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# An Examination Of The Services That Contribute To Positive Vocational Outcomes In Adults With Developmental Disabilities

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# AN EXAMINATION OF THE SERVICES THAT CONTRIBUTE TO POSITIVE VOCATIONAL OUTCOMES IN ADULTS WITH DEVELOPMENTAL DISABILITIES

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AN EXAMINATION OF THE SERVICES
THAT CONTRIBUTE TO POSITIVE VOCATIONAL OUTCOMES
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DEVELOPMENTAL PSYCHOLOGY

## ABSTRACT

One of the most pressing issues concerning persons with developmental disabilities is making sure their needs are met once they reach adulthood. As adults, they should have the abilities and skills to be as independent as possible and to be contributing members of society. Without the proper services and help, though, this may not be possible for a large portion of this population. Research suggests that supportive employment services alone may not be enough to meet their unique vocational needs and to improve the likelihood of their achieving personal and financial independence. The purpose of this study was to determine whether receiving appropriate complementary services would improve vocational outcomes and whether that relationship was mediated by indicators of well-being. Adults with a developmental disability who received job coaching ($N$ = 47) were recruited to participate in this study. Records were reviewed to determine their service and employment history. Participants were administered questionnaires assessing quality of life, adaptive behavior, self-esteem, and self-efficacy. Results suggest that receiving more services is associated with obtaining and maintaining employment. Some services, such as social outings and gendered group therapy, were more related to successful vocational outcomes than others, but well-being did not mediate these relationships.

*Keywords*: developmental disabilities, social services, well-being, vocational outcomes

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TABLE OF CONTENTS

*Page*

LIST OF TABLES

LIST OF FIGURES

# CHAPTER 1

## INTRODUCTION

Developmental Disabilities (DD) refer to a broad range of conditions that significantly impact development from birth or early childhood and continue to influence the lives of the individuals affected by these conditions throughout their lifespan (APA Division 54, 2014). Abilities such as self-care, learning, thinking, understanding, working, and communicating are often impaired for those affected. Examples of DDs include behavior disorders such as attention deficit/hyperactivity disorder, neurodevelopmental disorders such as autism spectrum disorders (ASD), motor disorders such as cerebral palsy, and broader disorders such as learning disorders or intellectual disability. With the continued success of widespread early diagnosis and intervention efforts (Jordan & Jones, 1999), more and more of the children affected by DDs will be able to live fully or partially independent adult lives. However, most will still require further assistance to achieve their full potential as adults. Great advances have been made in the treatment and intervention for these children, but there continues to be a lack of empirical research demonstrating what interventions are necessary and effective for adults with a DD to transition to independent or semi-independent living. The current study was an exploratory examination into some of the current interventions and services provided to this population.

As noted above, many adults with a DD continue to struggle with communication and social problems, daily living skills, work skills, and comorbid diagnoses (APA Division 54, 2014). They will need services that support their needs in each of these areas. Limited services are offered and many families and individuals rely heavily on federally-funded support programs (Parish, Rose, & Swaine, 2010). Also, funding for these programs is limited and not all services or clients are eligible for reimbursement. While most parents fully expect to care for their children's needs during childhood, few are financially prepared to continue this once the child reaches adulthood (Parish et al., 2010). This does not bode well for the individual, family, or our society, as adulthood lasts much longer than childhood and the funding necessary to support someone throughout adulthood can be substantial. Research on the services and needs of adults with a DD is important not only for the individuals diagnosed with these disorders, but also for their families and the society that surrounds and supports them. This study examined how the amount, duration, and type of services for adults with a DD are related to their vocational success.

## Transition to Adulthood

The families of individuals with a DD have the same goals for the adult lives of their children as families with typically developing children. Research shows that parents of children with DDs rate normative adult outcomes, such as living independently, working, and having a family, as important outcomes for their children (Poon, Koh, & Magiati, 2013). However, these same parents also rated these important outcomes as highly unlikely to occur. Specifically, some of the greatest differences between

importance and likelihood ratings were for items concerning independent living, a secure financial future, and community acceptance. Further complicating the picture, Howlin (2000) reviewed the needs of adolescents and adults with autism, one of the more prevalent DDs, and confirmed that too few specialist programs exist for adults. Results from such studies suggest that most individuals will depend heavily on their family for the support they need in adulthood.

One of the more important tasks set before any adult wishing to become independent is finding and maintaining gainful employment. Unfortunately, people with DDs have had significant difficulty with this (Schaller & Yang, 2005). Job coaching, supportive employment services, and vocational rehabilitation services have proven helpful in this endeavor (Test, Carver, Ewers, Haddad, & Person, 2000).

Throughout this paper, job coaching will refer to employment training and assistance that is provided by private specialists and vocational rehabilitation services will be reserved for federally or state-funded programs that provide employment services (McDonough & Revell, 2010; Rusch & Braddock, 2004). Supportive employment services will be used as a broader term to encompass both job coaching and vocational rehabilitation. Typically, these programs work with the client to find suitable employment based on their social, behavioral, and adaptive skills and their preferences and interests. Supportive employment specialists will train the employee on how to perform the required tasks and how to navigate the work environment. These professionals also inform employers and coworkers on how to avoid problems and how to deal with them if they arise. After a few months, some programs will implement a long-term support system and periodically check on both the employer and employee.

Unfortunately, there are many limitations to these approaches and to the extent of their success. First, only vocational rehabilitation services (and occasionally job coaching services) are federally funded for adults with DDs, and they are usually only provided on a temporary basis (Gerhardt & Lainer, 2011). Second, research suggests that the job coach's presence at the worksite may reduce the client's interaction with coworkers (Chadsey, Linnerman, Rusch, & Cimera, 1997). Consequently, involvement of the job coach in the natural work environment needs to be minimal and should encourage appropriate interpersonal interactions with coworkers. Finally, even when employment is attained, hours and pay are usually minimal and below what the individuals would prefer (Domin & Butterworth, 2013; Fresher-Samways, Roush, Choi, Desroiers, & Steel, 2003; Yamaki & Fujiura, 2002). Thus, there is much room for improvement within the employment assistance systems as they currently exist.

Although adults with DDs may qualify to receive financial assistance for some employment services, and insurance may cover all or part of the cost of counseling therapy, any other services they might need would have to be paid for by the individual. It is currently unclear whether employment services are meeting the full gamut of vocational needs for these individuals (Fresher-Samways et al., 2003). Other necessary skills for employment success potentially include interpersonal skills, problem solving skills, daily life skills, adaptive behavior skills, and numerous others. Understandably, difficulty with navigating public transportation systems or with rearranging daily tasks to accommodate the employer's priorities that day would complicate one's ability to obtain or maintain employment. An assessment of one's strengths when preparing for the workforce, and any resulting interventions, must therefore include abilities and skills not

directly related to the ability to perform the job tasks alone. Unfortunately, these competencies are not often considered in the skills assessment process and thus are not addressed when providing employment services. Therefore, additional services may be needed, over and above supportive employment services, for individuals to reach their full vocational potential.

## Vocational Outcomes and Services

Overall, poor vocational outcomes for adults with a DD are common. The results of one study examining the employment status of adults with DD indicated that only 27.6% of adults with DDs had a job in any given month, a significantly lower proportion than in the general population (75.1%; Yamaki & Fujiura, 2002). More recently, and utilizing a sample of 879 individuals, it was found that less than 32% found work in the 18 months after filing a disability claim (Holwerda, van der Klink, de Boer, Groothoff, & Brouwer, 2013). Of those who found employment, only 70 individuals maintained employment for six months or greater – only 8% of the original sample. Similarly, Simonsen and Neubert (2012) found that only 14% of youth transitioning from high school with a DD were earning at least minimum wage in competitive employment. These numbers are discouragingly low. However, since these studies were conducted on samples from the general population – it is unknown how many individuals, if any, were utilizing supportive employment services.

Vocational rehabilitation or job coaching services can be effective in assisting individuals to obtain and maintain employment. One study reviewed the employment status of all clients served by the South Carolina Department of Disabilities and Special

Needs (*N* =57,979). Fifty-six percent of individuals that had job coaches were employed within the following year (McInnes, Ozturk, McDermott, & Mann, 2010). However, only 9% who did not utilize job coaching services were employed in the same time frame, comparable to the studies described above. Even though this is only one study of short-term success, these results are encouraging for the promise of success of supportive employment services.

Long-term success seems a distinct probability from supported employment programs as well. One longitudinal study across a six year span demonstrated that participants in supportive employment had high satisfaction across many areas (Test et al., 2000). They were satisfied with their work, the friendships made, the money earned, and the supports provided by the job coach, both on the job and away from the job. Additionally, another study showed that after implementing a supported employment program, adults who had never had previous work or who had interpersonal or behavioral difficulties were able to obtain and maintain employment (Mawhood & Howlin, 1999). Eight years later, this program was still continuing to show success (Howlin, Alcock, & Burkin, 2005). Satisfaction continued to be high among employers, employees, and staff and the job finding rate was as high as 70% for some locations of the program. While the costs of the program were high initially, the cost per job, per person decreased over time. Additionally, participants in the program experienced increased salaries and were less dependent on disability funding. This program mainly targeted high-functioning individuals with an ASD, but the authors noted there was initial evidence for success with those who had lower-functioning abilities.

Besides the critical vocational outcomes of obtaining and maintaining employment, supportive employment services have proven beneficial in other ways as well. Supported employment increases general cognitive performance compared to non-supported employment with a moderate effect size (Garcia-Villamisar & Hughes, 2007). It seems likely that a supported employment program may also teach problem-solving skills that may generalize to other areas of life. Additionally, it was discovered that self-esteem was increased for persons in supported employment programs compared to persons participating in workshops (Griffin, Rosenberg, Cheyney, & Greenberg, 1996). The skills taught in these programs likely increase one's self-esteem through increased self-efficacy and the knowledge that one is capable of being a productive member of society.

As employees benefit from supported employment programs, so too do employers of persons with a DD. The majority of employers who had hired and worked alongside persons with a DD indicated that employing such individuals was often a positive experience for their business (Morgan & Alexander, 2005). Further, employers with past experience employing persons with a DD were more likely to hire persons with DD in the future. They also identified advantages (e.g., consistent attendance) more frequently than employers without experience.

In summary, poor vocational outcomes are common for persons with a DD. But employment services do offer hope. Based on interviews with adults with DDs, it was found that a lack of employment and concern for economic independence were the top two problem areas for this population (Fresher-Samways et al., 2003). Many reported feeling dissatisfied with their work – wishing for full-time or permanent work, increased

pay, and greater appreciation. However, they also reported being proud to have employment and satisfaction with their accomplishments. This study shows that this population wants to work, to earn their own wages, and to be independent and contributing members of society.

## Important Considerations for Vocational Outcomes

Supportive employment services clearly improve the vocational opportunities for persons with a DD. However, obtaining employment is not the only outcome that is important. Maintaining employment, expanding the number of hours worked, and increasing salaries must also be examined and improved upon. Holistic approaches that utilize person-centered life planning, such as "wrap-around" services, are critical to attaining and maintaining successful full-time employment and independence (Domin & Butterworth, 2013). The remainder of this section will identify other areas of need for adults with DDs and how services addressing those areas could prove beneficial for vocational outcomes.

### Social Skills

Persons with DDs frequently have significant difficulty with communication and social interaction (APA Division 54, 2014). They tend to show great deficits in adaptive and positive social skills and social relatedness (Njardvik, Matson, & Cherry, 1999). This likely explains why social relationships of adults with DDs are lacking in depth, number, and intimacy (Fresher-Samways et al., 2003). These social issues can impact vocational outcomes. In one study examining barriers to employment for persons with DDs,

common reasons for involuntary termination included too much socialization with others and relationship difficulties with supervisors or coworkers (Lemaire & Mallik, 2008). Historically, it seems as though more job losses occur due to social skills deficits and social behavior problems for persons with an intellectual disability than for any other reason (Walker & Calkins, 1986). Obviously, social and communicative deficits can negatively affect work relationships and even the ability to maintain the employment position.

Indeed, supportive employment services alone were insufficient in promoting the social skills necessary for employment in a study investigating well-being and supported employment in three women with DDs (Siporin & Lysack, 2004). Explicit social skills training was suggested to improve the communication, anger management, punctuality, and other problem social behavior issues exhibited by study participants. In fact, the impact of job coaches in the work setting may decrease the social interactions between the program participant and coworkers (Chadsey et al., 1997). As the focus of the job coach is on the skills and abilities necessary to fulfill the position, social skills training, communication training, or sessions with a speech-language pathologist to facilitate communication abilities of the client in the workplace have all been suggested to assist in their work relationships (Chadsey et al., 1997; D'Agostino & Cascella, 2008). Although limited research is available, one can conclude that social skills are necessary to successfully navigate any work environment and that assistance beyond supportive employment programs may be necessary for improving vocational outcomes. The sparse amount of literature that does exist supports this notion.

**Adaptive Behavior and Daily Living Skills**

General adaptive behavior and daily living skills are another common problem area for adults with a DD. Recent studies have supported the assumption that mastery of daily living skills had not been achieved for most adults with an ASD, but abilities peaked by the late 20s and began to decline by early 30s (Smith, Maenner, & Seltzer, 2012). This makes living independently very difficult for these individuals. In fact, most studies report more than 50% of adults with a DD are living with their family, and less than 25% are living independently (Eaves & Ho, 2008; Farley et al., 2009). In these studies, adaptive behavior was most closely indicative of overall adult outcome. This shows that living independently is unlikely for these individuals and adaptive behavior may be a key component to this achievement. Fortunately, new skills (e.g., problem-solving skills) can be learned at any age, these newly learned skills can positively affect development, generalizations to other contexts can occur with proper instruction, and these positive results can last beyond the learning/ teaching phase (Farmer-Dougan, 1994; Gaus, 2007), making living independently a reachable goal for many adults with a DD.

In regards to how daily living skills and adaptive behavior may affect vocational outcomes, living independently is found to be positively related to finding employment (Holwerda et al., 2013). Additionally, good adaptive skills, fewer behavioral problems, good social skills were correlated with an increased probability that an individual with intellectual disability would find paid work (Huang & Blum, 2010). Further evidence that adaptive behavior may influence the services received-vocational outcomes relationship is provided by a study showing that higher functional ability is related to more integration, more independence, and more productivity (Wilhite & Keller, 1996). Those

with higher functional ability made greater use of their community and participated in the community events and activities more often. They had more control over their own life choices. They also made more money, lived in non-institutionalized settings, and were their own primary caregiver. Taken together, these studies suggest that, employment success is related to personal independence. It also does not seem that this is purely a function of financial independence either, but rather that the ability to live independently is predictive to vocational outcomes. Functional ability, independence, productivity, and integration can all be addressed by wrap-around services.

**Psychological Needs**

Another area that is not often considered in relation to vocational outcomes is the psychological needs of persons with a DD. Persons with DDs employed in competitive employment had increased feelings of empowerment and independence versus persons employed in sheltered employment settings (Kober & Eggleton, 2005) and had higher self-esteem than those who were unemployed (Jiranek & Kirby, 1990). Further, persons with DDs who expected to find full time employment were more likely to find work (full-time or part-time) than those who did not have such high expectations (Holwerda et al., 2013). It may be that the expectations were realistic, or maybe the expectations became the motivation to finding employment. While 48% of men with a DD had high self-esteem, only 32% of the women had self-esteem in the same category. Although not explored further, the authors proposed that the relationship could be explained by the additional finding of more women (44%) not expecting to find employment than men

(34%). Self-efficacy and self-esteem are related to vocational outcomes and could be improved with therapeutic counseling.

Examining comorbidity of DDs, it was discovered that 50% of the sample in one study had met diagnostic criteria for more than one diagnosis (Kaplan, Dewey, Crawford, & Wilson, 2001). These authors argued that "comorbidity" should not be a term used to describe multiple DD diagnoses as this is generally the rule and not the exception – perhaps suggesting common etiologies. Psychiatric problems are also common for adults with DDs. Farley and colleagues (2009) found that 59% of their participants with an ASD had at least one comorbid psychiatric diagnosis (e.g., anxiety disorders, schizophrenia, bipolar disorder). This was true even though their sample had average or near-average cognitive abilities, which would presumably provide for better coping skills. These numbers are much higher than in the general population. Further, these problems and disorders may present differently in adults with DDs than in the typical population, as symptoms and developmental level may influence each other, and may require specialized care (Antonacci & Attiah, 2008). Due to communication deficits, treatment can prove difficult, with multiple diagnoses further complicating the picture for independence and employment. Receiving the additional service of therapeutic counseling would provide the individual the assistance they need to cope with and overcome their unique challenges, thereby increasing their chances for independence and vocational success.

Also concerning the psychological needs of individuals with a DD, another study examined four groups of adults: (1) adults with intellectual disability only, (2) adults with intellectual disability and an ASD, (3) adults with intellectual disability, ASD, and

comorbid psychopathology, and (4) a group of adults with intellectual disability and comorbid psychopathology (Matson, Rivet, Fodstad, Dempsey, & Boisjoli, 2009). Their results indicated that comorbid psychopathology (e.g., bipolar disorder, depression, etc.) was the predominant factor affecting adaptive behavior. Further, the authors concluded that psychopathology was severely inhibiting participants' potential for independence. Without help to address these persistent and invasive psychological issues, any success in a work setting would likely be short-lived.

**Quality of Life**

All of the factors discussed thus far have one thing in common: they all impact one's quality of life (QOL). Social support from family and friends, good coping skills for life's tough obstacles and even the day-to-day struggles, positive thinking towards one's self, and good self-care skills are all important to have a high QOL (WHOQOL group, 1998) . Thus, this general and over-arching concept may additionally impact vocational outcomes. Supportive evidence for this idea comes from studies suggesting that competitive employment is associated with a higher QOL (Kober & Eggleton, 2005). People with an intellectual disability reported a higher QOL when in competitive employment positions compared to persons employed in sheltered employment settings. Further, those in competitive positions integrated themselves more within their community and expressed a greater feeling of social belonging. Wilhite and Keller (1996) found that being employed was also predictive of higher community integration and higher productivity in terms of both paid work and work done within the home. Higher pay was predictive of both types of productivity and also one's independence in terms of

making one's own decisions and depending upon one's self for care and daily tasks. Based on these studies, one can conclude that having a steady (and especially a gainful) income would increase the opportunities for community participation, thereby increasing one's QOL.

Each of these concepts will be examined for their association to vocational outcomes. As such, adaptive behavior, self-esteem, self-efficacy, and QOL should be positively impacted by the receipt of these complementary, wrap-around services. Job coaching is helpful in finding adults with DDs employment. However, because of their likely impact on such important outside factors as these, additional services may prove helpful in allowing the individuals to obtain or maintain that employment, earn higher salaries, or work more hours per week. Variables, and their effects, do not occur in seclusion. It is likely that receiving a service aimed towards one goal would have overlapping effects into another area of one's life.

## Triumph Services, Inc.

Some private service providers, such as Triumph Services, Inc. of Birmingham, AL, offer the training and intervention necessary to address needs in each of these important areas. Specifically, in addition to job coaching, Triumph Services, Inc. offers life coaching, group social activities, individual social support, gendered group meetings, and counseling. Upon applying to receive services from Triumph Services, Inc., individuals complete assessments that determine each person's interests, needs, strengths, and weaknesses. Based on these assessments, the staff and the individual determine

which services would be most helpful for the client[1]. The remainder of this section will describe each service in detail.

At Triumph Services, Inc., job coaching is a four-part process. This begins with a detailed assessment of strengths and weaknesses as well as preferences for work and any accommodations that might be needed. Then, Triumph Services, Inc. staff assist the client in developing a resume and a work schedule and completing applications for employment positions. Once employed, job coaching begins immediately to assist the individual with the tasks and skills necessary for the job. Finally, once established at the workplace, the job coach begins the long-term support process of periodically checking on the employee and employer. Job coaching services range in price from $1200 to $2100, depending upon the phase of job coaching services being received at that time. The cost of this particular service is covered by vocational rehabilitation reimbursement services, but only for those who qualify. Individuals who do not qualify for this federal funding must pay for this service themselves.

Life coaching, as offered by Triumph Services, Inc., includes a specialist who works with an adult with a DD on developing and maintaining domestic independence by fostering adaptive behavior skills (e.g., how to balance a checkbook, how to plan meals and grocery lists). This service ranges from $85 for one hour to $125 for two hours of in-home life coaching. Group social activities are unstructured outings to local restaurants or entertainment centers (e.g., bowling alleys, movie theaters) that are planned based on the clients' preferences. Clients get to eat their preferred food or enjoy their preferred

[1] It should be noted that Triumph Services, Inc. refers to their clients as participants to convey the adults' independent and contributing role in their own services. For the sake of clarity between all adults served at Triumph Services, Inc. and the participants in this study, client was substituted for participants where necessary.

activities while practicing public interaction and social skills in real settings. Participating in the group social activities costs $100 per month, plus the cost of each activity.

Individual social supports are based on each individual's needs, desires, and interests and are aimed at introducing people with like interests to help foster friendships. During the first meeting, a social coordinator will meet with two individuals with similar interests. Any further meetings must be coordinated between the individuals, if they so desire. This service is priced at $60 per hour. The gendered group therapy sessions are led by licensed therapists, meet monthly, and focus on topics of interest to the group (e.g., dating, family relationships, understanding sarcasm, etc.). The fee for group sessions is $45 per month. Finally, counseling at Triumph Services, Inc. is conducted by a licensed professional counselor who is experienced in working with people with DDs. For individual therapy, the cost is $90 per hour and the cost for couple's therapy is $100 per hour. Therapy commonly targets self-esteem, problem-solving skills, and self-efficacy for improvement.

Triumph Services, Inc. offers their services to any adult with a qualifying DD who is striving towards a goal of independence. They are a not-for-profit organization, and are financed through contributions and the cost of services. Unfortunately, many individuals are not able to take advantage of all the services they might need as they must personally pay for them at full cost. Scholarships are available for those who qualify, but only if the funding is available.

## Aims and Hypotheses

The purpose of this research is to determine what and how many services and abilities or areas of strength are related to better vocational outcomes for adults with DD and whether well-being variables affect this relationship. Specifically, we examined whether receiving individual therapy, social activities, life skills training, women's/men's therapy groups, or individual social support from Triumph Services, Inc. improved the likelihood that someone obtained or maintained employment, worked more hours, or earned higher pay, and whether concepts such as QOL, adaptive behavior, self-esteem, or self-efficacy mediated these relationships. By examining services that contribute to positive vocational outcomes, we will be better able to determine what skills are essential for successful careers in the workforce.

Aim 1: First, we examined the relationship between additional services received and vocational outcomes. Hypothesis 1: It was expected that participation in each service type (individual therapy, social activities, life skills training, women's/men's therapy groups, and individual social support) would positively relate to employment status, length of time employed, hours worked per week, and hourly salary. Each of these interventions teaches or improves skills that would be useful or helpful in workplace settings. For example, social skills training on how to know when others are interested in the conversation would serve to improve coworker relations. Previous research supports such a conclusion. Evidence suggests that receiving a greater number of community-based services was associated with greater participation in social and recreational activities (Orsmond, Krauss, & Seltzer, 2004). The authors propose that there may be

"spillover effects" from these services that can carry over into other areas of life. We expected a similar finding in this study.

Aim 2: We examined how additional services impacted vocational outcomes via their influence on well-being. Hypothesis 2: We expected to see positive impacts on QOL, self-esteem, and self-efficacy from the receipt of additional services and we expect these positive outcomes to mediate the influence of these services on vocational outcomes. As QOL, adaptive behavior, self-esteem, and self-efficacy are central targets of these interventions, it follows that positive influences would be detected. Increased self-esteem, self-efficacy, adaptive behavior, and positive outlook (as measured by QOL) are expected to positively impact one's ability to maintain employment or to earn promotions in terms of hours worked or pay earned (see Figure 1). As previously explained, improved well-being has been shown to result from positive vocational outcomes, and from the receipt of additional services. However, these relationships have not been examined together. Following a structured teaching intervention for adult men with autism after a residence relocation, independence and behavioral measures of QOL were seen to increase together (Persson, 2000). With a similar link in our sample, and if our first hypothesis was true, then we should see both direct and indirect effects of the additional interventions on vocational outcomes.

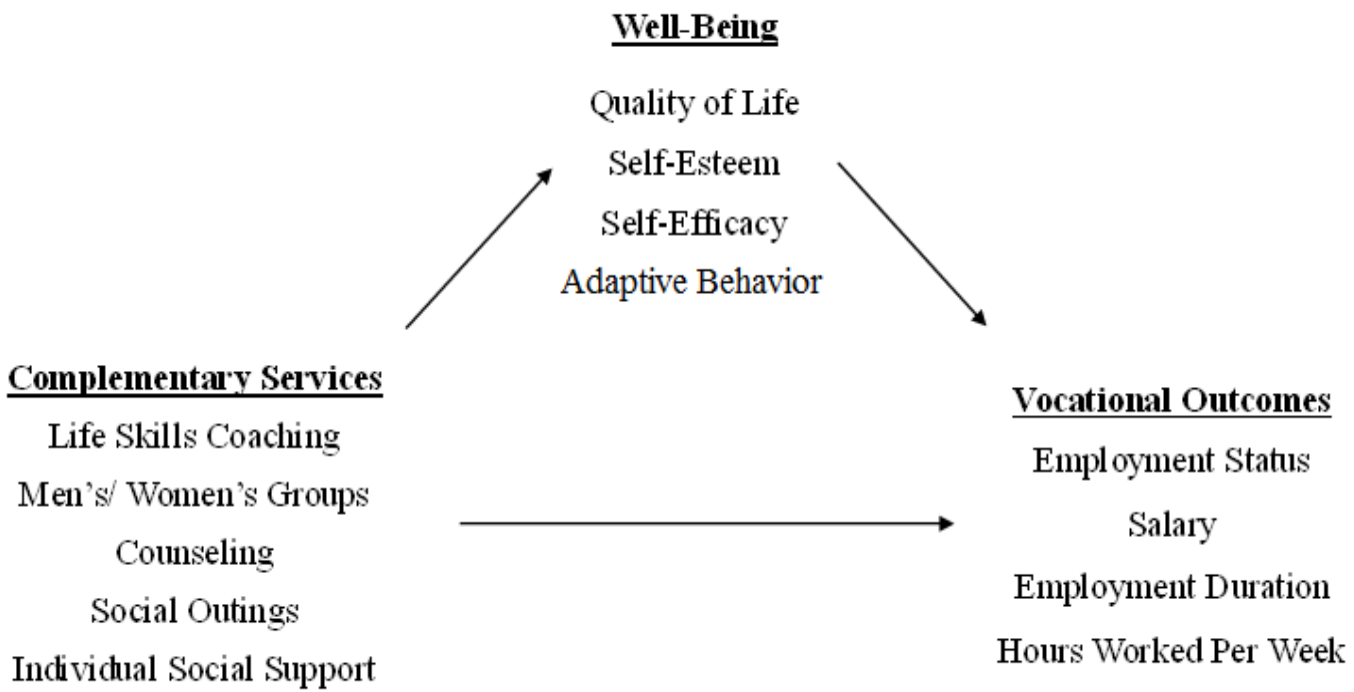


Figure 1. Model illustrating the proposed mediation relationships (Aim 2).

# CHAPTER 2

## Methods

### Participants

Following approval from the IRB, participants who had received job coaching between 2007 and 2013 from Triumph Services, Inc. were recruited. The original list of potential participants included 143 names, of which the PI was able to contact 98 people (69%). Forty-eight participants (49% of those contacted) were recruited and agreed to participate. One participant decided to leave the study before her questionnaire data could be collected, but her demographic, work history, and service data were used in the study. Another participant's data were later excluded because he had not received job coaching comparable to all other participants, resulting in a final sample of $N = 47$ participants.

At the time of data collection, participants averaged 32.21 years of age ($SD$ = 9.74, range = 20-59). The majority of participants were Caucasian (89%) and male (64%). Thirty-eight percent of participants were living independently or with a spouse or roommate ($N = 18$). Primary disabilities included ASD (62%, $N = 29$), intellectual disability (15%, $N = 7$), and other DDs such as ADHD or Cerebral Palsy (23%, $N = 11$). It should be noted that 55% of the sample ($N = 26$) had at least one comorbid diagnosis. This sample of individuals is representative of relatively high-functioning adults with DDs as the mean full-scale IQ score was 84.86 ($SD$ =16.72), with only six participants

scoring below the standard cutoff of 70 for consideration of intellectual disability. Table 1 displays in more detail the demographic summary of the sample.

Table 1
Descriptive statistics for sample demographic data

| | M | SD | N | % |
|---|---|---|---|---|
| Age | 32.21 | 9.74 | 47 | |
| Gender | | | | |
| Female | | | 17 | 36% |
| Male | | | 30 | 64% |
| Ethnicity | | | | |
| African American | | | 5 | 11% |
| Caucasian | | | 42 | 89% |
| Marital Status | | | | |
| Single | | | 40 | 85% |
| Married | | | 5 | 11% |
| Divorced | | | 2 | 4% |
| Living Arrangement | | | | |
| Independently* | | | 18 | 38% |
| With Family | | | 29 | 62% |
| Primary Disability | | | | |
| Autism Spectrum Disorder | | | 29 | 62% |
| Intellectual Disability | | | 7 | 15% |
| Other Developmental Disability | | 11 | 23% | |
| IQ | | | | |
| Full Scale IQ | 84.86 | 16.72 | 29 | |
| Verbal IQ | 88.67 | 17.78 | 24 | |
| Performance IQ | 85.85 | 17.04 | 24 | |
| Education | | | | |
| High School or equivalent | | | 17 | 36% |
| Some College | | | 19 | 40% |
| Bachelors or greater | | | 11 | 24% |

*Living independently includes those who live with a spouse or roommate.

**Procedure**

Triumph Services, Inc., delivered fliers to clients who would be appropriate for the study and follow-up phone calls were made by the Principal Investigator (PI). Potential participants were then invited in to Triumph Services, Inc. to meet with a

Triumph Services, Inc. staff member and the PI to fully discuss the requirements, benefits, and risks of participating in the study. If individuals agreed to participate, they signed an informed consent document. After the consent process had been completed with all participants, researchers then pulled client records from Triumph Services, Inc. to gather data necessary for the study.

Researchers gathered data on demographic information, diagnoses, work history before and after approaching the organization, and Triumph Services, Inc. service history for each individual. Demographic information that was collected included date of birth, age, ethnicity, gender, marital status, intelligence scores, and education. Work history information included the position held, length of employment (in months), salary per hour, and average number of hours worked per week. Service information included the number of services received, which specific services were received, and number of months each service was received (including time spent in each service after obtaining employment). Not all participants had complete records, and thus not all data points were able to be collected for all participants.

After data collection from participant records had been completed, participants were called to schedule questionnaire administration (see Materials section below for a list and description of all questionnaires). At least 90 minutes were allotted for each administration, but the majority of participants completed the questionnaires in under an hour. Questionnaire order was counterbalanced using the Latin square technique to deter any potential order effects (Grant, 1948). Most participants read and responded to each questionnaire independently, only asking for help when an item was not clear. However, approximately a dozen participants requested the items be read to them. This did not

seem to reflect a difference in comprehension, but more a preference for time efficiency as several of these participants had motor problems or slow reading speeds. Participants were debriefed and compensated for their time with $20 cash incentive after the completion of their questionnaires.

## Materials

**Quality of Life.** The World Health Organization Quality of Life Scale (WHOQOL; 1998) contains 100 items assessing subjective perception of QOL in different domains (WHOQOL group, 1998). Only items related to the domains of Psychological QOL, Level of Independence QOL, Social Relationships QOL, and Environmental QOL were retained in the questionnaire administered to participants. Examples of Psychological QOL domain items include "How much do you enjoy life?" and "How much confidence do you have in yourself?" Items such as "Do you have difficulty performing your routine activities?" and "How satisfied are you with your capacity to work?" were included in the Level of Independence QOL domain. The Social Relationships QOL domain included items such as "How alone do you feel in your life?" and "Do you get the kind of support that you need from others?" Finally, the Environmental QOL domain included items such as "How comfortable is the place where you live?" and "Do you have problems with transportation?" Each item was measured on a 5-point Likert scale, with responses varying based on the question being asked. Examples of responses ranged from "Not at all" to "Completely", "Very Dissatisfied" to "Very Dissatisfied", and "Very Poor" to "Very Good". Scores for each domain were

calculated via simple addition of corresponding item/facet scores. A composite score was calculated to indicate overall well-being by summing the domain scores.

This measure was originally normed on "well" adults and adults with life-altering diseases and disorders. Internal consistency coefficients ranged from .71 to .86 for all respondents and test-retest coefficients ranged from .68 to .95 for well respondents (WHOQOL group, 1998). Chronbach's alpha for the current sample ranged from .84 to .89 for all domains and the composite score.

**Adaptive Behavior.** The Adaptive Behavior Assessment System, 2nd edition (ABAS-2) provides a measure of adaptive behavior for three domains of functioning – Conceptual, Social, and Practical (Harrison & Oakland, 2003). The ABAS-2 is available in a self-administration form for adults aged 16-89 years of age. It takes approximately 15-20 minutes to complete the 239 items and asks respondents to select on a 4-point Likert scale whether, and how frequently each activity is performed. Response ratings range from "Is not able" (0) to "Always, when needed" (3). Each domain, and the General Adaptive Composite (GAC) score, are reported as standard scores ($M$ = 100, $SD$ = 15). Example items from the Conceptual domain include "Routinely arrives at places on time." and "Budgets money to cover expenses for at least one week." The Social domain includes items such as "Invites others home for a fun activity." and "Keeps a stable group of friends." The Practical domain includes items such as "Follows another's directions to nearby places." and "Lives on his/her own earnings." The ABAS-2 GAC includes all items and domains from the questionnaire. The standardization sample included typically developing participants and 20 clinical groups, including persons with autism. Internal consistency is superior for this measure, with coefficients all at .90 or

greater. General adaptive composite test-retest correlations were near or above .90 as well. Chronbach's alpha for the different domains and the composite score ranged from .93 to .95 for the current sample.

**Self-Esteem.** The Rosenberg (1965) Self-Esteem Scale is a direct measure of self-esteem and relies on self-report. The assessment includes ten items, such as "I take a positive attitude towards myself." and "I feel I have a number of good qualities." Each item is rated on a 5 point Likert scale ranging from Strongly Agree to Strongly Disagree and the overall self-esteem score is calculated from summing the items. This measure is widely used in research settings. Chronbach's alpha for this sample was .82.

**Self-Efficacy.** Self-efficacy was measured using the scale created by Chen, Gully, and Eden (2001). This self-administered measure contains eight items, each measured on a 5-point Likert scale from strongly disagree (1) to strongly agree (5). Example items include "In general, I think I can obtain outcomes that are important to me." and "Compared to other people, I can do most tasks quite well." Self-efficacy is represented by a sum score of all items. Initial validation studies showed that the measure showed sufficient test-retest reliability coefficients, ranging from .62-.67. Additionally, internal consistency coefficients were high at .86 and .90 (Chen et al., 2001). An impartial third party established this measure's construct validity by showing high correlations with other self-efficacy measures (Scherbaum, Cohen-Charash, & Kern, 2006). These authors also concluded this measure to have excellent item discrimination, item information, and efficiency. Chronbach's alpha for this scale was .86.

## Data Analysis Plan

**Preliminary Analyses.** Mediator variables were examined for multicollinearity using Pearson product moment correlation coefficients as well as the linear regression function in SPSS to evaluate VIF and tolerance values. The minimal acceptable value for tolerance was set at the standard of .1 and the standard of 3 was set as the maximum acceptable value for VIF. This helps to ensure that each mediator included in each analysis is accounting for unique variance in the dependent variable.

**Aim 1: Services.** To examine the relationship between number of services received and vocational outcomes, Pearson product moment correlations coefficients were used for the continuous dependent variables (employment duration, hours worked per week, and salary earned per hour) and an independent samples t-test was used for the dichotomous dependent variable (employment status). Then, each dependent variable was examined for its relationship to participation in each service. For the continuous dependent variables, this was done via independent samples t-tests and for the dichotomous dependent variable this was done via Test for Independence Chi Squares. When the t-test or Chi Square indicated a relationship between a particular service received and a vocational outcome, this relationship was explored further using hierarchical linear regressions. To account for the influence of job coaching on the vocational outcome (as vocational training should presumably have the greatest impact on vocational outcomes), the length of time spent receiving job coaching was entered into the first block of the regression. Then either the variable indicating participation in that service (yes or no) or the variable indicating the length of time spent participating in that service was entered into the second block.

**Aim 2: Mediation.** Based on the sample size and the number of predictors and mediators to be included, the Preacher and Hayes (2008) method of indirect multiple mediation analysis and bootstrapping (5000 iterations) was utilized for the continuous dependent variables of hourly pay, hours worked per week, and months employed. In each analysis, the independent variable was the number of services received. For each dependent variable, five mediational analyses were performed. The first analysis included all well-being variables as mediators (i.e., QOL composite, ABAS-2 GAC, self-esteem, and self-efficacy), and the last four included these variables separately. The variability within employment status was too minimal to obtain reliable results using the Preacher and Hayes (2008) mediation method for the dependent variable of employment status. Therefore, the Baron and Kenney (1986) method was used to detect for mediation between number of services received and employment status by well-being variables.

# CHAPTER 3

## Results

### Data Preparation and Assumptions of Analyses

The ABAS-2 was hand-coded, and each protocol was checked to 100% accuracy by the PI. All data were entered and analyzed using SPSS, version 22 by a trained research assistant and were also checked to 100% accuracy by the PI. In order to include all participants in analyses, those who had not found employment were coded as having worked "0" hours per week, earned "$0" per hour, and been employed for "0" months. This process was repeated for the number of months receiving each service. If a person did not receive a particular services, they were coded as having received that service for "0" months. Then, the dependent variables of hours worked per week, number of months employed, and salary per hour were examined for normality. Hours worked per week and salary per hour were within the preferred ranges of -1 to +1 for both skewness and kurtosis. Months employed, however, was highly positively skewed. To correct for this, months employed was transformed using the natural logarithm function. The transformed variable fell within appropriate ranges for skewness and kurtosis and so the transformed version of this variable was used in all further analyses. Job attainment status (yes/no obtained employment) was also a dependent variable, but as a dichotomous variable, the normality assumption is not applicable. Table 2 presents descriptive statistics for each of the dependent variables, before transformations and coding adjustments.

Variables considered for mediation were examined for multicollinearity. The QOL composite score, the ABAS-2 GAC, the self-esteem sum score, and the self-efficacy sum score were examined for multicollinearity. Tolerance levels were above the standard of .1, VIF values were below the standard of 3, and the different combinations of the variables produced correlation coefficients ranging from $r$ = .33 to .62. It was determined that these variables were safe to be considered in the same analyses together. Descriptive statistics for these variables can be found in Table 2.

Table 2
Descriptive statistics for dependent variables and potential mediators

| | *M (SD)* | Range | % | *N* |
|---|---|---|---|---|
| Employed | | | | |
| Yes | | | 85% | 40 |
| No | | | 15% | 7 |
| Months employed* | 26.53 (34.77) | 2-145 | | 40 |
| Hours worked per week* | 20.92 (11.55) | 3-48 | | 39 |
| Salary earned per hour* | $8.62 ($4.03) | 7.25-20.50 | | 38 |
| Psychological QOL | 75.57 (11.39) | 54-98 | | 41 |
| Level of Independence QOL | 65.43 (9.94) | 41-80 | | 41 |
| Social Relationships QOL | 42.56 (11.01) | 13-60 | | 42 |
| Environmental QOL | 129.32 (16.06) | 90-157 | | 42 |
| QOL Composite | 313.46 (38.64) | 232-389 | | 41 |
| ABAS-2 Conceptual | 92.79 (12.52) | 67-119 | | 42 |
| ABAS-2 Social | 92.45 (16.01) | 55-120 | | 42 |
| ABAS-2 Practical | 90.52 (13.60) | 63-120 | | 42 |
| ABAS-2 Composite | 91.21 (13.88) | 60-119 | | 42 |
| Self-esteem | 37.76 (6.58) | 18-50 | | 42 |
| Self-efficacy | 33.27 (4.20) | 21-40 | | 42 |

*The information presented here is representative of those who had employment only (i.e., before "0" was entered for number of hours worked, number of months employed, or number of dollars earned per hour).

**Preliminary Analyses**

Order effects were examined using ANOVA to determine if the order in which questionnaires were presented affected responses. Questionnaire order did not explain scores on the ABAS-2 GAC, QOL composite score, self-efficacy, nor self-esteem (all *p*'s > .05). Finally, age, IQ, gender, ethnicity (as there were only two ethnicities represented in the sample), and having been employed before (yes or no) were investigated for their relationship to other study variables as potential covariates using Pearson product moment correlation coefficients. None of these variables demonstrated a significant relationship to any dependent variables or predictor variables (all *p*'s > .05).

The relationships between the services received and well-being variables were examined with correlations. Participating in one service increased the likelihood of participation in any other service (all *p*'s < .05). Participating in life skills training (versus not participating in this service) was associated with lower self-esteem $r$ (40) = -.37, $p$ < .05. No other relationships between services received and well-being variables were significant (all *p*'s > .05). These correlations are displayed in Table 3.

Correlations were also calculated for the length of time spent participating in each service. Except for the length of time spent participating in Individual Social Support, which showed no relationship to the length of time spent in any other service, the longer a person spent participating in one service, the longer they were likely to participate in any other service (all *p*'s < .05). These relationships are displayed in Table 4. Descriptive statistics for the participation and length of participation are located in Table 5.

Table 3
Correlations between services received and well-being variables.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Life skills | - | | | | | | | | |
| 2. Counseling | .55*** | - | | | | | | | |
| 3. Social outings | .51*** | .51*** | - | | | | | | |
| 4. Group | .41** | .48*** | .74*** | - | | | | | |
| 5. Individual Social Support | .37** | .48*** | .40** | .34* | - | | | | |
| 6. QOL composite | -.13 | .04 | .21 | .10 | .07 | - | | | |
| 7. ABAS-2 GAC | -.14 | -.20 | -.04 | -.11 | .17 | .62*** | - | | |
| 8. Self-esteem | -.37* | -.04 | -.08 | .13 | .08 | .57*** | .33* | - | |
| 9. Self-efficacy | -.11 | -.05 | .04 | -.01 | .11 | .60*** | .56*** | .57*** | - |

*Indicates significance of $p < .05$; **Indicates significance of $p < .01$; ***Indicates significance of $p < .001$



Table 4.
Correlations between length of time spent receiving each service.

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. Job Coaching | - | | | | | |
| 2. Life Skills Training | .78* | - | | | | |
| 3. Counseling | .77* | .85* | - | | | |
| 4. Social Outings | .71* | .73* | .83* | - | | |
| 5. Group | .52* | .46* | .49* | .75* | - | |
| 6. Individual Social Support | .03 | .22 | .23 | .21 | .09 | - |

*Indicates significance of $p < .001$

Table 5.
Descriptive statistics for services participated in and the length of time receiving services

| | *M* | *SD* | % | *N* |
|---|---|---|---|---|
| Number of services received | | | | |
| 1 | | | 36% | 17 |
| 2 | | | 19% | 9 |
| 3 | | | 13% | 6 |
| 4 | | | 8.5% | 4 |
| 5 | | | 15% | 7 |
| 6 | | | 8.5% | 4 |
| Months received job coaching | 31.21 | 22.75 | | 47 |
| Group therapy | | | | |
| Yes | | | 25% | 12 |
| No | | | 75% | 35 |
| Months received group therapy | 39.25 | 26.04 | | 12 |
| Counseling | | | | |
| Yes | | | 51% | 24 |
| No | | | 49% | 23 |
| Months received counseling | 33.92 | 21.59 | | 24 |
| Life skills coaching | | | | |
| Yes | | | 40% | 19 |
| No | | | 60% | 28 |
| Months received life skills coaching | 42.74 | 26.89 | | 19 |
| Individual social support | | | | |
| Yes | | | 19% | 9 |
| No | | | 81% | 38 |
| Months received individual social support | 12.11 | 4.73 | | 9 |
| Social outings | | | | |
| Yes | | | 38% | 18 |
| No | | | 62% | 29 |
| Months received social outings | 38.61 | 26.99 | | 18 |

Finally, the continuous dependent variables of employment duration, number of hours worked per week, and salary earned per hour were examined for their linear relationship to each other. Higher salaries were associated with longer employment

durations, $r$ (36) = .34, $p < .05$, and more hours worked per week, $r$ (43) = .64, $p < .001$. Employment duration was not associated with the number of hours worked per week, $r$ (37) = .01, $p > .05$.

**Aim 1: Services**

**Hourly pay.** Salary earned per hour was not correlated with number of services, $r$ (43), = .20, $p$ = .19. Independent samples t-tests were used to examine how each service related to hourly pay. Those who received life skills training earned a higher salary ($M$ = \$8.84, $SD$ = \$2.53), than those who did not ($M$ = \$6.24, $SD$ = \$5.74), $t$ (38.34) = 2.08, $p <$ .05. Salary earned per hour was not associated with receiving counseling, $t$ (38.50) = 1.50, $p$ = .14, participating in social outings, $t$ (42.11) = .98, $p$ = .33, participating in group therapy, $t$ (42.46) = 1.31, $p$ = .20, or participating in individual social support, $t$ (43) = .42, $p$ = .68.

Hierarchical linear regressions were then used to determine how receiving life skills training impacted salary. In the first block of the regression, the number of months spent in job coaching was entered to account for this variable's influence on salary. Participation in life skills training was entered into the second block. The full model was significant, $F$ (2, 42) = 4.96, $p < .01$, $R^2$ = .19. But only months spent in job coaching could account for any differences in salary, $B$ = .09, $t$ = 2.50, $p < .01$. A second regression was run using months spent in job coaching in the first block and months spent in life skills training in the second block. Again, the full model was significant, $F$ (2, 42) = 6.24, $p < .01$, R2 = .23, and again, months spent in job coaching was the only significant predictor, $B$ = .15, $t$ = 3.11, $p < .01$. Both regressions suggest that participation in life

skills training is not uniquely associated with salary when months spent in job coaching is considered. More time spent in job coaching is associated with a higher salary.

**Hours worked per week.** The number of services each person participated in was not associated with the number of hours worked per week, $r$ (44) = .11, $p$ = .48. Independent samples t tests were conducted to examine the association of participation in each service and number of hours worked per week. Receiving life skills training was marginally significant, $t$ (44) = 1.85, $p$ = .07. Those who received life skills training worked more hours per week ($M$ = 22.06, $SD$ = 12.43) than those who did not receive life skills training ($M$ = 14.96, $SD$ = 12.89). Hours worked per week was not associated with receiving counseling, $t$ (44) = 1.32, $p$ = .19, participation in social outings, $t$ (44) = .66, $p$ = .51, participation in group therapy sessions, $t$ (44) = .58, $p$ = .56, nor receiving individual social support, $t$ (44) = .39, $p$ = .70.

Two hierarchical linear regressions were used to examine how participation in life skills training affected hours worked per week, over and above what the number of months spent in job coaching could predict. Months spent in job coaching was entered into the first block for both regressions. The first regression contained the variable indicating participation in life skills training (yes or no) in the second block, and the model was not significant, $F$ (2, 43) = 1.67, $p$ = .20. Neither predictor was related to the dependent variable (both $p$'s > .05). Similarly, the second regression containing months spent in life skills training in the second block was also not significant, $F$ (2, 43) = .63, $p$ = .54. Again, neither predictor variable was significantly associated with hours worked per week (both $p$'s > .05). When considered together, neither the amount of time spent in

job coaching nor life skills training can account for the differences seen in the number of hours worked per week.

**Months Employed.** The number of services participated in was positively related to the number of months a person had maintained employment, $r$ (38) = .32, $p < .05$. The more services a person participated in, the longer they were likely to keep their job (refer to Figure 2). Participation in each individual service was used as the independent variable for five separate independent samples t-tests to examine their relationship to number of months employed. Participation in life skills training was not related to the number of months employed, $t$ (38) = 1.37, $p$ = .18, nor did receiving counseling services, $t$ (38) = 1.23, $p$ = .23. Participation in social outings marginally was associated with number of months employed, $t$ (38) = 1.84, $p$ = .07, with participants in this service maintaining employment longer ($M$ = 3.02, $SD$ = 1.07) than non-participants ($M$ = 2.42, $SD$ = .99). Participation in group therapy sessions was related to the number of months employed, $t$ (38) = 2.79, $p < .01$. Those who participated in group therapy were employed longer ($M$ = 3.33, $SD$ = .92) than those who did not participate in this service ($M$ = 2.42, $SD$ = 1.00). Participation in individual social support was not associated with the number of months employed, $t$ (38) = .32, $p$ = .75.

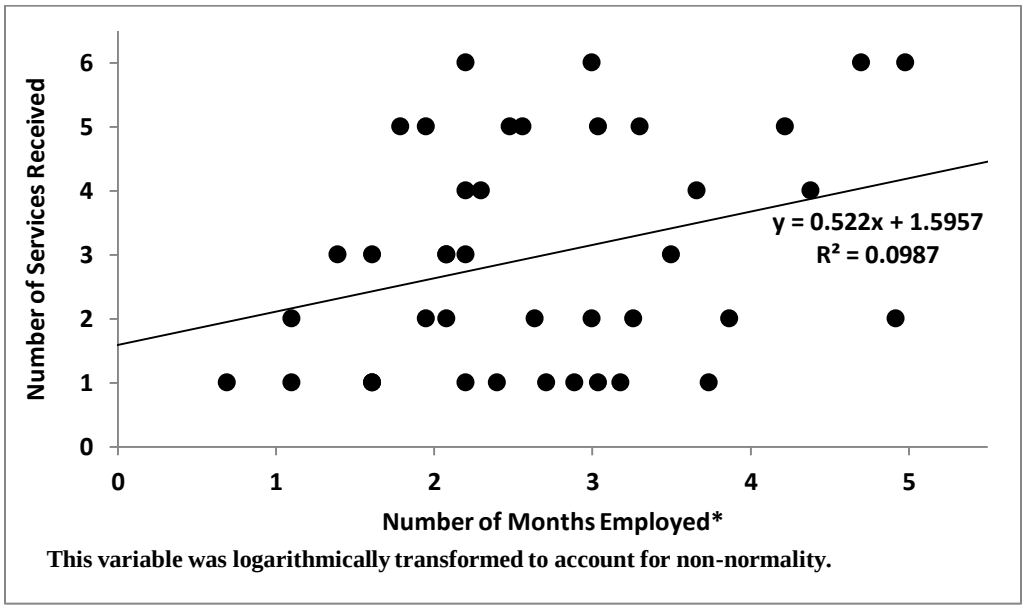


Figure 2. Scatterplot depicting the correlation between the number of services participated in and number of months employed.

Participation in social outings and in group therapy sessions were explored further for their impact on number of months employed. Hierarchical regressions were used for this, with number of months in job services used in the first step of each regression. Two regressions were performed for each service – one using the participation variable in the second block, and one using the number of months spent participating in that service in the second block. For participation in social outings, the model was significant, $F$ (2, 37) = 6.30, $p < .01$, $R^2 = .25$. Months spent in job coaching significantly predicted number of months employed ($t = 2.92$, $p < .01$, $\beta = .45$), but participation in social outings did not ($p = .42$). Similarly, the model utilizing number of months spent participating in social outings was significant, $F$ (2, 35) = 6.00, $p < .01$, $R^2 = .26$. And again, the number of months spent in job coaching accounted for the relationship ($t = 2.11$, $p < .05$, $\beta = .42$) more so than the number of months spent participating in social outings ($t = .55$, $p = .58$).

Thus, it seems that participation in social outings does not relate to number of months employed when the number of months spent in job coaching is considered. More time spent in job coaching is predictive of a longer time period of continuous employment.

The model examining participation in group therapy was significant, $F$ (2, 37) = 8.49, $p < .001$, $R^2 = .32$. Both the number of months spent in job coaching ($t = 2.88$, $p < .01$, $\beta = .41$) and participation in group therapy ($t = 2.00$, $p < .05$, $\beta = .28$) positively related to the number of months employed. More time in job coaching and participation in group therapy (versus not participating) were associated with longer periods of employment. When examining how the number of months spent in group sessions impact the number of months employed, the model is significant, $F$ (2, 37) = 7.50, $p < .01$, $R^2 = .29$. Months spent in job coaching was predictive of number of months continuously employed ($t = 2.29$, $p < .05$, $\beta = .37$) but months spent participating in group sessions was not ($p = .12$). When accounting for the number of months spent in job coaching, participation in group sessions, but not the length of that participation, suggests a longer length of employment.

**Employment status.** The relationship between employment status and the number of services received was examined using independent samples t-test, $t$ (42.84) = 5.95, $p < .001$. Persons who were employed participated in more services ($M = 3.00$, $SD = 1.75$) than persons who were unemployed ($M = 1.14$, $SD = .38$). Figure 3 displays this relationship.

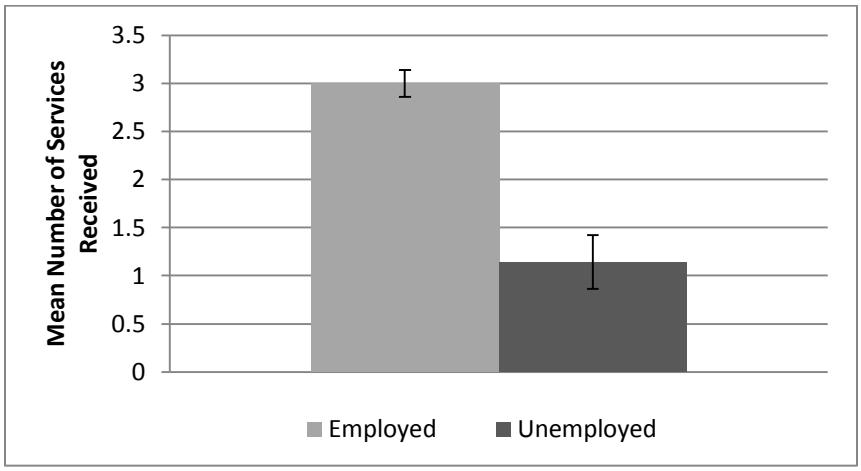


Figure 3. Column chart depicting the differences between the mean number of services received for employed versus unemployed persons.

Test for Independence Chi Square analyses were used to detect relationships between employment status and participation in each individual service, resulting in five sets of analyses. Employment status was related to receiving life skills training, $\chi^2$ (1) = 5.58, $p < .01$, OR = 13.60, receiving counseling, $\chi^2$ (1) = 4.45, $p < .05$, OR = 8.12, and attending social outings, $\chi^2$ (1) = 5.11, $p < .05$, OR = 12.33. Based on the odds ratios, employed persons were 13 times more likely to have had life skills training, 8 times more likely to have had counseling services, and 12 times more likely to have attended social outings. One hundred percent of those who received life skills training, 96% of those who received counseling, and 100% of those who attended social outings had obtained employment. For those who had obtained employment without the use of these services, the percentages were 75%, 74%, and 76% respectively. Participation in group therapy was marginally significant, $\chi^2$ (1) = 2.82, $p = .09$, OR 6.58 with similar groupings. One hundred percent of those who participated in group had also found employment (versus 80% who had not participated but had found employment) and employed persons were

more 6 times more likely to have had group therapy. No relationship between participation in individual social support and employment status was observed, $\chi^2$ (1) = 1.95, $p$ =.16. It should be noted that for both support and group sessions, there was little variability in the service participation variable. Only 25% of the sample participated in group sessions and only 19% participated in individual social support. Finally, differences between length of time spent participating in each service were examined for those who had obtained employment versus those who had not using independent samples t-tests. Employed persons had participated in each service for longer periods of time than persons without employment (all $p$'s < .05). Refer to Table 6 for these results in detail.



Table 6

Means, standard deviations, and independent samples t-test values for group differences between employed versus unemployed persons

| | Employed | | | | |
|---|---|---|---|---|---|
| | No ($N$ = 7) | Yes ($N$ = 40) | $t$ | $df$ | $p$ |
| Months receiving job coaching* | 11.29 (5.47) | 34.70 (22.85) | 5.63 | 40.50 | < .001** |
| Months receiving life skills training* | 0.00 (0.00) | 20.30 (28.30) | 4.54 | 39 | < .001** |
| Months receiving counseling* | 1.29 (3.40) | 20.13 (23.78) | 4.74 | 44.68 | < .001** |
| Months attending social outings* | 0.00 (0.00) | 17.45 (26.97) | 3.99 | 37 | < .001** |
| Months receiving group therapy* | 0.00 (0.00) | 11.78 (22.89) | 3.26 | 39 | < .01** |
| Months receiving ISS* | 0.00 (0.00) | 2.73 (5.55) | 3.10 | 39 | <.01** |

* Indicates a violation of the homogeneity of variance assumption, and correction using modified degrees of freedom.
** Indicates significant differences between employment status group

**Aim 2: Mediation**

**Hourly pay.** Examining the relationship between the number of services received and hourly pay rate as it is affected by QOL, adaptive behavior, self-esteem, and self-efficacy, the full model was not significant, $F$ (5, 33) = 2.08, $p$ = .09. Indirect effects were not significant for any well-being variables (all $p$'s > .05), all bias-corrected confidence intervals included "0", and the non-significant direct effect of the number of services on hourly pay ($t$ = .86, $p$ = .39) suggest that there are no relationships between these variables. Each mediator was then examined in a separate analysis. The full mediation model including self-efficacy was significant, $F$ (2, 37) = 3.77, $p$ < .05, $R^2$ = .17. However, the tests of indirect effects suggested that self-efficacy was not mediating the relationship significantly, $Z$ = .55, $p$ = .58, and "0" was within the range of the bias-corrected confidence interval. Also, the number of services was not directly related to hourly pay, $t$ = .80, $p$ = .43. The individual models assessing the mediation relationship of QOL, adaptive behavior, and self-esteem were not significant (all $p$'s > .05). Further, no test of indirect effects were significant (all $p$'s > .05), and all bias-corrected confidence intervals for each meditator included "0". Therefore, the results suggest that the number of services one receives is not predictive of hourly pay and there are no indirect effects of well-being (i.e., QOL, adaptive behavior, self-esteem, nor self-efficacy) on hourly pay.

**Hours worked per week.** The first test on hours worked per week, containing all well-being variables, suggested that mediation was not present, $F$ (5, 34) = .93, $p$ = .47. None of the tests of indirect effects were significant (all $p$'s > .05), and all bias-corrected confidence intervals included "0" suggesting none of the well-being variables were related to hours worked per week. It should also be noted that the number of services did

not significantly predict hours worked per week in a test of direct effects, $t = .45$, $p = .65$. This effect was examined with each well-being variable included in four separate analyses, and the results were consistent for each analysis (all $p$'s > .05 and all confidence intervals included "0"). Thus, the number of services received is not predictive of the number of hours worked per week, and there is no evidence of indirect effects on this variable from QOL, adaptive behavior, self-esteem, nor self-efficacy.

**Months Employed.** First, the model assessing mediation of all well-being variables was performed. The full model was significant, $F$ (5, 30) = 2.99, $p < .05$, $R^2 = .33$. The direct effect of number of services on the number of months employed was significant, $t = 2.53$, $p < .05$, $c' = .25$, suggesting that receiving more services was associated with a longer length of continuous employment. However, no indirect effects of well-being variables were significant (all $p$'s > .05) and all bias-corrected confidence intervals of these variables included "0" suggesting that mediation was not present in this relationship. Next, individual well-being variables were analyzed in separate mediation analyses. The model including self-efficacy was significant, $F$ (2, 34) = 6.15, $p < .01$, $R^2 = .27$. The number of services received was directly related to the number of months employed, $t = 2.31$, $p < .05$, $c' = .22$. This again confirms that more services are related to longer lengths of employment. The indirect effect of self-efficacy was not significant, however, $Z = -.01$, $p = .99$, and the bias-corrected confidence interval for this variable contained "0". Therefore, self-efficacy is not a significant mediator of the relationship between number of services received and number of months employed.

The model examining self-esteem as a mediator was not significant, $F$ (2, 34) = 2.20, $p = .12$. When adaptive behavior was used in the analysis, the model was

significant, $F$ (2, 34) = 3.24, $p$ = .05. The direct relationship between number of services received and number of months employed was significant, $t$ = 2.02, $p$ = .05, $c'$ = .20. The test of the indirect effect, however, was not significant, nor did the bias-corrected confidence intervals suggest a mediation relationship by adaptive behavior. Finally, the mediation analysis using QOL was significant, $F$ (2, 33) = 3.74, $p < .05$. The direct effect of number of services on number of months employed was significant, $t$ = 2.29, $p < .05$, $c'$ = .23. The indirect effect of QOL was not significant, $Z$ = -.24, $p$ = .82, and the bias-corrected confidence interval included "0". Therefore, these results suggest that the number of services received positively predict the number of months employed but there is no evidence suggesting that this relationship is mediated by well-being.

**Employment status.** First, the effect of number of services on employment status was examined. This model was significant $\chi^2$ (1, $N$ = 47) = 10.92, $p < .001$, and the number of services received was marginally significant as a predictor, Wald statistic = 3.32, Exp($B$) = 6.01, $p$ = .07. The next step requires using each mediator as the criterion variable with the number of services as the predictor variable. This resulted in four regressions. Number of services was not a significant predictor for QOL composite score, ABAS-2 GAC, self-esteem, nor self-efficacy (all $p$'s > .05). Therefore, the process of testing for mediation on employment status was terminated as the second requirement of a mediational relationship could not be fulfilled.

**Follow up Analyses**

The relationship between services received and well-being variables were examined more closely using the facet scores and domain scores from the ABAS-2 and

the WHOQOL scale. Receiving life skills training was associated with the Level of Independence QOL, $r$ (39) = -.37, $p < .05$. Those who participated in life skills training tended to have a lower Level of Independence QOL domain score. Receiving counseling services was associated with Home adaptive behavior, $r$ (40) = -.33, $p < .05$. This indicates that those who received counseling services had lower Home adaptive behavior facet scores. Attending social outings was associated with Services QOL, $r$ (40) = .32, $p < .05$, which suggests that those who attend the social outings reported a higher satisfaction with the social and medical services they received. Participation in group therapy sessions was associated with lower vocational adaptive behavior scores, $r$ (40) = -.35, $p < .05$. Participation in individual social support was not associated with any well-being variables (all $p$'s > .05). No other significant relationships between services received and well-being facet or domain variables were observed (all $p$'s > .05).

## Discussion

This project had two main aims. First, we wanted to determine the relationship between services received and vocational outcomes. We predicted that participation in each service would positively relate to vocational outcomes. Results were supportive of this hypothesis in terms of employment status and length of employment. Second, we wanted to determine if well-being variables mediated the relationship between the number of services received and vocational outcomes. We predicted that participation in a greater number of services would positively affect well-being and that this would compound the effects seen on vocational outcomes. The results of this study were not supportive of our second hypothesis.

There are many benefits of employment and Hendricks (2010) outlines many of these. First, employment allows the individual to earn wages that can be used to support one's self and pursue one's interests. Also, employment encourages important healthy psychological well-being such as the concepts proposed for examination in this study. Employment by the individual with DDs decreases dependence on family or social programs for financial support. Depending on the position and place of employment, the employee might also be able to obtain medical insurance, reducing the need for public programs. Finally, employers benefit from employing adults with DDs. Employers have reported valuing the trustworthiness, reliability and low abseentism often seen in these adults. Adults with a DD desire these and other benefits of employment.

Receiving more services was positively associated with employment status and length of employment. Those who received and participated in more services were more likely to obtain employment and to maintain that employment. Further, those who had obtained employment were 6-13 times more likely to have participated in a specific service and were utilizing each service type for longer periods than those who had not obtained employment. These results are evidence in support of previous work suggesting that more holistic approaches and wrap-around services are needed for adults with a DD (Domin & Butterworth, 2013; Morgan & Schultz, 2012).

It is interesting that the participants in this study had a much higher success rate in terms of finding employment than is seen in previous studies of employment support programs: 85% of participants were employed, with all but four of them (10% of employed persons) finding their current employment after beginning their service program at Triumph Services, Inc. Addressing the social, day-to-day, and psychological

needs of adults with a DD appears to benefit them in their work environment as well. A previous study showed that work productivity and accuracy and job satisfaction were increased when supportive employment participants were well-matched to the position in terms of preference and skills (Hall, Morgan, & Salzberg, 2014). Certainly, matching individuals to employment positions would prove more successful with multiple service providers collaborating on their knowledge and experiences with each adult. As such, this evidence is suggestive that these extra services are necessary for continued vocational success of this population.

Persons who obtained and maintained employment longer were more likely to have participated in social outings and gendered group therapy. Previous research has shown that job coaches are not typically successful in implementing social interventions aimed at increasing the social interactions of the employee with their coworker (Chadsey et al., 1997). In fact, the presence of the job coach seemed to decrease social interactions at the workplace. Perhaps the work site is not the time nor the place for direct practice or instruction on social skills. Further, job coaches have been trained in employment skill supports, and not in social and communication supports. Recent research does suggest that, on average, job coaches are lacking in their knowledge of symbolic and intentional communication (D'Agostina & Cascella, 2008). Thus, it seems likely that the licensed therapists who are leading the social outings and group therapy sessions may be more successful in terms of improving the client's social interaction skills and this may be contributing to their ability to obtain and maintain employment.

Participation in life skills training, social outings, gendered group therapy, and counseling services was also related to finding employment. Furthermore, attending

social outings and gendered group therapy was associated with an increase in employment duration, and receiving life skills training was associated with increased salary and more hours worked per week. These results suggest that there are positive vocational outcomes to be observed, in terms of obtaining and maintaining employment, by addressing the non-vocational needs of adults with DDs. Support for this notion is provided from a study showing that persons with a DD reported increased independence when they were receiving the appropriate services for all of their needs (Fresher-Samways et al., 2003). Additionally, higher self-esteem was associated with employment status in another study (Holwerda et al., 2013). Addressing the psycho-social needs of persons with a DD is going to go far in assisting their ability to get or keep a job.

Factors that were related to finding and maintaining employment were not the same as those related to salaries and hours worked per week. Participation in more services did not explain any differences observed in the number of hours an employee worked per week or the amount of money an employee earned per hour. Participation in life skills training, though, was positively associated with salary and number of hours worked per week. Those who participated in this service were more likely to earn a higher wage and to work more hours per week. One of the main goals of life skills training is to improve adaptive behavior or functional ability. And, in previous research, weekly salary was predictive of both productivity and independence (Wilhite & Keller, 1996). Therefore it seems that those who are earning more have a higher functional ability. Life skills training likely addresses skills and abilities that are necessary in the vocational realm as well as the domestic one.

Our tests of mediation did not suggest that the positive effects of these additional services on vocational outcomes were working through their impact on well-being. In fact, follow-up analyses suggest that participation in certain services is correlated with lower indicators of well-being. Those who participated in life skills training reported lower feelings of self-esteem and lower QOL in terms of their independence, participants of counseling services reported lower adaptive behavior in the home setting, and group therapy participants reported lower adaptive behavior in the work setting.

These results suggest two possible conclusions. First, it is possible that participation in certain services leads to lower well-being. This is highly unlikely as numerous interventions have proven successful in improving the QOL, adaptive behavior, self-esteem, and self-efficacy of adults with a DD (Farmer-Dougan, 1994; Gaus, 2007). Furthermore, there was no difference on any well-being variable between employed persons and unemployed persons. This seems to suggest a different reason for the negative relationship between well-being and services received. As being employed is associated with receiving a greater number of services, but not higher well-being, and receiving some services are associated with a lower well-being, it is possible that those with employment, who are receiving these extra services, have a higher awareness of the difficulty of their situation. Participants are enrolled in the services in which they need. Perhaps they are utilizing these services because they know they need better skills in many areas of life to be competitive in the workplace, but their self-esteem and self-efficacy are lowered because they can compare themselves to their competition of persons without a DD who are striving for the same work position. Previous work supports the latter conclusion. In one study, it was discovered that short-term work

experience did not improve self-esteem nor self-efficacy for persons with a DD (Szivos, 1990). Additionally, psychological well-being and QOL did not improve upon initial placements into supportive employment programs (Garcia-Villamisar, Wehman, & Navarro, 2002; Jiranek & Kirby, 1990). However, assessments at the five-year follow up showed significant increases in QOL (Garcia-Villamisar et al., 2002). For those with a lower developmental level, accommodation to work requirements and responsibilities and to the benefits of employment may take a longer period of time than had lapsed for our study participants.

**Cost**

The financial burden of paying for these extra services typically falls entirely on the family or the individual. Insurance may cover part or all of individual therapy services, but little else. And as mentioned earlier, federal funding may support the individual in vocational rehabilitation services, but only if they qualify. This cost has a high impact on families' available funds. A study on the poverty rate, assets, and net worth of parents of children with a DD found high rates of poverty for all parents (Parish et al., 2010). The youngest (under 45 years of age) and oldest (over 65) groups of parents had the highest rates of poverty, less income, and a lower net worth than the two other age groups examined. Based on these findings, these authors conclude, as others have, that the supports available for these individuals and their families may be lacking. Vocational rehabilitation can be successful in finding employment, but ensuring the employee is progressing in the workforce seems to require additional help. While the costs may be high initially, with the implementation of empirically-supported programs,

the cost will likely drastically decrease over time. Furthermore, the societal costs are in support of supported employment (Rusch & Braddock, 2004). The cost of placing someone in a segregated adult day program is four times that for supported employment. Also, having someone pay into taxes instead of solely benefiting from tax programs proves beneficial for society as well.

**Limitations and Future Research**

As with any study, there will be limitations to the scope of this project. This study was retrospective and a true control group of persons not receiving employment services was not included. Neither was it possible to randomize subjects to groups. This raises two specific concerns. First, concern over directionality of effects is appropriate because of this and because of the correlational nature of the study. Second, services received are confounded by their needs – clients only receive services that address their individual deficits. Another limitation is that the adults with DDs in this sample represent generally high-functioning individuals, making it impossible to confidently generalize the results of this study to populations of lower-functioning individuals. However, the adults with DDs who are most likely to benefit from employment services and to obtain meaningful, competitive employment are those with less deficits in functioning. Also, it would be unethical to enroll someone into a service that they do not need. These additional services (that are participated in precisely because they are needed) have shown to be beneficial to vocational outcomes. Thus, the sample used in this study is appropriate as it should generalize to the exact population to whom it may be helpful.

Sample size and limited variability seen in the dependent variable of employment status and in some of the newer services such as individual social support are also limitations of this study. It is possible that with a larger sample size, and more variability within specific variables, more relationships of interest would have been discovered. Further, while the participants in this study were relatively high functioning, it is currently unknown how well their responses to well-being questionnaires represent the true state of affairs. If future studies can corroborate participants' responses with job coaches' or parents' responses, this validity of the current study would be expanded.

This study has shown that receiving and participating in additional services improves the likelihood of obtaining and maintaining employment. How this works exactly, however, has not been clarified. Future studies should implement a longitudinal design to examine the effect of well-being variables over time on vocational outcomes or look beyond well-being to answer the question of how additional services improve vocational outcomes. Such information would have significant implications for clinicians, clients, and also public welfare. Clients and clinicians would have greater insight into which services or skills would increase the likelihood of successful work-related outcomes for each client. Increasing the number of people who are contributing members of society is an important local and national goal. More workers in the workforce and fewer people on disability-related income would contribute to reducing the impact on local and national debt.

Previous research has demonstrated that when adults with a DD can find employment, they usually work less than full-time hours and are usually employed at or near minimum wage (Domin & Butterworth, 2013; Fresher-Samways et al., 2003;

Yamaki & Fujiura, 2002). This study found similar results with only 15% of employed persons working full time and only 37% of employed persons earning more than $1 over minimum wage. The results of this study do not provide strong implications for ways to improve upon these outcomes, and thus future research should focus on what interventions and/or skills are necessary to make financial independence a more realistic goal for this population.

**Summary**

Adults with a DD have the same goals as the rest of us. They want to work full time, be independent, gain a quality education, travel, etc. (Fresher-Samways et al., 2003). This study has shown that addressing the social, day-to-day, and psychological needs of adults with DDs with wrap-around services will result in overlapping effects into the vocational realm. This will potentially allow for successful integration of a large proportion of previously unemployed or previously unemployable persons into the workforce. If these services can be made more readily available, then increased independence and decreased reliance on disability funding is a likely outcome. While no well-being did not mediate the relationship between services received and vocational outcomes, it is highly likely that with future endeavors aimed at increasing salary or work hours to full-time status, improvements in QOL will also be observed. It goes without saying that persons with DDs deserve the same rights and opportunities as any other individual. This is a priceless endeavor.

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# APPENDIX A

# INSTITUTIONAL REVIEW BOARD APPROVAL

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

*Institutional Review Board for Human Use*

Form 4: IRB Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

UAB's Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). The Assurance number is FWA00005960 and it expires on January 24, 2017. The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56.

| | |
|---|---|
| Principal Investigator: | HARRIS, ABBEY |
| Co-Investigator(s): | |
| Protocol Number: | **X130702003** |
| Protocol Title: | *An Examination of the Services that Contribute to Positive Vocational Outcomes in a Sample of Adults with Developmental Disabilities* |

The IRB reviewed and approved the above named project on 8-23-13. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date: 8-23-13

Date IRB Approval Issued: 8-23-13

IRB Approval No Longer Valid On: 8-23-14

Marilyn Doss

Marilyn Doss, M.A.
Vice Chair of the Institutional Review Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

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