et al., 1980), while individuals with disabilities have averaged scores between 3.5 (Merz & Szymanski, 1997) and 9 (Dipelou, Hargrave, Sniatecki, & Donaldson, 2012). Low scores on MVS indicate confusion about participants' vocational identity and self-assessment of vocational skills, while high scores indicate more confidence and better self-assessment of skills.

Problem-Solving Test (Nezu, Nezu, & D'Zurilla, 2012). The Problem-Solving Test is a 25-item measure assessing problem-solving skills. This measure also contains 5 different 5-item subscales: Positive Problem Orientation, Planful Problem Solving, Negative Problem Orientation, Impulsive/Careless, and Avoidance. It was originally intended to be used as a self-help guide for individuals to be able to obtain an estimate of their problem-solving abilities. Psychometrics have yet to be conducted on this measure, thus authors recommend interpreting results with caution. In the current study, this measure was given to participants and parents of participants. The Problem-Solving Test provides a total score ranging from 0 to 100. Low scores indicate weaker problem solving skills, while high scores indicate stronger problem solving skills.

Secret Shopper Protocol and Measures. Participants' vocational skills were assessed using a novel, 10 to 15 minute "Secret Shopper" protocol created for the current study. The principal investigator gave a brief orientation to the mock flower shop created for the study which included the 4 types and prices of plastic flowers available at the shop (ex. "This is a poppy bush and it costs \$5"), money for change if the participant needed it, a white board with the types of flowers and prices written on it, and instructions to the participant that a customer

was going to come in to the shop to buy some flowers. The principal investigator then observed and scored the participants, while another assessor, the “Secret Shopper,” approached the participant and interacted with the participant based on preset scenarios. First, the assessor rated the participant from 0-4 on two First Impression categories: Appropriate Hygiene and Approachability. Appropriate Hygiene was assessed based on the following criteria: clean hair, appropriate work apparel (ex. proper shoes, shirt is clean), clean face, and clean smell (ex. body and breath). Each criterion was worth one point. For approachability, pleasant demeanor when approaching (ex. smiling), availability (ex. head down, staring off), greeting (ex. did participant greet the Secret Shopper?), and eye contact, were each worth one point. Next, the Secret Shopper proceeded with the participant through 4 different scenarios with increasing difficulty. Scenario 1: The Secret Shopper asked the participant for more information about a particular flower in the flower shop (ex. “What kind are the blue flowers?”). Participants were scored on a 0-4 scale based on the following criteria: Appropriate answer (ex. “Those are poppies”), ability to regulate emotion, eye contact, and pleasant demeanor. Scenario 2: Secret Shopper asked for item but then when she received that item, Secret Shopper said that she actually asked for a different item. Participants will be scored on a 0-4 scale based on the following criteria: Appropriate answer (ex. the customer is always right; getting the other item instead for the secret shopper), ability to regulate emotion, eye contact, and pleasant demeanor. Scenario 3: Secret Shopper accidentally dropped the flowers she just received on the floor, and asked for new flowers. Participants were scored on a 0-5 scale based on the following criteria: Picking up flowers for customer, appropriate answer (ex. customer is always right; giving customer new flowers), ability to regulate emotion, eye contact, and pleasant demeanor. Scenario 4: Secret Shopper does not like the new flowers and asked for a refund. Participants were rated on a 0-4 scale based on the

following criteria: Appropriate answer (gives refund), ability to regulate emotion, eye contact, and pleasant demeanor. The protocol procedure was to stop the assessment if at any point participants seemed to be getting upset. All participants made it through the 4 scenarios, except for one non-verbal participant whose scenarios were altered because the protocol was adjusted for use with the participant's alternative communication device, but not able to be scored the same way as the other participants. The ending of the interaction was then rated on a 0-4 scale based on the following criteria: saying goodbye, eye contact, saying thank you, and some additional positive comment (ex. "Have a nice day," "See you next time," etc.). Scores from the interaction were summed for a Total Secret Shopper Observational Assessment score ranging from 0 to 29 (Hygiene, greeting, each of the scenarios, and ending; 4 possible points for each, except Scenario 3 which has 5 possible points). Overall quality scores were rated by the Secret Shopper independently using items such as "Quality of greeting," "Ability to help you," and "Overall rating of experience"(1-5 scale: Poor to Excellent). In addition, participants were given a self-report version of the same Secret Shopper quality score measure to rate themselves on their ability to handle the Secret Shopper. For both the Secret Shopper assessor ratings and the participant self-report ratings, scores of 30 suggest an excellent performance, scores of 18 suggest an average performance, and scores of 6 suggest a performance which needs significant improvement.

Supports Intensity Scale (SIS; Thompson, 2004). The SIS, which was previously used in Wehman and colleagues' (2014) study evaluating the outcomes of the Project SEARCH employment program for adults with ASD, was administered. The SIS is a standardized parent-report interview used to assess adaptive behavior and intensity of support needs. The SIS measures the frequency, amount of time, and type of supports individuals with disabilities

require in six different aspects of life: 1. Home Living, 2. Community Living, 3. Lifelong Learning, 4. Employment, 5. Health and Safety, and 6. Social. The final score provides a normative Support Needs Index (SNI) score and indicates whether the individual requires limited support (SNI 1-60), intermittent support (SNI 61-84), extensive support (SNI 85–116) and pervasive support (SNI 117 and above). Reliability has been established for internal consistency (each factor exceeds .94), test–retest reliability (corrected r for each factor ranged from .74 to .94), inter-rater reliability (inter-interviewer ratings ranged from .74 to .96; Thompson et al. 2004b, 2008). Validity has also been established for content, criterion, construct (6 factor structure) validity (Bossaert et al. 2009; Kuppens et al. 2010; Thompson et al. 2004b; Weiss et al. 2009).

Vocational Index (Taylor & Seltzer, 2012). The vocational index is a way to categorize participant’s current vocational standing from most to least independent ranked from 9 to 1. Participants were given a score at Pre-intervention based on current employment or volunteer positions, amount of vocational support needed and number of hours that they participate in vocational or volunteer activities. This information was gathered from the parent interviews. For example, a 1 on the Vocational Index is defined as “No vocational/educational activities,” a 2 is defined as “Volunteering,” a 6 is defined as “Employed in the community with supports for 10 hours or less per week,” a 9 is defined as “Employment in the community without supports for more than 10 hours per week.” The full scale of the Vocational Index is published below in Table 2.

Wechsler Abbreviated Scale of Intelligence (WASI-II; Wechsler, 2011). The WASI-II was administered to all participants in order to estimate cognitive abilities. It took about 15

minutes to administer. This abbreviated version consisted of Matrix Reasoning, which measures fluid and visual abilities, and Vocabulary, which measures verbal abilities. The WASI-II was developed to quickly and accurately estimate cognitive intelligence when administration of a full battery is not feasible or necessary (McCrimmon & Smith, 2013).

CHAPTER THREE: ANALYSIS

Aim 1: To explore the past and current vocational and support experiences of the participants according to parent report.

In order to address this aim, both qualitative and quantitative analyses were conducted using data collected from the parent interviews (n=14). The interviews were recorded and then transcribed verbatim. Transcripts were then analyzed using Braun & Clark (2006)'s method of thematic analysis, which focuses on identifying major themes and patterns within a qualitative data set to succinctly describe the data. The thematic analysis for the current study incorporated the framework from the following 6 factors that previous research has shown most commonly lead to successful employment for individuals with developmental disabilities: 1. *With the right supports, difficulties associated with disabilities may be fostered into great benefits* 2. *Families with higher socioeconomic status* 3. *Fierce and prolonged advocacy from parents* 4. *Greater independence in daily living activities* 5. *Previous positive work experience* 6. *Collaboration occurring between educational and vocational service systems* (Chen et al., 2014; Taylor & Mailick, 2014). Additional themes that fell outside of this framework were determined inductively by rereading the transcripts.

In order to measure reliability, a second coder read through two transcripts picked at random and coded the major themes and the minor themes specific to each question that were previously determined by the primary investigator. After the independent coding of both transcripts, Cohen's kappa, which indicates the proportion of agreement which is beyond what can be expected by random chance alone, was calculated to determine rater agreement (Cohen, 1960). Only the codes of the primary themes were included in establishing inter-rater agreement.

Inter-rater agreement was determined to be .92. A value above .90 is considered to be a nearly perfect agreement (Everitt, 1996).

Aim 2: To determine the participant outcomes as a result of engaging in an apprenticeship model employment program, and potential factors associated with outcomes.

In order to address this aim, primary analyses utilized basic descriptive statistics to determine how many of the participants successfully achieved employment, and each of their average scores on all of the measures administered to them and their parents. Average change scores for each measure that were administered at multiple time points were calculated for the first cohort participants by subtracting their mid-intervention scores from their post-intervention scores; for the second cohort, average change scores were calculated by subtracting their pre-intervention scores from their post-intervention scores. Paired samples T-tests were utilized to test for within-group differences between time points.

Vocational Index scores were compared between the participants from the apprenticeship model program and the comparison group in order to determine potential differences in employment status based on program participation. It was hypothesized that participants in the apprenticeship model employment program would exhibit higher Vocational Index scores and a greater change from Pre- to Post-intervention time points. Independent samples T-tests were utilized to test for significant differences in Vocational Index scores between groups.

In order to address the potential factors associated with the apprenticeship model employment program outcomes, secondary analyses utilized logistic regression in order to determine which factors best predict whether participants achieved employment from participating in the apprenticeship model employment program.

Exploratory Aim 3: To determine whether the “Secret Shopper” observational assessments are able to measure change in vocational skills.

In order to address this aim, Secret Shopper Total scores were calculated and compared from Pre-intervention to Post-intervention. Then, these scores were correlated with post and follow-up employment outcomes, in addition to scores on other skill-related questionnaires (emotion regulation, problem solving, etc.) to determine the relationship between employment outcomes and Secret Shopper scores. It was hypothesized that: (1) Secret Shopper scores would positively correlate with employment outcomes, emotion regulation, and problem solving scores and (2) Secret Shopper scores would increase at from Pre- to Post-intervention for all participants.

CHAPTER FOUR: RESULTS

Aim 1: To explore the past and current vocational and support experiences of the participants according to parent report.

The 15 interviews provided rich data with the aim of better understanding the vocational experiences of participants and the positives and negatives of these experiences from their caregivers' perspectives. One of the previously determined 6 themes, "*Families with higher socioeconomic status*," did not come up as a theme during the interviews. Only one additional major theme was identified, called "*Unprompted negativity*," in which parents made negative statements regarding their sons or daughters when asked about positive or neutral things such as their son's or daughter's strengths. *Unprompted negativity* was not theorized to relate to employment outcomes in any way, instead it was a separate, recurrent theme that was common in the parents' responses to a variety of questions. Unique, minor themes were also determined inductively for each interview question. Each minor theme is presented in Table 3 with examples from the transcripts and number of parents who touched on each minor theme.

All identifying information and names of businesses have been stripped from the quotes to maintain confidentiality.

With the right supports, difficulties associated with disabilities may be fostered into great benefits (n=13). Thirteen of the fifteen parents who were interviewed endorsed this statement during various parts of the interview. When discussing her son's current employment, one parent said the following:

[A grocery store] has worked with us for 8 years when [my son] wasn't functioning well and would give him a suspension for a few weeks and let him cool down, [this grocery store] could've fired him 50 times but they've been accommodating him...now, they love him.

The understanding exhibited by her son's employer has allowed him to keep his employment for a long period time and gain valuable vocational experience. Another parent discussed one of his son's first employment experiences which took place at a snack bar at a summer camp he had attended for a number of years.

It was good to have the job experience in a place where it was really a learning environment where the stakes weren't so high, where the staff knew him well and what his challenges were.

Similarly, another parent mentioned how well it is working for her daughter to be employed at a local preschool.

She loves it, for her it's part of a community, it's truly a community, it's more than a job. There's one teacher that oversees her a little bit more than the others, they get her so they made her a little chart to help her through the day.

This theme also came up on questions that were not about employment experiences. One parent was discussing her son's interests when she said the following:

He did theater in high school and in college he was in the theater group. I don't think it's something he wanted to do as much as it was a village to belong to. Theater is the most accepting village in the world. He was in the shows every year that they did at [his college]. I know for a fact it's not a career thing, it's more of a social thing.

The social difficulties this participant with ASD generally experiences were not evident in theater program. As in the previous examples, "the right supports" mentioned ranged from a physical support like the chart mentioned above, to one understanding person, or an understanding group of people, to a type of environment.

Fierce and prolonged advocacy from parents (n=8). A majority of the parents interviewed mentioned how difficult it was to secure the right supports their sons and daughters needed and continue to need. When asked if she needed to advocate for any of her son's supports, one parent responded with the following:

Let me paint a picture for you, [my son's] 27, if you can imagine 25 years ago having your child on the spectrum and nobody really knew what the heck was going on. There were 2 children fully included in [his elementary school] and he was one of them. I fought for that. I helped create an organization of parents, and we all worked together to advocate for our children and I attended not only my own child's IEP's but other children's IEP's to get them the support services they needed to be successful. I fought like hell. That was probably the worst time in my life, especially his middle school years. Those were the hardest years of my life. I didn't even want modifications I just wanted very minor things for him.

Another participant's father mentioned being on the forefront of the inclusion process:

Let's just put it this way, I basically spearheaded special ed in [our local district] when [my son] first started and I was on the business advisory committee for the district, specializing in special ed, and also chairman of [our district's] special ed for many years. I was a big advocate.

One parent did not have to "fight like hell" in order to obtain services for her son or have him fully included in their local school, but she did emphasize how lucky they were:

We were really lucky that nobody put roadblocks along the way.

The other parents who mentioned their *fierce advocacy* never suggested that this process was only moderately difficult or just somewhat frustrating. Each parent had their own stories of truly fierce advocacy involving lawyers or using phrases like "long journey" or "the biggest issue in our family life."

Greater independence in daily living activities (n=7). Almost half of the parents interviewed mentioned this theme in their responses to a variety of questions. One parent, when asked about one of the most important supports or programs which her daughter received or in which she participated, discussed the significance of a sleepaway camp in another state that her daughter attended:

She went there for about a week. It was the first time she went away and wasn't with us, and they asked them to do different tasks and she had to be on her own. She said that convinced her that she could go away to college on her own.

Summer camp was a common method of achieving greater independence that parents discussed. Another parent mentioned her daughter's longtime employment as giving her a greater sense of independence:

She's learned how to be responsible and that she needs to show up on time and how important that is, it teaches her accountability and responsibility.

Three other parents echoed this sentiment in regards to the sense of responsibility and confidence that their sons or daughters gained from their employment.

Previous positive work experience (n=13). Almost all of the parents mentioned that their sons or daughters had a previous positive work experience. While some parents described only one or two positive experiences their son or daughter ever had, other parents mentioned a number of distinct positive experiences at a variety of jobs. Because this theme only came up during the first interview question regarding past employment experiences, the specific minor themes for this question will also be described. For past employment experiences, the codes *task related aspects of job* and *non-task related aspects of job* were utilized. Fourteen distinct examples of positive *task related aspects of job* (ex. "He really loved shredding paper") were mentioned, while 18 distinct positive *non-task related aspects of job* (ex. "She loved working there because she got to meet lots of different people") were discussed by parents.

Collaboration occurring between educational and vocational service system (n=1). Only one parent endorsed an experience involving this final theme from the predetermined framework. Her son participated in a work training program that involved collaboration between her son's school district and a separate vocational program in which he toured a variety of different jobs for a few months at a time. The mother listed this as a mixed positive and negative experience:

It wasn't very exciting for him because the supervision was by these untrained aids from the school district. If he even glanced up at a display or something they would say "get back on task!" They paid attention to the negative so much that I

was like this is doomed! He also had on the job training at [a hotel] that was for a whole semester and that went very well.

Unprompted negativity (n=10). This was the only theme that was identified inductively by rereading through the transcripts. The principal investigator noticed the phenomenon that parents frequently discussed deficits their sons or daughters exhibit or particular difficulties their sons or daughters experience, even when the interview question was about a more positive topic, such as their son's or daughter's strengths or interests. For example, after a parent was asked about her son's strengths, toward the end of her response she said:

But reading and writing were his biggest weaknesses.

Six other parents also responded with identifying weaknesses when asked about their son or daughter's strengths. Another parent was asked what her son's "dream job" is and she responded:

He has extreme dysfunctional thinking. He is a gamer. He got addicted to gaming. He thinks he wants to design games, but he's not good enough he doesn't have the skills.

One other parent also responded to the question with an answer involving why his son may not be able to attain his dream job. When another parent was asked about where he could realistically see his son working, he responded:

I can tell you things he can't do: can't handle money really, if it's retail environment has to be behind the scenes, but not something that requires handling money.

Four other parents also responded with answers more about what their sons or daughters would not be able to do.

The next portion of the interview, the three most impactful services or supports participants have received in the past, was analyzed both qualitatively and quantitatively. The resulting categories were: Educational Services (ex. Special education teacher, special education

program, college program, etc.), Therapy (ex. Psychologist, Occupational Therapist, etc.), Medical Services (ex. Pediatrician, Psychiatrist, Medication, etc.), Recreational Services (ex. Summer Camp, Theater Program, etc.), Vocational Experience (ex. Holding a job for a long time), Family, Religious Affiliation (ex. Synagogue or Church program), a General Support Strategy (ex. Positive Support or Positive Reinforcement), and “Not Many Good Ones.” The 9 categories and the number of parent mentions are below in Table 4. Of the 9 categories of services that were determined through inductive coding after reading all of the responses, therapy, educational, and recreational services, in that order, were most often listed as impactful.

The last portion of the interview asked for general comments or opinions regarding the apprenticeship program the participants were currently attending. The majority of parents’ positive feedback (n=7) was in response to the skills that their sons and daughters were learning through the program and how great the instructors were. The majority of parents’ negative feedback (n=6) doubted the ability of the program to secure full time employment for their sons and daughters, thus reinforcing the relatively pessimistic view the parents had for their sons or daughters’ futures.

Aim 2: To determine the participant outcomes as a result of engaging in an apprenticeship model employment program, and potential factors associated with outcomes.

Participant self-report measures. Means, standard deviations, and number of participants who completed each measure are presented in Table 5 and Table 6. The differing *n* values for each measure and time point are a result of missing data.

Participants reported no significant differences from pre- to post-intervention in MVS scores.

Parent-report measures. Means, standard deviations, and number of participants who completed each measure are presented in Table 8. Only two scores significantly differed from pre- to post-intervention. Firstly, the parent-reported MVS scores for cohort 2 significantly increased from pre- to post-intervention, which indicates that participants' confidence in their vocational abilities increased from pre- to post-intervention, according to their parents. And, secondly, the parent-reported Negative Problem Orientation subscale scores of the Problem-Solving Test for cohort 2 decreased from pre- to post-intervention, which indicates the tendency to think about problems in ways that are inaccurate while also experiencing difficulty managing emotions under stress, as described by Nezu and colleagues (2012), decreased from pre- to post-intervention. All other measures, including the other four Problem Solving Test subscales, exhibited no significant differences from pre-, or mid-, to post-intervention.

Predictors of Employment Status. In regards to the binary logistic regression analyses, no variables emerged as significant predictors of employment status of the participants in the apprenticeship model program at post-intervention.

Correlations between the variables were analyzed. Significant correlations are presented in Table 10. The Social Support Needs subscale of the SIS was the only variable to correlate with employment status at both pre- and post-intervention, while Age and MVS parent report at pre-intervention correlated with employment status at pre-intervention. Both comparison group participants and apprenticeship program participants were included in the age and employment status correlations.

Between-group Vocational Index Measure. Change in Vocational Index score from pre to post intervention was calculated for both cohorts as well as the comparison

group. Significant differences between scores at pre-intervention were found, while these differences no longer existed at post-intervention. The apprenticeship program participants were significantly less employed than the comparison group at pre-, and the apprenticeship program participants were no longer significantly less employed than the comparison group at post-intervention. The Vocational Index scores for participants in the comparison group remained stable over that same amount of time. The results are presented in Table 10 and Figure 1.

Exploratory Aim 3: To determine whether the “Secret Shopper” observational assessments are able to measure change in vocational skills.

Means for Secret Shopper self-report, the Secret Shopper assessor report, and observing assessor report increased from pre-intervention to post-intervention. Paired samples T-tests were used to test for significant differences within participants from pre-intervention to post-intervention. Only the Secret Shopper observational assessor report was determined to significantly increase from pre-intervention to post-intervention. Results are reported in Table 10.

CHAPTER FIVE: DISCUSSION

The first aim of the study was to explore the past and current employment and support histories of participants. Though the 15 parents interviewed provided their own distinct accounts, common experiences between these accounts emerged following thematic analysis. The examples provided fit within a published framework from other studies (Taylor & Mailick, 2014; Chen et al., 2014), but unique categories also emerged.

With the right supports, difficulties associated with disabilities may be fostered into great benefits. With 13 of the 15 parents endorsing this major theme of the framework, it was the most highly endorsed of the major themes. Parents' statements provided examples of people, programs, or businesses sometimes going out of their way to provide accommodations for participants, and the resulting benefits experienced by the participants. The example mentioned most often of the "right support," was simply an understanding person or environment. This type of person or environment provides the individual with a place where it is okay to make mistakes and learn from these mistakes. This finding echoes Shattuck & Roux's (2014) commentary that the burden of finding supports or achieving employment should not always fall on individuals with disabilities and their families. Society as a whole should also make an effort to compromise and meet these individuals half-way; because when this type of compromise occurs, it has such a positive and powerful impact on individuals and their families. However, parents noted that finding these types of supports and understanding environments is often an arduous journey.

Fierce and prolonged advocacy from parents. Several parents shared stories of how they had to become the heads of various school committees or parent groups in order to try to get the services needed for their children. Considering the ages of the participants in this study, at the time these participants were in elementary school, the concept of inclusion was relatively new.

Many of the parents mentioned that they had to educate their respective schools in to how to go about providing effective supports for their children.

Though parents had many examples of their advocacy during the elementary school years, not many examples were provided in regards to advocating for vocational supports. One reason for this may be that, as stated earlier, not much is known about the effectiveness of particular vocational supports and programs. Thus, parents do not have the information available to know what supports for which they should be advocating. Another reason, as stated in Taylor and Mailick (2014), may be that as parents get older, they are less able to effectively advocate.

Greater independence in daily living activities. Parents also stressed the importance of their children increasing their independent living skills through a variety of ways. The three main means of achieving greater independence mentioned in the interviews were through participating in programs which specifically teach independent living skills, participating in programs like summer camps which indirectly teach independent living skills, and having previously attained employment. Through these three means parents endorsed that their sons and daughters learned accountability, responsibility, and self-confidence. Parents endorsed the idea that learning these skills is essential for their sons and daughters to support themselves, both mentally and financially. Taylor and Mailick (2014) indicate that achieving greater independent living skills is not only important for increased likelihood of positive employment outcomes, but also for general quality of life outcomes; particularly because independent living skills can be increased in adulthood, while other common indices of positive outcomes, better early language and lack of a comorbid intellectual disability (Eaves and Ho, 2008; Howlin et al., 2004), have not been found to be malleable in adulthood (Taylor & Mailick, 2014).

Previous positive work experience. Although most participants in each cohort were unemployed at the start of the program, the majority of parents reported that their sons or daughters had a positive employment experience at some point in their lives. Parents endorsed more non-task related positive aspects of previous employment experience than task related aspects, which may relate to most participants' previous work experience that involved largely mundane and repetitive tasks (e.g., bagging groceries, stocking shelves, etc.). The high number of previous positive work experience mentions and low employment rates in this sample further supports previous research which has shown when individuals with disabilities attain employment, they are not often able to maintain employment (Hendricks, 2010). Even though participants have positive experiences from jobs that they were ultimately unable to keep, these positive experiences appear to be motivating and reinforcing enough to them to continue on their journeys to find jobs.

Collaboration occurring between educational and vocational service systems. Only one parent mentioned an experience regarding collaboration between her son's educational and vocational service systems. As mentioned earlier, under the Individuals with Disabilities Education Act (IDEA; 2004), preparation for employment is the primary purpose of public education. Thus, collaboration between these two systems for students with disabilities should be much more common. Services assisting individuals with disabilities in their transition to leaving the public education system are greatly lacking, which is supported by the findings of the current study. This is an area in need of further research, considering that few studies have aimed to describe the most beneficial means of structuring a collaborative relationship between educational and vocational service systems (Chen et al., 2014).

Unprompted negativity. Parents' negativity and pessimism towards positively worded questions was striking at first. Even when questions were asked regarding their son or daughter's strengths, some parents would respond with statements indicating that it was easier for them to describe their weaknesses. This phenomenon has been well-documented in the fields of disability studies and special education (Carter et al., 2015). Given that disabilities are often assessed and characterized in terms of gaps in performance in comparison to typically developing peers, it is common for parents of children with disabilities to be more aware of their children's deficits than they are of their strengths (Carter et al., 2015). It may have been easier for parents in this study to talk about their son's or daughter's difficulties and weaknesses because it is what they are most familiar with, and used to talking about with professionals in the field of special education. The word "disability" is itself a negative word, and many prefer to use a more positive term, such as neurodiversity, to emphasize that people are all unique and different, as opposed to being more or less able than one another. It is essential for society as a whole to continue to emphasize the strengths of individuals with disabilities, especially in relation to employment. Additionally this negativity exhibited by parents may be the result of years of frustration from their *fierce and prolonged advocacy* for appropriate supports and services, given that these supports are often granted based on their child's deficits.

Most impactful types of supports according to parents. Various types of services and supports were named by parents as the most impactful for their sons or daughters. Of these types of services, Therapy and Educational were most often named, with Recreational services the third most named. While both therapy and educational services or interventions are well-studied within the field of disability, recreational services are not as rigorously researched. Results from the current study highlight the need to further research recreational services and community-

based programs, as parents and families seem to place almost as much significance on this area of support. Additionally, as evidenced by the parents' responses, the therapy and educational services were most often focused on ameliorating deficits and difficulties, while the recreational services were strength- or interest-based, and environments that were more centered around simply having fun. Further research into the impacts of recreation and community-based programs for individuals with disabilities, or ways to combine these three types of services into effective interventions is warranted.

Feedback regarding the apprenticeship based employment program. Parents' feedback regarding the program was fairly split. Most really appreciated the skills being taught and were complimentary of the instructors. The negative feedback centered on being unsure if these skills would generalize to their sons and daughters actually successfully attaining full-time employment. In part, the parents are right, based on the results of the program, that not all of the participants achieved employment through participation of the program. It may have been unrealistic for all participants to achieve employment through participation in the program, but, because this is a new program, and apprenticeship model employment programs have been minimally studied, future studies need to be conducted to more accurately determine what parents should be able to expect from similar programs.

Employment outcome as a result of the apprenticeship program. The second aim of the study intended to address this very point regarding what outcomes should be expected from the program, and factors that are associated with these outcomes. The main goal of the program was to help every participant successfully achieve employment. While this ended up not being the case at post-intervention for *all* participants, Vocational Index scores significantly increased from pre- to post-intervention: from an average of around 2 on the Vocational Index at pre-

intervention (volunteer activities) to an average of around 4 on the Vocational Index at post-intervention (working in a sheltered vocational setting greater than 10 hours per week). This score of a 4 corresponds to 6 of the 19 individuals in the apprenticeship program having increased from a score of 1, or participating in no vocational activities, at pre- to being placed in a 10 hour per week apprenticeship, in small businesses created by the apprenticeship program (e.g., working at the holiday shop where they sell seasonal items, or at the ice cream truck) upon completion of the program. In addition, 9 out of the 19 participants were able to increase their Vocational Index score, or level of employment, from pre-intervention to post, while only one participant from the comparison group increased his or her level of employment over the same time period. The comparison group started out with significantly higher levels of employment at pre-intervention than did the apprenticeship program group. Reasons for this difference at pre-intervention were not tested and are unknown. However, at post-intervention, though the apprenticeship program group still exhibit average Vocational Index scores lower than that of the comparison group, the two groups no longer significantly differed. Thus, preliminary results appear to indicate that the apprenticeship model program was able to increase the employment statuses of its participants in contrast to the comparison group. However, due to the limited sample sizes, inability to collect complete data from both cohorts, and the inability to collect the full battery of measures from the comparison group, further research is needed.

Pre- and post-intervention factors associated with apprenticeship program outcome. The second goal of the apprenticeship model employment program is to increase employability by focusing on improving vocational-related skills such as emotion regulation, problem solving, self-advocacy, and self-confidence. Results from parent-report questionnaires addressing 2 of these 4 skills revealed significant results. First, parents of participants in the 2nd cohort reported

an increase in participants' vocational confidence (as measured by the MVS). Increased parent-report scores on the MVS at pre-intervention also significantly correlated with employment scores at pre-intervention, though not at post-intervention. The MVS measure is the most central measure to what is taught in the apprenticeship program as it assesses participants' feeling confident about their vocational skills and what they would like to do for a career. Merz and Szymanski (1997) support the sensitivity of the MVS to be used as a pre-test, post-test measure, as they used it on a study of adults with multiple disabilities and found participants' scores to increase as a result of a vocational rehabilitation workshop.

Secondly, parents of participants in the 2nd cohort reported significant decreases from pre- to post-intervention in negative problem orientation, as measured by the Problem Solving Test, which indicates the tendency to think about problems in ways that are inaccurate while also experiencing difficulty managing emotions under stress (Nezu, Nezu, & D'Zurilla, 2012). The ability to regulate negative emotion by focusing on participants abilities to better identify their emotions was another daily focus of the apprenticeship model program. However this change in emotion regulation abilities was not found using the Emotion Regulation Checklist. It is possible that this measure is, even after adaptation from its use as a parent-report measure of children, not applicable to or sensitive to change in adults.

It is unknown whether similar results would have been found from Cohort 1 due to the inability to collect pre-intervention data on any of the measures. However, parent-reported feedback from the interviews revealed that, at least anecdotally, parents noticed changes in their sons and daughters in the areas of emotion regulation and self-confidence.

Other factors associated with employment program outcome. The Social Supports scale of the SIS negatively correlated with employment status at both pre- and post-intervention

indicating that participants in need of more social supports (e.g., help maintaining friendships, socializing with others, etc.) are significantly less likely to be employed at either time point. Research supports this finding in that individuals with developmental disabilities lose their jobs due to social difficulties more often than they do based on inability to perform tasks related to the job (Dew & Alan, 2007; Homles, 2007; Hurlbutt & Chalmers, 2004; Westbrook et al., 2012).

Cognitive ability, as measured by the WASI-II, did not prove to be a significant factor associated with apprenticeship program outcome. This is supported by previous research which indicates that individuals with ASD and increased cognitive abilities exhibit similar, sometimes even greater, rates of unemployment as individuals with intellectual disabilities (Howlin, 2013).

Binary logistic regression analyses yielding insignificant results, in addition to few factors significantly correlating with employment outcomes. These results are most likely due to the apprenticeship employment program providing employment for some of the participants at post-intervention based on participant interest and not on any of the skills gained through the program. For example, a participant who may have exhibited low MVS scores, indicating low vocational confidence, was just as likely to be employed in the apprenticeship program small businesses as an individual who exhibited high scores. Still, scores should have changed from pre- to post-intervention, which indicates again that either the limited sample size and lack of complete data from Cohort 1 was to blame or some of the measures may not been accurate measures of what the participants were actually learning in the program.

Secret Shopper measure sensitivity. The Secret Shopper measures were an exploratory attempt to generalize what the participants were learning in the program to more real-life vocational scenarios. All Secret Shopper measure scores improved from pre- to post-intervention though only the Observational Assessment significantly increased. Out of the three measures, the

observational assessment was the most objective, involving checking off boxes for what the participants did or did not do. The other two measures were more subjective given that they were measures of quality (e.g., overall ability to help secret shopper, overall rating of experience, etc.) which may have contributed to the non-significant findings from pre- to post-intervention. Results indicate that the observational assessment portion of the Secret Shopper measure is sensitive to change, though future replications should be conducted with complete data from each time point and a larger sample size. In addition, to see more generalizable results, different types of Secret Shopper settings should be used (i.e., not the same Flower Shop every time) and multiple Secret Shoppers should be used, some who are difficult customers and some who are not, which would make the assessment more realistic. If possible, it would be best to conduct these assessments at participants' actual jobs, though it may be difficult to adapt the protocol to different types of jobs. Still, the Secret Shopper measure is currently the only observational assessment in existence that is tailored specifically to individuals with developmental disabilities; further research is warranted.

In sum, the apprenticeship model appears to be more effective than the comparison model in increasing employment statuses of individuals with developmental disabilities, as it provides individuals desperately in need of vocational experience with hands-on practice in an understanding environment which allows for potential mistakes. However, these results are exceptionally preliminary, and the apprenticeship model employment program in the current study is brand new and learning right alongside its apprentices, the program participants. It is essential to continue this line of research into this promising vocational model as more and more individuals with developmental disabilities are coming of working age.

Limitations

As mentioned above, small sample sizes and missing data were critical limitations to the current study and results should be interpreted with caution. In addition, even though the measure is mostly objective, the rater for the observational assessment of the secret shopper should be blind to the experimental condition, and multiple raters should be utilized. In the current study, this was not the case, as the observational assessor was the primary investigator. Future studies should incorporate a waitlist-controlled comparison sample to properly account for the limitations of the current study.

Future Directions

Overall, the current patterns of low employment are insufficient for adults with developmental disabilities to be able to live independently, leaving these adults' families to bear the burden for continued financial support (Roux et al., 2013). Given the increasing number of individuals with developmental disabilities reaching adulthood and seeking supports (Burgess & Cimera, 2014), and that these individuals are among the most costly of disability groups served (Cimera & Cowan, 2009; Lawer et al., 2009), it is of the utmost importance to further research and ameliorate the bleak employment outcomes of this population.

Many adults, with disabilities or without, define themselves through their work or careers (Eggleton et al., 1999) and research shows that employment is associated with higher quality of life (Kober & Eggleton, 2005). Work provides a sense of accomplishment and self-efficacy which can lead to improved self-concept (Wysocki & Neulicht, 1998), and serves as a source for socialization and friends (Evans & Repper, 2000). Aside from the personal well-being gains of achieving employment, increased employment also provides financial advantages (Hendricks, 2010), with more contribution to taxes and less reliance on government funding (Howlin et al., 2005; Jarbrink et al., 2007). Additionally, due to the utilization of resources, employment has

significant cost impacts on the economy (Hendricks, 2010) in that the cost of community programs would decrease because day programs would not be as relied upon (Jarbrink et al., 2007). Receiving health benefits through employment would also cover the expensive costs of medication and psychiatric services this population often needs (Hendricks, 2010).

Information gained from the current study provides this population, in desperate need of better supports, with preliminary information regarding the apprenticeship model of employment and its effectiveness for the greatly underserved population of adults with developmental disabilities.

Tables

Table 1. Demographics of Participants in the Apprenticeship Model Group and the Comparison Group

	Apprenticeship Model Group	Comparison Group
N	22	11
Gender	32% Female	45% Female
Average Age	25.6 Years Old	28.6 Years Old
Ethnicity	82% Caucasian	82% Caucasian
Employed at Pre-intervention	18%	45%

Note: Participants were considered to be “Employed” if they received at least a “3” on the Vocational Index. A score of “3” indicates “Sheltered vocational setting—total activities 10 hrs/week or less.”

Table 2. Vocational Index, from most to least independent

From Taylor & Seltzer, 2012

		Score Category
Most independent	9	Employment in the community <i>without</i> supports greater than 10 h a week
	9	Postsecondary, <i>degree-seeking</i> educational program greater than 10 h a week
	8	Postsecondary, <i>degree-seeking</i> educational program or employment in the community <i>without</i> supports—total activities 10 h a week or less
	7	Employed in the community <i>with</i> supports greater than 10 h a week. No time spent in sheltered settings.
	6	Employed in the community <i>with</i> supports (no time spent in sheltered settings)—total activities 10 h a week or less
	5	Sheltered vocational setting and supported community employment—total activities greater than 10 h a week
	4	Sheltered vocational setting and volunteering in the community—total activities greater than 10 h a week
	4	Sheltered vocational setting (workshop or day activity center) with no community employment/volunteering—greater than 10 h a week.
	3	Sheltered vocational setting—total activities 10 h a week or less
	2	Volunteering with no other activities or postsecondary <i>non-degree seeking</i> education with no other activities
Least independent	1	No vocational/educational activities

Table 3. Qualitative Analysis Minor Theme Codes and Examples

Interview Topic	Minor Theme Code	Number of Mentions	Example
Positive Employment Experience	Task related	14	“Loves shredding paper”
	Non task related	18	“Got to meet a lot of new people”
Dream Job	Realistic	8	“Working in an office building”
	Unrealistic	8	“Being a rock star”
Realistic Job	Positive	16	“She’s really good with kids”
	Don’t Know/Negative	8	“I honestly have no idea”
Strengths	Positive	20	“Has a fabulous memory”
	Negative	8	“Reading and writing were his biggest weaknesses”
Interests	Positive	27	“Loves to dance”
	Negative	2	“Never been good at any sports”
Advocacy	Hard	8	“Fighting and screaming and lawyers”
	Lucky	1	“We were really lucky”
Feedback	Positive	7	“She said the instruction was really good”
	Negative	6	“The whole purpose of the program was to get him a job, and it hasn’t happened”

Table 4. Most Impactful Support Types According to Parents

Therapy	15
Educational	14
Medical	2
Recreational	7
Vocational	1
Religious Affiliation	1
“Not Many”	3
Family	1
General Strategy	1

Note: Forty-five total answers were given and then coded into the following 9 categories.

Table 5. Vocational Index Descriptive Statistics

	Pre-intervention Mean (SD) <i>N</i>	Post-intervention Mean (SD) <i>n</i>
Apprenticeship Program	2.4 (2.7) ^A <i>n=22</i>	3.9 (3.1) ^B <i>n=19</i>
Comparison Group	4.8 (3.5) ^B <i>n=11</i>	4.9 (3.6) ^B <i>n=11</i>

Note: Superscripts with different letters significantly differ from one another at $p < .05$

Table 6. Descriptive Statistics for My Vocational Situation Self-Report

	Means (Standard Deviations)					
	Mid (Cohort 1)	Post (Cohort 1)	Cohort 1 Change (Mid-Post)	Pre (Cohort 2)	Post (Cohort 2)	Cohort 2 Change (Pre-Post)
My Vocational Situation (Self)	6.9 (3.9) <i>n</i> =9	6.1 (5.2) <i>n</i> =9	-0.7 (2.2) <i>n</i> =9	6.4 (5.1) <i>n</i> =9	6.7 (4.1) <i>n</i> =9	0.3 (3.7) <i>n</i> =9

Note: Only participants included are those who completed measures at both time points; required for Paired Samples T-tests.

*Significant difference between time points at $p < .05$.

Table 7. Weschler Abbreviated Scale of Intelligence-II (n=14)

	Minimum	Maximum	Mean	SD
Vocabulary	20	80	39.8	15
Matrix Reasoning	20	57	30.9	12.6
Full-Scale IQ	45	129	75.2	22.3

Table 8. Descriptive Statistics for Within-Group Parent-report Measures Administered at Multiple Time Points

Parent-report Measures	Means (Standard Deviations)					
	Mid (Cohort 1)	Post (Cohort 1)	Cohort 1 Change (Mid-Post)	Pre (Cohort 2)	Post (Cohort 2)	Cohort 2 Change (Pre-Post)
Emotion Regulation Checklist	77.0 (9.2) <i>n=10</i>	78.5 (10.0) <i>n=10</i>	1.5 (2.6) <i>n=10</i>	77.7 (4.5) <i>n=6</i>	76.0 (10.1) <i>n=6</i>	-1.7 (6.5) <i>n=6</i>
My Vocational Situation	4.6 (5.7) <i>n=10</i>	6.7 (5.9) <i>n=10</i>	2.1 (3.9) <i>n=10</i>	3.5 (4.4)* <i>n=6</i>	5.2 (5.5)* <i>n=6</i>	1.7 (1.6)* <i>n=6</i>
Problem-Solving Test	73.9 (11.0) <i>n=10</i>	75.2 (6.1) <i>n=10</i>	1.3 (9.3) <i>n=10</i>	59.3 (11.4) <i>n=6</i>	62.5 (19.3) <i>n=6</i>	3.2 (11.4) <i>n=6</i>
Negative Problem Orientation (Problem-Solving Test Subscale)	15.1 (3.5) <i>n=10</i>	15.1 (2.4) <i>n=10</i>	0 (2.7) <i>n=10</i>	21 (4.2)* <i>n=6</i>	18 (4.4)* <i>n=6</i>	3 (1.7)* <i>n=6</i>

Note: Only participants included are those who completed measures at both time points; required for Paired Samples T-tests.

*Significant difference between time points at $p < .05$.

Table 9. Descriptive Statistics for Supports Intensity Scale and Subscales
(n=14)

SIS	Mean	Standard Deviation
Home Living	12.6	9.0
Community Living	8.8	4.8
Lifelong Learning	17.1	7.4
Employment Supports	14.3	14.7
Health and Safety	12.3	8.3
Social Support	10.4	8.3
Support Needs Index (Total Score)	64.6	3.3

Table 10. Measures Correlating with Employment Outcomes

Measures	Correlations	
	Employed at Pre-intervention	Employed at Post-intervention
Age	.41*	--
My Vocational Situation Pre-Intervention (Parent)	.73*	--
Social Support Needs (Subscale of SIS)	-.64*	-.67*

Note: The “Age” variable includes participants from both the apprenticeship program and the comparison program. MVS and SIS measures include only participants from the apprenticeship program.

*Significant at $p < .05$

--Non-significant correlation

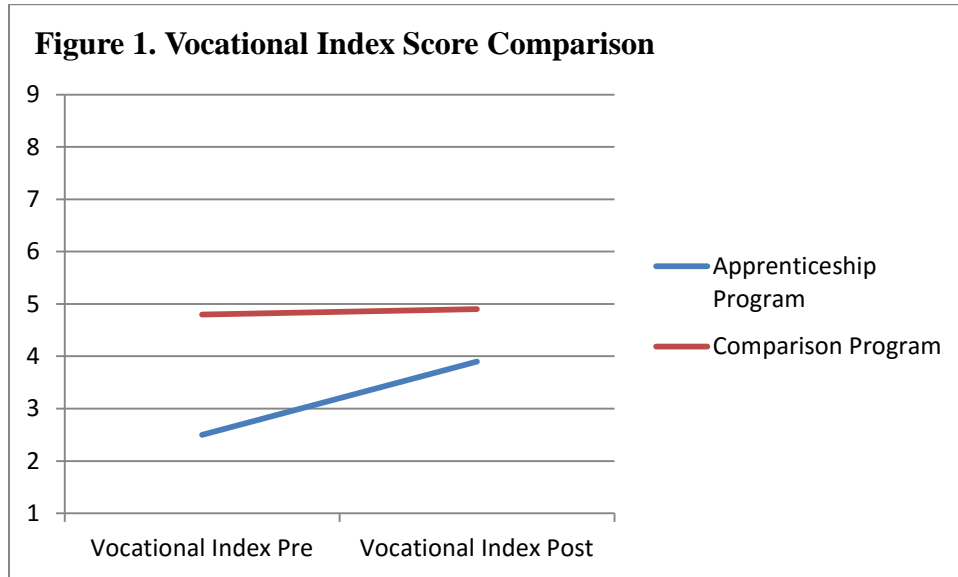
Table 11. Secret Shopper Descriptive Statistics

Means (Standard Deviations)		
Secret Shopper Measures (All Participants)	Pre-intervention n=9	Post-intervention n=18
Self-report	20.4 (5.2)	25.2 (4.6)
Secret Shopper report	25.9 (6.6)	32.1 (8.2)
Observational Assessment	22.0 (1.9)	24.7 (3.4)
Second Cohort Only	n=8	n=8
Self-report	20.4 (5.6)	22.6 (5.2)
Secret Shopper report	20.1 (4.7)	24.5 (7.0)
Observational Assessment	22.0 (1.92)**	25.7 (1.75)**

Note: Only the data for participants in the second cohort were analyzed for significance because their data were collected at both pre- and post-intervention time points.

**Significant at $p < .01$

Figures



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