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Using Video Modeling to Teach Vocational Skills to Young Adults with Autism Spectrum Disorder

Karl Schoenherr
ks4h9@mail.umsl.edu

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Karl Schoenherr

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Advisory Committee

April Regester, Ph.D.
Chairperson

Michael W. Bahr, Ph.D.

Lisa Gilbertsen, M.A.

Patricia Kopetz, Ph.D

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Abstract

This study evaluated the effectiveness of video self-modeling as a method for teaching two young adults with autism spectrum disorders (ASD) how to perform job-related skills in a vocational setting. Prior to intervention, videos were recorded of the participants as they performed single steps of novel tasks at their jobsites. The researcher created video self-models by combining and editing the recordings of the single tasks into a video that depicted the participants performing all the steps of the task in succession. The videos included written instructions and voiceovers of the instructions. The videos were uploaded to Box, an app that enabled the participants to watch their respective videos on a smartphone prior to attempting a task. The effectiveness of the video self-monitoring intervention was evaluated using a multiple baseline across behaviors design. Results indicated the participants performed job-related skills at higher levels after video-self modeling was presented. Social validity data indicated that video self-modeling was an effective, appropriate, and feasible method of teaching job-related skills in vocational settings.

Chapter One: Introduction and Literature Review

The Centers for Disease Control currently lists the prevalence rate of children with Autism Spectrum Disorders (ASD) in the United States to be one in sixty-eight (Baio, 2014). In 2012, over 450,000 students (ages 6-21) in the United States received special education services under the category of autism (United States Department of Education, 2015). The core characteristics of ASD (e.g., social communication, social interaction, restricted and repetitive patterns of behavior) often pose significant challenges for individuals with ASD, their families, and practitioners (American Psychiatric Association, 2013; Bauminger-Zviely, 2014). The aforementioned characteristics of ASD can impact various facets of life, including acquiring and maintaining friendships, progressing through the general education curriculum at school, obtaining employment in adulthood, and the autonomy to participate in society as one desires (Bauminger-Zviely, 2014; Koegel, Koegel, Miller, & Detar, 2014; Mazefsky & White, 2014).

Children with ASD tend to have better outcomes as adults when they receive behavioral intervention and supports earlier in life (Anderson, Liang, & Lord, 2014). However, it is highly likely that individuals with ASD will continue to experience difficulty in social and communicative functioning and exhibit restrictive, repetitive, and stereotyped behaviors, interests, and activities throughout adulthood (Roth, Gillis, & DiGennaro Reed, 2014). Moreover, the rise in incidence of children with ASD indicates there will be greater demand for appropriate services and supports when they reach adulthood (Gerhardt & Lainer, 2011; Roth et al., 2014).

The transition to adolescence and adulthood can be particularly challenging for individuals with ASD, along with their families, due to increased social and academic demands (Koegel, et al., 2014). Vocational and post-secondary educational opportunities for individuals with ASD increase on a yearly basis, yet many of them struggle to access employment, independent living, and community inclusion throughout their adult lives, particularly when compared to non-disabled, same-aged peers (Papay & Griffin, 2013; Roux, Shattuck, Cooper, Anderson, Wagner, & Narendorf, 2013; Henninger & Taylor, 2012). Although many individuals with ASD make moderate to significant progress in their functional skills by adulthood, the need for lifelong behavioral intervention and support remains (Tobin, Drager, & Richardson, 2014).

Autism Spectrum Disorders

Diagnostic criteria. ASD can be reliably detected by the age of 2 and sometimes as early as 18 months (CDC, 2015). Along with diagnostic tools, health professionals refer to the American Psychiatric Association (APA) Diagnostic and Statistical Manual of Mental Disorders (DSM-5) when considering an ASD diagnosis. The following standardized criteria are considered: (a) persistent deficits in social communication and social interaction across multiple contexts, (b) restricted, repetitive patterns of behavior, interests, or activities, (c) symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies later in life), (d) symptoms may cause clinically significant impairment in social, occupational, or other important areas

of current functioning, (e) these disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global development delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level (APA, 2013).

Intervention research. The rise in incidence of ASD throughout the United States underscores the need for research-validated interventions and supports for individuals with ASD throughout the trajectory of their lives. The vast majority of research on interventions for individuals with ASD is concentrated on children (Koegel, et al., 2014). The focus on young individuals with ASD is logical; the acquisition of effective communicative and behavioral skills enhances opportunity for learning throughout the rest of childhood (Green, Drysdale, Boelema, Smart, van der Meer, Achmadi, & Prior, 2013). Due to strong empirical support, parents/caregivers commonly requested early intensive behavioral intervention (EIBI) for young children with ASD and practitioners frequently recommend EIBI as a treatment approach (Reichow, 2012).

Much progress has been made over the past decade to identify effective practices for supporting children with ASD. Simpson (2005) evaluated common interventions and approaches for children with ASD and used current empirical support to identify practices that could be labeled as (1) scientifically-based practice, (2) promising practice, (3) limited supporting information for practice, and (4) not recommended. The findings listed by Simpson (2005) bolstered the

use of four scientifically based practices for children with ASD: (1) Applied Behavior Analysis (ABA), (2) Discrete Trial Teaching (DTT), (3) Pivotal Response Training (PRT), and (4) Learning Experiences: An Alternative Program for Pre-Schoolers and Parents (LEAP). DTT, PRT, and LEAP all incorporate aspects of ABA. For example, time-delay prompts are commonly used with DTT, while incidental teaching aligns with the naturalistic components of PRT. Additionally, PRT and LEAP are categorized as Comprehensive Treatment Models (CTMs) (Odom, Boyd, Hall, & Hume, 2009).

A CTM is a set of focused intervention practices (e.g., DTT, self-monitoring) structured on a common conceptual framework (Odom, et al., 2009). CTMs contain a set of components that are implemented in a formalized manner. CTMs vary in their efficacy, implementation fidelity, and social validity, but the associated operationalized procedures are attractive to researchers and practitioners because they are replicable (Odom, Boyd, Hall, & Hume, 2014; Odom, et al., 2009). Of the thirty sites that created CTMs (e.g., Lovaas Institute, Eden Institute), only seven provide services to adults with ASD (Odom, et al. 2009). Without diminishing the urgency of research and needed supports for children with ASD, it appears the need for appropriate supports and services for adults with ASD has largely been overlooked.

Currently, the amount of research on adolescents and adults with ASD pales in comparison to research on children with the same diagnosis (Howlin, 2014). The National Autism Center reviewed articles that covered educational and behavioral intervention for individuals with ASD (National Standards Project,

2015). Subsequently, fourteen interventions were identified as Established for individuals with ASD less than twenty-two years of age, while Behavioral Intervention was the sole Established Intervention recognized for adults with ASD ages twenty-two and older (National Standards Project, 2015). Moreover, eighteen interventions were designated as Emerging for individuals with ASD less than twenty-two years of age, while Vocational Training Package was the only Emerging Intervention for adults with ASD ages twenty-two and older (National Standards Project, 2015).

Although the body of literature on adults with ASD is substantially smaller than the research on children with ASD, recent trends indicate a significant increase. For example, Mazefsky and White (2014) identified an increase of research on adults with ASD over the past twenty-five years. Only ninety-three peer-reviewed articles on adults with ASD were identified from 1990-1999, contrasted by 285 articles from 2000-2009. The field of research focused on adults with ASD appears to be rapidly adapting as 199 articles on adults with ASD were identified from 2010-2012. Although the surge of interest is encouraging, the current and anticipated funding and research dedicated for adults with ASD is unlikely to adequately support the large population of individuals with ASD transitioning into adulthood (Mazefsky & White, 2014).

The lack of research on adults with ASD has been identified as a concern, and the more recent increase in studies on adults with ASD indicates that many are working to address the issue (Mazefsky & White, 2014; National Standards Project, 2015; Roth et al., 2014). Like the increase in research on children with

ASD years ago, the body of literature on adults with ASD will need to grow substantially to identify Established Interventions for this underserved population (National Standards Project, 2015). Simply put, additional research on adults with ASD must be conducted if they are to have access to comparable supports as children with ASD. Thus, the need for research on interventions for adults with ASD is a worthwhile and warranted pursuit.

School-age children with ASD. Although the focus of this study is adolescents and adults with ASD, it is important to consider experiences of children with ASD, particularly because the skills they do or do not acquire are likely to impact adulthood outcomes (Anderson et al., 2014). The number of students in the United States receiving special education services under the category of autism continues to increase on a yearly basis (United States Department of Education, 2015). Transitioning from one setting to the next (e.g., pre-school to elementary school, elementary school to middle school) is often difficult for children with ASD due to increased social demands, academics shifting from concrete to abstract concepts, and changes in school routine and structure (Bauminger-Zviely, 2014, Koegel et al., 2014).

School-age children with ASD comprise between 1-2% of the school population in the United States, and the multidimensional deficits many of them exhibit present a complex and substantial challenge for supporting educators and family members (Bauminger-Zviely, 2014). Additionally, school-age children with ASD have been reported to be four times more likely to be bullied by their peers than their typically developing peers (Little, 2002). They are also more

likely to be identified with additional diagnoses (e.g., learning disabilities, speech impairments) than children without ASD (Montes & Halterman, 2006; Bauminger-Zviely, 2014). Although the progression from kindergarten through high school is rife with hurdles and unexpected difficulties for most students, the ever-changing routines, increase in social demands, and push for greater autonomy can be particularly difficult for students with ASD and their families.

On a more encouraging note, the decade following the release of Simpson's (2005) evaluation of scientifically based interventions for children with autism has brought with it an ever-expanding body of literature. Parents, educators, and other stakeholders now have access to fourteen Established Interventions for children with ASD, including Behavioral Interventions, Modeling, Parent Training, Pivotal Response Training, Self-Management, and Story-based Intervention (National Standards Project, 2015). Given the complexities associated with ASD, stakeholders now have options for evidence-based interventions that can target specific priorities of individuals on a case-by-case basis. For instance, as multidisciplinary teams discuss appropriate interventions for specific children with ASD, they can choose interventions according to social-significance, developmental levels, cognitive functioning, habilitation, and priorities of the child and family. Although the challenges that school-age children with ASD face will not disappear, a solid body of research informs appropriate and effective practice for supporting this population (National Standards Project, 2015).

Adult outcomes. As with all students, the goal is for individuals with ASD to acquire skills throughout childhood and adolescence that will be applied throughout adulthood. Ideally, the skills that students acquire during their school years will increase the likelihood of having the choice to pursue post-educational and/or vocational opportunities. Habilitation is an important concept when considering behavioral intervention (Cooper, Heron, & Heward, 2007) because all stakeholders must consider and prioritize the possible short-term and long-term impact of acquiring and applying specific skills.

The study of outcomes of individuals with ASD is important because it provides an idea of the degree of habilitation they have historically accessed. Starting with longitudinal research conducted by Kanner (1971), Henninger and Taylor (2012) analyzed over three decades of research focused on outcomes of adults with ASD. Twenty-eight years after identifying eleven children with "inborn autistic disturbances of affective contact", Kanner (1971) located six of the individuals in adulthood. He found two of the individuals achieved favorable outcomes because they were able to successfully engage in work, social, and community activities. The remaining four individuals had all been placed in institutions and were found to demonstrate unfavorable outcomes such as regression in language skills. The results of other outcome reports from this era (Rutter, Greenfeld, & Lockyear, 1967; Lotter, 1974) are difficult to consider as a whole because of sample size variance, latency of follow-up, populations, and differences in criteria used to determine successful outcomes (Henninger & Taylor, 2012). Although hampered by a lack of clear and reliable outcome

criteria, the consensus gleaned from the reports was the majority of individuals with ASD experience poor outcomes in adulthood.

Recognizing the lack of standardization, researchers in the early 2000s sparked the second era of studying outcomes for adults with ASD. Howlin, Goode, Hutton, & Rutter (2004) proposed a global rating scale called the Overall Outcome Rating (OOR) scale. The OOR rates the outcome of adults with ASD by considering domains of work, friendship, and independent living. To illustrate, a score between 0-2 is labeled as *very good*, meaning that the individual has friends, a job, and a high level of independence. Conversely, a score of 11 is labeled as *very poor* due to requiring a high-level of hospital care while having no friends or autonomy. Though the OOR scale provided a more rigorous method of scoring outcomes studies for adults with ASD, the results mirrored those identified by Kanner (1971) in the era of frequent institutionalization (Henninger & Taylor, 2012; Eaves & Ho, 2008; Howlin et al. 2004). To illustrate, Howlin et al. (2004) collected outcome data with the OOR scale on sixty-eight adults with ASD born between the years of 1959-1979. At the time of data collection, 4% of the sample lived independently, 13% were independently employed, and less than 50% had significant friendships. Subsequently, 57% of the adults with ASD experienced *poor* to *very poor* outcomes (Howlin et al., 2004; Henninger & Taylor, 2012).

The third and present era of examining outcomes for adults with ASD blends the previously mentioned standardized procedures with added measures of the relationship between the individual and the surrounding environment. Billstedt, Gillberg, and Gillberg (2010) supplemeted the OOR (Howlin et al.,

2004) with two additional categories: (1) Autism-Friendly Environment, and (2) Parent-Carer-Rating of Individual's Well-Being. When Billstedt et al. (2010) added the two additional categories to results collected six-years prior, a dramatic difference in results was obtained (Billstedt, Gillberg, and Gillberg, 2005; Henninger & Taylor, 2012). The 2005 results indicated 78% of the sample met the criteria for the *poor* or *very poor* category, whereas 62% of the sample were in the *good* or *very good* category for "Autism-Friendly Environment" (Billstedt et al., 2005; Billstedt et al., 2010). Additionally, the 2011 data indicated that 91% of parents/caregivers of the sample group of adults with ASD rated the residential outcomes to be *good* or *very good*, even though 87% of the sample group lived in their parents' homes or in community-based group homes (Billstedt et al., 2005; Billstedt et al., 2010; Henninger & Taylor, 2012). Supplementing standardized scores based on societal norms with the individual's subjective outlook may reveal a more nuanced and complete representation of outcomes for adults with ASD (Henninger & Taylor, 2012).

Furthermore, research on employment outcomes for adults with ASD indicates that this population has less favorable outcomes in comparison to other young adults with different disabilities (Roux, Shattuck, Cooper, Anderson, Wagner, & Narendorf, 2013). Using data from the National Longitudinal Transition Study-2 (NLTS2), Roux et al. (2013) analyzed postsecondary employment outcomes of adults with ASD. The study found that approximately half of young adults with ASD obtain competitive employment within the first eight years after high school. Surprisingly, adults with ASD with higher cognitive

ability remain unlikely to be employed, perhaps because more supports are available to adults (with and without ASD) who are diagnosed with intellectual disabilities (ID) (Taylor & Seltzer, 2011). In comparison with adults diagnosed with ASD and ID, adults with ASD without ID were identified as three times more likely to have no formal day activities after high school (Taylor & Seltzer, 2011). Taylor & Seltzer (2011) indicate a group of adults with ASD is currently underserved because their functioning is not severe enough to receive adult day services, but do not have the skills to function independently. Moreover, Roux et al. (2013) found that adults with ASD who were from higher income households, and who applied better social skills or functional skills (e.g., telling time, counting change, finding phone numbers and using a phone) were more likely to obtain employment.

Wehman et al. (2014) conducted a randomized clinical trial of participants in Project SEARCH, a 9-month internship for youth with developmental disabilities to participate in job skills training at a large community business. Reaching a wide variety of individuals, Project SEARCH is not disability specific. Every member of the sample group had a medical diagnosis or educational identification associated with ASD (i.e., Autism, Pervasive Developmental Disorder-Not Otherwise Specified, and Aspergers Disorder). Along with the standard Project SEARCH program, the treatment group also received supports specific to ASD. The supports included intensive instruction using principles of applied behavior analysis (e.g., discrimination, generalization, self-monitoring, self-reinforcement, stimulus transfer to fade control from training

stimuli to naturally occurring supervision activities) along with on-site supervision and feedback from a behavior/autism specialist. The results of the study highlight the need for additional research of specific supports for adults with ASD on jobsites, particularly techniques that are aligned with applied behavior analysis. At the conclusion of the study, 21 of the 24 treatment group participants acquired employment, while only 1 of 16 of the control group achieved the same result. The participants who were hired obtained a wide variance of positions (e.g., pharmacy technician, teacher's aide, clerical assistant) and their wages were up to 24% above minimum wage (Wehman et al., 2014). Wehman et al. (2014) indicate that their study is the first randomized clinical design to evaluate employment outcomes for youth with ASD. At time of publication, Wehman et al. (2014) noted maintenance data would be collected at the twelve-month and twenty-four-month periods. Although the results were encouraging, Wehman et al. (2014) acknowledged the relatively high-functioning skill levels of their participants may impact the generalizability of their findings. To further analyze the efficacy of Project SEARCH plus the ASD Supports model, it was suggested that additional research be conducted (Wehman et al., 2014).

For many individuals with ASD, improvement in behavioral skills and deficits associated with ASD significantly slows after the completion of high school (Taylor & Seltzer, 2010). Walton and Ingersoll (2013) suggest that social skills support remains important throughout adulthood for individuals with ASD because the progress made on their social skills may not be commensurate with

the progress made toward other skills (e.g., vocational, self-care). Moreover, some individuals with ASD may experience increased difficulty in adulthood due to lack of independence, limited employment opportunities, and inadequate behavioral supports and services (Mazefsky & White, 2014). Of utmost concern, Shattuck, P. T., Narendorf, S. C., Cooper, B., Sterzing, P. R., Wagner, M., & Taylor, J. L., (2012) list individuals with ASD from lower-income families and greater functional impairments to be more likely to experience poor outcomes in adulthood.

The common outcomes of adults with ASD highlight a need for increased opportunity to access appropriately supportive post-secondary and vocational education for this population (Roux et al., 2013). Adolescents and adults with ASD continue to require supports that promote independence and self-monitoring, which increases the likelihood that they will achieve successful outcomes throughout their lives (Hume, Loftin, & Lantz, 2009). If adults with ASD are to experience better outcomes, it is crucial to identify research-based interventions that will increase their habilitation in vocational, community, and post-educational settings. To address this gap, the focus of the research described in this manuscript is intended to increase the current knowledge on effective behavioral interventions for adolescents and adults with ASD in vocational settings. The following text will elaborate on a promising method of supporting individuals with ASD, video-based intervention (VBI).

Video-based Intervention

VBI has been a commonly researched topic for supporting children with ASD, particularly within the last decade (Bellini & Akullian, 2007). Video modeling, under the broader category of modeling, has been identified as an Established Intervention for children with ASD (Bandura, 1977; National Standards Project, 2015). Meta-analyses by Bellini and Akullian (2007) and Delano (2007) identified VBI as effective because it employs visually cued instruction, a learning modality that is commonly effective for children with ASD. Additionally, VBI is a dynamic tool that can be used to address various targets such as social-communicative skills, functional skills, and perspective taking skills (Delano, 2007). Before one determines the type of video-based intervention to create and implement with a student or client, a clear understanding of the target behavior and desired results must be identified (Bellini, 2006).

Types of video-based intervention. Although VBI continues to evolve, it is typically classified between four categories: (1) other as model, (2) self as model, (3) subjective video modeling, and (4) video prompting (Delano, 2007; Sigafoos et al., 2005; Sigafoos, et al., 2006; Rayner, 2010). The *other as model* method entails creating a video in which a separate individual from the observer, perhaps a teacher or peer, performs the targeted behavior. In the *self as model* method, the viewer serves as the model in the video. Prior to viewing, the video is edited to depict only the desired behavior or task. It is important to note that researchers in the field use different terms for the same concepts. In other literature, *other as model* videos may be labeled “video modeling” (VM), while

self as model videos are also called "video self-modeling" (VSM); (Buggey, 2009).

There are two methods of VSM: (1) feedforward, and (2) positive self-review (Bellini, 2006). In the feedforward method, the observer is recorded engaging in a new, yet developmentally appropriate behavior. This is often achieved by splicing elements of many different videos to create a representation of the individual engaging in the desired behavior. For example, clips of a student who typically only speaks in one or two-word utterances could be combined to depict the student speaking a full sentence. Positive self-review is used to increase fluency or proficiency on a skill the observer has already acquired. To illustrate, students may watch videos of themselves appropriately making a request of a teacher with the intent of increasing further initiation.

Subjective video modeling (SVM) involves recording video clips that depict an individual's point-of-view, meaning the viewer of the video watches the hands of the subject on the video complete a task (McCoy & Hermansen, 2007). Subjective video modeling may be particularly useful for tasks that primarily involve using hands (e.g., cooking, assembling small objects) because the videos can closely parallel what the individual will see when attempting to complete the task.

Video prompting is a method that can use VM, VSM, or SVM video clips. Instead of watching the behavior chain from start to finish, the viewer watches each step individually. After watching a clip, the viewer performs the task that was demonstrated in the specific step shown on the video. Once the task has been

completed, the viewer watches the next clip and completes the related task after viewing. This process repeats until the viewer has completed every step included in the task analysis for the specific skill (Sigafoos, O'Reilly, & de la Cruz, 2007).

One benefit of VBI is the flexibility to tailor the content and presentation according to the needs of the individual. Additionally, VBI promotes consistency because the videos may be viewed repeatedly, as opposed to the variance that might occur if a teacher or coach modeled a behavior across different times and settings. The ability to watch videos over extended periods of time and without direct supervision from an instructor makes VBI a practical and potentially cost-effective method of intervention (Sigafoos et al., 2007).

Video-based intervention for adults with ASD. VBI for adults with ASD is a field that is relatively unexplored. For instance, Roth et al. (2014) conducted a meta-analysis of behavioral interventions for adolescents and adults with ASD. For articles to be included in the meta-analysis, they had to meet the following criteria: (1) contain at least one participant with ASD, (2) the participant with ASD had to be at least 12 years old, (3) an intervention was evaluated that used principles of applied behavior analysis, (4) intervention targeted specific skills (e.g., social skills, vocational skills), (5) study employed single case research, (6) results were presented in a line graph, (7) article appeared in peer-reviewed journal, (8) article was published within the last 20 years, and (9) the article was written in English. Of the forty-three articles that met the criteria, only eleven employed VBI in any form (Roth et al., 2014).

Specifically, of the eleven articles identified in Roth et al. (2014), one

article addressed academic skills (Delano, 2007), eight articles addressed adaptive skills (Cannella-Malone, H., Sigafoos, J., O'Reilly, M., de la Cruz, B., Edrisinha, C., & Lancioni, G. E., 2006; Edrisinha, C., O'Reilly, M. F., Choi, H. Y., Sigafoos, J., & Lancioni, G. E., 2011; Goodson, J., Sigafoos, J., O'Reilly, M., Cannella, H., & Lancioni, G. E., 2007; Mechling, L. C., Gast, D. L., & Seid, N. H., 2009; Rayner, 2010; Rayner, 2011; Sigafoos, J., O'Reilly, M., Cannella, H., Upadhyaya, M., Edrisinha, C., Lancioni, G. E., 2005; & Sigafoos, J., O'Reilly, M., Cannella, H., Edrisinha, C., de la Cruz, B., Upadhyaya, M., 2006), and two articles addressed vocational skills (Allen, K. D., Wallace, D. P., Greene, D. J., Bowen, S. L., & Burke, R. V., 2010a; & Allen, K. D., Wallace, D. P., Renes, D., Bowen, S. L., & Burke, R. V., 2010b).

Although video modeling has been demonstrated as effective for many children with ASD (Wang & Spillane, 2009; Bellini & Akullian, 2007), Roth et al. (2014) identified similar results for adolescents and adults with ASD. It should be noted that all three of the aforementioned meta-analyses identified medium effects for VBI. Wang & Spillane (2009) and Bellini and Akullian (2007) used the percentage of non-overlapping data points analysis (PND) to calculate the effect size, while Roth et al. (2014) used the nonoverlap of all pairs method (NAP) to calculate the effect size. At the very least, the similar conclusions of the meta-analyses suggest further research on VBI for adults with ASD is warranted.

Additionally, seven out of the eleven articles that employed VBI had conclusive certainty of evidence, determined by (1) the use of experimental design (e.g., ABAB), (2) documentation of inter-observer agreement and

treatment fidelity, and (3) experimental control (Roth et al., 2014). Furthermore, six of the eleven articles utilized video prompting, which is a method that involves the observer performing only one step of a task chain immediately after watching the single step on video (Sigafoos et al., 2005; Sigafoos et al., 2006). Of the remaining five articles, one study utilized VSM (Delano, 2007), three studies utilized VM (Allen et al., 2010a; Allen et al., 2010b; & Rayner, 2011), and one study utilized the subjective model method (Rayner, 2010). The subjective model approach involves the observer watching the video as if they were completing the task themselves (van Laarhoven, Zurita, Johnson, Grider, & Grider, 2009). The meta-analysis by Roth et al. (2014) is a step in the right direction, but it highlights the need for additional research for it to be an intervention that is as established for adults with ASD as it is for children with ASD. Moreover, the variance in research of addressing target skills (e.g., academic, adaptive, vocational) for adults with ASD using VBI means that research to support using the method to address specific skills is extremely limited.

Vocational skills. Vocational skills training and support is a logical and practical method of addressing concerns about adults with ASD obtaining and maintaining employment. Wilczynski, Trammell, and Clarke (2013) responded to the substantial underemployment by reviewing workplace supports for adults with ASD. Several of the supports utilize individuals and systems already in place at the job, such as on-site job trainers, trade associations, unions, and coworkers. Video supports are listed as an attractive method of teaching vocational skills in

the workplace because VBI allows for accurate visual supports that demonstrate the desired skills and behavior (Wilczynski et al., 2013).

Returning to the meta-analysis on behavioral interventions for adults with ASD by Roth et al. (2014), only two of the eleven studies that utilized VBI targeted vocational skills. Both studies used the VM approach to teach individuals with ASD to interact with customers in a retail setting while wearing a mascot suit (Allen et al., 2010a; Allen et al., 2010b). The dependent measures were behaviors one would typically see in a mascot, such as waving, shaking hands, and giving high-fives. A 15-second partial interval system was used to record the behavior. Allen et al. (2010a) determined that engaging in one of the behaviors identified as dependent measures needed to occur in a minimum of 30% of the intervals to be appropriately meet the responsibilities of the job as mascot.

In both studies, a multiple baseline across participants design was utilized to examine the effects of video modeling. During baseline, the participants were allowed to stand in the store with the costume and were given no specific instruction on how to perform their job responsibilities. During the intervention phase of the design, the participants took a break for the retail floor and viewed both a scripted and naturalistic VM of the mascot. When the participants returned to the retail floor, they were given the same verbal prompt as in the baseline condition. If the success criterion was not met, both videos were repeated during the subsequent break.

A six-point Likert-type scale was given to the participants to gauge the social validity of the intervention based on the comfort level and willingness of

the participants to perform a job that required wearing a mascot costume. Inter-observer agreement (IOA) was scored during 35% of observations. IOA was recorded by calculating the number of agreements between observers on the occurrence of multiple target behaviors, dividing the number of agreements plus disagreements on occurrence, and multiplying by 100. The IOA between four individuals who collected data ranged from 75%-100%.

A follow-up session was conducted a month later. The participants were shown the video prior to wearing the costume on the retail floor, but three of the four did not meet the criterion. After viewing the videos for a second time, all three participants increased their skill application to 35%-40% of the intervals. The participants rated the experience as acceptable, with the social validity average scores ranging from 4.8-5.9 out of 6.0.

Significance of Study

Gerhardt and Lainer (2011) note that a large gap currently exists between the research on behavioral interventions for adults with ASD and actual practice. Roth et al. (2014) strongly encourage conducting additional studies to bolster the certainty of evidence for this specific population. The rising incidence of children diagnosed with ASD in the United States (Baio, 2014) leads one to logically conclude that there will continue to be a need for effective and appropriate behavioral interventions for individuals with ASD as they reach adulthood. The significance of this study is that it contributes to an area of research that is currently insufficient for the population it targets, adults with ASD.

Purpose of Study

The purpose of this study was to analyze the impact of video self-modeling on the acquisition and application of vocational skills by young adults with ASD. Additionally, the social validity of using video self-modeling in an employment setting was examined. In a broader sense, this study contributed to the literature on vocational skills intervention for adults with ASD. More importantly, the involvement of the participants potentially increased their habilitation. Specifically, the acquisition, application, and maintenance of vocational skills may positively impact the participants over the course of their adult lives. Successful job performance may lead to consistent financial income, involvement in the community at large, and the possibility for career growth and development.

Research Questions

Therefore, this study adds to the knowledge about behavioral interventions for adults with ASD by answering the following research questions:

1. Will video self-modeling increase independent completion of vocational tasks performed by young adults with ASD?
2. What is the social validity of using video self-modeling as an intervention in a vocational setting?

Delimitations

The research was conducted from March 2017 - May 2017. The participants were members of a Midwest postsecondary program and could range from 18-25 years of age. Video self-modeling was used to target vocational skills

for each participant. The video self-modeling intervention took place at the employment locations of the participants.

Chapter Two: Methods

Participants

Three participants were selected from the group of current students in a Midwest postsecondary program, in which students with intellectual and developmental disabilities earn a certificate after two years. Purposive sampling was used to create a homogenous sample, meaning the demographics and traits of the participants met specific criteria. The purpose of this research was to help fill the current knowledge void in the topic of behavioral interventions for adolescents and adults with ASD, particularly in the area of acquiring and applying vocational skills.

Table 1*: Midwest Postsecondary Program Eligibility Criteria*

Demographic Information
18-25 years of age Documented intellectual or developmental disability
Education Experience
Attending and participating in classes for up to 50-90 minutes at a time High school completion with a modified/standard diploma or certification of program completion
Commitment and Requirements
Two-year (four semesters) college certificate program and take 4 to 8 hours of classes per week Be able to follow the Student Standard of Conduct Demonstrate a strong interest or desire to pursue post-secondary education to expand career & life opportunities Demonstrate a strong interest or desire to pursue post-secondary education to expand career & life opportunities Have experience staying overnight without parent supervisions (camp, class trip, relatives' home)
Prerequisite Skills
Be able to spend time alone and manage own self-care Be able and willing to learn and participate in inclusive classroom and work settings

For the purpose of adding to the literature on behavioral interventions for adults with ASD, the researcher determined that students in the program required a current diagnosis of ASD and employment in a vocational setting to be considered as potential participants in the study.

IRB approval (see Appendices A-E) was obtained on February 23, 2017. Since all of the students were identified with an intellectual or developmental disability, a full review by the IRB was conducted to ensure appropriate protections were in place for the participants.

Once IRB approval was obtained, the researcher presented information about the study to two separate classes of students to recruit participants. Potential participants signed Assent to Participate forms or obtained a signature from a legal guardian on a Consent to Participate form.

Initially, three participants were selected to participate in the study. Data collected on one of the initial participants was not included because the individual withdrew from the study due to personal reasons unrelated to the research. Subsequently, another participant was added to the study. Another one of the initial three participants was withdrawn from the study due to an unanticipated change in job assignments after intervention had already been initiated, which left insufficient time to collect the necessary data before the semester concluded. Therefore, the study was conducted with two participants.

Participant 1. At the time of the study, Participant 1 was twenty-two years of age. He was diagnosed with autism spectrum disorder. He was a first-year student in a Midwest postsecondary program and was employed with the University

Facilities Management department. His job responsibilities included sweeping the stairs in parking garages, picking up litter around campus, and assembling notebooks out of recycled materials.

The Midwest postsecondary program provided previous assessment results to the researcher for the purpose of providing insight into Participant 1's cognitive/intellectual functioning. According to the Comprehensive Test of Nonverbal Intelligence – Second Edition (C-TONI-2), Participant 1 had a Full Scale score of 74 (5^{th} percentile). Additionally, Participant 1's cognitive abilities were assessed through the Differential Abilities Scale (DAS). The Verbal Scale score was 103 and was the only section of the DAS administered to Participant 1. Both assessments were conducted by the school district in which Participant 1 was enrolled in the spring of 2010.

Participant 1's strengths included his persistence on academic tasks, use of humor in interactions with others, participation in classes, and creativity. His weaknesses included basic reading skills, reading comprehension, written expression, language skills, and social skills. Participant 1 was typically quiet in the presence of other peers and worked best in small group settings. He experienced difficulty in initiating and maintaining conversations. Throughout his educational career, Participant 1 benefitted from receiving accommodations for extended time on assignments and assessments.

Participant 2. At the time of the study, Participant 2 was twenty years of age. He was diagnosed with autism spectrum disorder and attention deficit hyperactivity disorder. He was a first-year student in a Midwest postsecondary

program and was employed with the University Grounds department. His job responsibilities included operating a push lawn mower, operating a trimmer, and operating a leaf blower.

The Midwest postsecondary program provided previous assessment results to the researcher for the purpose of providing insight into Participant 2's cognitive/intellectual functioning. According to the Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV), Participant 2 had a Full Scale score of 81, Verbal Score of 87, Perceptual Reasoning score of 88, Working Memory score of 71, and a Processing Score of 91. The assessment was conducted by the school district in which Participant 2 was enrolled in the fall of 2011.

Participant 2's strengths included his persistence on academic tasks, providing assistance to others, and doing activities that required him to use his hands. Additionally, Participant 2 communicated that he enjoyed working outdoors. Participant 2's weaknesses included initiating social interactions with peers, advocating for himself, and following multi-step directions.

Throughout his educational career, Participant 2 benefitted from receiving accommodations for additional time on assignments, breaking assignments down to smaller parts, and directions given in multiple ways (e.g., oral, written). Participant 2 enjoyed playing video games and watching television shows as leisure activities. He communicated that he would like to gain employment as a park ranger in the future.

Identified Target Tasks

Prior to conducting the study, the researcher contacted the supervisor of each participant. The researcher asked the job supervisor to provide at least five different job tasks that were not yet in the participant's repertoire. Based on information provided by the supervisor and participant, the researcher selected three tasks to target based on significance, feasibility, potential for habilitation, and participant preference.

Once the three target tasks were selected, the researcher, supervisor, and participant prioritized the order in which the tasks would be addressed. The purpose of prioritizing the target tasks was to address the highest areas of need first.

Next, the researcher created task analyses for each of the target tasks to be addressed through VSM. The task analyses were created by asking the job supervisor or a co-worker who was already fluent with the task to perform each of the steps of the task. The researcher wrote a list of the steps. The participants were not involved in the creation of the task analyses to prevent the introduction of confounding variables to the study.

Table 2: Identified Target Tasks

Participant	Task 1	Task 2	Task 3
1	Sweeping Stairs	Assembling Notebooks	Cutting Materials
2	Starting a Mower	Starting a Trimmer	Starting a Leaf Blower

Settings

The participant observations were conducted at their places of employment, with the permission of their job supervisors. The videos were recorded in the same locations in which the tasks were typically performed. The participants used the same (or identical) materials as those depicted in their videos.

Participant 1's tasks took place in two separate locations. The first task, sweeping the stairs, occurred in the stairwells of two parking garages located near the northeast corner of the campus. Participant 1 typically performed this task on a weekday between 9:00-10:00 a.m., at least once per week. Participant 1's two remaining tasks (i.e., assembling notebooks, cutting materials) were performed in the Facilities department offices between 9:00-10:00 a.m., at least once per week.

Participant 2's tasks typically took place in the garage of the Grounds department, which is located near the northeast corner of the campus. The observer met Participant 2 at 6:45 a.m. to collect the data points before he joined his co-workers on their daily assignment. There were two separate instances in which the observer met Participant 2 at different locations on campus because the Grounds crew started working earlier in the morning than expected. During the study, Participant 2 worked at least twice a week. It should be noted that his job responsibilities were subject to change on a daily basis due to the weather status.

Research Design

The study was conducted with a multiple baseline across behaviors design. Multiple baseline designs (MBL) allow (1) for the demonstration of change while

(2) inferring that it is unlikely that anything other than the independent variable impacted the dependent variable. Multiple baseline designs promote both goals listed above by "(a) ensuring that manipulation of the independent variable is active rather than passive, (b) incorporating replication of at least three basic effects, and (c) staggering onset of the independent variable across at least three different points in time" (Kratochwill & Levin, 2015).

Initially, baseline data were collected on each of the three target tasks. Once the first target reached a stable baseline, the intervention phase was initiated. While intervention was implemented on the first target, baseline data continued to be collected on the remaining two targets. Once an upward trend across three consecutive data points for the first intervention occurred, the intervention for the second target was delivered, while continuing to collect baseline data on the third target. When an upward trend across three consecutive data points for the second intervention occurred, the intervention for the third target was delivered.

Graphs were created for each participant and their respective targets. The graphs allowed for visual inspection of the intervention results. The x-axis of the graph represents the data collection sessions. The y-axis of the graph represents the percentage of steps in the task analysis the participant accurately performed on that date. The graphs contain a baseline phase, intervention phase, identify when mastery occurred, and contain maintenance data points on previously mastered targets.

Dependent Measures

Instruments. The primary measure was observational data checklists created for each separate targeted task of the respective participants. The checklists (see Appendix G) were comprised of task analyses, which meant the target tasks were broken down into discrete, observable steps. The observer(s) recorded whether specific steps were or were not successfully performed, including identifying whether the participant watched the video prior to attempting to perform the skill. The participants were video recorded performing the targeted tasks. The videos were uploaded to the Box app for the researcher to observe and record data. The primary dependent measure was calculated by dividing the number of accurately performed steps within the task analysis by the total number of steps in the task analysis and multiplying that number by 100. The mastery level for each task of both participants was 80% over three consecutive data collection sessions.

The secondary measure was an informal interview guide (see Appendix H). Interviews were conducted with the participants and their job supervisor at the conclusion of the study to assess the social validity of the VSM intervention. The interviews were semi-structured and allowed for open-ended discussion between the researcher and the respondents (Merriam, 2016). Additionally, the interviews were recorded and transcribed. The participants and job supervisor were asked different questions that pertained to their respective roles.

Materials

Videos. Each participant had three target tasks that were demonstrated through video self-models. The videos were specifically created for the

participants individually. The participants were only able to access their own videos.

The videos were recorded with an iPhone 6 and edited using iMovie 10.1.2. Each step shown on the video contained white text on a black background placed at the bottom of the screen that labeled the action depicted on the video clip. The clips with text included a voice-over in which the text was read verbatim in case the participant(s) could not read the words. The researcher organized the clips in the order they were listed in the task analyses. The researcher used the best examples of the steps that were performed. Any inaccurate or irrelevant clips were not included in the final video. Once the video was completed in iMovie, the researcher bounced the video to an .mp4 file and uploaded the file to the Box account designated for the specific participant. The duration of the videos created ranged from twenty-seven seconds to sixty-three seconds.

Video streaming. The researcher subscribed to Box, a video streaming service. Among several different options, Box was selected due to price, quality of technical support, and reliability of the app. The researcher created a separate account for each participant, in which they were given their own username and password to access the videos. The participants were only able to access the videos of their own targeted tasks. The researcher's Box account included access to data on the respective participants, including the frequency, time, and duration of specific video viewing by each participant. The videos were not uploaded to the accounts of the participants until the specific target skill reached the intervention phase.

Video self-models. Once the baseline data collection phase was complete, the researcher used the task analysis created with the employer or job coach to record the participant accurately performing each step of the task. If necessary, the steps of the tasks were recorded one at a time. The video files were stored on the researcher's iPhone 6 and uploaded to the researcher's MacBook Pro. The researcher edited and uploaded the video self-models to Box and deleted the videos from the iPhone and Macbook. After the first targeted skill reached the mastery level, the second video was recorded. The third targeted skill continued to be in the baseline data collection phase until the second targeted skill reached the mastery level. Once the second targeted skill reached the mastery level, the third video was created to address the last target skill.

Devices. The researcher recorded all the necessary clips with an iPhone 6. The videos were edited, bounced, compressed, and uploaded to a streaming service, Box, with a MacBook Pro. The participants used a device (e.g., smart phone, tablet, media player) to access the video self-models prior to performing the targeted tasks. The device had to be capable to access the App Store (Apple iOS) or the Google Play Store (Android) to download the Box app. It was necessary for the device to reliably access and play the videos in their entirety.

Internet access. The researcher required internet access to upload the completed video self-models to the video streaming service. The participants needed WIFI access or 3G/4G wireless data access to stream the videos at their place of employment. To test this prior to the study, the researcher uploaded test videos to the accounts of the participants on Box to ensure they could be streamed

reliably at their place of employment. The test videos were similar in duration and file size as the estimated size of the videos that would be created for the purpose of the study. The Box app also provided the option of being able to watch the videos "offline", meaning the participants could choose to download the video, negating the need for internet access. Although available offline, the videos were still only accessible through the password-protected Box app.

Procedural Reliability

The researcher used a checklist created by LaCava (2008) (see Appendix J) to monitor the treatment fidelity of the video self-modeling intervention over the course of the study. The checklist was completed by the researcher at least once in the baseline phase and at least once in the intervention phase per each participant.

Data Analysis

A visual inspection of the data was used to analyze the impact of the video self-models on the accuracy of the participant performance on their targeted tasks. The specific tasks were considered to reach mastery when the participants performed at or above the accuracy level (80% for all three tasks) across three consecutive data points. Graphs documenting task performance were created for each participant using Microsoft Excel. The percentage of steps completed correctly during baseline phase were compared to data points from intervention and maintenance phases (Kellems & Morningstar, 2012).

Inter-observer agreement. Inter-observer agreement (IOA) was

calculated for 34% of the data collection sessions in this study. IOA was obtained by having a second observer analyze videos of the participants performing their respective tasks and record a score using an identical data collection sheet to the one used by the researcher. The point-by-point agreement ratio (the number of agreements divided by the number of agreements plus disagreements then multiplied by 100) was used to calculate inter-observer agreement (Kazdin, 1982). Observations were considered reliable if at least 80% IOA was achieved for each observation (Kellems & Morningstar, 2012). IOA was calculated for 38% of all baseline data collection sessions in this study and the agreement ranged from 83% to 100% (*M* = 88%). IOA was calculated for 31% of all intervention data collection sessions in this study and the agreement ranged from 83% to 100% (*M* = 97%).

Social validity. The interviews were recorded and then transcribed. Data were coded and analyzed by constructing categories, sorting categories and data, and identifying themes and patterns (Merriam, 2016).

The process was initiated by identifying segments in the data that were pertinent to the research questions posed in this study. The researcher read a transcript and wrote observations and questions about potentially important data in the margins. Once the researcher completed the open-coding (Merriam, 2016), he grouped the notes that shared characteristics. The same method was repeated for the remaining transcripts, while simultaneously considering the groupings that were identified in the first transcript. Once all the transcripts were analyzed, the grouped data from each transcript were combined into a single list of concepts.

The researcher analyzed the list of concepts and named primary categories after considering (1) the researcher's own perspective, (2) the words of the participants, and (3) the existing body of literature that pertains to this study (Merriam, 2016). After naming the categories, the researcher read the transcripts and related notes again. Data from each interview was sorted under the identified categories. The sorted data were then used to inform a narrative account of the findings.

Procedures.

Once the sample of applicable students was identified, the following criteria were used to recruit participants from the Midwest postsecondary program: (1) the types of vocational tasks to be performed at the jobsite had to be task-analyzed, meaning that the tasks could be broken down to singular, teachable units, (2) a demonstrated need for vocational skills support, as determined by staff, (3) the willingness of student to participate, (4) and the willingness of employer to participate.

Furthermore, the participants had to demonstrate the ability to use a familiar smartphone/tablet/electronic device to view their respective videos. The capability to download apps from the App Store (Apple iOS) or the Google Play Store (Android) for the devices used by the participants was necessary. Though the devices were not required to be the same make or model, they had to be able to play videos through the Box app, a video-streaming service that was available to the participants at no cost on both platforms.

To appropriately access the videos, the participants demonstrated the ability to accurately and reliably complete the following steps: (a) turn on device, (b) locate and select the Box app, (c) sign-in by entering username and password, (d) select correct video to watch, and (e) watch the correct video for the entirety of the clip. Using devices with which the participants were already fluent guided the assumption that the specific devices were not confounding variables.

The procedures for creating the video-self models were as follows:

1. Select targets for intervention by creating a prioritized list of job responsibilities with the participant and the work supervisor and identifying which tasks the participant does not yet know how to complete. The researcher, work supervisor, and the participant should consider the possibility of participant habilitation when selecting targets for intervention with the individual.
2. Create tasks analyses for each target by performing the task yourself, asking an expert, or by observing someone who has already mastered the skill. Write each step as simply as possible. Once the task analysis is written, follow each step to ensure there are no omitted steps or inaccuracies. Create a checklist containing each step to use as a data collection sheet. Determine the level of mastery for each task by checking with the participant's work supervisor.
3. Record baseline data by observing the participant attempt to complete the targeted task. Refrain from providing any kind of prompt (e.g., verbal, gestural, physical) that will impact the participant's performance of the

task. If a participant completes a step of the task correctly, write a "+" on the appropriate section of the data collection sheet. If a participant makes an error on a step of the task, write a "-" on the appropriate section of the data sheet. Calculate the percentage of steps in the task-analysis completed accurately. Create a line graph with data collection sessions on the x-axis and percentage of steps completed correctly on the y-axis. Collect at least four stable baseline data points before providing the intervention. When the baseline data is stable, add a phase change line to the graph to indicate you are moving to the treatment phase.

4. Record each step of every targeted task for each participant. Upload the video clips to a video editing software program (e.g., iMovie, Final Cut Pro). Splice the best examples of each step of a task together and make the transitions as smooth as possible. Use the video editing software to add text for each step. For example, if the clip showed the participant closing a lid, the text on the screen would read "close the lid." Use the video editing software to record voice overlays that mirror the text on the screen. For example, a voice would read aloud the words "close the lid" as they simultaneously appeared on the screen. Bounce the video project to a commonly used video file format, such as .mp4 or .wmv. Upload the video to Box, a web video service. Contact the participants to inform them that their videos are ready for viewing.
5. Using the data collection sheet that was created while writing the task analysis for the targeted task, observe the participant perform the task

independently. If a participant completes a step of the task correctly, write a "+" on the appropriate section of the data collection sheet. If a participant makes an error on a step of the task, write a "-" on the appropriate section of the data sheet. To collect the first treatment phase data point, calculate the percentage of steps completed correctly and add a corresponding data point to the graph. Disconnect the last data point in the baseline phase from the first data point in the treatment phase, meaning there should not be a line intersecting the phase change line. Periodically use a treatment fidelity checklist to ensure the intervention is being administered correctly. After each data collection session, calculate the percentage of steps completed correctly and add a corresponding data point to the graph.

6. Visually inspect the graph after each data collection session to check for trends. After the participant's accuracy stabilizes at or above the mastery level, collect skill maintenance data.
7. After the skill has been mastered, collect measures of social validity with the participant and the work supervisor.

The following chapter will include the results of the aforementioned data collection methods.

Chapter Three: Results

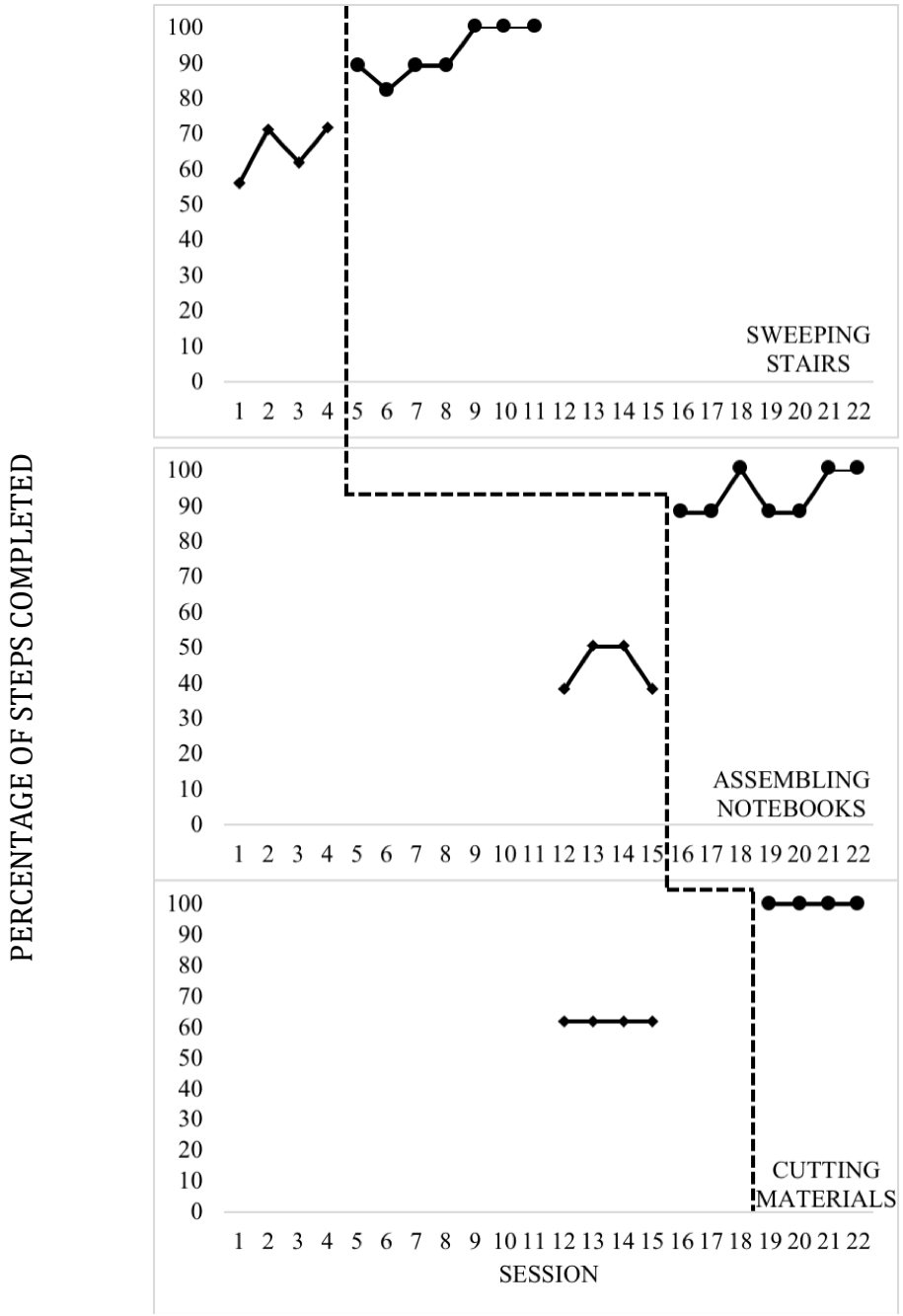
As stated in Chapter 1, this study examined the impact of video self-modeling on the independent completion of vocational tasks by young adults with ASD. The chapter is organized in terms of the two specific research questions posed in Chapter 1. First, it reports the results of the VSM intervention for vocational task performance. Secondly, it examines the social validity of using VSM as an intervention in a vocational setting. A summary of findings concludes the chapter.

The first research question is, *Will video self-modeling increase independent completion of vocational tasks performed by young adults with ASD?* Results were examined through visual analysis of data recorded using the observational data collection sheet. Results for each participant will be presented individually.

Participant 1

The selected target vocational tasks for Participant 1 were (1) sweeping stairs in a parking garage on campus, (2) assembling recycled materials to create notebooks to be used by university students, and (3) cutting materials to create notebooks to be used by university students. All of the tasks were new to Participant 1. During baseline data collection, Participant 1 completed the stair sweeping steps at a mean average of 65% over four data points. During the VSM intervention phase, Participant 1 completed the steps of the stair sweeping task at a mean average of 93% over seven data points.

Figure 1. Percentage of steps completed correctly by Participant 1



◆ - Baseline, ● - Intervention

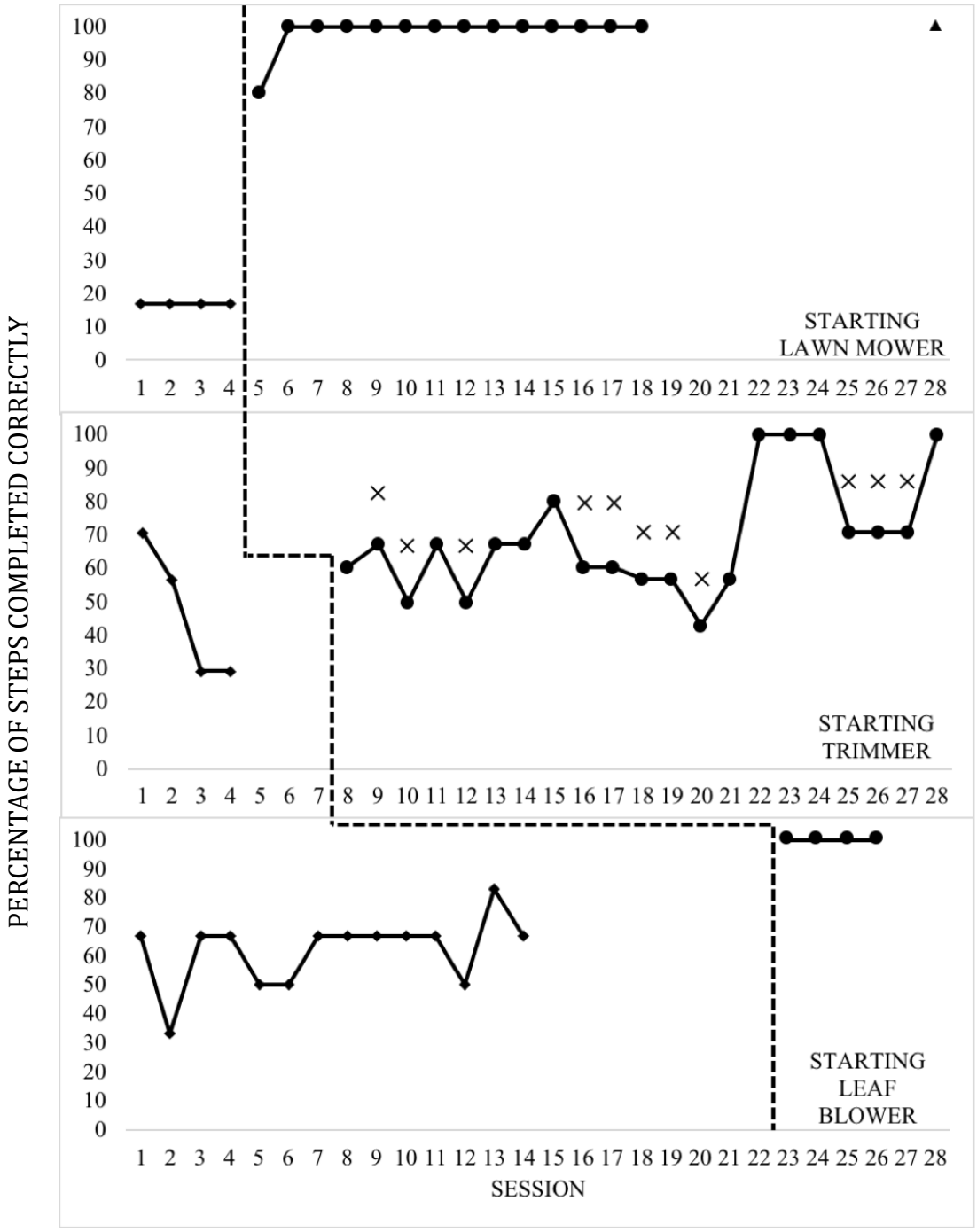
These data show a significant increase in the number of steps Participant 1 completed correctly during the VSM intervention phase. Baseline data were collected on Participant 1 assembling notebooks, in which the mean average of the steps completed accurately was 44% over four data points. After the data points on sweeping the stairs met the requirements for moving the second task out of baseline to intervention (at least three consecutive data points trending upward and/or at the mastery level), he received the VSM intervention for assembling notebooks. The mean average of his steps completed accurately on the notebook assembly task was 93% over seven consecutive data points.

Baseline data were collected on Participant 1 cutting materials for the notebooks, in which the mean average of steps completed accurately was 62%. After the data points on assembling the notebooks met the requirements for moving the cutting materials task from baseline to intervention (at least three consecutive data points trending upward and/or at the mastery level), he received the VSM intervention for cutting materials for the notebooks. The mean average of the steps on the cutting materials task completed accurately was 100% over four consecutive data collection points.

Participant 2

The selected target vocational tasks for Participant 2 were (1) starting a lawn mower, (2) starting a trimmer, and (3) starting a leaf blower. All of the tasks were new to Participant 2. During baseline data collection for starting the lawn mower, Participant 2 completed the steps at a mean average of 17% over four data points.

Figure 2. Percentage of steps completed correctly by Participant 2



◆ - Baseline, ● - Intervention, ▲ - Maintenance, × – Trimmer Malfunction

During the VSM intervention phase, Participant 2 completed the steps of starting the lawn mower at a mean average of 99% over fourteen data points. These data show a significant increase in the number of steps Participant 2 completed correctly during the VSM intervention phase.

Baseline data were collected on Participant 2 starting a trimmer, in which the mean average of the steps completed accurately was 47% over four data points. After the starting the lawn mower task met the requirement for moving the second targeted skill from baseline to intervention, (at least three consecutive data points trending upward and/or at the mastery level), he received the VSM intervention for starting a trimmer. The mean average of his steps completed accurately was 69% over twenty-one consecutive data points.

Baseline data were collected on Participant 2 starting a leaf blower, in which the mean average of steps completed accurately was 62% over four data points. After the starting the trimmer task met the requirement for moving the third targeted skill from baseline to intervention (at least three consecutive data points trending upward and/or at the mastery level), he received the VSM intervention for starting a leaf blower. The mean average of his steps completed accurately was 100% over four consecutive data collection points.

Social Validity

The second research question asked, *What is the social validity of using video self-modeling as an intervention in a vocational setting?* The participants and job supervisor associated with the Midwest postsecondary program responded to questions related to the social validity of video self-modeling in their respective

vocational settings. Results were analyzed using qualitative data analysis methods.

Semi-structured informal interviews were held with both participants and their job supervisor. Transcripts from the interviews were coded and analyzed. Common themes that were identified throughout the interviews included: (a) the videos were a helpful tool, (b) work was more enjoyable for the participants after the videos were introduced, (c) watching the videos before each task attempt was inconvenient, and (d) the participants would have preferred to watch their videos in a more private manner. Each of the main themes discovered through the analysis of the participant and job supervisor interviews will be discussed in the following text.

During their individual discussions with the researcher, each interviewee frequently used the word “helpful” to describe the VSM intervention. Both participants and the job supervisor communicated that VSM was an effective teaching method for the vocational skills targeted in this study. Participant 2 stated, “My performance improved when I watched the videos.” Furthermore, Participant 2 shared that he appreciated the videos because he thought they complemented his individualized learning style. Participant 1 mentioned that the videos were helpful because they guided him through entire tasks. Additionally, Participant 1 said, “The videos showed the parts of the job I was messing up before.” The job supervisor stated that both participants depended on the videos to learn the new skills at their job. In regard to Participant 1, the job supervisor listed the ease of use, accessibility, and option to watch the videos repeatedly as positive

aspects of the VSM intervention for him in his vocational setting. The job supervisor said that Participant 2 benefitted from the VSM intervention because he learned a large amount of information in a short period of time. All three interviewees presented a different perspective of how the VSM intervention was helpful in their individual situations.

In addition to increased performance at work, both participants communicated that the VSM intervention made work more enjoyable. Participant 2 said, “Watching the videos made things easier and I was more prepared.” Participant 1 mentioned that the tasks became fun for him once he was successfully performing the steps. The job supervisor stated the workplace became a more welcoming environment for Participant 2 because the videos demonstrated how to safely start lawn care equipment that can be dangerous when operated incorrectly. Although the main purpose of the VSM intervention was to increase the accuracy of steps performed in vocational tasks, the participants and job supervisor described ways in which VSM positively impacted other aspects of work.

Another common theme among the interviewees was the inconvenience of watching the videos prior to task attempts, particularly when the prior attempt was at or above the mastery level. Per the design of the study, the participants were required to watch the videos before each attempt. Participant 2 shared that the videos were very helpful when he was first learning the tasks. However, watching the videos became more burdensome as his performance increased. Participant 2 discerned that he would be open to using VSM to learn complex or advanced

tasks in the future, but it would not be necessary for simpler vocational tasks. When interviewed by the researcher, Participant 1 did not communicate that the VSM intervention was burdensome once he was performing the tasks successfully. However, the job supervisor stated that Participant 1 expressed that he did not like having to watch the videos before each task attempt and that it took away time that he could have been working. Although the interviewees still maintained that watching the videos was helpful and effective, they noted that it became inconvenient once the participants achieved greater accuracy on their tasks.

The final theme that was identified through analyzing the interviews was that the participants would have preferred to watch the videos in a more private manner. Participant 1 stated that it would have been more comfortable for him to watch the videos prior to arriving to work, as opposed to directly before attempting a task. When asked about the acceptability of watching the videos at work, Participant 2 responded by saying that he liked the videos because they made it easier to complete the task accurately. The job coach shared that Participant 1 communicated he did not like the possibility that attention could be drawn to him because of watching the videos on the jobsite. Although Participant 1 would have preferred to watch the videos in a more private setting, he intimated that he did talk about aspects of videos that he perceived as positive with several peers. The job coach shared that watching the videos was viewed as acceptable by the co-workers of both participants. However, the job supervisor stated that Participant 2 and Participant 1 thought it singled them out.

Summary

The percentage of steps completed correctly increased for all three target behaviors of both participants when video-self modeling was introduced. Both participants met the mastery criterion (80%) in all three tasks. Though the participants and job supervisors provided input about how VSM could be implemented differently according to the context of the specific jobsite, the overall response to the intervention was positive.

Chapter Four: Discussion

The purpose of this study was to investigate the effectiveness of video self-modeling as an intervention for teaching vocational skills to young adults with ASD. Additionally, the study reflected the participant and job supervisor views regarding the social validity of video self-modeling in a vocational setting. This chapter discusses the findings, considers limitations of the study, provides possible implications for practitioners, and suggests ideas for future research.

Summary of Findings

The results of this study indicate that video self-modeling is an effective method of increasing the job-related skills of young adults with ASD. A multiple baseline across behaviors design was employed to assess if a change occurred when video self-modeling was used to teach vocational tasks. A visual analysis of the data demonstrates an increase in the level of task performance of both participants in all of their targeted tasks as they progressed from baseline to the intervention phases in which VSM was introduced. These findings align with previous studies that focus on the effectiveness of video-based interventions for adults with ASD and vocational supports for adults with ASD (Kellems & Morningstar, 2012; Roth et al., 2014). This study contributes to a small, but growing, body of literature on behavioral interventions for adolescents and adults with ASD.

The data demonstrate an increase in both participants' accuracy in the performance of steps in vocational tasks after VSM was introduced across all three of their respective targeted tasks. The increase in accuracy was significant to

the point of both participants achieving mastery criterion for all three of their targeted tasks. This suggests that video self-modeling is a potent method of intervention for teaching vocational skills to adults with ASD.

Participant 1. A visual analysis of Participant 1's graphs demonstrates an increase in the number of steps completed accurately on his targeted tasks. The data points in each of his intervention phases demonstrate an upward trend or stabilizing at 100% accuracy. Participant 1 experienced a significant and unanticipated event during the study. His job at the university was switched from the Grounds Department to the Facilities Department in early March. Once Participant 1 received the new work assignment, new tasks had to be identified for possible intervention. This reduced the amount of time that data were collected, which minimized the opportunity to collect maintenance data. Two of Participant 1's tasks were performed in the Facilities Department offices, while the other task was performed in a parking garage.

Particularly regarding the stair sweeping task, Participant 1's accuracy was impacted because he barely missed the criterion for a specific step in the behavior chain. For example, there were many instances in which Participant 1 swept a stair four times when the task analysis stated that the stair should be swept five times. Although the stair might not have been noticeably different between four and five sweeps of the broom, the step was not marked as correct unless five sweeps occurred.

One of the participants who withdrew from the study worked with Participant 1 as he swept the parking garages. Participant 1 and his co-worker

were prompted to go to different parts of the garage as they worked. This was done to prevent the introduction of a confounding variable by providing Participant 1 with the opportunity to observe a peer completing the same sweeping the stairs task in which he was receiving intervention.

Participant 2. A visual analysis of Participant 2's graphs demonstrates a significant increase in the number of steps completed accurately on his targeted tasks. The video self-modeling intervention was particularly effective in teaching Participant 2 how to start a lawn mower. He quickly achieved the mastery level criterion. A maintenance data probe was conducted at the end of the study, and he performed the task with 100% accuracy.

Once Participant 2 received the VSM intervention for starting a lawn mower and starting a leaf blower, he achieved and maintained 100% accuracy on the second and first data point, respectively. However, the data points on Participant 2 starting the trimmer display the most variance throughout the data collected in this study. One unanticipated factor in this study was that the Grounds department owned several different identical trimmers. Though the components of the machine were the same, there was variation in the condition and reliability of each trimmer. Therefore, Participant 2 was at the mercy of whichever trimmer was available when observations occurred. The final step in the starting the trimmer task was to pull the rope until the trimmer started. There were some instances in which Participant 2 completed the prior steps accurately, but the trimmer did not start. The graph accounts for those instances by illustrating what the accuracy level would have been if the trimmer had functioned correctly.

It is worth noting that all of Participant 2's tasks were similar in nature. Though each machine had similar components (e.g., pull cord, gas cap, plunge ball), they were not set up identically. The baseline and intervention data phases do not appear to indicate that the similarity of the tasks interfered with the dependent variable.

On an encouraging note, Participant 2 informed the researcher that he obtained employment with a lawn service company after the study concluded. Participant 2 also told the researcher he still has aspirations of being a park ranger in the future.

Social Validity of the Intervention

The most prevalent theme among the participant and job supervisor responses to the interviews pertaining to social validity was the effectiveness of video self-modeling as a method for teaching vocational skills. In particular, the job supervisor indicated that their ability to watch the entire task performed as a chain and the option to watch the videos repeatedly benefitted both participants. Participant 1 noted that the VSM intervention helped him because it broke multi-step tasks into individual units and provided a visual representation of the expected behavior. Participant 2 stated that the VSM intervention helped him to learn new tasks quickly and that it increased his confidence on the job.

Both participants identified that increased performance on their vocational tasks positively impacted the way they perceived their work. Specifically, Participant 1 mentioned that work became fun for him once he could perform the tasks successfully.

Both participants stated that watching the videos prior to each attempt at the task became cumbersome. Though the videos were all approximately a minute in length, both participants stated that watching them consumed time in which they could have been working. Additionally, the respondents communicated that they would have preferred fading the requirement for watching the videos before each task attempt once they were performing the tasks at mastery.

Finally, the job supervisor communicated that both participants would have preferred to watch their videos in a more covert or private manner. The participants did have access to the videos during times in which they were not observed, but the requirement for them to watch the videos prior to each task attempt remained. The participants indicated that they were concerned that watching the videos in front of co-workers might draw unwanted attention to themselves.

Overall, the social validity results indicate that the participants experienced increased job performance, and it positively impacted the way they viewed their jobs. The videos could be simply and reliably accessed from the Box app, which was identified as a positive aspect by the job supervisor. The feedback provided by the respondents about the requirement to watch the videos prior to each task attempt, as well as the intrusion of privacy, will be discussed in greater detail later in this chapter.

Other Findings

Though both participants used the Box app to view the videos, they viewed them using different smartphones. Participant 1 was not able to

independently download the Box app to his iPhone due to parental permission needing to be obtained to download anything from the App Store. Subsequently, Participant 1 viewed his videos via the Box app on the smartphone of the individual(s) who recorded his task performance on each respective day. Though the app is identical on iOS and Android devices, the screen size and devices through which Participant 1 watched his videos varied slightly among observers. Conversely, Participant 2 independently viewed his videos via the Box app on his iPhone.

The job supervisor associated with the university communicated interest in learning how to expand the use of video-based interventions among the entire postsecondary student group. The job supervisor stated that there were several students who did not meet the criteria for this study who would likely benefit from the use of VBI to learn new skills. Therefore, the job supervisor suggested it would be beneficial to teach employees of the Midwest postsecondary program how to create and implement VBI.

One surprising factor in this study was the willingness of co-workers to participate in the process, specifically regarding the creation of task analyses. In particular, two co-workers willingly assisted in writing the steps of tasks with the researcher. Additionally, the co-workers of both participants communicated they knew that it was permissible for Participant 1 and Participant 2 to use electronic devices (for the purpose of watching their videos) during work hours, even though other employees were not allowed to do so.

Limitations

The time that was available to collect data for both participants was less than anticipated when the study was proposed. Factors that influenced the available time to collect data included job reassignments, weather conditions (particularly for Participant 2), and other work responsibilities that were still necessary for the participants to uphold. Of utmost importance for discussion, the change in Participant 1's job assignment impacted the data collection process. New targets had to be identified once the job change occurred. The first target was not completed at the same time or location as the second and third targets, which prevented the researcher from collecting the data concurrently.

The baseline data collected for both participants warrants discussion. After identifying a stable trend during the baseline phase of Participant 1's third target, data collection was stopped to allow for sufficient time to be dedicated to collecting data on the intervention phase of the second target. The data for Participant 2's second and third targets were not collected for the entirety of their respective baseline phases due to the availability of equipment and time constraints within Participant 2's work shifts. Additionally, only one maintenance data point was collected for Participant 2, which prevents the researcher from speaking to the long-term impact of the interventions included in this study. Although the baseline data were not collected as originally designed, all baseline phases in this study included data that were stable or trending downward over at least four data points.

The students in the postsecondary program must meet specific requirements (see Table 1) to be admitted. This impacts the generalizability of this study to the larger population of adults with ASD, many of whom do not meet at least one of the Midwest postsecondary program candidate criteria.

Another limitation to consider is that Participant 1 did not reach 100% accuracy across three consecutive data points on the assembling materials task. Additionally, Participant 2 regressed to below the mastery level on the trimmer task immediately after he performed at 100% across three consecutive data points. Although both participants did reach the mastery level of 80% accuracy for each task, reliably performing at 100% accuracy would have been optimal.

Future Research

A need still remains for research that focuses on interventions for adolescents and adults with ASD. Many employers, supervisors, and/or job coaches now have the ability to record high-quality videos with minimal effort. However, editing the video clips into a cohesive video that accurately depicts the entire behavior chain requires technical expertise. It is likely that practitioners who are unfamiliar with video editing software would benefit from the use of task analysis, behavior skills training, or VBI to increase their competence with video editing. Future research is warranted in the area of increasing the usage and effective implementation of video-based interventions, particularly for adults with ASD.

Though Participant 1 significantly increased the steps he performed accurately after watching video self-models on sweeping the stairs, the duration of

the performance remained relatively long. Future research could also examine the impact of VSM on the duration, or other behavioral dimensions, of the targeted tasks. There were instances in which Participant 1 did not perform the task as written (i.e., swept a stair four times instead of five), but the difference between the correct response and the incorrect response was likely indistinguishable. Future research could consider additional ways in which behavior could be measured to analyze the efficacy of VBI.

Initially, this study was going to incorporate an ABAB reversal within the multiple baselines across behaviors design (Kratochwill & Levin, 2015). Due to unanticipated time constraints, the MBL included an AB design instead of ABAB. In the future, a similar study could incorporate a reversal design with the intent of increasing scientific credibility.

The interventions in this study occurred over a period of three months. Future research could explore VBI over longer periods of time. Similarly, future research could include more than three targeted tasks.

Another possible area of research is to provide participants an option to receive video-prompting for a single step in a task or to view the task as a whole through video modeling, video self-modeling, or subjective video modeling. Additionally, research could be conducted on the impact of fading the use of VBI after meeting set mastery criteria.

Lastly, future researchers could use VBI as a universal support available to all employees in a vocational setting. The feedback provided by both participants in this study indicate that they had concerns about the social impact of watching

their videos in the presence of their co-workers. Future research could analyze the impact of VBI on the performance of all employees within a setting while simultaneously examining the impact on the social validity of interventions that are available to everyone.

Implications for practitioners. The results of this study suggest that learning to create video models is a potentially beneficial skill for practitioners to acquire. The commercial availability of smartphones increases the feasibility for many individuals to record high-quality videos. Though recording a video on a smartphone is relatively simple, editing videos requires additional skills. There are apps that can be used on a smartphone to edit videos. However, a practitioner will need to know how to transfer the video(s) from a smartphone to a computer if greater editing capability is desired. The researcher required approximately ten minutes to edit a single video with iMovie 10.1.2.

Practitioners may need to consider many different variables when deciding if video self-modeling would be an appropriate form of intervention to teach a specific skill. Possible factors include (1) the number of steps in the behavior chain, (2) the variance in equipment the individual might be using, and (3) contextual factors that might lead to variability in task steps.

The social validity results of this study underscore the importance of using interventions that the participants view as acceptable. Although both participants clearly stated that VSM was an effective tool for teaching new vocational tasks, they expressed concern about the social implications of participating in an activity that drew attention to themselves. After receiving input from the individuals

receiving the intervention, antecedent modifications should be explored to identify ways in which the intervention can be implemented with fidelity while still maintaining the dignity of the participants.

Conclusions

Observational data indicates that video self-modeling was an effective intervention for teaching young adults with ASD vocational tasks. The use of a smartphone app resulted in a simple and reliable method for the participants to access the videos created by the researcher. Social validity results indicate that the participants viewed the video self-modeling intervention as a helpful tool. The present study contributes to the growing body of research on video-based interventions, specifically video self-modeling. Additionally, this study contributed to the research on interventions for adults with ASD, which is currently an underrepresented population.

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Appendix A: IRB Application

Application for Full Review by the Institutional Review Board

I. Introduction

The general purpose of the study is to add to a limited base of research on behavioral interventions for adults with Autism Spectrum Disorder (ASD). The participants in this study will be students in Midwest postsecondary program, which is a post-secondary program for students between the ages of 18-25 with intellectual and developmental disabilities.

The specific aim of this study is to find if video self-modeling, delivered through a participant-owned smart phone or tablet, will increase independent completion of vocational tasks performed by young adults with ASD. Additionally, the social validity of using video self-modeling in a vocational setting will be analyzed.

II. Methods

The participants in this study will serve as their own control and experimental groups through the use of single case design (multiple baseline across behaviors). An "ABAB" withdrawal will be used to potentially identify a functional relationship between the independent and dependent variables.

The proposed number of study participants is 3.

The subjects will be recruited from the group of current students in the program. All participants must meet the following criteria: (1) be between age 18 through 25 years of age, (2) have a documented diagnosis of ASD, (3) have obtained employment at one of the agencies partnered with the program, and (4) own a smartphone or tablet that can be accessed on the job site to watch video-self models. The subjects may be selected due to individual job responsibilities, the willingness of specific job sites to participate, and the number of students working at specific job sites.

The subjects will be video recorded for the purpose of obtaining sufficient footage for the Principal Investigator to edit multiple video clips into a visual representation of them correctly performing a vocational task. Next, the subjects will be provided access to watch edited videos of themselves correctly performing a vocational task. Lastly, the subjects will attempt to independently complete the targeted vocational tasks after watching their video self-models.

The Principal Investigator will create task analyses for three targeted vocational tasks for each participant. The specific skills to be targeted will depend on the job site and position of each respective participant. Potential examples include how to organize and file legal documents, how to perform custodial duties (e.g., clean specific rooms, use cleaning equipment/tools), or how to complete a specific data entry process through a form/spreadsheet.

This will be accomplished by identifying the specific, successive steps that must be completed to accurately perform the tasks. Before providing any intervention, the Principal Investigator will collect baseline data for at least four consecutive sessions on the current percentage of steps the subjects are accurately performing independently. The Principal Investigator will then record the subjects on an individual basis. Video clips that accurately depict every step for every subject must be obtained. The Principal Investigator will then splice the video clips together until the targeted vocational task for each subject can be viewed as a single, fluid video self-model. The videos will be uploaded to "Box", a HIPAA compliant file storage service. The subjects will view their video self-models prior to performing the targeted vocational skills. Additionally, the video web service will track how many times the subjects watch their videos. Once the subjects have demonstrated mastery of the targeted vocational tasks, maintenance data will be collected.

Social validity questionnaires will be administered by the researcher to the participants and their respective job supervisors at the conclusion of this study. The questionnaires should take no longer than thirty minutes and each participant and supervisor should only need to be interviewed one time.

The expected duration of the subjects' participation is for 1-5 hours per week for 10-14 consecutive weeks.

III. Risk/Benefit Assessment

The subjects will assume the possible psychological and social risk of being video recorded at their place of employment and watching themselves perform their targeted vocational tasks on their electronic devices.

To minimize risk, the videos will be uploaded to "Box", a HIPAA compliant file storage service. The participation of the subjects will be voluntary, and they may withdraw for any reason at any time in the study. The researcher will give the participants the option of filming the clips during times in which no peers or co-workers are present. If the participant chooses to film the clips without anyone other than the researcher present, the researcher will make arrangements with the job supervisor to record during a time in which no one else would be present (e.g., before or after the shift, while a co-worker is on break). If the participant chooses to film while others are present, the researcher will remind them that they can withdraw at any point in time. If the participants express concern about watching the videos while others are present, the researcher will communicate with the job supervisor to arrange a time in which the participants may watch the video and attempt to perform the skill without others around.

The possible benefits for the subjects include acquisition of new vocational skills and monitoring for maintenance of acquired vocational skills over time. Increasing vocational skill repertoires may also impact long-term vocational options, as the subjects may be able to list specific skills on a future resumé.

The risk of the multiple baseline across behaviors design is that two out of the three target behaviors for each participant will not receive immediate intervention. Withholding intervention on the second and third skills could potentially prevent the participants from acquiring skills as quickly as they could if they received intervention immediately. However, the interventions

the participants will receive are not provided to other students at their job sites, meaning the extra support could be potentially beneficial.

The study will use an ABAB reversal design, which will be structured as follows:
After collecting stable baseline data over at least four data points, the first target behavior will be addressed through video-self modeling while the two remaining target behaviors will continue to be in baseline. When the first target behavior shows an upward trend across three consecutive data points, the second target behavior will be addressed through video-self modeling while the third target behavior remains in baseline. When the second target behavior shows an upward trend across three consecutive data points, the third target behavior will be addressed through video-self modeling. When the third target behavior shows an upward trend across three consecutive data points, all three target behaviors will return to a second baseline phase. The same progression listed above will be followed again. If all skills have been mastered after the second phase of intervention, maintenance data will be collected on a bi-weekly basis for each of the target behaviors (if time allows). Additionally, the participants will be left with a permanent product that could continue to be used after the research is concluded.

The possible benefits to society include adding content to a relatively small base of literature of behavioral interventions for adults with ASD, particularly regarding vocational skills support. It is also possible that this study will benefit society by increasing the vocational skills of several current employees in the workforce.

IV. Debriefing Statement

Deception will not be a component of this study.

V. Subject/Parental Consent Form (s)

The Subject Consent Form is attached with this document. The Principal Investigator will meet with all the students during one of their vocational skills classes at the university prior to conducting the study. Students who express interest in being participants in the study will either notify the Principal Investigator or the Coordinator of Vocational Experiences. Once the participants have been officially selected, the Principal Investigator will meet with them individually at the campus to review and sign the consent form. If a student expresses interest in being a study participant but does not have legal guardianship, the legal guardians of the student will be contacted about signing the consent form. The Principal Investigator will ask the legal guardian(s) to select a location in which they prefer to meet.

VI. Assent Form (must be included if project involves minors)

The assent form is attached with this document. None of the participants will be minors, but it is possible that a parent/caregiver could have maintained guardianship after the age of 18. The assent form will be read aloud to the participants.

Appendix B: Informed Consent (Participants)

Informed Consent for Participation in Research Activities
Using video self-modeling to increase vocational skills for adults with ASD

Participant _____ HSC Approval Number _____

Principal Investigator: Karl Schoenherr

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1. You are invited to participate in a research study conducted by Karl Schoenherr and Dr. April Regester. The purpose of this research is to measure the impact of adults with autism watching videos of themselves perform tasks at work that they do not yet know how to independently complete.

2. a) Your participation will involve finding a task you need to complete at your job that you do not yet know how to complete. After deciding which task to improve, Karl will identify how to complete every step needed to perform the task correctly. Next, Karl will video record you accurately performing each step of the task. Then, Karl will find the best video clip for each step and combine them using computer software to show you performing all the steps together as an entire task. The videos will be uploaded to a web service that you will allow you to watch them on your smartphone or tablet. You will be able to watch the videos when you want, especially if you need to be reminded of how to complete a task. Karl will observe you completing the task by yourself to see if watching the videos is helping you complete the task correctly by yourself. Once you have learned to complete the task independently, Karl will check to see if you are still performing the task correctly after a long period of time. When the study is close to being over, Karl will ask you questions about how you liked watching the videos, whether they were helpful, and whether you would want to do something similar in the future.

The observations will take place once a week, and they should take no more than an hour. They will be done at your job.

b) Approximately 3-5 participants may be involved in this research.

c) The study is expected to last from January 2017 to May 2017.

3. There are no anticipated risks associated with this research.
4. The possible benefits to you from participating in this research are learning new job skills and maintaining job skills over an extended period of time.

5. Your participation is voluntary, and you may choose not to participate in this research study or to withdraw your consent at any time. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.

6. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication or presentation that may result from this study. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection). That agency would be required to maintain the confidentiality of your data.

7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Karl Schoenherr, or the Faculty Advisor, April Regester. You may also ask questions or state concerns regarding your rights as a research participant to the Office of Research Administration.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my participation in the research described above.

Appendix C: Informed Consent (Job Supervisors)

Informed Consent for Participation in Research Activities
Using video self-modeling to teach vocational skills to adults with ASD

Participant _____HSC Approval Number _____

Principal Investigator: Karl Schoenherr

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1. You are invited to participate in a research study conducted by Karl Schoenherr and Dr. April Regester because you are a job supervisor of at least one of the study participants. The purpose of this research is to measure the impact of adults with autism watching videos of themselves performing tasks at work that they do not yet know how to independently complete.

2a. Participant involvement includes the following:

- Being interviewed by Karl at the end of this study about the effectiveness and feasibility of the video interventions used by your employee(s) who were participants.

b) The study is expected to last from January 2017 to May 2017.

4. There are no risks posed to you in this study.
4. The possible benefit to you from participating in this research is improved employee performance and a potential vocational support that could be continued in the future.
5. Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.

6. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication or presentation that may result from this study. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection). That agency would be required to maintain the confidentiality of your data.

7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Karl Schoenherr, or the Faculty Advisor, April Regester. You may also ask questions or state concerns regarding your rights as a research participant to the Office of Research Administration.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my participation in the research described above.

Appendix D: Parent/Guardian Consent Form

Informed Consent for Child Participation in Research Activities
Using video self-modeling to teach vocational skills to adults with ASD

Participant _____ HSC Approval Number_____

Principal Investigator: Karl Schoenherr

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1. Your child is invited to participate in a research study conducted by Karl Schoenherr and Dr. April Regester. The purpose of this research is to measure the impact of adults with autism watching videos of themselves perform tasks at work that they do not yet know how to independently complete.

2. a) Participant involvement includes the following:

    - Being video recorded performing all the steps of a task at the job site
    - Watching the recordings before performing certain tasks at the job site
    - Being interviewed by Karl at the end of this study
    - 3 participants will be involved in this research.

    b) The study is expected to last from February 2017 to May 2017.

5. As a participant, your child will assume the possible psychological and social risk of being video recorded at their place of employment and watching themselves perform the targeted vocational tasks on an electronic device. The videos will be uploaded to a HIPAA compliant filed storage service called "Box". Participants may withdraw from the study at any time. If your child wants to record the videos at times when co-workers are not present, Karl will communicate with the job supervisor to set up a time. If your child chooses to record the video when co-workers are present but decide to stop when Karl is filming, they may do so. If your child does not want to watch the videos when co-workers are present, Karl will communicate with your job supervisor to identify an appropriate time.
4. The possible benefits to your child from participating in this research are learning new job skills and maintaining job skills over an extended period of time.
5. Your child's participation is voluntary, and you may choose not to let your child participate in this research study or to withdraw your consent for your child's participation at any time. Your child may choose not to answer any

questions that he or she does not want to answer. You and your child will NOT be penalized in any way should you choose not to let your child participate or to withdraw your child.

6. We will do everything we can to protect your child's privacy. By agreeing to let your child participate, you understand and agree that your child's data may be shared with other researchers and educators in the form of presentations and/or publications. In all cases, your child's identity will not be revealed. The videos that will be created will not be used for any other purposes other than this research study, such as presentations. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection). That agency would be required to maintain the confidentiality of your child's data.

7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Karl Schoenherr, or the Faculty Advisor, April Regester. You may also ask questions or state concerns regarding your child's rights as a research participant to the Office of Research Administration.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my child's participation in the research described above.

Appendix E: Assent Form

Assent to Participate in Research Activities
Using video self-modeling to teach vocational skills to adults with ASD

1. My name is Karl Schoenherr.

2. I am asking you to take part in a research study because we are trying to learn more about how watching a video of yourself might help you learn new skills at your job.

3. If you agree to be in this study, you will be recorded in videos that you will watch before you perform certain tasks at your work place.

4. At the end of the study, I will ask you to answer questions about what it was like to record and watch the videos of yourself at work.

5. If being recorded or watching yourself on video makes you feel uncomfortable, please talk to me so I can help.

6. Being in this study might help you learn new skills at your job. You will also be able to watch the videos of yourself after the study is over.

7. If you do not want to be in this study, you do not have to participate. Remember, being in this study is up to you, and no one will be upset if you do not want to participate or if you change your mind later and want to stop. If you change your mind, please tell me.

8. You can ask any questions that you have about the study. If you have a question later that you didn't think of now, you can call me.

9. Signing your name at the bottom means that you agree to be in this study. You will be given a copy of this form after you have signed it.

_____	_____	_____
Participant's Signature	Date	Participant's Printed Name

Appendix F: Device Screening Tool

Participant Device Usage Screening Tool

Participant Name:_____

Criteria for mastery: 100% accuracy across three consecutive trials

KEY: "+" If step completed correctly "-" If step not completed correctly

Trials / Accessing Video Steps															
Turn on device															
Locate and select the Box app															
Sign-in by entering username and password															
Select correct video to watch															
Watch the correct video for the entirety of the clip															

Appendix G: Observational Checklist

Observational Checklist

Participant Name:_____

Vocational Task:

_____

_____

KEY: "+" If step completed correctly "-" If step not completed correctly

Task Analysis Steps / Dates															
1.															
2.															
3.															
4.															
5.															
6.															
7.															
8.															
9.															
10.															
(B) Baseline/ (I) Intervention															
% of steps completed correctly															

(Kellems, 2010)

Appendix H: Participant Social Validity

Participant Social Validity Interview Guide

Please answer these questions about the videos you watched. You can choose to write your answers or say them out loud.

1. What did you think about watching the videos on your device?

2. What did you think about watching the videos as you worked?

3. What difference did watching the videos have on your job?

4. Would you like watching more videos at work showing you how to do things?

5. Who have you told about using your device at work?

(Kellems, 2010)

Appendix I: Job Supervisor Social Validity

Employer or Job Coach Social Validity Interview Guide

Please answer these questions about the videos the participant watched on the device

1. How do you think they enjoyed watching the videos on their device?

2. What do you think they thought about using the device while they worked?

3. What impact did watching the videos have on their performance at work?

4. Is this something you can see them using in the future? Why or why not?

5. Was it socially acceptable for them to watch the videos while they worked?

(Kellems, 2010)

Appendix J: Procedural Fidelity

Step 1. Targeting a Behavior for Teaching	**Yes**	**No**	***NA**	**Notes**
1. Teachers/practitioners identify a target behavior that is important for the learner to be taught.				
2. Teachers/practitioners define and describe the target behavior so that it is observable and measurable.				
Step 2. Having the Correct Equipment	**Yes**	**No**	***NA**	**Notes**
1. Teachers/practitioners acquire a video recording device (e.g., hand-held video camera, digital camera, computer technology).				
2. Teachers/practitioners identify how the video will be played back (e.g., DVD, VCR, computer).				
3. Teachers/practitioners become familiar with the equipment and are comfortable using it.				
Step 3. Planning for the Video Recording	**Yes**	**No**	***NA**	**Notes**
1. Teachers/practitioners write a script or task analysis detailing exactly what needs to be said and/or done on the video.				
Step 4. Collecting Baseline Data	**Yes**	**No**	***NA**	**Notes**
1. Learners complete as much of the skill as possible.				
2. Teachers/practitioners collect baseline data to identify the steps of the task analysis that the learner can complete without assistance.				
Step 5. Making the Video	**Yes**	**No**	***NA**	**Notes**
1. Teachers/practitioners identify the kind of video that is appropriate for the learner (e.g., video modeling, self-modeling, point-of-view modeling, video prompting), based on the learner's skill level and preferences, as well as the target behavior.				
2. Teachers/practitioners prepare the model (with basic video modeling) or the learner (with self-modeling) for the video.				

3. Teachers/practitioners record a video that is satisfactory in quality and accurately reflects the steps of the task analysis.				
4. Teachers/practitioners edit the video and remove any errors and prompts.				
5. Teachers/practitioners complete voice-overs, if necessary.				
Step 6. Arranging the Environment for Watching the Video	**Yes**	**No**	***NA**	**Notes**
1. Teachers/practitioners identify the environment where the video will be watched, considering when and how it will be used within natural routines.				
2. Teachers/practitioners ensure that the materials for the performance of the task match those on the video.				
Step 7. Showing the Video	Yes	No	*NA	Notes
1. Teachers/practitioners allow the learner to watch the video and provide prompts necessary to gain and/or keep attention.				
2. Teachers/practitioners allow the learner to watch the video an appropriate number of times before expecting the learner to use the target behavior.				
3. For video prompting, teachers/practitioners stop the video after each step of the task analysis so the target behavior can be performed by the learner.				
Step 8. Monitoring Progress	**Yes**	**No**	***NA**	**Notes**
1. Teachers/practitioners collect data on the performance of the target behavior, noting the specific steps of the task learners were able to do independently.				
2. Teachers/practitioners note how often and when the learner watches the video when using the target behavior.				

3. If after collecting data on three to five occasions, learners are not making progress, teachers/practitioners should begin troubleshooting. If learners are making progress, instruction is continued until they have reached maximum proficiency.				

(LaCava, 2008; Kellems, 2010)