Paraprofessional-Implemented Vocational Training for Students With Severe Disabilities

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By
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Abstract

This dissertation consists of an introduction, three stand-alone papers, and a concluding research statement. Chapter 1 is an introduction to the literature and dissertation, as well as a statement of the problem and future directions. Chapter 2 is a comprehensive literature review of vocational skills interventions for students with autism spectrum disorder (ASD). Chapter 3 is a research study that evaluated the effects of paraprofessional-implemented video prompting on the vocational skill acquisition for students with severe disabilities. Chapter 4 is a practitioner paper that disseminates the findings from Chapters 2 and 3, and provides guidelines for practitioners to use video prompting as a vocational intervention. Finally, Chapter 5 is a statement summarizing my research to date, the place of my dissertation, and describing future directions for my research.
This dissertation is dedicated to my brother Mathew, who has taught me to view the world from a different perspective.
Acknowledgments

I wish to express my sincere appreciation to those who have contributed to this dissertation and supported me in one way or the other during this journey. To my advisors, Dr. Helen Malone and Dr. Matthew Brock. I would like to thank you for encouraging me, and for allowing me to grow as a research scientist. Your advice on both research as well as on my career have been invaluable.

To Paula Chan, your guidance and advice throughout my time in this program has been paramount to both my success and my sanity. To Amy Heider and Nicole Casper, whose help was instrumental to the completion of this project.

To my family, thank you for always encouraging and believing in me. To my Mom. Thank you for your love, patience, and belief in me. You have always been there to support me when I needed you most.

To my fiancé, Chris. You have been an incredible source of strength for me, I honestly do not know what I would have done without you during this process. Your constant support and encouragement ultimately made it possible for me to see this project through to the end.
Vita

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Publications


Fields of Study

Major Field: Educational Studies

Area of Emphasis: Special Education & Applied Behavior Analysis
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Chapter 1: Introduction

This dissertation is written as three stand-alone papers supported by an introduction of the literature and a broad discussion of the overall results. The predominant theme of this dissertation is vocational skill acquisition for individuals with autism spectrum disorder (ASD) and intellectual disability (ID), and the training needed for the practitioners who work with these individuals. Specifically, I will synthesize the existing literature, present an experimental research study, and provide guidelines for practitioner implementation.

Rationale

Individuals with disabilities have extremely poor employment outcomes, with only 20% being employed compared to the 68% of individuals without disabilities (United States Department of Labor, 2015). Further, those with ASD and ID have some of the poorest outcomes, having both the shortest duration of employment (e.g., 30% have only been employed for 2 months or less) and the lowest wages earned (e.g., an average of $7.25/h) even among individuals with other disabilities (e.g., emotional disturbance, learning disabilities, hearing or visual impairment; Newman, Wagner, Cameto, & Knokey, 2009). Furthermore, individuals with ASD do not experience the
many benefits that accompany sustained, gainful employment such as social well-being, access to health insurance, and improved quality of life (Roux et al., 2013).

Employment First is an initiative designed to invest in systems change efforts that result in increased community-based, integrated employment opportunities for individuals with significant disabilities, and it is based on the assumption that all individuals are capable of full participation in integrated employment and community life (Employment First). In stark contrast to the thought that people with disabilities need to be rehabilitated, Employment First champions the idea of supported employment and providing the resources needed to succeed in the workplace (Niemiec, Lavin, & Owens, 2009). Fortunately, initiatives such as Employment First have been adopted by a number of states since its introduction in 2003. Wehman et al. (2014) identify initial job site training as one of the crucial facets of supported employment, suggesting that targeting vocational skills is a fundamental pathway to obtaining gainful employment.

**Overview of Strategies**

A number of researchers have shown that with systematic teaching and job training, students with ASD and ID can indeed learn these critical vocational skills. There have been numerous evidence-based practices that have been proven effective in teaching vocational skills to these students such as audio cuing, self-monitoring, and systematic prompting (Cannella-Malone & Schaefer, 2015). These practices have been used to target a wide range of vocational tasks from restaurant work (Chang, Kang, & Huang, 2013) and mail sorting (Alexander, Ayres, Smith, Shepley, & Mataras, 2013) to janitorial tasks (Kellems & Morningstar, 2012) and food preparation (Johnson, Blood, Freeman, & Simmons, 2013).
This dissertation focuses on using the evidence-based practice of video prompting to promote vocational skills acquisition, as it consists of several unique characteristics that make it an ideal intervention to implement in an employment setting. Video prompting is an evidence-based practice in which the learner is shown a video clip (i.e., prompt) depicting a single step of a task at a time (Sigafoos et al., 2007). Unlike video modeling, in which the learner performs the task after viewing a video of the entire task, video prompting allows the learner to perform each step of the targeted task (e.g., making a latte) after watching each individual video clip (e.g., getting a cup).

Video prompting was chosen because this intervention provides several benefits that suit employment settings. The video aspect of this teaching method allows for implementation on a mobile device such as an iPhone, which allows the intervention to be both portable and inconspicuous in an employment setting (Cihak, Kessler, & Alberto, 2007). Additionally, this intervention allows trainers on the job site who may not be educated in evidence-based practices (e.g., job coaches, paraprofessionals) to systematically implement an evidence-based instructional strategy. Moreover, if instruction is occurring in a classroom or training setting, the prompts can include video of an environment in which the skill would normally be performed (i.e., the place of employment setting), improving the likelihood that the skill will generalize from the video to that environment.
**Practitioner Training**

Although significant progress has been made in the area of vocational skills training, there must be validated methods of practitioner training to accompany the growing literature base. Studies indicate that many practitioners are not familiar with the concept of evidence-based practice (Stahmer, Collings, & Palinkas, 2005), and report implementing ineffective educational practices just as often as those with a strong evidence base (Burns & Ysseldyke, 2009). Although researchers have studied training methods to close the research-to-practice gap, the most promising method (i.e., coaching with feedback) may not be feasible on a large scale. Subsequently, the practitioner training method used in the experimental study presented in Chapter 3 is focused on an antecedent-based training method (e.g., video modeling). As they eliminate the need for extensive coaching and feedback, antecedent training methods are both cost and resource effective.

The practitioner training that was used in the experimental study presented in Chapter 3 is a combination of video modeling, role play, and feedback. Not to be confused with video prompting, video modeling is an evidence-based staff training procedure that consists of a practitioner viewing a model of an entire task before implementing the modeled procedure with their student.

**Future Directions**

In extending this research for my dissertation, I will be exploring this topic in several ways. First, chapter 2 provides a systematic review of the literature regarding interventions that target vocational skill acquisition for individuals with ASD. Specifically, the review investigates (a) interventions or teaching strategies used to teach
vocational skills to individuals with ASD, (b) the setting in which the skills were taught, (c) the use of technology within the intervention, (d) whether the vocational training resulted in employment, (e) if generalization and maintenance were assessed, (f) the effectiveness of the intervention, and (g) the quality of the intervention.

Next, chapter 3 uses a single-case design to test the efficacy of an antecedent-based training package (i.e., video modeling and self-monitoring) to train job coaches to implement the core components of video prompting. An antecedent-based training package was used because it provides the unique benefit of requiring significantly less performance feedback than a typical training package. This allows me to promote effective implementation without extensive performance feedback in order to demonstrate a more sustainable model of implementation. The efficacy of a completely job coach-implemented intervention on the skill acquisition in both a training environment as well as peak work hours are examined. Because I am interested in student skill acquisition and professional development, I am measuring both student vocational outcomes as well as job coach implementation fidelity. This study will address important questions about the effects of practitioner-implemented video prompting and vocational skill acquisition for students with significant disabilities.

Chapter 4 presents a practitioner’s guide to implementing video prompting to teach vocational skills to students with ASD and ID. This guide includes an overview of data collection and progress monitoring, implementation, error correction, and troubleshooting, as well as instructions and examples for applying these components in applied situations. In addition, there are several reproducible resources included to aid in these processes. Finally, chapter 5 is comprised of a comprehensive discussion of how
these three pieces fit into the existing vocational intervention and practitioner training literature, as well as providing a discussion of how my future research will continue to investigate the variables that lead to successful, gainful employment for individuals with ASD and ID.
Chapter 2: Literature Review

In this chapter, I present a review of the literature on vocational training interventions targeted specifically to adolescents and adults with ASD. A version of this paper was accepted for publication in the *Journal of Developmental and Physical Disabilities*. This version includes an updated literature review and discussion presented as an addendum (Seaman & Cannella-Malone, 2016).

Abstract

With a disproportionately high unemployment rate, obtaining and maintaining employment is exceptionally difficult for individuals with autism spectrum disorders (ASD). Further, few individuals with ASD have been trained in the vocational skills needed to obtain gainful employment. The need to evaluate not only our current knowledge about the employment needs of individuals with ASD, but also to inquire about interventions, strategies, and supports in the workplace is pressing. This review of the literature focuses on vocational training interventions targeted specifically to adolescents and adults with ASD. Twenty studies evaluating pre-employment, specific vocational skill training, and job retention interventions are discussed, trends in intervention characteristics are highlighted, and recommendations for future research are suggested.
Vocational Skills Intervention for Adults With Autism Spectrum Disorder: A Review of the Literature

With a staggering 64% increase since 2006, the CDC estimates that about 1 in 68 children is identified with an autism spectrum disorder (ASD) (CDC, 2012), which is accompanied by a myriad of challenges encompassing language, social, and behavioral deficiencies (Njardvik, Matson, & Cherry, 1999). Fortunately, there is an abundance of research concerning how to best address and build on these challenges, with a sizeable number of studies devoted to facilitating, instructing, and assessing individuals with ASD (Coresllo, 2005; McEachin, Smith, & Lovaas, 1993; Sallows & Graupner, 2005). However, much of the research directed towards this population has concentrated on interventions for young and school-age children, with considerably less focus on adults (Hurlbutt & Chalmers, 2004). Of 150 recently reviewed intervention studies targeted towards individuals with ASD, 63% were conducted with children between the ages of 2 and 8 years, and less than 2% of the studies were conducted with participants 20 years of age and older (Edwards, Atkins, Lotfizadeh, & Poling, 2012). This narrowly focused research scope has left a significant gap in the literature for older individuals, leading to burgeoning issues in applied settings influencing skill deficits in life, community, and vocational settings (Cimera & Cowan, 2009). The lifelong challenges that stem from ASD require lifelong support and teaching (Bennet & Dukes, 2013).

Few individuals with ASD have been trained in the vocational skills needed to obtain gainful employment. As Hendricks (2010) discussed, the complexities that accompany ASD, such as interactional and behavioral difficulties as well as the supplementary cognitive functioning deficits, add to the struggles of employment for this
population. Subsequently, the most costly implications arise from the lack of research evaluating transition planning and employment outcomes (Hendricks, 2010). The stigma of behavioral issues (e.g., outbursts, aggression, antisocial behavior) associated with ASD make it increasingly difficult to find businesses that will employ individuals with ASD. Further, the novelty of situations, tasks, and routines makes it difficult for individuals with ASD to adjust to workplace environments (Muller, Schuler, Burton, & Yates, 2003). As such, vocational interventions need to be tailored to address these unique characteristics. However, the existing body of research is still quite small and further inquiries are needed to evaluate not only our current knowledge about the employment needs of individuals with ASD, but also to inquire about interventions, strategies, and supports in the workplace (Hendricks, 2010; Roux et al., 2013; Taylor, 2014).

In addition to the lack of research on employment-related interventions, adults with ASD are vastly under- and unemployed. Even among other adults with disabilities, those with ASD yield one of the lowest rates of paid employment at only 55% (Shattuck et al., 2012). Data from the National Longitudinal Transition Study 2 (NLTS2) found that young adults with ASD earned an average of $8.10 per hour, which is lower than the average wage for young adults in the comparison groups of emotional disturbance (ED), learning disability (LD), speech/language impairment (SLI), and mental retardation (MR). Further, young adults with ASD were found to have held jobs clustered in a limited number of occupational types such as food preparation, cleaning, and maintenance (Roux et al., 2013). Compared to other disability categories (e.g., SLI, LD, and MR), adults with ASD had the lowest rates of participation in both paid and unpaid employment experiences. Moreover, adolescents with ASD had the highest risk (35%) of
being completely disengaged from any kind of postsecondary education or employment (Shattuck et al., 2012).

These discouraging statistics suggest additional ramifications. There is a substantial discrepancy between the estimated costs associated with ASD, the evidence base for understanding what interventions can optimize employment, and the costs incurred (Taylor, McPheeters, Sathe, Dove, & Veenstra-VanderWheele, 2012). For example, the costs related to the services for adults with autism are notably higher than their peers with other disabilities. From 2002 to 2006, individuals with autism obtained services that cost Vocational Rehabilitation an average of $3,213 annually, and only individuals with sensory impairments exceeded these expenses at $4,210 (Cimera, 2009).

Jarbrink, McCrone, Fombonne, Zandén, and Knapp (2007) examined the cost of an individual with ASD both with and without employment. They argued that those who are employed with community supports would substantiate a decrease in cost by creating less reliance on day programs and activities, such as adult day care. If individuals with ASD were employed, costs could be saved, as the wages earned would go towards providing for the individual’s additional costs, such as medical and living expenses. The harsh reality of high unemployment rates for adults with ASD, and the consequently high cost of services, can be aided by examining the best practices for supporting employment.

In their literature review, Bennet and Dukes (2013) searched the peer-reviewed literature for studies focused on teaching employment skills to individuals with ASD between the ages of 14 and 22. Within these studies, they examined the instructional tactics used to teach employment skills, as well as the effectiveness of these interventions. Although their search yielded a relatively small number of studies, there have been an increasing
number of studies published since 2010 (Bennet & Dukes, 2013) suggesting a need to revisit the subject and reassess the most effective intervention qualities. Focusing on some of the limitations that Bennet and Dukes (2013) reported, this review examined (a) interventions or teaching strategies used to teach vocational skills to individuals with ASD, (b) the setting in which the skills were taught, (c) the use of technology within the intervention, (d) whether the vocational training resulted in employment, (e) if generalization and maintenance were assessed, (f) the effectiveness of the intervention, and (g) the quality of the intervention.

Method

Searches

A three-step process was followed to identify journal articles for this review. First, electronic database searches were conducted using Education Research Complete, ERIC, MEDLINE, Psychology and Behavioral Sciences, PsycINFO, Vocational and Career Collection, and Google Scholar. A four-way search was conducted with the following search terms: (a) autism OR ASD, (b) employ* OR voc* OR work* OR job, (c) instruct* OR train* OR teach*, and (d) transition OR adult OR “high school” OR “middle school” OR “secondary educ*”. Next, a hand search of the references from articles that met the inclusion criteria was conducted. Finally, the “Cited by” feature in Google Scholar was used to forward search each of the included articles. This three-step process identified 20 articles that met all of the inclusion criteria.
Figure 1. Flow diagram of study identification procedures.
Inclusion Criteria

Peer-reviewed journal articles evaluating the acquisition of employment skills for individuals with ASD were systematically reviewed. Four inclusion criteria were selected prior to the literature search. First, at least 50% of the participants in the study must have been identified as having an ASD, including Asperger Syndrome and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). This criterion was selected to ensure a balanced representation of individuals with ASD, and follows the inclusion criteria of Bennett and Dukes (2013). Second, the study had to have evaluated an intervention designed to improve one or more vocational skills (e.g., mail sorting, packing, and food preparation) or skills directly related to obtaining or maintaining employment (e.g., job interviews). Third, 75% of the participants had to be at least 14 years of age, which is the age when transition planning and instruction typically begin with students served in special education (Bennett & Dukes, 2013). Further, this criterion eliminated studies comprised primarily of younger participants. Finally, the study had to be published in a peer-reviewed journal between 2010 and 2015. This criterion was chosen based on Bennett and Dukes’ (2013) review of the literature, which included studies through 2010.

Coding

Articles were reviewed and analyzed by five participant characteristics: age, number, gender, diagnosis, and percentage diagnosed with an ASD. Additionally, nine intervention characteristics were coded: vocational skill taught, intervention used, setting, incorporation of technology, generalization, generalization setting, maintenance of the
vocational skill, job acquisition (i.e., if the intervention resulted in job acquisition for the participants), and experimental design.

Finally, all studies were coded according to the What Works Clearinghouse Single Case Design evidence standards (Kratochwill et al., 2010). Studies were coded by the extent to which they met the evidence standards, whether the standards were met, and the level of evidence that was suggested by the intervention effects. A description of the evidence criteria is displayed in Figure 2. It should be noted that those studies that used an alternating treatments design were not coded for evidence strength as no standards for this design were provided.

**Independent Coder**

An independent reader analyzed and coded 33% of the included articles. All of the above participant and intervention characteristics were coded for each article. There was 98% (range: 96–100%) agreement between observers. After review, no major discrepancies were observed.

**Results**

The results of a systematic search of the 915 articles identified through the electronic search yielded 20 articles that met the inclusion criteria. These 20 articles included 21 independent experiments that were analyzed separately.

**Demographics**

There were a total of 203 participants included in the 21 experiments; 178 were male and 25 were female. Participants ranged in age from 13 to 60 years old, and the median age of participants was 24 years old.
Figure 2. Flow diagram of What Works Clearinghouse single case design standards.
The percentage of participants with an ASD diagnosis included in each experiment ranged from 50–100%, and 96% of all participants had a diagnosis of ASD (N = 196). Additional participant diagnoses included MR, intellectual disability (ID), and Down syndrome. There were 19 experiments in which all of the participants had an ASD. In the remaining three studies (Dotson, 2013; Johnson, 2013; Van Laarhoven, Winiarski, Blood, & Chan, 2012), between 50% and 69% of the participants had a diagnosis of ASD. Five studies included participants who had secondary diagnoses of ASD and comorbid diagnoses of ID, MR, Down syndrome, or cerebral palsy.

Intervention

Vocational skills were broken into three main categories: pre-employment, job tasks, and job retention. Within job tasks, skills were further broken into categories of restaurant, retail, and clerical. Table 1 displays these vocational skills by the characteristics of intervention name, technology type, design, generalization, and maintenance.

Results indicated that a university setting was used in all of the studies that targeted pre-employment skills. Additionally, 75% of the retention-targeted studies were conducted in workplace sites. Similarly, 85% of the studies targeting retail job interventions were also conducted in workplace sites.

Moreover, 62% (n = 9) of the job skills interventions employed either video modeling or video prompting, and an additional 21% (n = 3) of each used a form of audio prompting or an intervention package.

Inspection of the remaining intervention characteristics revealed that generalization was assessed in 33% (n = 7) of studies, with generalization settings including a school
environment (Alexander, 2013), a work environment (Allen, Burke, Howard, Wallace, & Bowen, 2012; Allen, Wallace, Greene, & Bowen, 2010; Bennett, 2013; Dotson, 2013), or a warehouse (Burke, 2010a; Burke 2010b). Furthermore, maintenance was assessed in 57% (n = 12) of the studies. Lastly, four studies evaluated job acquisition with participants who were already employed, and only two studies (Allen et al., 2012; Allen et al., 2010) reported whether the vocational training intervention resulted in employment for the participants.

With respect to experimental design, 71% (n = 15) utilized a single case design and 29% (n = 6) employed a group design. All (n = 3) of the interventions targeting pre-employment skills evaluated the results with a group design, and 75% (n = 4) of the studies targeting job maintenance skills also used a group design. The majority (92%; n = 13) of interventions targeting job skills (e.g., restaurant, clerical, and retail) used a single subject design.

Evidence Standards

Table 2 displays results of the quality and strength of evidence of each study by intervention type. Given that this method of evaluating evidence strength is only applied to single case design studies, only 71% (n = 15) of experiments were evaluated. Examination of study quality indicated that 29% (n = 6) of the studies met the evidence standards without reservations and 14% (n = 3) met the evidence standards with reservations. Moreover, 29% (n = 6) of the studies did not meet the evidence standards, and an additional 29% (n = 6) studies were not evaluated, as they did not use a single case design methodology.
<table>
<thead>
<tr>
<th>Vocational Skill</th>
<th>Article</th>
<th>Intervention</th>
<th>Technology Type</th>
<th>Setting</th>
<th>Design Type</th>
<th>Generalization</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-employment</td>
<td>Morgan et al. (2014)</td>
<td>Interview Skills Curriculum</td>
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<td>University</td>
<td>Group</td>
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<tr>
<td></td>
<td>Smith et al. (2014)</td>
<td>Virtual Reality Job Interview</td>
<td>Computer</td>
<td>University</td>
<td>Group</td>
<td>No</td>
<td>No</td>
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<tr>
<td></td>
<td>Strickland et al. (2013)</td>
<td>Web-based Interviewing Program</td>
<td>DVD &amp; Computer</td>
<td>University</td>
<td>Group</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Job-Task Restaurant</td>
<td>Johnson et al. (2013)</td>
<td>Video Prompting</td>
<td>Video (iPod)</td>
<td>School</td>
<td>Single Subject</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Kellem &amp; Morningstar (2012)</td>
<td>Video Modeling</td>
<td>Video (iPod)</td>
<td>Various Work Sites</td>
<td>Single Subject</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Job-task Retail</td>
<td>Allen et al. (2012)</td>
<td>Video Modeling and Audio Cutting</td>
<td>Laptop &amp; Transceiver with</td>
<td>Factory Warehouse</td>
<td>Single Subject</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
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<td>Allen et al. (2010)*</td>
<td>Video Modeling</td>
<td>Video</td>
<td>Retail Store</td>
<td>Single Subject</td>
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<td>Yes</td>
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<td></td>
<td>Allen et al. (2010)</td>
<td>Video Modeling</td>
<td>Video</td>
<td>Retail Warehouse</td>
<td>Single Subject</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Bennett, Ramassamy, &amp; Honsberger (2013)*</td>
<td>Covert Audio Coaching</td>
<td>Two-way radio and headset</td>
<td>School</td>
<td>Single Subject</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td></td>
<td>Burke et al. (2013)</td>
<td>Video Modeling &amp; Prompting</td>
<td>Tablet</td>
<td>Warehouse</td>
<td>Single Subject</td>
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<td>Burke et al. (2010)*</td>
<td>Behavior Skills Training &amp;</td>
<td>iPod</td>
<td>Warehouse</td>
<td>Single Subject</td>
<td>Yes</td>
<td>Yes</td>
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</table>

Table 1. Vocational skills by intervention
Table 1 continued

<table>
<thead>
<tr>
<th>Vocational Skill</th>
<th>Article</th>
<th>Intervention</th>
<th>Technology Type</th>
<th>Setting</th>
<th>Design Type</th>
<th>Generalization</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Burke et al. (2010b)</td>
<td>Behavior Skills Training &amp; Performance Cue</td>
<td>iPod</td>
<td>Warehouse</td>
<td>Single Subject</td>
<td>Yes</td>
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<tr>
<td>Job-task Clerical</td>
<td>Alexander et al. (2013)</td>
<td>Video Modeling</td>
<td>Video (iPad)</td>
<td>School</td>
<td>Single Subject</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Bennett, Gutierrez &amp; Honsberger (2013)</td>
<td>Video Prompting</td>
<td>Video (iPad)</td>
<td>School</td>
<td>Single Subject</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Bennett, Ramasamy, &amp; Honsberger (2013)</td>
<td>Covert Audio Coaching</td>
<td>Two-way radio and headset</td>
<td>School</td>
<td>Single Subject</td>
<td>No</td>
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<tr>
<td></td>
<td>Bereznak et al. (2012)</td>
<td>Video Self-prompting</td>
<td>Video (iPhone)</td>
<td>School</td>
<td>Single Subject</td>
<td>No</td>
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<tr>
<td></td>
<td>Dotson et al. (2013)</td>
<td>Group-based Teaching Interaction Procedure</td>
<td>None</td>
<td>University</td>
<td>Single Subject</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Retention</td>
<td>Gentry et al. (2015)</td>
<td>Training Student to Use iPod as Communication Aid</td>
<td>iPod</td>
<td>Various Work Sites</td>
<td>Group</td>
<td>No</td>
<td>No</td>
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<tr>
<td></td>
<td>Liu et al. (2013)</td>
<td>Autism Specific Workplace Training Program</td>
<td>None</td>
<td>University</td>
<td>Group</td>
<td>No</td>
<td>No</td>
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<tr>
<td></td>
<td>Montgomery et al. (2011)</td>
<td>Audio Prompting System</td>
<td>Cassette Tape Recorder &amp; Headphones</td>
<td>Restaurant</td>
<td>Single Subject</td>
<td>No</td>
<td>No</td>
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<tr>
<td></td>
<td>Van Laarhoven et al. (2012)</td>
<td>Video Modeling</td>
<td>DVD &amp; Computer</td>
<td>Restaurant</td>
<td>Group</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
As per What Works Clearinghouse Single Case Design evidence standards recommendations (Kratochwill et al., 2010), only studies that meet evidence standards with or without reservation can be evaluated in examining the strength of evidence. As such, 42% (n = 8) studies were coded for this variable. It was found that a total of 9% (n = 2) of studies exhibited moderate evidence and 29% (n = 6) exhibited strong evidence.

Discussion

The number of under- and unemployed adolescents and adults with ASD is exceptionally high, especially compared to those in similar disability groups (Shattuck et al., 2012). Although the number of studies evaluating vocational interventions for individuals with ASD has almost doubled in recent years (Bennett & Dukes, 2013), there is still a relatively small literature base regarding this imperative topic. As such, the purpose of this review was to explore the research on this subject published in the last 5 years. The results showed that there are numerous interventions that have been effective in teaching vocational skills to adults and adolescents with ASD. Among these interventions, there have been several skills targeted, such as mail sorting, photocopying, food preparation, and even interacting with customers. Additionally, there are interventions for both prevocational and job retention skills, such as interviewing and on-task behavior. Further, these skills have been successfully evaluated in both teaching and real-life settings. Several prominent themes emerged from the nine intervention characteristics that were coded and in the sections following, the research questions will be discussed in those contexts.
<table>
<thead>
<tr>
<th>Intervention Type</th>
<th>Article</th>
<th>Meets Standards</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video based</td>
<td>Alexander et al. (2013)</td>
<td>With reservations</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>Allen et al. (2012)</td>
<td>Does not meet standards</td>
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<tr>
<td></td>
<td>Allen et al. (2010)*</td>
<td>Without Reservations</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Bennett, Gutierrez, &amp; Honsberger (2013)</td>
<td>Without reservations</td>
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<tr>
<td></td>
<td>Bereznak et al. (2012)</td>
<td>With reservations</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Burke et al. (2013)</td>
<td>Does not meet standards</td>
<td>---</td>
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<tr>
<td></td>
<td>Johnson et al. (2013)</td>
<td>Does not meet standards</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Kellems &amp; Morningstar (2012)</td>
<td>With reservations</td>
<td>Strong</td>
</tr>
<tr>
<td>Audio based</td>
<td>Van Laarhoven et al. (2012)</td>
<td>Not single case design</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Bennett, Ramasamy, &amp; Honsberger (2013)</td>
<td>Without reservations</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Bennett, Ramasamy, &amp; Honsberger (2013) *</td>
<td>Without reservations</td>
<td>Strong</td>
</tr>
<tr>
<td></td>
<td>Montgomery et al. (2011)</td>
<td>Without reservations</td>
<td>Moderate</td>
</tr>
<tr>
<td>Intervention Package</td>
<td>Burke et al. (2010)a</td>
<td>Does not meet standards</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Burke et al. (2010)b</td>
<td>Does not meet standards</td>
<td>---</td>
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<tr>
<td></td>
<td>Dotson et al. (2013)</td>
<td>Does not meet standards</td>
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<td></td>
<td>Gentry et al. (2015)</td>
<td>Not single case design</td>
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<tr>
<td></td>
<td>Liu et al. (2013)</td>
<td>Not single case design</td>
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<td></td>
<td>Morgan et al. (2014)</td>
<td>Not single case design</td>
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<tr>
<td></td>
<td>Strickland et al. (2013)</td>
<td>Not single case design</td>
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</tr>
<tr>
<td>Virtual Reality</td>
<td>Smith et al. (2014)</td>
<td>Not single case design</td>
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</tbody>
</table>
The distribution of skill type (i.e., pre-employment, job task, or job retention) is of note among the included studies. Although more than half of the interventions fall into the category of job tasks, there is just a fraction related to job retention, and an even smaller number targeting pre-employment skills. Although job task skills are crucial to successful employment, job acquisition and maintenance are vital to be mastered and maintained as well. Although lacking, the mere presence of pre-vocational studies demonstrates the advancement of this body of research, as there were no studies that focused on pre-vocational skills in Bennett and Duke’s (2013) review. However, researchers of future studies should seek to evaluate evidence-based practices in relation to both pre-employment and job retention skills. For example, this could be accomplished by applying the most frequently used, evidence-based interventions from this review (video modeling/prompting) and using them to teach skills such as resume writing.

Similarly, many of the skills involved in job maintenance are considered soft skills (e.g., as organization, customer and co-worker interactions, time management), which are often the most difficult for individuals with ASD. One advantage of targeting and evaluating soft skills is that instruction can be incorporated into the school day, and taught at an earlier age. Teaching these skills while individuals are still school-age would provide the distinct advantage of using the funding provided by the Individuals With Disabilities Act (IDEA). This is particularly important as funding is significantly decreased after the individual is no longer involved in school programming. This review only identified one study (i.e., Morgan, Clark, & Siller, 2014) examining the training and improvement of the soft skills involved in employment (i.e., social pragmatic skills). However, the vocational skills targeted in this study were job interview skills, not
exclusively the soft skills identified above. The identification of these studies may have been limited by the search terms and criteria. Including terms such as “social skills”, “time management”, and “pragmatic skills” could aid in creating a more thorough search. The current search did not include these expanded search terms, as the aim of this review was to evaluate interventions or teaching strategies used to teach specific vocational skills, rather than those skills that would support the maintenance of a job. Researchers of future studies should consider focusing a review solely on soft skill acquisition related to acquiring and keeping a job.

In regards to employment settings and targeted jobs, there are several areas for further investigation. The most commonly taught skills of the included studies took place in clerical, restaurant, and retail positions. However, according to the NLTS2, the most common placements of adults with ASD are those in clerical, transportation, and production jobs. This highlights a research-to-practice gap. Applying evidence-based interventions, such as video modeling (Wong et al., 2015), to these common employment areas is paramount. Researchers of future studies should aim to evaluate the evidence-based interventions described above in combination with the jobs in which adults with individuals with ASD are most likely to be employed. Moreover, researchers should seek to investigate paths to expand the narrow job market for individuals with ASD, and provide additional employment opportunities to this population.

Technology

With technology growing in popularity, it has led to an increased presence in the literature. As such, the majority of the studies in this review employed some, or even multiple, forms of technology. One of the key outcomes sought for vocational
programming is independence for employees, and it is this independence that contributes
to competitive and sustained employment while reducing the dependence on job-coaches,
teachers, or other employees (Lancioni & O’Reilly, 2001). Interventions that employ
technology allow for this independence to manifest with greater ease. Van Laarhoven et
al. (2012) cite several benefits to using technology, specifically video-based supports, to
promote independence in employment settings.

The incorporation of technology leads to several other advantages. First, in
formats that use video or audio recordings, there is the opportunity for the user to review
or repeat steps as needed. This is especially advantageous for individuals who need
repeated practice or experience memory issues related to an intellectual disability. Self-
directed video prompting (Bereznak, Ayres, Mechling, & Alexander, 2012), for example,
allows the participant to independently navigate through the steps of the task and even
repeat steps to successfully complete a job. Second, interventions such as covert audio
coaching (Bennett, Ramasamy, & Honsberger, 2013) and video prompting (Johnson,
Blood, Freeman, & Simmons, 2013) are easy to incorporate into the workplace, as they
blend into the environment far more easily than obtrusive visual aids or other supports.
Future researchers should build on this evidence, and investigate incorporating these
technologies into other areas such as generalization to different skills and environments.

Also of importance, technology is cost effective in terms of both materials and
vocational training (Van Laarhoven et al., 2012). First, employees often have audio and
video devices, such as cellphones, on hand. Technology has become readily available in
recent years, and the significant decrease in cost has made it far more accessible for both
general use, and for that with students with disabilities. In regards to vocational training,
the incorporation of technology with traditional job coaching can significantly lower the costs associated with supported employment. Compared to the typical cost of a job coach and supported employment (Cimera, 2012), teaching an employee with ASD to use video prompting would require significantly less time and money. Johnson et al. (2013) trained a teacher to use video prompting with her students to teach food preparation skills. The results showed that it took her students between 2 and 13 days to reach mastery of those skills with minimal assistance from the teacher. This is in sharp contrast to the weeks and sometimes months that a job coach is required to work with a client. Researchers of future studies should examine various avenues of implementing cost-effective, self-directed technology.

Vocational Outcomes

Only two studies provided data pertaining to the acquisition of employment following completion of the study. Further, both of these studies were conducted by the same research team (Allen et al., 2010; Allen et al., 2012). As the purpose of many of the included interventions was to assist individuals with ASD in the process of obtaining gainful employment, it is vital to document whether or not these interventions result in said outcomes. If the interventions are not resulting in the desired outcome of employment, it would be these data that would lead to reevaluation and modification of the intervention to ensure that employment is still within grasp. Researchers of future studies should investigate the real-life employment outcomes that are associated with the interventions and training they are evaluating. Moreover, tracking and recording the acquisition of employment following vocational training would provide possibly the most valuable data of all.
Study Evaluation

The What Works Clearinghouse single case design standards (Kratochwill et al., 2010) were used in the current study to evaluate the design and effectiveness of a single case design study. Given that the scope of this review included studies that utilized both group and single case designs, only 71% (n = 15) of the experiments were evaluated using these standards. However, out of the 15 studies that were evaluated, only 29% (n = 6) demonstrated strong evidence of an effect. With such a small research base examining vocational skills training for individuals with ASD, the implications from these findings lie within the design and intervention effects of future studies. In order to provide justification for the interventions that are being designed for this population to be woven into the existing training framework, it is key that they are able to demonstrate their effectiveness to practitioners. Researchers should ensure that their studies are designed according to the standards set by Kratochwill et al (2010). If study designs do not meet these standards, it will be difficult to evaluate the effectiveness of the interventions we put forth. Finally, we did not evaluate those studies that implemented a group design. Future researchers should seek to employ methods that allow for evaluation of all vocational skills studies, regardless of experimental design.

Generalization and Maintenance

Similar to vocational outcomes, generalization and maintenance measures are also central components when evaluating interventions. Generalization measures are designed to be implemented in a real-life setting rather than the controlled or contrived environment to which many studies are confined. Additional generalization measures that could be evaluated are those across vocational skills. This measure would be especially
valuable for those studies in which generalization to a new environment would not be practical (i.e., job retention).

The results indicate that the intervention setting of these studies is limited to either on the job, or in a university or school. Although many of the interventions conducted in a school or university setting evaluated pre-vocational skills (e.g., filling out job applications), several studies evaluated vocational skills tasks that were also measured in this type of environment. However, this can become problematic when an intervention is only proven effective in a contrived setting. With this, it is impossible to know if there are characteristics of the intervention that would need to be modified in order for the participant to be equally effective when performing the skill on the job. Further, it is difficult to measure these skills in contrived environments and then generalize these results to real-life employment settings. It would be far more advantageous to have continued support and training in a generalized environment (e.g., on the job). This would allow for extraneous variables such as other co-workers, loud noises, and time constraints to be accounted for. Examining the studies that evaluated pre-employment skills, there was no measurement of generalization or maintenance in any of the studies. Additionally, there were no generalization measures reported for the studies that evaluated job retention skills. Further, when evaluating all included studies, maintenance was only measured in 57%, and generalization in a mere 33%. Researchers of future studies should record further measures of generalization that would allow these interventions to be utilized in a variety of other skills and settings.

Given the overwhelming evidence of the efficacy of vocational skill interventions for individuals with ASD, it can be concluded that many of these interventions could
easily be incorporated into a variety of in-school or on-the-job teaching opportunities. In addition to the many aforementioned benefits of vocational interventions, a greater focus on transition-age students and employment training will greatly contribute to the body of intervention research for individuals with ASD. Moreover, expansion of the included studies will build a more complete repertoire of skills needed for the full spectrum of employment. With the hopeful growth of literature in this area, there can be improved employment and life outcomes for individuals with ASD in the near future.
Addendum

This updated literature review was conducted by replicating the methods used in the original review and using an additional filter to limit the search to between 2015 and 2017. The initial search identified 178 potential articles, of which 165 were excluded based on title and abstract. Of the remaining 13, seven were excluded based on exclusion criteria. For example, Dunn, Diener, Wright, Wright, and Narumanchi (2015) used a qualitative analysis to explore the processes that contributed to engagement and learning for youth with autism in a technology-based extracurricular program. This study was excluded because the authors did not use an experimental design. The remaining six articles (Bonete, Calero, & Fernández-Parra, 2015; Hayes et al., 2015; Mackey & Nelson, 2015; Rausa, Moore, & Anderson, 2016; Shireman, Lerman, & Hillman, 2016; Smith et al., 2016) were forward searched using the “cited by” feature on Google Scholar and backward searched by combing each article’s reference section. I did not identify any additional articles this way. These six studies were analyzed using the same process described above.

Results

Demographics

The six studies included added 75 students with significant disabilities to the total; 65 were male and 10 were female. All of the included participants had an ASD diagnosis.

Intervention

Analogous to the original search, results indicated that a university setting was used in the study that targeted a pre-employment skill (Hayes et al., 2015). Additionally,
all of the job retention-targeted studies (Bonete et al., 2015; Mackey & Nelson, 2015) were conducted in workplace sites. In contrast to the original search, no studies targeted retail or restaurant skills. Instead, a new category of customer interaction emerged, accounting for 67% (n = 2; Rausa et al., 2016; Shireman et al., 2016) of studies in the broad category of job skills. The remaining study in this category fell into clerical skills (Smith et al., 2016).

Moreover, 67% (n = 2; Rausa et al., 2016; Smith et al., 2016) of the job skills interventions employed either video modeling or video prompting, and both of the studies targeted job retention (Bonete et al., 2015; Mackey & Nelson, 2015). Inspection of the remaining intervention characteristics revealed that generalization was assessed in 33% (n = 2; Shireman et al., 2016; Smith et al., 2016) of studies. Furthermore, maintenance was assessed in 67% (n = 4) of the studies. Lastly, two studies evaluated job retention with participants who were already employed (Bonete et al., 2015; Mackey & Nelson, 2015).

With respect to experimental design, 67% (n = 4) utilized a single case design and 33% (n = 2; Bonete et al., 2015; Hayes et al., 2015) employed a group design. The only intervention targeting pre-employment skills evaluated the results with a group design, and half (n = 1; Bonete et al., 2015) of the studies targeting job maintenance skills also used a group design. All of the interventions targeting job skills (e.g., restaurant, clerical, and retail) used a single case design.

Evidence Standards

All studies using a single case design (n = 4) were evaluated for their quality and strength of evidence. Examination of study quality indicated that 33% (n = 2) of the
studies met the evidence standards without reservations and 17% (n = 1) met the evidence standards with reservations. Moreover, 17% (n = 1) of the studies did not meet the evidence standards, and an additional 33% (n = 2) studies were not evaluated as they did not use a single case design methodology. As per What Works Clearinghouse Single Case Design evidence standards (Kratochwill et al., 2010) recommendations, only studies that meet evidence standards with or without reservation can be evaluated in examining the strength of evidence. As such, 50% (n = 3) of studies were coded for this variable. It was found that a total of 33% (n = 1) of studies exhibited moderate evidence and 66% (n = 2) exhibited strong evidence.

Discussion

The findings of this updated literature review parallel those of the larger review with one noteworthy exception. This search identified the first studies targeting customer service as a job skill (Rausa et al., 2016; Shireman et al., 2016). Previously, job skills fell into one of three categories: clerical, restaurant, or retail. It is possible that this change could be the beginning of a shift towards a wider range of jobs for individuals with ASD. Moreover, this shift could coincide with the emphasis that is being placed on the Employment First initiative—striving for gainful employment for individuals with disabilities.
Chapter 3: Research Paper

This chapter is included as a stand-alone research paper. This section includes a brief literature review, a description of the method, a summary of the results, and the discussion of the findings and future directions for research and practice.

Abstract

Few individuals with severe disabilities have been adequately trained in the vocational skills needed to obtain gainful employment, leading to dismal employment outcomes for these individuals. Video prompting is an evidence-based practice that can be used to quickly and efficiently teach a variety of skills, and offers several advantages when implemented in an employment setting. Given its feasibility with students with severe disabilities, as well as its effectiveness in teaching vocational skills, it is key that practitioners are trained in video prompting. This study uses a multiple-probe-across-participants design to evaluate the efficacy of paraprofessional-implemented video prompting for students with severe disabilities in their place of employment.
Young adults with severe disabilities experience alarmingly poor employment outcomes. The US Department of Labor reports that the workforce participation rate for individuals with disabilities is about one third that of people without disabilities. Carter, Austin, and Trainor (2012) found that only 26% of adults with severe disabilities were employed in the two years after high school. Further, a staggering 43% of those adults with severe disabilities who were employed were reported to work in jobs where most of the other workers also had a disability, rather than in integrated employment settings with their peers.

With the Employment First initiative, the U.S. government has made integrated employment a priority for people with severe disabilities. Employment First is a national movement that urges service delivery agents to invest in systems change efforts that result in increased community-based, integrated employment opportunities for individuals with significant disabilities (Office of Disability Employment Policy, 2016). To achieve the goal of integrated employment, school-age young adults need job skills that will make them competitive applicants. However, individuals with severe disabilities often lack marketable skillsets, because there are often insufficient supports available in school settings (Test, Smith, & Carter, 2014), as well as lack of work and internship experiences (Carter et al., 2016). One way to address these poor employment outcomes for individuals with severe disabilities is to improve vocational training both on the job and in schools.

Researchers have demonstrated that video prompting can be an effective means to teach vocational skills. Video prompting is an evidence-based practice in which the learner watches each step or task in a chain and performs the step before advancing to the
next step in the chain (Sigafoos et al., 2007). This intervention is ideal not only for learners with severe disabilities, but also for use in employment settings (Seaman & Cannella-Malone, 2016). The efficacy of video prompting to teach vocational skills has been demonstrated numerous times with skills such as cleaning an animal shelter (Van Laarhoven, Johnson, Van Laarhoven-Myers, Grider, & Grider, 2009), dishwashing (Sigafoos et al., 2007), and customer interaction (Allen, Wallace, Greene, Bowen & Burke, 2013) among others.

Although the evidence shows that research teams can implement video prompting to improve vocational outcomes, it remains unclear if authentic practitioners and schools can also implement this approach effectively to produce similar outcomes. Cook and Odom (2010) assert that implementation is the key in translating research to practice and that in the absence of implementation, even the most effective intervention will not sustain results. Indeed, ensuring that the practitioners who teach students daily are trained in evidence-based practices is crucial. Unfortunately, practitioners report implementing ineffective educational practices just as often as those with a strong evidence base (Burns & Ysseldyke, 2009).

One study has begun to address this issue. Seaman, Cannella-Malone, and Brock (under review) evaluated the effects of a training package using methods from the broader training literature (i.e., practice description and rationale, modeling, role play, self-monitoring, and performance feedback) to teach a paraprofessional to implement the core components of video prompting: writing a task analysis, creating the video segments, and implementing video prompting with a student with autism spectrum disorder (ASD). Results indicated that the training package resulted in increased video
prompting implementation behavior for the paraprofessional, as well as corresponding, increased vocational skill behavior for the student. Additionally, Seaman, Cannella-Malone, Brock, & Dueker (under review) used this training package to evaluate paraprofessional-implemented video prompting in the vocational skill acquisition of students with ASD in their place of employment (i.e., their middle school copy room).

Although initial indications support the use of video prompting applied by practitioners, limitations to these studies leave important questions unanswered. First, these studies were not conducted in an employment setting, but rather a semi-regular volunteer position located at the students’ school. Unfortunately, it is difficult to determine if the positive results achieved would generalize to an in vivo employment setting. Second, the training package that was used (i.e., Behavioral Skills Training) may not be feasible for widespread use in a school or job site as it is a resource intensive method. To provide the necessary components, a trainer—who is often external to the school or job site—must be present for multiple sessions of performance feedback.

The present study will seek to address the aforementioned limitations by extending the research on the effects of practitioner-implemented video prompting to teach vocational skills to students with severe disabilities. First, the vocational training was conducted in the students’ school-based work setting rather than a more secluded training setting. Second, to introduce a more cost and resource efficient practitioner training method, video modeling was used in place of Behavioral Skills Training. In contrast to more traditional training methods (e.g., performance feedback), video modeling only requires the trainer to create a short video rather than provide multiple sessions of more intensive training. Although there is limited research using exclusively
video modeling as a practitioner training method, video modeling in combination with performance feedback has shown promise (e.g., Brock, Seaman, & Ranney, under review). Specifically, the following research questions are posed: (a) what is the efficacy of paraprofessional-implemented video prompting for students with ASD? (b) in the workplace, will the student acquire a vocational skill through paraprofessional-implemented video prompting, and (c) will the student generalize their skills during peak work hours and maintain the skills over time?

Method

Participants

After receiving Institutional Review Board and district approval, I asked the co-teachers of a high school special education classroom to recommend students for participation in a vocational training study. In recruiting the teacher recommendation, I asked them to identify students who (a) were between the ages of 14 and 22, (b) qualified for the state alternate assessment, (c) verbally communicated in the English language, (d) followed at least two-step directions, and (e) were working in the school-based coffee shop.

Student Participants

Marsha. Marsha was a 15-year-old White female in the 9th grade diagnosed with Down Syndrome. She was in the ninth grade in a self-contained high school classroom. She had a composite adaptive behavior score of 48 (i.e., indicating moderately deficient adaptive functioning) on the Vineland Adaptive Behavior Scale (Sparrow, 2011), and a 54 (i.e., falling in the extremely low range) on the Peabody Picture Vocabulary Test.
(Dunn, Dunn, Bulheller, & Hacker, 1965). Marsha’s teacher reported that she would like part-time job in the community.

Jan. Jan was a 16-year-old White female in the 10th grade diagnosed with Down Syndrome and Prader Willi Syndrome. She had a score of 50 on the Kaufman Assessment Battery for Children (Kaufman & Kaufman, 1983; i.e., 1st percentile) and a 71 (i.e., indicating borderline adaptive functioning) on the Adaptive Behavior Assessment System (Harrison & Oakland, 2003). Jan’s teacher reported that she wanted to work at Red Robin or Wendy’s making drinks. She further reported that Jan could complete multi-step vocational activities and tasks when given models and prompts.

Greg. Greg was a 15-year-old White male in the 9th grade with ASD. He was in the ninth grade in a self-contained high school classroom. He had a composite adaptive behavior score of 73 (i.e., indicating borderline adaptive functioning) on the Vineland Adaptive Behavior Scale (Sparrow, Balla, Cicchetti, Harrison, & Doll, 1984), and a composite score of 64 (i.e., falling in the very low range) on the Woodcock-Johnson Test of Cognitive Ability-Third Edition (Woodcock, McGrew, & Mather, 2001). Greg’s teacher reported that he would like to work a few days a week. Additionally, she indicated that Greg needs continued training on new, multi-step vocational activities, is able to work for up to 20 min, and is willing to try new vocational tasks with one-on-one assistance.

Peter. Peter was a 16-year-old Asian male in the 10th grade with ASD. He had a composite adaptive behavior score of 60 (i.e., indicating mildly deficient adaptive functioning) on the Vineland Adaptive Behavior Scale, and a 51 (i.e., low extreme range) on the Naglieri Nonverbal Ability Test (Naglieri, 2003). Peter’s teacher reported that he
hoped to be employed a couple of days a week in an environment in which could work with objects. She also reported that he completed multi-step vocational tasks with models and prompts.

Paraprofessional

*Bobby.* Bobby was a 52-year-old Black paraprofessional. Bobby had a Teaching Assistant certificate and some college education. He had been working as a paraprofessional and paraprofessional for 3 years and had been working with the target students for 2 months at the start of the study. Bobby accompanied the students to the coffee shop every morning and prepared lattes.

Setting and Materials

All baseline, training, generalization, and maintenance sessions took place in a coffee shop located in the participants’ high school. Training sessions took place after the coffee shop had closed for the day, and generalization sessions took place while the coffee shop was open for business and students were filling customer orders. In all sessions, materials were present that would enable the paraprofessional to implement video prompting and the students to complete the vocational task. Ice, coffee cups, cold brew coffee, a 3 oz measuring cup, flavored creamer, stirrers, and an iPhone 5s with a video prompting app downloaded (inPromptu, Cannella-Malone & Wheaton, 2011), was placed on a table in front of the participants. The inPromptu app is a free iOS application available for download that allows users to film, edit, and store video clips. Also available to the paraprofessional upon request were any materials that they had created during training (see Training section below).

Dependent Measure and Recording
The dependent measure for the students was the percentage of task analysis steps implemented correctly for the target vocational task. Data were collected during the video prompting implementation tier for each student. For each task, data were collected on whether each step was completed correctly independently, correctly after viewing the video segment, or incorrectly. An independent correct response was defined as the student accurately completing a step without viewing that segment of the video. A correct with video response was defined as the student accurately completing a step during or within 5 s of a video prompt to complete the task and/or completion of the first viewing of the video segment. If the students did not complete a step correctly following the video prompt, stopped for more than 5 s after starting to complete the step, or incorrectly completed a step, the step was scored as incorrect. The percentage of steps completed correctly (either independently or with the video) was calculated by dividing the number of steps completed correctly by the total number of steps and multiplying by 100.

Experimental Design

I used a multiple-probe-across-participants design and included baseline, intervention, maintenance, and generalization phases (Gast, Lloyd, & Ledford, 2014). I took baseline measures simultaneously for all students, and intervention for the first student began once a stable or decreasing trend in baseline was reached across five sessions. Intervention for subsequent students began once an increasing trend was seen for the previously intervened student for at least three sessions.

Reliability and Procedural Integrity

Paraprofessional implementation data were collected throughout the baseline, training, generalization, and maintenance phases. For task analysis creation, I coded
whether each step (a) was necessary to complete the task, (b) was listed sequentially, and (c) included no more than one discrete task. For video creation, we coded whether each filmed step had (a) a video and (b) a voice recording that matched the corresponding task analysis step. For video prompting implementation, we coded whether the paraprofessional completed the following for each step: (a) said “Watch this” and pressed play, (b) if the student did not start the step immediately when the clip ended said, “Now you do it” and (c) when the student completed the step correctly, moved to the next step OR when he completed the step incorrectly, implemented the error correction procedure. The error correction procedure consisted of the paraprofessional: (a) blocking the incorrect response, (b) verbally telling the student what was done incorrectly, (c) playing the video segment a second time, and (d) completing the step as a model if the student completed the step incorrectly a second time. A percentage correct was calculated by dividing each component of the step that was correct by the total number of step components for the task.

I conducted all observations in this study, and secondary trained observers attended 27% of all observations across all participants and experimental phases. Observers were one undergraduate and one graduate-level student in a Special Education program who I trained in the study procedures. In a 1-hr training session, the secondary observers reviewed the training manual (which contained written examples and non-examples of all procedures) and set opportunities to practice data collection were provided. Before collecting data, the secondary observers achieved 100% accuracy on a written test of procedural definitions and at least 90% agreement with the first author on all variables in live settings. Overall interobserver agreement for the target behaviors was
calculated by dividing the agreements on occurrence of multiple targeted behaviors divided by agreements plus disagreements multiplied by 100. Overall agreement was 93% (range: 82–100%) across both the paraprofessional and student variables, 92% (range: 80–100%) across the paraprofessional implementation fidelity variables, and 99% (range: 90–100%) across the student variable.

Procedures

Paraprofessional training. Bobby was trained in the three main components of video prompting: task analysis creation, video creation, and video prompting implementation. Task analysis creation consisted of dividing a task (e.g., filling an envelope) into its component steps to assess and teach the skill (Wong et al., 2015). Video creation consisted of identifying an actor and materials, filming the steps of the task analysis using the video camera on the iPhone, and editing the steps using the inPromptu app. Video prompting implementation consisted of positioning the student in front of the task, playing one video segment at a time, and providing the student 5 s to respond. Additionally, if the student did not complete the step correctly or did not attempt the step within 5 s, the paraprofessional was taught to implement an error correction procedure that consisted of blocking the incorrect response, verbally telling the student what was done incorrectly, and playing the video segment a second time. If the student completed the step incorrectly a second time, the paraprofessional then completed the step as a model. These components were selected because they are essential in the accurate implementation of a video prompting procedure.

Video modeling. After ensuring that the paraprofessional could access the video model, he was given a folder for each component that included the following: a first page
with a web address where he could access the video model of the video prompting components from a file-sharing server. In addition to the web address, this page included instructions to (a) watch the video and review the handouts in the folder, (b) watch the video a minimum of five times, (c) check off each step on the checklist as it was performed during the video model, and (d) begin to attempt implementation of the video prompting procedure on the day of the role play check-out. All folders also included a one-page implementation checklist of the video prompting components (see Appendix A, B, and C for the contents of these folders). The paraprofessional was also told that the video would help him learn a new strategy he could use to teach vocational skills to his student. Further, he was told not to begin implementation until he had completed the role play phase described below. To move on to role play, the paraprofessional must have documented that he had watched the video model and followed along with the implementation checklist at least five times.

For both the task analysis and video creation components, the video model demonstrated how to implement each step of the components. The video model included the following features: (a) an overview of the video prompting component, (b) a rationale why the component would likely be effective for promoting student progress, and (c) a model of each implementation step.

In addition to the features described above, the video prompting implementation and error correction video contained a role play feature in which myself and an undergraduate student demonstrated how to implement each implementation step of the video prompting procedure. This role play included four scenarios (i.e., correct task, functionally correct task, functionally incorrect task, and incorrect task). I served in the
role of the paraprofessional providing instruction on the target vocational skill, and the undergraduate student served in the role as the student with a disability. For the correct task scenario, the student completed the steps of the task analysis as written. I taught the paraprofessional not to provide any additional prompts and to move the video to the next clip after each step. For the functionally correct task, the student performed between one and three steps of the task analysis out of order. In this scenario, although the steps were performed out of order, the task was still completed correctly. For example, the student folded the left side of the shirt before the right—still leading to a correctly folded shirt by the end of the task. In these scenarios, I taught the paraprofessional to let the student proceed with the task independently. For the functionally incorrect task, the student performed between one and three steps of the task analysis out of order. In this scenario, the steps that were performed out of order led to the task being performed incorrectly. For example, the student folded the middle of the shirt before the sleeves—yielding an incorrectly folded shirt. I taught the paraprofessional to implement the error correction procedure in these cases. For the incorrect task scenario, the student completed between one and three steps of the task analysis incorrectly. I taught the paraprofessional to implement the error correction procedure immediately following the incorrect step.

Role play check-out. Following at least five documented viewings of the video model, I role played the four scenarios described above with the paraprofessional, with the paraprofessional acting as himself and myself acting as the student. If the paraprofessional implemented the intervention with 100% fidelity during this probe, he proceeded to video prompting implementation with his student. If any implementation
errors were made during this probe, I provided feedback and we rehearsed the scenarios in one session until 100% fidelity was reached.

Coaching with feedback. Coaching with feedback was introduced when the paraprofessional made any video prompting implementation errors with the student. When coaching was needed, the procedure was stopped and feedback was provided immediately after the error was made. This feedback included, (a) a model of the correctly implemented step, (b) an opportunity for the paraprofessional to rehearse this step, and (c) an opportunity to ask any questions.

Baseline. Prior to training, the student’s work participation consisted of (a) handing the paraprofessional a cup to prepare the latte, (b) filling latte cups with ice, or (c) handing the customer the latte the paraprofessional prepared. During the baseline condition, students were given the necessary materials to complete the vocational task and I asked them to “show me how to make a latte.” If an error occurred, I turned the student away from the task and I completed that step. Next, the student was allowed to proceed to the next step and attempt to finish the task. Using a multiple opportunity method (Cooper, Heron, & Heward, 2007), I scored all correctly completed steps. As described above, I scored steps completed in a functionally correct order as correct. Upon completion of the task, I thanked the student for participating and gave them a high five regardless of their performance.

Intervention. During intervention, the paraprofessional told the student, “we’re going to watch a video to learn how to make a latte.” Then, the student was given the necessary materials to complete the vocational task and asked to “show me how to make a latte.” The paraprofessional then implemented video prompting according to the fidelity
steps described above.

Fading. When students communicated the desire to control their own video prompts (i.e., pressing the ‘next’ button on the app), they were permitted to do so. Jan was the only participant to make this request with no outside influences. Marsha, Greg, and Peter all made this request after seeing Jan directing her own prompts.

After two sessions at 100% accuracy, I probed the students to see if they could complete the task without the video prompts. If they remained at the same level of accuracy, the paraprofessional stopped providing video prompts. If their accuracy dropped below 100%, the paraprofessional re-introduced the video. Once the student completed the task with 100% accuracy, I probed them again to see if they completed their task without the video prompts.

Maintenance. I conducted maintenance probes at 6 and 12 weeks after mastery criterion of 3 days at 100% accuracy was met for the students. Jan was no longer present at the coffee shop to conduct a 12-week maintenance probe. The procedures for the maintenance sessions were the same as those used during baseline.

Generalization. Across all conditions, I probed the vocational task during peak work hours to determine if the students would generalize their skills from training to customer service. I measured this in the same manner as the intervention task, and all procedures described in baseline were in place.

Social Validity

Bobby rated his perceived proficiency of the video prompting preparation and implementation. This proficiency questionnaire used the following 5-point scale (1 =}
Effective At All; 2 = Not Very Effective; 3 = Somewhat Effective; 4 = Quite Effective; 5 = Very Effective).

Results

A multiple-probe experiment was conducted across four students, allowing four opportunities to demonstrate experimental effects. Each student’s performance immediately improved after video prompting, demonstrating a functional relation between paraprofessional-implemented video prompting and student vocational skill acquisition. Further, after training, Bobby required minimal prompting for implementation fidelity. Data are described below and summarized in Figure 3.

Student Outcomes

*Marsha.* During the baseline phase, Marsha showed a low, stable level (range: 11–22%). Following paraprofessional-implemented video prompting, Marsha’s performance increased to 67% correct, and then 100% correct in the first two sessions. For the next 4 sessions, her data showed a variable trend (range: 78–100%) before stabilizing at 100% for the final three sessions, achieving mastery by the 7th intervention session (day 34). It is important to note that during the 3rd intervention session, Marsha requested to direct her own prompts, and continued directing her own prompts for the remainder of the sessions. During the 8th intervention session, she completed the vocational task independently (i.e., without any video prompts), and continued to perform it independently for the remainder of the sessions. For the generalization probes, Marsha demonstrated a low, stable level (range: 11–20%) during baseline, and then increased to 100% for 4 of 5 sessions following paraprofessional-implemented video prompting.
Figure 3. Participants’ percentage of latte making steps performed accurately during the training environment (closed circles) and generalization environment (open triangles). The session Greg’s behavior intervention began is denoted with an asterisk. Maintenance data during peak work hours were collected at 6 and 12 weeks post-intervention.
During the 4\textsuperscript{th} generalization session, Marsha completed the vocational task independently (i.e., without any video prompts). This high accuracy maintained at 100\% for the 6 and 12–week maintenance probes.

\textit{Jan.} During the baseline phase, Jan demonstrated a low, stable level (range: 0–13\%) of responding. After paraprofessional-implemented video prompting, her data increased to 67\% correct, and then increased to 100\% correct over the next two sessions. Jan’s data maintained at 100\% for the remainder of sessions. It is important to note that during the 2\textsuperscript{nd} intervention session, Jan requested to direct her own prompts, and continued directing her own prompts for the remainder of the sessions. During the 5\textsuperscript{th} intervention session, she completed the vocational task independently (i.e., without any video prompts) and continued to perform it independently for the remainder of the sessions. For the generalization probes, Jan exhibited a low, stable level (range: 11–22\%) during baseline, and then increased to 100\% for the remainder of generalization probes following paraprofessional-implemented video prompting. During the 2\textsuperscript{nd} generalization session, Jan completed the vocational task independently (i.e., without any video prompts). This high accuracy maintained at 100\% for the 6-week follow-up probe. Jan was no longer working in the coffee shop during the 12-week maintenance probe.

\textit{Greg.} During the baseline phase, Greg exhibited a low, variable trend (range: 0–33\%). Following paraprofessional-implemented video prompting, Greg’s data increased to 89\% correct, then decreased to 56\% correct the next session. From here, data showed an increasing trend to 100\% correct during intervention session 4. Greg’s data once again decreased to 89\% the following session, and then increased to 100\% for the remaining sessions. It is important to note that during the 3\textsuperscript{rd} intervention session, Greg requested to
direct his own prompts, and continued directing his own prompts for the remainder of the sessions. For the generalization probes, Greg showed a low, stable level (range: 22–33%) during baseline, and then increased to 89% correct following paraprofessional-implemented video prompting. Greg’s data then increased to 100% for the remaining generalization probes. During the 3rd generalization session, Greg completed the vocational task independently (i.e., without any video prompts), and continued to perform it independently for the remainder of the sessions. This high accuracy maintained at 100% for the 6-week follow-up probe. During the 12-week maintenance probe, Greg’s accuracy decreased to 68%. Because of this decrease, a booster session was implemented, and data immediately increased to 100% correct for the following session.

Peter. During the baseline phase, Peter first demonstrated a slightly increasing trend, which then stabilized at 27%. Upon paraprofessional-implemented video prompting, Peter’s data had an immediate, sharp increase to 89% correct. The following session continued to increase to 100% correct, and maintained at this level for the remainder of the sessions. It is important to note that during the 4th intervention session, Peter requested to direct his own prompts, and continued directing his own prompts for the remainder of the sessions. During the 5th intervention session, Peter completed the vocational task independently (i.e., without any video prompts), and continued to perform it independently for the remainder of the sessions. For the generalization probes, Peter demonstrated a low, stable level (range: 22–33%) during baseline, and then increased to 100% correct for the remainder of generalization probes following paraprofessional-implemented video prompting. During the first generalization session, Peter completed the vocational task independently (i.e., without any video prompts). Peter’s data then
decreased to 22% at the 6-week follow-up probe. Because of this decrease, a booster session was implemented, and data immediately increased to 100% correct for the following 2 sessions. During the 12-week maintenance probe, Peter’s accuracy decreased to 78%. Because of this decrease, a booster session was implemented, and data immediately increased to 100% correct for the following session.

Job Coach Fidelity

Bobby maintained 100% fidelity for 10 of the 12 intervention sessions in which he provided the video prompting implementation. For two of the 12 sessions, Bobby completed one step of the fidelity checklist incorrectly (i.e., 95%) and required coaching with feedback. On both occasions, the step that was missed was initiating the error correction procedure.

Social Validity

Bobby indicated that he felt that the training package was “quite effective” (i.e., 4 on a 5-point scale). He indicated that he felt that video prompting was “quite effective” with the students (i.e., 4 on a 5-point scale). He also indicated that he was “somewhat likely” (i.e., 3 on a 5-point scale) to use the same strategy with the same students or a different student in the future, and that the reason for this was “just the patience”. Finally, Bobby indicated that he would be “somewhat likely” (i.e., 3 on a 5-point scale) to participate in a similar professional development opportunity in the future, but that he would be “quite likely” (i.e., 4 on a 5-point scale) to recommend this kind of professional development opportunity to a colleague.
Discussion

Effective vocational training is a valuable tool that may lead to improved employment outcomes for individuals with severe disabilities. Video prompting also supports the initiatives set forth by Employment First to provide gainful employment for all individuals with disabilities. Previous studies have shown that given effective training, paraprofessionals can implement video prompting that results in increased vocational skill acquisition for students (e.g., Seaman, Cannella-Malone & Brock, under review). In the present study, I trained a paraprofessional to task analyze a vocational skill, create a video, and implement video prompting with error correction. We evaluated the efficacy of his implementation with four students with severe disabilities on the acquisition of a vocational task in their school-based work environment. Each participant’s performance immediately improved after video prompting, and successfully generalized from a training to work environment with minimal paraprofessional effort. These findings extend the literature related to implementation science and practitioner-implemented video prompting in a number of key ways.

First, findings from this study suggest that given effective training, a paraprofessional may be able to create and implement video prompting effectively to teach vocational skills to transition-age students with severe disabilities. In previous studies, I have shown positive results with a paraprofessional acting as the implementation agent, however, this is the first study to evaluate vocational skill acquisition with a paraprofessional acting as the implementation agent. The positive results of this study mirror those of video prompting with authentic implementation
agents (i.e., Seaman, Cannella-Malone & Brock, under review; Seaman, Cannella-Malone, Brock, & Dueker, under review). Moreover, this study further demonstrates the efficacy of practitioner-implemented video prompting by providing additional replications of practitioner-implemented video prompting with error correction.

Second, students expressed a desire to independently control the video themselves (i.e., self-directed video prompting; Mechling, Gast, & Fields, 2008) rather than having the job-coach perform this function. This allowed for natural fading of adult support, rather than more systematic processes described in other studies (e.g., Sigafoos et al., 2007). This adjustment in prompt control not only provided the participants with the benefits of self-directed video prompting in a work environment (e.g., allowing the participants to easily blend in with their peers due to the reduction of job-coach interaction), but had the added advantage of allowing the paraprofessional to perform other essential tasks during this time such as taking orders. Although this type of self-fading has been documented for students with mild and moderate disabilities (Mechling, Gast, & Fields, 2008), my findings suggest that some students with severe disabilities may also be capable of taking responsibility for their own learning and fading with video prompting.

Third, results indicated that after 3 to 5 initial sessions with paraprofessional-implemented video prompting in a training environment, all participants accurately performed the vocational task (i.e., making a latte) in a high stakes work environment. This information contributes to the scant number of studies that report generalization findings in both the video prompting (Banda, Dogoe, & Matuszny, 2011) and vocational training literature (Cannella-Malone & Schaefer, 2015). Further, this provides crucial
information about the efficacy of video prompting and generalization to authentic environments.

Implications for Practice

The results from this study yield important implications for paraprofessionals who work with students with severe disabilities, or any school and district staff members involved in transition and employment (e.g., transition coordinators). First, paraprofessionals should consider implementing a video prompting intervention with their students with severe disabilities, as results from this study demonstrate that paraprofessional-implemented video prompting can be used to quickly and efficiently to teach a new vocational skill to workers with severe disabilities. Second, transition coordinators and vocational rehabilitation centers should endeavor to use video modeling as a resource efficient way to train paraprofessionals in an evidence-based practice such as video prompting. Although feedback was required for the implementation component, the paraprofessional completed both the task analysis writing and video creation components without any additional training. With this, paraprofessional trainers could quickly and effectively train higher volumes of staff.

Limitations and Future Directions

Limitations of this study highlight several opportunities for future research. First, as a fading procedure was not needed, we were not able to evaluate the effects of paraprofessional assisted fading for a video prompting intervention. Although this particular group of participants did not require systematic fading of the video prompts, many individuals with severe disabilities may require this fading to be independently
successful at a job site. Researchers of future studies should endeavor to train and evaluate the efficacy of a job-coach implemented systematic fading procedure.

Second, although paraprofessional implemented video prompting led to the vocational skill successfully generalizing from a training environment to a school-based work environment, we were not able to see if this skill would further generalize to an employment setting where the participants could be gainfully employed. Future studies may benefit from evaluating paraprofessional-implemented video prompting in a setting where participants are gainfully employed to ensure related factors such as paraprofessional demands still allow this procedure to be effective. For example, researchers could collaborate with community employers to set up opportunities for participants to try out their newly acquired skills.

Third, Bobby did not watch the training videos on his own. After three weeks of reminders without success, the classroom teacher set aside a time during the day for Bobby and I to watch the videos together. Future researchers should work with supervisors from the outset to provide times for training to take place.

Fourth, Bobby still required feedback for the error correction component even after he had demonstrated mastery of this during the role play. Future researchers should consider using a student with a disability rather than a confederate during this process.

Finally, Greg exhibited challenging behaviors during his generalization sessions (i.e., throwing materials, yelling, disrupting other workers). Unfortunately, Bobby did not know how to fix these issues on his own, and I had to intervene. Although Bobby was implementing the video prompting intervention, the behavior intervention I provided (i.e., a rule sheet with consequences) constituted an external variable.
Conclusion

Findings from this study show that given effective training to implement video prompting, a paraprofessional can independently and effectively implement video prompting to teach skills to a number of students. There are a variety of evidence-based practices for students with severe disabilities that could be used to improve vocational skills. I have demonstrated that paraprofessionals can implement one, but they could be even more effective with a wider repertoire of evidence-based practices. Given the unique qualities of video prompting (i.e., consistent implementation regardless of skill level), it might be easier to train paraprofessionals to implement this intervention than others. Researchers should consider how to design other intervention approaches in a way that reduces opportunities for practitioners to make errors, especially when practitioners like paraprofessionals have little training or experience in delivering instruction to students with severe disabilities.
Chapter 4: Practitioner Paper

This chapter contains a practitioner paper that is intended to provide guidelines for practitioner implementation of the practice evaluated in Chapter 3. The following paper includes a summary of employment outcomes for students with autism spectrum disorder (ASD), information on video prompting and its place in the workplace, and provides instructions for implementation.

Abstract

This paper serves as a guide for teachers, job coaches, and other practitioners to effectively implement video prompting with their students with ASD. Video prompting in the context of a work environment for students with ASD is introduced and implementation steps are provided. A case example and resources are incorporated throughout to aide in the implementation process. Finally, progress monitoring, fading, and troubleshooting are discussed.
Rosie is a 19-year-old high school student diagnosed with autism spectrum disorder (ASD). She has never been gainfully employed, but she enrolled in a transition program that has matched her with both a job and a job coach at her local coffee shop. Rosie is enjoying working with her peers, but unfortunately, she has been assigned several tasks that she is having difficulty learning. Her job coach, Connor, is unsure of how to help her learn new skills while still attending to the other trainees at the job site. Rosie’s work supervisor does not see a future for Rosie at the coffee shop if she is not able to independently make coffee and serve customers and is unsure of how to best help her.

Like Rosie, many students with severe disabilities struggle with obtaining and keeping a job. In fact, individuals with severe disabilities have the lowest rates of employment even among other disability groups (Carter, Austin, & Trainor, 2012). There are several possible reasons for this low rate of employment including interactional difficulties, behavioral complications, and most importantly, difficulties in vocational task execution (Hendricks, 2010). Fortunately, research has shown that there are a number of evidence-based practices that can help students with more significant disabilities acquire the vocational skills needed for employment (Cannella-Malone & Schaefer, 2015). Although the literature is promising, translating the implications and findings from research into practice can be difficult, and identifying effective methods for teaching vocational skills can be a challenging task (Butterworth, 2015). This paper will explore one of the more promising practices—video prompting—and its place in the workplace, as well as provide instructions for how to implement video prompting to teach vocational skills.
Video Prompting

What is video prompting? Video prompting is an evidence-based practice where the learner is shown a video clip (i.e., prompt) depicting a single step of a task analysis at a time (Sigafoos et al., 2005). Unlike video modeling, in which the learner performs the task after viewing a video of the entire task, with video prompting, the learner will perform each step of the targeted task (e.g., making a latte) after watching each individual video clip (e.g., getting a cup from the stack).

Why should we use video prompting? Video prompting has been proven effective with a wide variety of learners and with an abundance of tasks (Banda, Dogow, & Matuszny, 2011). One of the benefits of using video prompting with learners with severe disabilities is that some students are more likely to respond positively to video instruction than a more traditional instructional method, such as static pictures (Banda, 2011). Moreover, video prompting places a smaller cognitive load on people with more severe disabilities by providing shorter clips while still giving the benefit of a video model. Finally, in the case of self-directed video prompting (i.e., the learner navigating the video rather than the instructor), the learner is offered a greater degree of independence by reducing the need for an instructor.

Video prompting in the workplace. Video prompting has the potential to be highly valuable in the workplace, as it is one of the few evidence-based practices that allows trainers on the job site—who may not be trained in the implementation of evidence-based practices (e.g., job coaches, paraprofessionals)—to systematically implement an instructional strategy (Seaman, Cannella-Malone, & Brock under review). Moreover, video prompting can be implemented on a mobile device such as an iPhone, which allows
the intervention to be both portable and inconspicuous in a work setting (Cihak, Kessler, & Alberto, 2007). Finally, once a video is created for a specific skill, it can be used for any student who may need to learn that skill in the future. When choosing a method to improve skill acquisition in the workplace, video prompting is one of the few practices that is advantageous to both the employer, job coach, and employee.

How To Teach Using Video Prompting

Video prompting consists of seven main components for the instructor: (a) writing the task analysis, (b) creating the video prompts, (c) implementing video prompting, (d) the error correction procedure, (f) fading, (g) data collection, and (h) trouble shooting. This instructional guide builds upon the work of both Kellems et al. (2016) and Weng, Savage, and Bouck (2014) who provide a thorough overview and step-by-step guide of (a) how to write a task analysis and (b) the video creation component of video prompting, respectively. Utilizing these resources for the preparation of the first two components, the following sections will focus on video prompting implementation, error correction, fading, data collection, and trouble shooting.

Connor, Rosie’s job coach, has prepared the materials he needs to start using video prompting. He observed a colleague performing the target task (i.e., making a latte), wrote a task analysis according to the steps he observed, filmed each task analysis step as a separate video clip, and entered them into his chosen video prompting app (i.e., VideoTote; Burke et al., 2013). Now, Connor is ready to take a baseline measure to identify which steps for making a latte may be more difficult for Rosie.

Data collection and progress monitoring.
Baseline. In order to monitor your learner’s progress, data collection is essential. Without this measure, you cannot take an accurate snap shot of your learner’s skill. For example, if in baseline Connor were to see that Rosie could already complete steps 1 to 3 independently, he could begin instruction at step 4, saving valuable instructional time. Using the sample data sheet provided in Figure 4, you can simply fill in the steps of your learner’s task analysis and begin to measure your baseline. To collect this data, you will tell the learner to begin the task. For each step of the task analysis on the data sheet, you will mark either an “I+” or an “X”. For the first step, you will give the learner 5 s to begin the first step on the task analysis after asking them to complete the task. If they complete the step independently, you will mark an “I+”. If the learner completes the step incorrectly or does not begin the step after 5 s, you will mark an “X” and complete the step for them while the turns away. You will repeat this process for each subsequent step on the task analysis. Once a stable or decreasing trend is seen in the baseline data for 3 days, intervention can begin.

To collect a baseline measure, Connor uses the data sheet depicted in Figure 5, tells Rosie to “make me a latte,” and lets her begin the task. To ensure that he is getting an accurate measure of her skill level, Connor does this before showing her any video clips, and he allows Rosie 5 s to begin each step on his task analysis. For each step that Rosie completes correctly, Connor marks that step as an “I+” on the data sheet. If Rosie begins to complete a step incorrectly or does not initiate a response after 5 s, Connor completes the step for her, marks that step as an “0”, and allows her to continue.

Intervention. Using the same data sheet as you did for baseline, you can now collect your intervention data. Similar to baseline, you will tell the learner to begin the
task. However, for each step of the task analysis on the data sheet, you will now have four options for each type of response you may see.

*Response types and error correction.* Before beginning any intervention or error correction procedure, it is important to note the type of correct or incorrect response in order to ensure that the learner is corrected only when there is an actual error being made. Below are examples of each of the four possible learner responses, an explanation of what action the instructor should take, and a fidelity checklist for the error correction procedure (Figure 6).

Correct response. A response is considered correct if the student completes the step of the task exactly as shown after watching the clip. *After filling the cup to the line with ice (i.e., step 2 of the data sheet), Rosie watches the next video clip and pours 3 oz of cold brew into the small silver cup. Because this was the correct response, Connor marks an “I” on the data sheet and moves on to the next video clip.*

Functionally correct response. A response is considered functionally correct if the student completes a step of the task out of order, but the task as a whole still ends up completed correctly. *After filling the cup to the line with ice, Rosie watches the next video clip and fills the cup with milk to the line. Although this is not the next step in the sequence of the task, the end product will be the same. Taking this into consideration, Connor marks an “I” on the data sheet and moves on to the next clip with no error correction.*
Figure 4. Blank data collection sheet

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Student Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>2.</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>3.</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>4.</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>5.</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>6.</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>7.</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>8.</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>9.</td>
<td>I+ I X 0</td>
</tr>
</tbody>
</table>

Percent Correct (sum I+ & I) _________/9

*Directions:* Observe the student completing the task. Circle one of the following for each step:

- **I+**: Correct without video prompt
- **I**: Correct with video prompt
- **X**: Correct following second viewing of video prompt
- **0**: Incorrect
### Rosie’s data collection sheet

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Student Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Get a cold cup</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>2. Fill the cup to the line with ice</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>3. Pour 3 oz. of cold brew into the small silver cup</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>4. Dump cold brew into the cold cup</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>5. Fill cup with milk to the line</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>6. Pour 1 small cup of flavor into the white cup</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>7. Dump flavor into the cold cup</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>8. Stir drink with the long spoon</td>
<td>I+ I X 0</td>
</tr>
<tr>
<td>9. Place the lid on the cup</td>
<td>I+ I X 0</td>
</tr>
</tbody>
</table>

**Percent Correct (sum I+ & I) /9**

**Directions:** Observe the student completing the task. Circle one of the following for each step:

- **I+**: Correct without video prompt
- **I**: Correct with video prompt
- **X**: Correct following second viewing of video prompt
- **0**: Incorrect

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Figure 5. Rosie’s data collection sheet
Functionally incorrect response. A response is considered functionally incorrect if the student completes a step of the task out of order, and this causes the task as a whole to be completed incorrectly. After pouring 3 oz of cold brew into the cup, Rosie watches the next video clip and pours flavor into the measuring spoon. Connor, knowing that pouring in the flavor before the milk will cause the latte to mix improperly, blocks Rosie and implements the error correction procedure. As he has already blocked Rosie’s incorrect response so that she does not practice any errors (i.e., Figure 6, step 6A), he then says, “Not quite right. Here, watch this again and make sure you pour the milk first” and plays the video clip a second time (i.e., Figure 6, step 6B). After viewing the video a second time Rosie correctly completes the step. Connor marks and “X” moves on to the next video clip.

Incorrect/no response. A response if considered incorrect if the student completes the step incorrectly after viewing the video clip. After pouring 3 oz of cold brew into the cup, Rosie watches the next video clip and starts watching the customers in line. Connor waits 5 seconds, and since Rosie still has not attempted a response, begins the error correction procedure (i.e., step 6). Connor says, “Not quite right. Here, watch this again and make sure you pour the milk first” and plays the video clip a second time (i.e., step 6B). After viewing the video clip a second time, Rosie begins to put the lid on the cup. Since Rosie has now performed the step incorrectly twice, Connor models the correct step (i.e., pouring the milk in the cup), marks an “0” on the data sheet, and moves to the next video clip.

Implementation. Once the instructor has taken the baseline measure and recorded a steady or decreasing trend, it is time to implement video prompting. Following the
fidelity checklist shown in Figure 6, Connor begins to teach Rosie how to make a latte.

After bringing Rosie to the work area and ensuring that she is attending to the video screen (i.e., steps 1 and 2), Connor says, “watch this,” and plays the first video clip (i.e., step 3). When the clip ends Connor says, “now you do it,” (i.e., step 4) and allows Rosie 5 seconds to complete the step independently. If Rosie completes the step correctly, he will repeat steps 3 and 4 with the next video clip (i.e., step 5). If Rosie completes the step incorrectly or does not begin the step within 5 seconds, he will begin the error correction procedure.

Trouble shooting. Like most evidence-based practices, video prompting is only effective when practitioners collect data and make data-based adjustments to their instruction when necessary. Based on your data, modifications for troubleshooting may be needed. In these cases, it is important to consider whether the learner is able to perform the task or not. If the learner is unable to perform the task, then the task analysis should be broken into smaller parts to ensure the learner’s success. However, if the learner continues to make errors but you have observed them completing the task in the past, it is possible that the learner is simply not motivated to do so. In these cases, it may be beneficial to use goal setting and differential reinforcement to increase the learner’s success. Sometimes it can be difficult to decipher if your learner is unable to complete the task, or is needing some extra motivation. An easy way to see if this is the case it to try using larger or more powerful reinforcers to increase motivation for the learner. If the learner can complete the step with the introduction of this augmented reinforcer, try setting goals and providing reinforcement rather than re-teaching a skill that the learner may have already acquired.
As Connor is reviewing the data he collected over the past 2 weeks (see, Figure 7), he notices that although Rosie’s data improved from 11% to 76% fairly quickly, she seems to have reached a plateau in session 10. Frustrated after following the fidelity
checklist for several days without seeing any improvements, Connor reviews his data sheets from the past three sessions to decipher where the problem may be.

Motivation. Connor has noticed that for the past two days, Rosie has gotten a “0” on step 8 (i.e., stirring the drink with the long spoon). However, after looking at the data, he sees that she completed this step correctly in sessions 5 and 8. Sometimes, the issue is not that the learner does not know how to complete the step, but that they are simply not motivated to do so. Given that Connor knows that Rosie has independently completed this step in the past, he decides that Rosie may no longer be motivated to complete the task. Rather than re-teaching a skill that he believes Rosie may have already acquired, he sets a goal and provides reinforcement by telling her “if you remember to stir the drink with the long spoon, we can finish 5 minutes early today.” For a guide on how to set goals for your student, see Patel and Laud (2009). Further, Connor insures that he is only providing reinforcement for correct responses, while ignoring incorrect response. For a guide on how to use differential reinforcement, see Gongola and Daddario (2010).

Skill deficit. Similarly, if Connor saw that had not yet completed that step correctly, he could conclude that Rosie has not yet learned that step. In the case of “stirring with the long spoon,” Connor might consider having Rosie practice this step in isolation until she is successful. This practice will likely need more intensive intervention, for example, full physical prompts. Once Rosie can complete this step independently, Connor will once again have her attempt the task in its entirety.

Fading. Once the student begins consistently completing the task with high levels of accuracy, it is time to begin fading the video prompts and reinforcement so that the student can become more independent. To do this, you can edit two to three clips together
(i.e., chunking) to form several longer clips. This process reduces the number of prompts that the learner receives. Once the learner again reaches and maintains 100% accuracy for several days with the longer clips, you can try removing the video clips entirely. If the learner is still successful, then they are completely independent with this task. If they are unsuccessful, you can continue chunking together video clips until you have created a video model (i.e., one long clip) rather than individual video prompts.

Looking at his data, Connor observes that for sessions 11, 12, and 13, Rosie has reached, and maintained at 100% accuracy. Now, he can begin fading the video prompts. To do this, he edits three clips together to form longer clips. Connor chose to chunk together steps 1, 2, and 3 to form one long video clip that consists of getting a cup from the stack, filling it with ice, and then adding the cold brew. Similarly, then chunked steps 4, 5, and 6 and well as steps 7, 8, and 9 together.

Conclusion

Students with ASD experience very poor employment outcomes. However, with the use of evidence-based practices such as video prompting, practitioners can help effectively teach vocational skills that may improve these outcomes. Video prompting can be used to systematically teach a range of vocational tasks that with additional training, can be generalized to a work environment. Although this article provides guidelines for video prompting, it is important to remember that modifications can and should be made according to students’ individual skills sets and behaviors.
<table>
<thead>
<tr>
<th>Date</th>
<th>Session</th>
<th>Correct Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/28/16</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>9/29/16</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>9/30/16</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>10/3/16</td>
<td>4</td>
<td>67</td>
</tr>
<tr>
<td>10/5/16</td>
<td>5</td>
<td>78</td>
</tr>
<tr>
<td>10/26/16</td>
<td>6</td>
<td>67</td>
</tr>
<tr>
<td>10/27/16</td>
<td>7</td>
<td>67</td>
</tr>
<tr>
<td>10/31/16</td>
<td>8</td>
<td>78</td>
</tr>
<tr>
<td>11/1/16</td>
<td>9</td>
<td>67</td>
</tr>
<tr>
<td>11/3/16</td>
<td>10</td>
<td>67</td>
</tr>
<tr>
<td>11/5/16</td>
<td>11</td>
<td>100</td>
</tr>
<tr>
<td>11/7/16</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>11/8/16</td>
<td>13</td>
<td>100</td>
</tr>
<tr>
<td>11/13/16</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>11/14/16</td>
<td>15</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 7. Rosie’s data and graph
Chapter 5: Discussion

The preceding three chapters of this dissertation focus on the existing research literature on vocational training interventions for adolescents and adults with ASD, my own research study that extends that literature, and recommendations for practitioners that stem from both my study and the existing literature. In this chapter, I will describe the specific aims of my research line on vocational training interventions, how the three preceding chapters relate to these aims, and how my future research will further address these aims.

Research Aims

The under and un-employment of individuals with ASD is a critical issue that researchers must continue to address. In particular, researchers must develop and test interventions for teaching crucial vocational skills. I plan to improve vocational outcomes for students with severe disabilities by conducting studies evaluating the efficacy of professional development packages for secondary educators, transition staff, and job coaches. Through this work, I hope to answer questions about using the most efficient strategies to train practitioners to implement evidence-based practices to support individuals with severe disabilities in becoming productive and independent members of their community.

Further, I am interested in extending this work to training practitioners to teach these individuals soft skills such as communication, interpersonal skills, and
professionalism. Specifically, I plan to investigate how job coaches might be trained to promote both technical and soft vocational skills in both structured teaching environments as well as employment environments. By using behavior analytic methods to train practitioners in these fields, I firmly believe that we can improve outcomes for a wide range of individuals geared toward preparing them to live independently, thrive socially, and meaningfully contribute to society.

The Development of This Dissertation

During my first year as a doctoral student, I conducted a literature review that examined the vocational training interventions targeted specifically to adolescents and adults with ASD, which I presented in Chapter 2. This review indicated that there are numerous interventions that have been effective in teaching vocational skills to adults and adolescents with ASD. Among these interventions, there have been several skills targeted such as mail sorting, photocopying, food preparation, and even interacting with customers; as well as interventions for both prevocational and job retention skills such as interviewing and on-task behavior. However, there are several limitations such as skills taught and measured in contrived settings, lack of studies targeting soft and pre-employment skills, as well as a lack of studies targeting younger participants (i.e., 13–22 years of age).

Based on these findings, I designed and conducted an experimental study during my second year of the doctoral program. This study used a multiple-baseline-across-behaviors design to evaluate the training methods used to teach a paraprofessional in the preparation and implementation of video prompting with his student with ASD to teach a vocational skill. Further, the behavior and learning of both the paraprofessional and
student were measured. Results indicated that the training package led to increased video prompting implementation behavior for the paraprofessional, as well as corresponding, increased vocational skill behavior for the student.

Building on these results, I then conducted another study using a multiple-probe-across-participants design to evaluate (a) the degree to which the paraprofessional from the previous study generalized implementation to new students and situations, and (b) the degree to which his implementation resulted in three middle school students with ASD acquiring an authentic vocational skill (i.e., photocopying in the school office). Results showed that the paraprofessional implemented the video prompting procedure with high fidelity without any additional training or support, and all three participants quickly mastered the photocopying skill and generalized their implementation to authentic copy requests from school staff. These results suggest that focused coaching on video prompting implementation with one student may enable paraprofessionals to effectively generalize implementation when targeting similar skills with other students.

Both of these studies address important questions about the effects of practitioner-implemented video prompting as well as vocational skill acquisition for students with ASD, and led to my dissertation. The experimental study presented in Chapter 3 extended this line by measuring the outcomes in a more authentic employment setting. Using a multiple-probe-across-participants design, I evaluated the efficacy of paraprofessional-implemented video prompting for students with severe disabilities in a school-based work environment. From the research study, I chose to focus the practitioner paper on video prompting, its place in the workplace, and an instructional guide for how to implement
video prompting to teach vocational skills. Specifically, this guide focused on video prompting implementation, error correction, fading, data collection, and trouble shooting.

Future Research

The results from my dissertation and related studies show that given effective training, practitioners can serve as effective implementation agents for preparing and teaching vocational skills for students with severe disabilities. I recently received a grant from Autism Speaks that will allow me to conduct this research on a larger scale. By creating a partnership between the OSU Special Education Program, Autism Speaks U, and local high schools, I will train pre-service teachers in video prompting with the intention of serving as job coaches for students with ASD. This model is two-fold, as students with ASD will be receiving systematic job coaching via video prompting in both their classrooms and place of employment. This job coaching will teach the students a wide range of new vocational skills so that they can maintain their current employment or maintain new employment if desired. Additionally, pre-service practitioners will be trained in how to effectively plan and implement a video prompting procedure.

Once at a University, I hope to continue this model. Although I plan to pursue additional research funding, given that I will have access to undergraduate teacher trainees, this is a model that I could continue to investigate with relatively few resources. In addition to video prompting, I will train undergraduates in other evidence-based practices (e.g., audio-cueing, time delay) that were found effective in the literature review from Chapter 2. This model will not only create a sustainable partnership with the local high schools, but will also allow me to continue my line of research while evaluating training measures of interest.
My first year as a faculty member, I plan to write a conceptual paper discussing the soft skills that are needed for employment for students with ASD. In order to address these employment outcomes, it is essential to determine their foundation, and examining the feelings of employers of individuals with ASD may provide insight into this disparity between disability groups. In their review investigating employer attitudes toward workers with disabilities, Ju, Roberts, and Zhang (2013) found that four skills were viewed as the most important for employers of people with and without disabilities alike: demonstrating personal integrity/honesty in work, ability to follow instructions, ability to show respect for others, and ability to be on time. Contrarily, in their review discussing trends in employment for individuals with ASD, Chen, Leader, Sung, and Leahy (2015) cited ample evidence that socially inappropriate behaviors, such as inability to understand others’ emotions, deficits in social interactions, and maintaining communication in the workplace, were among the principal difficulties for people with ASD in the workplace. In order to begin to improve poor employment outcomes, it is essential to expand the vocational emphasis to the soft skill deficits unique to individuals with ASD.

Analogous to technical vocational skills, one of the most effective ways to ensure that future employees with ASD are indeed learning soft skills is to train the educational practitioners who will be teaching these skills. Each year, I plan to conduct two studies based off of the aforementioned conceptual paper: one targeting soft skill acquisition for students with ASD, and one training a job coach or other practitioner to teach this skill. Once I establish relationships with local schools or vocational training agencies, I plan to answer a number of questions through applied research. These include investigating the most effective methods to systematically teach soft vocational skills to students with
ASD as well as examining approaches to fade practitioner support in work environments.

Conclusion

Throughout my career, I will further develop the skills that will enable me to be an independent, productive researcher. By using behavior analytic methods to train practitioners in these fields, I firmly believe that we can improve employment outcomes for individuals with ASD. Training practitioners to implement interventions could indeed be an effective means to teaching vocational skills, and significantly improve employment outcomes for students with ASD in the future. One can hope that with a continued focus on employment, this population will gain not only the technical competence, but the non-technical soft skills essential for students entering the workforce to ensure success.
Asterisks indicate the article was included in the Chapter 2 literature review.


Appendix A: Contents of Video Modeling Folder for Task Analysis
Go to this web address to watch your video:

\[
\text{go.osu.edu/}\_
\]

- watch the video and review the handouts in this folder
- please watch the video at least 5 times
- check off each step on the checklist as it is performed during the video model
- when we observe we will be looking for you to implement the new strategy that you learned from the video
Task Analysis

What is it?

A task analysis is the process of breaking a skill into smaller, more manageable steps in order to teach the skill. As the smaller steps are mastered, the learner becomes increasingly independent in his or her ability to perform the larger skill.

Why should we use one?

A task analysis is an effective way to plan the teaching of skills that require several steps to be performed in a certain order such as telling time, tying shoes, or doing long division, as well as larger more complex tasks (e.g. preparing and serving a meal, or cleaning a cafeteria).
**Directions:** Check off each step on the checklist as it is performed during the video model. Start a new column for each of the 5 times you watch this video.

<table>
<thead>
<tr>
<th>TASK ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Watch video and write down steps necessary to complete task in sequential order. Make sure that EACH step</td>
</tr>
<tr>
<td>a. Is necessary</td>
</tr>
<tr>
<td>b. listed sequentially (top to bottom) within the list of steps</td>
</tr>
<tr>
<td>c. cannot be broken down into a smaller step</td>
</tr>
<tr>
<td>2. Gather materials needed to perform task</td>
</tr>
<tr>
<td>Have a coworker or colleague perform the steps exactly as written</td>
</tr>
<tr>
<td>A. If the model successfully completes the task from your steps, stop.</td>
</tr>
<tr>
<td>B. If the model is unable to complete the task or completes the task incorrectly, ask model for feedback as to why he/she was unable to perform step</td>
</tr>
<tr>
<td>3. Return to step 2 and modify your task analysis</td>
</tr>
</tbody>
</table>
Appendix B: Contents of Video Modeling Folder for Video Creation
Go to this web address to watch your video:

go.osu.edu/videocreation

• watch the video and review the handouts in this folder
• you are welcome to review video as many times as you would like, but a minimum of five times
• check off each step on the checklist as it is performed during the video model
• when we observe we will be looking for you to implement the new strategy that you learned from the video
Video Prompting

What is it?

Video prompting is a teaching method where the learner is shown a video clip depicting only one step of a task analysis at a time. Following each clip, the learner will perform that step of the task.

Why should we use it?

Video prompting has been proven effective with a wide variety of learners and a wide variety of tasks. Additionally, it gives a level of independence to the learner by not needing to have an instructor present.
### Video Creation

#### Filming Videos Clips

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Gather materials needed for task</td>
</tr>
<tr>
<td>2.</td>
<td>Obtain actor for video</td>
</tr>
<tr>
<td>3.</td>
<td>Open “camera”</td>
</tr>
<tr>
<td>4.</td>
<td>Slide to “video”</td>
</tr>
<tr>
<td>5.</td>
<td>Press the red record button and read the first step from your task analysis</td>
</tr>
<tr>
<td>6.</td>
<td>Following, have the actor perform that step</td>
</tr>
<tr>
<td>7.</td>
<td>Press the red button to end recording</td>
</tr>
</tbody>
</table>

Repeat steps 5 through 7 for your remaining task analysis steps

#### Editing Video Clips (for first step)

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Open impromptu</td>
</tr>
<tr>
<td>2.</td>
<td>Select “my tasks” on the bottom</td>
</tr>
<tr>
<td>3.</td>
<td>Select “add playlist”</td>
</tr>
<tr>
<td>4.</td>
<td>Type name of task into “new playlist” and select “save”</td>
</tr>
<tr>
<td>5.</td>
<td>Select “add video from device”</td>
</tr>
<tr>
<td>6.</td>
<td>Select “choose from camera roll”</td>
</tr>
<tr>
<td>7.</td>
<td>Select “camera roll”</td>
</tr>
<tr>
<td>8.</td>
<td>Select first video</td>
</tr>
<tr>
<td>Step</td>
<td>Instruction</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>9.</td>
<td>Select “choose”</td>
</tr>
<tr>
<td>10.</td>
<td>Type 2 word phrase that describes the step into “describe this step” and press “save”</td>
</tr>
<tr>
<td>11.</td>
<td>Select your task name from the list</td>
</tr>
<tr>
<td>12.</td>
<td>Select “edit” in the top right corner</td>
</tr>
<tr>
<td></td>
<td><strong>For Remaining Steps</strong></td>
</tr>
<tr>
<td>13.</td>
<td>Select “+ videos”</td>
</tr>
<tr>
<td>14.</td>
<td>Select “add video from device”</td>
</tr>
<tr>
<td>15.</td>
<td>Select “choose from camera roll”</td>
</tr>
<tr>
<td>16.</td>
<td>Select “camera roll”</td>
</tr>
<tr>
<td>17.</td>
<td>Select next video</td>
</tr>
<tr>
<td>18.</td>
<td>Select “choose”</td>
</tr>
<tr>
<td>19.</td>
<td>Type 2 word phrase that describes the step into “describe this step” and press “save”</td>
</tr>
<tr>
<td>20.</td>
<td>Repeat steps 13-19 for remaining steps</td>
</tr>
<tr>
<td>21.</td>
<td>When all steps have been recorded, press done in the top right hand corner</td>
</tr>
<tr>
<td>22.</td>
<td>Select “play all steps” to review your video</td>
</tr>
</tbody>
</table>
Appendix C: Contents of Video Modeling Folder for Implementation and Error Correction
Go to this web address to watch your video:

go.osu.edu/implementation

- watch the video and review the handouts in this folder
- you are welcome to review video as many times as you would like, but a minimum of five times
- check off each step on the checklist as it is performed during the video model
- when we observe we will be looking for you to implement the new strategy that you learned from the video
Video Prompting

What is it?

Video prompting is a teaching method where the learner is shown a video clip depicting only one step of a task analysis at a time. Following each clip, the learner will perform that step of the task.

Why should we use it?

Video prompting has been proven effective with a wide variety of learners and a wide variety of tasks. Additionally, it gives a level of independence to the learner by not needing to have an instructor present.
**Teaching**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Brings student to setting and positions in front of task</td>
</tr>
<tr>
<td>2.</td>
<td>Holds the iPhone in front of the student so they can easily see the screen</td>
</tr>
</tbody>
</table>

**For Tasks**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Say, “Watch this,” and plays the video clip of the <strong>first</strong> step</td>
</tr>
<tr>
<td>B.</td>
<td>“When the clip ends say, “Now you do it.””</td>
</tr>
<tr>
<td>C.</td>
<td>If student completes step correctly, move on to next step</td>
</tr>
</tbody>
</table>

**C.**

1. If student starts step incorrectly or does not start within 5 seconds, block the response
2. say, “Not quite right. You need to ________.”
3. Say, Here, watch this again.” and play the video clip a second time.
4. If the student performs the step incorrectly again, complete the step for them.

**After Last Task**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Upon completion of the task, thank the student for working.</td>
</tr>
</tbody>
</table>
## Error Correction

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block the incorrect response</td>
<td>SAY ONLY  say, “Not quite right. And verbally repeat the step</td>
</tr>
<tr>
<td>Say, Here, watch this again.” and play the video clip a second time.</td>
<td>DO ONLY If the student performs the step incorrectly again, complete the step for them.</td>
</tr>
</tbody>
</table>
Appendix D: Probe Data Sheet
**Directions:** Observe the participant completing the task. Circle the following if the participant completes the step

- I+: Correct without video prompt
- I: Correct with video prompt
- X: Correct following second viewing of video prompt
- 0: Incorrect

<table>
<thead>
<tr>
<th>Participant Initials:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td></td>
</tr>
<tr>
<td>Task:</td>
<td>Making a Latte</td>
</tr>
<tr>
<td>Researcher Initials:</td>
<td></td>
</tr>
<tr>
<td>Observer:</td>
<td>Primary</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Get a cold cup</td>
<td>I+</td>
</tr>
<tr>
<td>2. Fill the cup to the line with ice</td>
<td>I+</td>
</tr>
<tr>
<td>3. Pour 3 oz. cold brew into the small silver cup (x1)</td>
<td>I+</td>
</tr>
<tr>
<td>4. Dump cold brew into the cold cup (x1)</td>
<td>I+</td>
</tr>
<tr>
<td>5. Pour 3 oz. cold brew into the small silver cup (x2)</td>
<td>I+</td>
</tr>
<tr>
<td>6. Dump cold brew into the cold cup (x2)</td>
<td>I+</td>
</tr>
<tr>
<td>7. Fill cup with milk to the line</td>
<td>I+</td>
</tr>
<tr>
<td>8. Pour 1 small cup of flavor (x1)</td>
<td>I+</td>
</tr>
<tr>
<td>9. Dump flavor into the cold cup (x1)</td>
<td>I+</td>
</tr>
<tr>
<td>10. Pour 1 small cup of flavor (x2)</td>
<td>I+</td>
</tr>
<tr>
<td>11. Dump flavor into the cold cup (x2)</td>
<td>I+</td>
</tr>
<tr>
<td>12. Stir with the long spoon</td>
<td>I+</td>
</tr>
<tr>
<td>13. Place the lid on the cup</td>
<td>I+</td>
</tr>
</tbody>
</table>

**Percent Correct (sum I+ & I)**  
\[ \frac{\text{sum I+ & I}}{13} \]
Appendix E: Implementation Fidelity Data Sheet
**Directions:** Observe the participant completing the task. If the participant completes the step correctly, circle Y. If the participant does not complete the step correctly, circle N. If the step is non-applicable, circle NA. You are only taking data on the first 5 steps of the task analysis.

<table>
<thead>
<tr>
<th><strong>Participant Initials:</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure:</strong></td>
<td>Video Prompting Implementation</td>
</tr>
<tr>
<td><strong>Researcher Initials:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Circle one:</strong></td>
<td>Primary IOA</td>
</tr>
</tbody>
</table>

***If paraprofessional does not use video within first step, circle NA for all***

<table>
<thead>
<tr>
<th>Step</th>
<th>Correct?</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Brings student to setting and positions in front of task</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>2. Holds the iPod Touch in front of the student so they can easily see the screen</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em><strong>If student completes step without video, instructor does not interrupt the student. If this this occurs, score the remaining letters as NA</strong></em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Says, “Watch this,” and plays the video clip of the first step</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>B. “When the clip ends says, “Now you do it.” if the student does not begin the step on their own</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>C. If student completes step correctly, moves on to next step</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>D. INITIATES ERROR CORRECTION: If student starts step incorrectly or does not start within 5 seconds, completes error correction procedure and moves to next step</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>1. BLOCKS: If student starts step incorrectly or does not start within 5 seconds, blocks the response</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>2. REPLAYS VIDEO: Says, “Not quite right. Here, watch this again.” and play the video clip a second time.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>3. MODELS: If the student performs the step incorrectly again, completes the step for them.</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

**Step 2**

***If student completes step without video, instructor does not interrupt the student. If this this occurs, score the remaining letters as NA*** | Y | N | NA |
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Says, “Watch this,” and plays the video clip of the <strong>second</strong> step</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>B. “When the clip ends says, “Now you do it.”” if the student does not begin the step on their own</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>C. If student completes step correctly, moves on to next step</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>D. <strong>INITIATES ERROR CORRECTION</strong>: If student starts step incorrectly or does not start within 5 seconds, completes error correction procedure and moves to next step</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>1. <strong>BLOCKS</strong>: If student starts step incorrectly or does not start within 5 seconds, blocks the response</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>2. <strong>REPLAYS VIDEO</strong>: Says, “Not quite right. Here, watch this again.” and play the video clip a second time.</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>3. <strong>MODELS</strong>: If the student performs the step incorrectly again, completes the step for them.</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td><strong>STEP 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*** If student completes step without video, instructor does not interrupt the student. If this this occurs, score the remaining letters as NA</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>A. Says, “Watch this,” and plays the video clip of the <strong>third</strong> step</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>B. “When the clip ends says, “Now you do it.”” if the student does not begin the step on their own</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>C. If student completes step correctly, moves on to next step</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>D. <strong>INITIATES ERROR CORRECTION</strong>: If student starts step incorrectly or does not start within 5 seconds, completes error correction procedure and moves to next step</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>1. <strong>BLOCKS</strong>: If student starts step incorrectly or does not start within 5 seconds, blocks the response</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>2. <strong>REPLAYS VIDEO</strong>: Says, “Not quite right. Here, watch this again.” and play the video clip a second time.</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>3. <strong>MODELS</strong>: If the student performs the step incorrectly again, completes the step for them.</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td><strong>STEP 4</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*** If student completes step without video, instructor does not interrupt the student. If this this occurs, score the remaining letters as NA</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>A. Says, “Watch this,” and plays the video clip of the <strong>fourth</strong> step</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>B. “When the clip ends says, “Now you do it.”” if the student does not begin the step on their own</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>C. If student completes step correctly, moves on to next step</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>D. INITATES ERROR CORRECTION: If student starts step incorrectly or does not start within 5 seconds, completes error correction procedure and moves to next step</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>1.</td>
<td>BLOCKS: If student starts step incorrectly or does not start within 5 seconds, blocks the response</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>2.</td>
<td>REPLAYS VIDEO: Says, “Not quite right. Here, watch this again.” and play the video clip a second time.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>3.</td>
<td>MODELS: If the student performs the step incorrectly again, completes the step for them.</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

**Step 5**

*** If student completes step without video, instructor does not interrupt the student. If this occurs, score the remaining letters as NA

<table>
<thead>
<tr>
<th></th>
<th>A. Says, “Watch this,” and plays the video clip of the <strong>fifth</strong> step</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B. “When the clip ends says, “Now you do it.”” if the student does not begin the step on their own</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>C. If student completes step correctly, moves on to next step</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>D. INITATES ERROR CORRECTION: If student starts step incorrectly or does not start within 5 seconds, completes error correction procedure and moves to next step</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>1.</td>
<td>BLOCKS: If student starts step incorrectly or does not start within 5 seconds, blocks the response</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>2.</td>
<td>REPLAYS VIDEO: Says, “Not quite right. Here, watch this again.” and play the video clip a second time.</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
<tr>
<td>3.</td>
<td>MODELS: If the student performs the step incorrectly again, completes the step for them.</td>
<td>Y</td>
<td>N</td>
<td>NA</td>
</tr>
</tbody>
</table>

3. Upon completion of the task, thank the student for working.

**Percent Correct:**

---
Appendix F: Social Validity
Your Initials: __________

1. What is the highest educational degree that you have earned?

2. What teaching/educational certification(s), if any, do you hold?

3. How many years have you been working as a paraprofessional?

4. How old are you?

5. How long have the target students been in your class?

6. To what degree do you feel that the training package you received was effective in helping you to implement video prompting (circle a choice below)
   1 = Not Effective at All
   2 = Not Very Effective
   3 = Somewhat Effective
   4 = Quite Effective
   5 = Very Effective

7. Was there anything in particular that you liked about the training package?

8. Was there anything that you did not like about the training package? Or something that you think would be helpful for us to know in the future as we make training packages for other paraprofessionals?
9. To what degree do you feel that the instructional practice (video prompting) you implemented with your students was effective? (circle a choice below)

1 = Not Effective at All
2 = Not Very Effective
3 = Somewhat Effective
4 = Quite Effective
5 = Very Effective

10. How likely would you be to use the same strategy with the same students or a different student in the future?

1 = Not at All Likely
2 = Not Very Likely
3 = Somewhat Likely
4 = Quite Likely
5 = Very Likely

11. Was there anything about the instructional practice you used with the students that you did not like? Or something you think would be helpful for us to know in the future as we design instructional practices for other paraprofessionals?

12. What is the likelihood that you would participate in a similar professional development opportunity in the future? (circle a choice below)

1 = Not at All Likely
2 = Not Very Likely
3 = Somewhat Likely
4 = Quite Likely
5 = Very Likely

13. What is the likelihood that you would recommend this kind of professional development opportunity to a colleague? (circle a choice below)

1 = Not at All Likely
2 = Not Very Likely
3 = Somewhat Likely
4 = Quite Likely
5 = Very Likely

14. Is there anything else that you would like to share with us that might be helpful to us in the future, or helpful for us to share with other educators and researchers when we write about these students?