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The evaluation of using video prompting to teach a full meal preparation task to emerging adults with developmental disabilities

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By

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The purpose of the current study was to evaluate the use of a video prompting intervention to teach a full meal preparation task to emerging adults with developmental disabilities. The study also sought to identify whether cooking skills generalized across people and settings. 10 participants ranging across 20-25 years participated in the study. Participants were required to understand and speak English, be able to attend to a video for at least 30 seconds, follow 2-step directions, and be able to stop and start a video on an iPad. Results of the study indicate rapid acquisition from baseline to intervention for a majority of participants. Cooking skills were maintained beyond the treatment setting and person. Further, participants reported the video prompting procedure was an acceptable approach for teaching cooking skills. The results of this study provide further evidence for the use of video prompting to teach cooking skills, and to expand to use to full meal preparation for emerging adults with developmental disabilities.

DEDICATION

I would like to dedicate this research study to my loving parents, Laurie and Tom, who have loved me unconditionally, nurtured me, and have given me the best life I could ever ask for. The amount of gratitude I have for the role you both played in helping me get to this point is insurmountable. You have been there for me through every academic struggle and have never wavered in your support of me achieving this lifelong goal. You both have been the ultimate role models and I can truthfully say I would not be here today if not for your wisdom, guidance and support. I love you forever, your baby I'll always be.

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CHAPTER I

INTRODUCTION

Video-based interventions, developed from Bandura's (1971, 1977) social learning theory, is a type of intervention that uses video technology as the main source to teach a new or desired behavior (Rayner, Denholm, & Sigafoos, 2009). Video-based interventions (VBI) are created by filming a model (e.g., self or other) engaging in a targeted behavior with the goal of producing a video showing mastery performance of the behavior to allow for replication in the subject viewing the video (Dowrick, 1991, 1999). Importantly, VBIs have been found to be effective for teaching new skills or behaviors to both typically developing individuals and individuals with atypical development (e.g., intellectual disabilities). Prior to the development of video technology, in-vivo modeling, or naturalistic modeling, was the main observational learning tool for teaching new behaviors. However, current VBI research has shown VBIs are more effective than in-vivo modeling for teaching new skills (Charlop-Christy, Le, & Freeman, 2000).

Research on VBIs has continued to grow since first appearing in the literature in the 1970s. Creer and Miklich (1970) were among the first to explore the use of video self-modeling (VSM) as a tool to effectively teach appropriate social behaviors to a 10-year old male in a residential facility. Since then, there has been a growing body of literature establishing the effectiveness of VBIs to teach a variety of skills such as social skills (Bellini & Akullian, 2007; Shukla-Mehta, Miller, & Callahan, 2010), for example,

play skills (Creer & Miklich, 1970), conversation skills (Charlop & Milstein, 1989), academics (Hitchcock, Dowrick, & Prater, 2003), daily living skills and vocational skills (Dowrick & Hood, 1981; van Laarhoven & van Laarhoven-Myers, 2006), and cooking skills (e.g., Mechling & Collins, 2012; Kellems, Mourra, Morgan, Riesen, Glasgow, Huddleston, 2016). A growing area of interest has been the investigation of the effectiveness of VBIs in teaching skills to individuals with disabilities, particularly functional life skills.

Life skills have been defined as leisure activities, independent living skills, personal care, and/or community participation (Alwell & Cobb, 2009). Independent living skills, or functional life skills, include skills such as household chores, cooking skills, personal hygiene, vocational skills, and community living skills (Domire & Wolfe, 2014). It is important for individuals with disabilities to develop these skills in order to live as autonomous lives as possible. However, individuals with intellectual disabilities often have difficulty developing independent functional living skills, which leads to a decrease in autonomy and has various negative effects on an individual's quality of life (Cannella-Malone et al., 2011).

One functional life skill that has received increased interest in the research literature on VBIs is cooking, especially among individuals with developmental disabilities. Importantly, obtaining the skill of cooking decreases an individual's reliance on others and increases financial outcomes by reducing the expense of eating at restaurants (Johnson & Cuvo, 1981). Shipley-Benamou, Lutzker, and Taubman (2002) were among the first to incorporate VBI methods to teach a food preparation task (i.e. making orange juice) to an individual with Autism Spectrum Disorder (ASD). Sigafoos

et al. (2005) followed soon after using video prompting procedures to teach three adults with developmental disabilities how to cook popcorn in the microwave. Additional studies following Sigafoos and colleagues (2005) also reported video prompting to be effective at teaching stovetop recipes (Graves, Collins, Schuester, & Kleinert, 2005; van Laarhoven, Kraus, Karpman, Nizzi, & Valentino, 2010) and multiple step meal prep, such as washing vegetables (Mechling & Gustafson, 2008) and setting a table. While current cooking literature has used both video modeling (VM) and video prompting (VP) to teach individuals with disabilities cooking skills (Kellems et al., 2016), there is supporting literature indicating VP leads to faster skill acquisition (Charlop-Christy et al., 2000). Also, VP is most effective for teaching longer, more complex skills when mastery can occur one step at a time (Kellems et al., 2016). Lastly, VP is the most popular VBI because it is more effective for teaching skills to individuals with developmental disabilities (Banda, Dogoe, & Matuszny, 2011).

The majority of the current literature has looked at the use of VBIs in individuals with ASD. As a result, there is limited research exploring the effectiveness of VBIs related to cooking amongst populations with disabilities outside of ASD. Researchers have suggested future investigations on VBIs should expand the use of VBIs across different populations (e.g., Mechling, Gast, & Seid, 2010), in addition to teaching a full-meal preparation task (e.g. making a sandwich and side dish).

Statement of the Problem

Individuals diagnosed with intellectual disabilities often display deficits in functional living skills (Jacobson & Ackerman, 1990; Kraijer, 2000; Sigafoos et al., 2007; Sigafoos, O'Reilly, & de la Cruz, 2007), such as self-care skills, cooking, hygiene,

household chores, vocational skills, and community living skills (Domire & Wolfe, 2014). The inability to independently perform functional living skills can negatively affect the individual's overall quality of life (Parmenter, 1994), such as having a decrease in autonomy (Cannella-Malone et al., 2011), learned helplessness, and poor self-esteem (Hayden, 1997). While there is a vast amount of research supporting the use of VBIs as an effective intervention for appropriately teaching functional living skills, there is little existing research exploring the use of VBIs among emerging adults, specifically within the cooking literature using VBIs. Furthermore, there is a gap in the cooking literature exploring the use of VBIs, specifically video prompting, to teach a full-meal preparation task. Existing literature has explored the effectiveness of using video prompting techniques to teach single food preparation skills, however, to date, no study has explored the use of video prompting as an intervention for complete meal preparation combining more than one recipe (Mechling, Gast, & Fields, 2008). Additionally, most of the existing VBI literature has explored the effectiveness of the intervention with adults within a community setting and with a focus on individuals diagnosed with ASD. However, few studies exist using a population with varying disabilities (i.e., genetic conditions) and in an emerging adult cohort.

Purpose of the Study

The purpose of the following study was to fill the gap in the literature for use of video prompting to teach emerging adults with developmental disabilities how to cook a full meal preparation task. Cooking skills are essential for independent living across a range of settings (Graves et al., 2005; Schuster, 1988). Additionally, deficits in cooking

skills requires individuals to rely on others to cook for them and can affect an individual's budget and health due to ordering in or eating out (Schuster, 1988).

With an increased development in technology, the availability of portable devices makes it possible to use video interventions across settings (Cihak, Fahrenkrog, Ayres, & Smith, 2010). The current study also expanded the current cooking literature as well as expanded the research on using portable, self-operated systems by evaluating the use of an iPad to deliver cooking instructions across novel settings and novel persons (Mechling et al., 2008).

Research Questions

This study seeks to answer the following research questions.

Research Question #1: Would video prompting be an effective intervention to teach a two-item meal preparation task simultaneously?

Research Question #2: Can video prompting be used to teach cooking skills to emerging adults with disabilities?

Research Question #3: Can video prompting be used to effectively generalize a two-item meal preparation task across people?

Research Question #4: Can video prompting be used to effectively generalize a two-item full meal preparation task across settings?

CHAPTER II

LITERATURE REVIEW

VBIs have been identified as an effective technique to teach a variety of tasks and skills that have lasting maintenance. The term VBI is used as an umbrella term to describe interventions that use video of a desired task or skill as the independent variable to teach a targeted skill (Rayner et al., 2009). VBIs involve taking unedited video recordings of the model and removing non-examples and/or performance errors to create a recording showing mastery performance of the skill (Dowrick, 1991, 1999). An adult or peer who is familiar or unfamiliar to the learner can model the targeted skill. The purpose of recording the modeled skill is to allow the learner to view the appropriate demonstration of the task an infinite amount of times. Within the literature, the term to describe interventions using videoing as the main media has been used interchangeably between video-based instruction (Banda et al., 2011; van Laarhoven et al., 2010), VBIs (Mechling, Ayres, Foster, & Bryant, 2013), and video-based modeling (Hong et al., 2016). To maintain consistency in terminology, the term video-based intervention will be used throughout the paper.

VBIs developed from the concept of using in-vivo (live) modeling as a way to generalize and maintain skills. This naturalistic type of modeling involves having an individual observe another person engage in a targeted behavior (Charlop-Christy et al., 2000). Through the observation of the skill, the learner constructs a mental image, which later serves as a guide for future performance of the skill (Bandura, 1971, 1977; Dowrick, 1999). Successful modeling occurs through the attention, retention, reproduction, and motivation of the learner (Bandura, 1971; Domire & Wolfe, 2014). Modeling is one of

the pivotal characteristics for learning a new behavior/skill, a concept rooted in Bandura's (1971, 1977) social learning theory. According to Bandura's theory, humans learn behaviors through the observation of others modeling behaviors or skills. Learning these behaviors occurs when the learner observes a model and later imitates their behavior. Bandura (1971, 1977) stated successful imitation of behavior occurs when the learner attends to the model, remembers or retains the observed behavior in order to imitate the behavior and lastly, is motivated to imitate the behavior in order for learning to take place. The combination of imitation and observational learning leads to the acquisition of the new behavior in which the new skill becomes part of the learner's behavioral repertoire when reinforced, building on traditional behavioral theory (Bandura, 1971, 1977).

Previous research has indicated modeling is an effective intervention that enhances generalization, as well as, maintenance and skill acquisition across a variety of skills such as cooking (Mechling & Collins, 2012; Rehfeldt, Dahman, Young, Cherry, & Davis, 2003; Shipley-Benamou et al., 2002), social skills (Bellini & Akullian, 2007; Shukla-Mehta et al., 2010), play skills (Creer & Miklich, 1970) conversation skills (Charlop & Milstein, 1989; Hepting & Goldstein, 1996), daily living and vocational skills (Dowrick & Hood, 1981; van Laarhoven & van Laarhoven-Myers, 2006), academics (Hitchcock et al., 2003), and reducing problem behavior (Schreibman, Whalen, & Stahmer, 2000). These skills have been taught using various features of VBIs, which will be described in the section below.

General Characteristics of Video-Based Interventions

VBIs are described and defined by four major features: model type, perspective, duration, and instruction type.

Model Type

The first feature of VBIs, model type, is identified through three main types of modeling: (a) *self* (e.g., VSM), (b) *other*, or (c) *mixed models*. Models that fall into the *other* category consist of an adult, such as a parent, teacher, sibling, or peer who is viewed as familiar or unfamiliar to the learner (Bellini & Arkullian, 2007; McCoy & Hermansen, 2007). Mixed models involve the combination of model types. For example, an adult model may be used in combination with VSM in order to give feedback on the performance of the skill (McCoy & Hermansen, 2007).

The type of model used and whether or not one model type is more effective than the other is a continuous debate. Research on modeling interventions suggests that the self is the most powerful model (Bandura, 1971, 1977; Prater, Carter, Hitchcock, & Dowrick, 2012) and the observation of the self, increases the likelihood of future behaviors (Dowrick, 1999). Gardner and Wolfe (2013) report no significant difference with model and perspective type; however, other studies have reported VBI is more effective when the model is similar to the learner (Bellini & Akullian, 2007; Prater et al., 2012), which is more likely to lead to imitation of the behavior (Bandura, 1971, 1977).

Perspective Type

The second feature of VBIs includes the perspective the video is viewed in. The perspectives include *first person* also known as *point-of-view* (POV), which shows the

video from the learner's perspective (Franzone & Collet-Klingenberg, 2008), and *third person*, which shows the entire scene or model to the learner (Spencer, Mechling, & Ivey, 2015). Some research has categorized POV as a model type rather than a perspective type even though POV is shown from the first person perspective (McCoy & Hermansen, 2007); therefore, the classification of the term as model type or perspective is interchangeable.

Previous research has explored whether the perspective of a video effects the outcome of skill acquisition. The results exploring the perspective type are inconclusive. Spencer et al. (2015) compared POV, third person, and a combination of POV and third person using video prompting. Results of the study indicated while VP was effective in teaching participants the skill, there was no clear indication of one perspective over the other, therefore, additional research is needed to identify whether the perspective has a significant impact on outcomes.

Duration

Thirdly, there are two options for video duration. One option known as *priming*, requires the learner to view the recording in full before giving the opportunity to model the skill (i.e., video modeling; McCoy & Hermansen, 2007). Viewing the video in full is a common characteristic for video modeling. The second option requires the learner to view the video footage one step at a time and then the learner is provided the opportunity to complete the step before moving onto the next step (i.e., video prompting; Mason, Davis, Ayres, Davis & Mason, 2016; Spencer et al., 2015). Showing the video clip one step at a time is a typical characteristic of video prompting.

While VM has been viewed in the research as an effective intervention, requiring the individual to view the entire video recording before engaging in the task may be problematic for individuals with developmental disabilities. Research conducted by Cannella-Malone et al., (2006) compared video prompting and video modeling as an intervention to teach daily living skills. Results from their investigations reported participants paid more attention to shorter clips and had more success completing the daily living skill when shown the video in parts (VP). This suggests using video clips that are shorter in duration are more effective.

Instruction Type

Current research on VBIs have analyzed the effectiveness of VBI as the primary intervention, or in combination with other components such as prompts, reinforcement, performance feedback (Goodson, Sigafoos, O'Reilly, Cannella & Lancioni, 2007; van Laarhoven, Johnson, van Laarhoven-Myers, Grider & Grider, 2009), and the combination or isolation of verbal and written instructions (Bellini & Akullian, 2007; Mechling & Collins, 2012; Sigafoos, O'Reilly, & de la Cruz, 2007). Common instruction types in VBIs includes voice over instructions or captions. A comparison of voice-over instruction and no voice-over instruction has shown no significant effects between the two (e.g., Mechling & Collins, 2012; Gutierrez, Bennett, McDowell, Cramer, & Crocco, 2016; Bennett, Crocco, Loughrey & McDowell, 2017). While research has greatly expanded to include multiple instruction types, there is minimal current literature differentiating between video features and mixed results have been found (Spencer et al., 2015). Therefore, this area requires continued exploration of which instruction type is most effective for individuals with disabilities.

Types of VBIs

There are three basic types of video-based interventions (VBIs): (a) *VM* (Gardner & Wolfe, 2013; Sigafoos, O'Reilly, & de la Cruz, 2007), (b) *VSM* (Buggey, 2005; Bellini & McConnell, 2010), and (c) *VP* (Banda et al., 2011; Cannella-Malone et al., 2006). Existing literature has also described VBI in terms of the perspective type and model type: (a) *VSM* (Dowrick & Raeburn, 1997b; Dowrick & Dove, 1980), (b) *POV* (Schreibman et al., 2000; Gardner & Wolfe, 2013), and (c) *video of other as a model* (Bellini & Akullian, 2007; McCoy & Hermansen, 2007). Previous research has shown that the model type and perspective vary depending on the skills targeted and the functional level of the individual (Gardner & Wolfe, 2013; Hong, et al., 2016; Mechling, Ayres, Bryant, & Foster, 2014). Interestingly, a review of the literature indicates the model is typically an adult or peer that is known or unknown to the learner (Bellini, & Akullian, 2007; McCoy & Hermansen, 2007).

Video Modeling (VM)

VM is one of the most widely researched forms of video interventions reported in the literature (Bellini & Akullian, 2007). VM, also known as basic video modeling (Franzone & Collet-Klingenberg, 2008; Rehfeldt et al., 2003), is the simplest form of VBI and involves recording the model engaging in a desired task or skill, and creating a video free of mistakes to allow the learner to accurately complete the task. VM procedures are typically filmed in the third person perspective, meaning the full body of the model is seen in the video.

Video Self-Modeling (VSM)

VSM is similar to VM interventions, except the learner acts as the model (Hong et al., 2016; Rayner et al., 2009). The learner watches him or herself engaged in the appropriate targeted behavior or task from the third or first-person perspective (Rayner et al., 2009). The ability for the learner to view him or herself engage in the targeted behavior allows the learner to observe him or herself accurately perform the target skill or task (Bellini & McConnell, 2010). This gives the learner the opportunity to view him or herself as competent in the skill.

Video Prompting (VP)

VP differs from VM and VSM methods by how the video is presented to the learner. Rather than having the learner watch the video clip in full, the skill is broken down into steps with incorporated pauses for the individual to complete the skill or task one step at a time (Banda et al., 2011; Sigafoos, O'Reilly, & de la Cruz, 2007). In other words, the recordings, which are 30-seconds or less (Cannella-Malone et al., 2006), are made up of chained tasks, which are made up of a series of steps sequenced together to make up one task. Recordings of the task are typically filmed from the perspective of the learner rather than from the third person view (Cannella-Malone et al., 2006). VP procedures are suggested to be the more preferred VBI for lengthy, more complex skills (Kellems et al., 2016), and for individuals with developmental disabilities, or who have difficulty attending to lengthy video clips (Banda et al., 2011; Mechling et al., 2014).

Supporting Evidence for VBIs

There is a significant amount of research supporting the effectiveness of using modeling to teach a variety of skills to both typically developing individuals and individuals with varying disabilities. With advancement in technology and growing interest in VBIs, video-based modeling has gained more popularity among researchers. Research comparing the use of in-vivo modeling and VBIs suggests VBIs are more cost effective, less time consuming, maintain higher treatment integrity, and are overall more effective (Charlop-Christy et al., 2000). For example, Charlop-Christy and colleagues (2000) compared the use of an in-vivo modeling technique to video modeling to teach developmental skills to children diagnosed with autism spectrum disorder. Results of the study found video modeling leads to faster acquisition and is more effective in promoting generalization compared to in-vivo modeling. Further, findings from VBI indicate the ability to record the skill removes the chance of the model incorrectly performing the skill, ensuring the model is demonstrating errorless skills. Using video recordings allow the ability to produce more naturalistic settings, there is greater control over the presentation of the skill, and the recordings can be used across multiple learners (Thelen, Fry, Fehrenbach, & Frautschi, 1979).

VBIs as a tool to teach new skills to individuals with developmental disabilities first appeared in 1970. Creer and Miklich (1970) compared role-playing and VSM on the effectiveness of teaching appropriate social behaviors. Researchers showed appropriate and inappropriate social behaviors via role-playing and VSM. The results of the preliminary study showed demonstration of the appropriate social behaviors via videotapes was effective in implementing behavior change for both inappropriate and

appropriate social behaviors. This study was the first to show the significant effects of VSM on increasing appropriate behaviors. Further, the results of this preliminary study initiated the shift from in-vivo modeling to VBIs.

Dowrick and Raeburn (1977a) further expanded the VBI literature. Instead of the learner viewing the inappropriate behaviors before viewing the appropriate behaviors via video, researchers first filmed the behavior, edited to omit unwanted behaviors, and then showed the film to the learner. The results of the study were the first to suggest deliberately selecting and editing portions of the video resulted in rapid learning when watching videos of the self as the model, with only correct behavior demonstrated.

Additional investigation on VBIs has researched the potential influence on the duration of the video, perspective, model type, and intervention type (Bellini & Arkullian, 2007; Cannella-Malone et al., 2006; Mechling et al., 2014). For example, Duker, Didden, and Sigafoos (2004) compared VM and VP to teach multi-step component tasks (i.e., putting groceries away, setting the table). Results showed using VP, which uses the step-by-step approach, may be faster in teaching skill acquisition. Alternatively, Cannella-Malone et al. (2006) suggests showing video clips of all the steps together may be more effective because the learner may quickly integrate each step of the task. However, in analyzing acquisition rate between VM and VP, results of Cannella-Malone et al. (2006) suggest VP was more effective than using VM. While VP typically leads to faster acquisition of the target behavior than VM, previous research has suggested VP may not be the most effective intervention for all skills (Charlop-Christy et al., 2000; Cannella-Malone, Mizrachi, Sabielny, & Jimenez, 2013).

A meta-analysis conducted by Bellini and Arkullian (2007) analyzed the effects of VM and VSM for children and adolescents diagnosed with ASD. Bellini and Arkullian (2007) reported VM and VSM are effective interventions for teaching a variety of skills such as social-communication skills, functional living skills, and behavioral functioning. In a similar study, Marcus and Wilder (2009) compared the effects of using a peer as a model and VSM to teach three children how to appropriately label novel letters. While both modeling procedures were effective, results indicated individuals reached mastery criterion more quickly using VSM compared to using the peer as the model. This contrasts other literature that has suggested there is no significant difference in the model type (Bellini & Arkullian, 2007; Gardner & Wolfe, 2013). The current research suggests the perspective used in VM should be based off the skill being taught as well as individual differences (Gardner & Wolfe, 2013).

VBIs have also been shown to be effective in teaching skills such as self-help, independent living, vocational skills, and skills needed to participate in the community to individuals with other disabilities (Rayner et al., 2009). VBIs, again, provide an opportunity to have a visual example of someone completing a task, which compliments the visual strengths of individuals with disabilities (McCoy & Hermansen, 2007). VBI research for individuals with disabilities is continuing to expand to better understand what components are helpful to increase independence across life skill areas. Within the past decade and half, researchers have chosen to incorporate VBI strategies to teach independent and life skills within special education research and in practice (Shipley-Benamou et al., 2002).

A considerable amount of research has focused on developing effective procedures for teaching functional life skills to individuals with developmental disabilities (e.g., Goodson et al., 2006). While previous research has indicated positive outcomes when using visual prompts (i.e., static pictures) to teach individuals with developmental disabilities, VBIs have been found to be more effective due to the use of real time motion clips (Mechling & Gustafson, 2009; van Laarhoven, Kraus, Karpman, Nizzi, & Valentino, 2010). In fact, studies have consistently demonstrated the effectiveness of VBIs to teach a variety of behaviors to individuals with ASD and other developmental disabilities (Banda et al., 2011; Bennett et al., 2017; Cannella-Malone et al., 2006). Individuals with disabilities have a preference for visual processing (Rayner et al., 2009), and VBIs, specifically VP, is more effective for individuals who have shorter attention spans (Banda et al., 2011).

While most of the current research has found a variety of VBIs to be successful in improving functional life skills in individuals with ASD, little research exists on their effects on individuals with other diagnoses. It is important to continue expanding on the effects of these interventions on other populations in order to provide further support that these interventions can improve functional life skills regardless of disability, cognitive functioning, and age (Ninci et al., 2015). Further, teaching functional life skills using VBI has continued to increase our knowledge of how to effectively implement VBI across a number of adaptive skills. While some functional life skills are well represented in the VBI literature, others, such as multi-component cooking, are not well documented.

Functional Life Skills

Individuals diagnosed with intellectual disability display deficits in functional life skills (Jacobson & Ackerman, 1990; Kraijer, 2000; Sigafoos et al., 2007). Functional life skills focus on an individual's ability to independently function in a post-school environment while meeting the demands of personal and social responsibilities (Harris, Belchic, Blum, & Celiberti, 1994; Sigafoos et al., 2007). These skills include, but are not limited to self-care skills, hygiene, household chores, cooking, vocational skills, and community living skills (Domire & Wolfe, 2014). Alwell and Cobb (2009) consider life skills to include at least one of three areas: leisure activities, independent living skills/personal care, and/or appropriate participation within the community. Specifically, functional life skills can be further categorized into self-help or domestic skills, employment skills, community skills, social skills, and daily living skills (Gardner & Wolfe, 2013; Hong et al., 2016). The development of these skills helps prepare the individual for independence and meaningful participation within the community (Alwell & Cobb, 2009).

Deficits in functional life skills can lead to learned helplessness, poor self-esteem (Hayden, 1997), passivity (Sigafoos et al., 2005), decreased autonomy (Cannella-Malone, et al., 2011) and can negatively affect the individual's overall quality of life (Parmenter, 1994). The inability to independently perform such daily living skills can limit their self-determination and also restrict their living environment (Cannella-Malone et al., 2011). Consequently, this decrease in autonomy requires the individual to rely on others to help care for them. As a result, it is important to teach individuals with disabilities daily living

skills in order to prepare them for independent living as possible and overall positive quality of life (Ninci et al., 2015). VBIs are increasingly used to teach such skills.

VBI Research on Functional Life Skills

It is well documented in the literature that individuals with disabilities are able to learn new skills after observing someone model those targeted skills (Rehfeldt et al., 2003). VBIs on functional life skills are one of the most well-researched topics within the video modeling literature, covering a wide range of skills with the goal to increase vocational and social independence. Research on VBIs has been shown to be an effective and efficient intervention for increasing functional life skills in individuals with disabilities such as ASD and intellectual disabilities (Spencer et al., 2015; Rehfeldt et al., 2003). Specifically, VBIs have covered functional life skills such as self-help, domestic skills (i.e., cooking), employment or vocational skills, and community skills in addition to daily living skills such as cleaning, setting the table, purchasing skills, putting away groceries, and washing dishes (Gardner & Wolfe, 2013; Hong et al., 2016).

Research on VBIs and functional life skills was first used to investigate a range of motor and daily living skills in physically handicapped children (Dowrick & Raeburn, 1977b). Additional works on improving functional living skills expanded to the use of VSM to teach swimming skills to individuals with spina bifida (Dowrick & Dove, 1980). Results showed moderate improvement for independent swimming and lead to rapid changes in swimming behavior.

Exposure to functional life skills is more commonly observed during the adult years. For example, Haring, Kennedy, Adams, and Pitts-Conway (1987) examined the effectiveness of VM procedures for teaching three adults diagnosed with ASD purchasing

skills. Purchasing skills were probed for generalization across three different settings using familiar, typically developing peers making purchases across the three different settings. VM procedures with a multiple baseline design across participants showed generalization of purchasing skills across all three settings was effective in teaching purchasing skills to the three adult participants. Haring and colleagues in 1987, then suggested future research should continue using VBI methods to explore the variation in the range of peers, behaviors, and settings within the video recordings. The literature has continued to expand in these areas in the years following.

Comparison of VM and VP Procedures

Numerous studies show VBIs are effective in teaching daily living skills to individuals with disabilities (Shipley-Benamou et al., 2002). Previous literature supports both VP and VM are effective interventions; however, current literature has further analyzed whether one is more effective than the other. For example, previous research has analyzed whether VM and VP is more effective in improving skills such as cooking (Graves et al., 2005; McGraw-Hunter, Faw, & Davis, 2006), task completion (Mechling et al., 2014), dishwashing (Sigafoos et al., 2007), play skills (Sancho, Sidener, Reeve, & Sidener, 2010), sweeping, use of a fire extinguisher, setting a table, hygiene (Charlop-Christy et al., 2000), and various other daily living skills. A review of the literature suggests VP is a more effective intervention in improving daily-living skills compared to VM (Cannella-Malone et al., 2013). Moreover, research has indicated prompting and fading the targeted steps until the steps are combined into one video may be more effective than VP alone (Cannella-Malone et al., 2013). Although research indicates VP is more effective than VM, VM remains a popular intervention for teaching a variety of

skills such as academic, behavior, social skills (Shukla-Mehta et al., 2010), and has been used as an optimal intervention to teach functional living skills (Ninci et al., 2015).

Additional literature on the topic has compared procedures such as VM and VP to analyze which is more effective in teaching daily living skills (Cannella-Malone et al., 2006; Taber-Doughty, Bouck, Tom, Jasper, Flanagan, & Bassette, 2011). While some studies have indicated VP is more effective than VM, some results comparing the two VBIs produce mixed results. For example, Canella-Malone et al. (2006) indicated VP was more effective in skill acquisition across all tasks and found VM was ineffective; whereas, Taber-Doughty et al. (2011) indicated both VM and VP techniques were effective in increasing completion of tasks independently. Taber-Doughty and colleagues (2011) compared VM and VP techniques in combination with a six-level system of least prompts to teach twelve recipes to three sixth grade students with mild intellectual disabilities. Each recipe was randomly assigned to either the VM or VP condition for each participant and the effectiveness of the video intervention was identified. The researchers recorded percentage of steps independently completed, whether the participant required a prompt, and the level of prompt. Following the intervention phase, a maintenance condition was implemented to confirm if the chosen video intervention increased participant's ability to complete the steps independently. An adapted alternating treatments design with baseline and maintenance condition showed both interventions were effective in increasing independence.

While literature appears to produce mixed results between the two types of VBIs, it is evident there is a clear difference between the two. VM is effective in teaching shorter, simpler tasks and VP is preferred for lengthy, complex tasks that are easier to

master if broken down into simple steps (Kellems et al., 2016). Therefore, previous research suggests when choosing between the two types of VBIs, consider the severity of the disability, and the complexity of the task (Kellems et al., 2016).

VBIs and Cooking Tasks

One particular functional living skill that has received increasing attention is the use of VBIs for teaching cooking skills. Shipley-Benamou et al. (2002) were among the first to incorporate VBI methods to teach a meal preparation task to an individual with ASD. Although the purpose of the study was to demonstrate whether instructional video modeling was effective in teaching a range of skills (i.e., mailing a letter, pet care, making orange juice, cleaning, setting the table), only the results of making orange juice will be discussed. Researchers used the POV technique, meaning the video is filmed in the perspective of the learner, combined with an adult as the model and tangible reinforcement to teach a 5-year-old male with ASD how to make homemade orange juice. Using a task analysis, researchers recorded the percentage of total steps completed during baseline, intervention, withdrawal, and follow-up stages. Results of the study suggested instructional video modeling was effective in teaching the meal preparation task. However, because POV modeling was used within a reinforcement package, it is hard to delineate whether POV modeling alone was responsible for improvement. Therefore, Shipley-Benamou et al. (2002) suggested isolating the two components to identify to what extent reinforcement had on the acquisition of the skill.

Since the introduction of using VBI to teach homemade orange juice and a simple meal preparation skill, research on cooking skills and variation in the model technique and type has grown. A majority of the current cooking literature includes using VP

techniques to teach items such as microwaving popcorn (Sigafoos et al., 2005), macaroni and cheese (Graves et al., 2005), Hamburger Helper (Mechling et al., 2008), pizza (van Laarhoven & van Laarhoven-Myers, 2006), instant mashed potatoes and oatmeal (Mechling et al., 2014), using the stove top to cook noodles (Graves et al., 2005; van Laarhoven et al., 2010), grilled cheese (Mechling et al., 2008), pancakes (Mechling, Ayres, Foster, & Bryant, 2013), and counter top meals such as ham salad (Mechling et al., 2008) and peanut butter and jelly sandwiches (Graves et al., 2005). Further research has included VM techniques using an adult as a model to teach coffee making skills to individuals with severe or profound intellectual disabilities (Bidwell & Rehfeldt, 2004).

Researchers have also been successful in modifying current VBI methods by comparing the use of static pictures and self-operated systems to teach multiple cooking tasks (Mechling et al., 2008; Mechling & Stephens, 2009; Mechling et al., 2010), and have analyzed the effectiveness of using VBIs to teach cooking related tasks (e.g., Mechling & Gustafson, 2008, 2009). Additionally, researchers have compared commercially available and custom VP videos (Mechling et al., 2013), and have also trained participants to look up meals on YouTube (Alqahtani & Schoenfeld, 2014). While these studies have modified current VBI methods, results of each study indicate that technological based intervention remains effective.

Simple Cooking Tasks

Thus far, VBI literature has focused on analyzing the effectiveness of teaching simple, single meal preparation tasks. In fact, Rehfeldt et al. (2003) were among the first to teach a simple meal preparation skill using VBI. Rehfeldt and colleagues (2003) taught three adults with moderate to severe intellectual disabilities how to make a peanut

butter and jelly sandwich using VM with other as the model. Additionally, this study is among the few studies that used a non-typical model in their intervention technique (e.g., Bidwell & Rehfeldt, 2004). Given the majority of VBI research included individuals with ASD, the researchers wanted to confirm whether individuals with moderate to severe intellectual disabilities could learn, generalize, and maintain the skill after observing the model. Participants' ability to complete each step in the task analysis was probed using multiple opportunities before instruction, during instruction, and after criterion was reached. Each participant received verbal instruction during baseline sessions (e.g., 'Make a sandwich') as well as verbal praise for the perfect completion of a step. VM with other as a model within a multiple probe design showed participants acquired, maintained, and generalized the skill. This study was the first to show the effectiveness of VBI methods for teaching cooking skills in a community treatment setting.

In a similar study, Sigafoos et al. (2005) used VP procedures to teach three adults with developmental disabilities how to cook popcorn in the microwave. Using a delayed multiple baseline design across subjects, participants viewed clips of each step until they performed the task at 100% accuracy, three consecutive times. Following the acquisition of the skill, the VP procedure was removed and maintenance of the skill was maintained at 80-100% accuracy for two of three participants over 2, 6, and 10 weeks. Likewise, McGraw-Hunter et al., (2006) found similar results in teaching four individuals with traumatic brain injuries (TBI) simple stovetop food preparation skills using VSM. The purpose of the study was to analyze whether VSM plus feedback was effective in teaching simple stovetop skills to individuals with TBI and if generalization to a novel

food item was feasible. Using a multiple probe across participants design, results of the study indicated three of the four participants reached criterion performance within four training sessions and the maintenance of the skill was maintained at two- and four-weeks follow-up.

The results of the previous studies have provided evidence to support the use of VBIs as an effective tool to teach a variety of cooking tasks. Additional research on VBIs have also analyzed the effectiveness of teaching multiple cooking related tasks (e.g. washing a carrot or chopping an onion) rather than an actual meal (e.g., Mechling & Gustafson, 2008, 2009; Mechling & Collins, 2012) by comparing the effectiveness of VBIs and static pictures. Mechling and Gustafson (2008) selected twenty cooking-related tasks and compared static photographs selected from three picture cookbooks to VP on the independent completion of a set of cooking tasks. Participants included six young men diagnosed with ASD. The percent of cooking related tasks completed independently was measured. Using an adapted alternating treatments design with baseline, comparison, withdrawal, and final treatment conditions, results showed both VP alone and static photographs alone were effective in increasing task performance. However, researchers found the use of VP alone, and VP plus static picture prompts increased participant's accuracy in completing the selected cooking tasks.

Similarly, Mechling and Collins (2012) compared the effects of VM with and without verbal cues on teaching fifteen cooking related tasks such as cutting or peeling vegetables, grating or slicing cheese, and spraying, greasing, or flouring a loaf pan in four young adults with moderate intellectual disabilities. Using an adaptive alternating

treatments design, results of the study showed VM plus verbal cueing was most effective for three of the four participants in the study.

Population

A majority of the current literature has looked at the use of VBIs in individuals with ASD and/or an intellectual disability. Research on VBIs has suggested future research should expand the use of VBIs across different populations (e.g., Mechling et al., 2010). Indeed, similar results have been found to support the effectiveness of VBIs in persons with Down syndrome and those with traumatic brain injuries (McGraw-Hunter et al., 2006).

For example, Al-Salahat (2016) conducted research on the effectiveness of VM to teach individuals diagnosed with Down syndrome how to make a simple meal (e.g., a sandwich). The purpose of the study was to explore whether VM would produce similar results for teaching individuals with Down Syndrome a simple meal task. Participants were instructed to view a video of a similar peer preparing a cream cheese sandwich. After viewing the entire video, participants were presented with the opportunity to make a cream cheese sandwich. Using a task analysis, the researchers identified whether the participant completed each step correctly. Researchers intervened if participants completed the step incorrectly and then instructed the participant to complete the remaining steps independently. Generalization and maintenance of the skill was also analyzed, and results indicated the participants mastered the targeted skill.

Researchers suggest VM not only is effective for individuals with ASD, but results may also extend to individuals with Down syndrome given results were consistent with previous findings on VBI on meal preparation tasks (e.g., Bidwell & Rehfeldt, 2004;

Rehfeldt et al., 2003). Further investigation, however, is needed to determine what types of disabilities may benefit from VBIs, particularly with cooking related tasks.

Furthermore, literature on the use of VBIs to teach multiple recipes or meal preparation provides supporting evidence for incorporating the use of videos to effectively teach, maintain and generalize multiple cooking skills (Graves et al., 2005; Johnson, Blood, Freeman, & Simmons, 2013; Mechling et al., 2008; Mechling & Stephens, 2009; Mechling et al., 2010; Mechling et al., 2013; Taber-Doughty et al., 2011). These cooking tasks include a variety of cooking skills on the stove, microwave or oven, and have also included common cooking tools (i.e., pan, can opener, knife).

Graves et al. (2005) analyzed the use of VM to teach three high school students with moderate to severe disabilities how to prepare ramen noodles, macaroni and cheese, and a peanut butter and jelly sandwich. Each cooking task was isolated and taught using constant time delay with VP procedures plus feedback from the teacher. Once the participant was able to complete the cooking task in three consecutive sessions with 100% completion, the new cooking skill was introduced. Results of the study indicated the constant time delay procedures were effective in teaching three separate cooking tasks.

Current studies have suggested while VBIs are effective in teaching a variety of cooking tasks, it is difficult to identify whether VBIs alone are responsible for effectively teaching the skill (McGraw-Hunter et al., 2006). This is because previous literature has also included an additional component which includes providing feedback or prompting, which comes from the support from another person. With the focus on teaching

individuals with disabilities the skills needed to be independent, it is also important to implement an intervention that decreases this level of support from another individual.

Self-Operated Systems and Cooking

Recent video technology literature has analyzed the effectiveness of self-operated systems such as iPads®, iPods®, tablets and personal digital assistants (PDAs) as effective ways to deliver more independently driven interventions. Current literature on self-operated systems has compared the effectiveness of using static pictures to videos (Mechling et al., 2010; Mechling & Stephens, 2009). While static pictures have been identified as helpful tools for teaching a variety of skills, results from Mechling et al. (2010) and Mechling and Stephen (2009) provide support for the use of self-operated systems as a more effective tool for teaching complex skills.

To date, there are only five known studies (i.e., Johnson et al., 2013; Mechling et al., 2008; Mechling & Stephens, 2009; Mechling et al., 2010; Taber-Doughty et al., 2011) that have used self-operated systems to teach multiple cooking recipes. Mechling et al. (2008) were among the first to analyze the use of a self-prompting device (e.g., DVD player) to teach three multiple cooking tasks. Current research that uses VBIs as a method to teach cooking tasks have relied on using the instructor as the individual who starts and stops the video recording (e.g., Graves et al., 2005; Rehfeldt et al., 2003; Sigafoos et al., 2005) rather than the student.

Self-prompting devices. Mechling et al. (2008) sought to evaluate the participants' ability to independently start and stop the self-operated prompting system. Three young adults with moderate intellectual disabilities were screened for prerequisite skills such as motor imitation skills, visual ability to see a video on a 7-inch screen on

their ability to independently complete a set of pre-identified cooking tasks (e.g., open a ziplock bag, remove and put on the lid for cooking oil spray). The setting of the intervention took place in a kitchen apartment and participants received history training for the use of the portable DVD player. Videos for the cooking tasks were filmed in the subjective point of view, meaning the videos were viewed as if the student were performing the step. Each video clip contained verbal cues that corresponded with the specific task (e.g., get the skillet and put it on the stove).

As seen in previous literature (e.g., Graves et al., 2005), three cooking tasks were chosen for the stove, microwave and countertop (e.g., hamburger helper microwave singles, grilled cheese sandwich, and ham salad). Additionally, the cooking tasks and responses were analyzed for the types of stimuli used (e.g., boxes, measuring cups) as well as the responses to the cooking tasks (e.g., opening, pouring, turning). Cooking items were taught individually, with participants performing one cooking task per session. After the probe sessions were completed, the tasks were presented to the individual in total sequence.

Using a multiple probe design, data was recorded on the percent of steps completed independently as well as whether or not the participants could complete the steps at 100% accuracy without using the skip/replay button on the DVD recording. Results of the study showed all three of the students increased in the number of steps independently completed and were also effective in teaching and maintaining multiple cooking tasks. This study showed that the use of a DVD player and a system of least prompts increased the percentage of steps completed by individuals who were completing a multi-step task. Additionally, Mechling et al. (2008) reported future research should

evaluate the effectiveness of a video self-prompting system to teach a complete meal preparation task that involves combining multiple recipes.

Static pictures. Mechling and Stephens (2009) went on to further expand the previous findings of Mechling and colleagues (2008) by comparing VP via a self-operated system plus self-prompting procedures to static pictures to teach multi-step cooking tasks. The study was conducted to evaluate the effectiveness of each intervention in isolation of additional instructional prompts as well as calculate the percentage of steps completed independently. An adapted alternating treatments design was replicated across three sets of cooking tasks with two tasks per set. Within each set, participants were instructed to learn two meal items (i.e., set 1: hot chocolate and ravioli, set 2: broccoli and chocolate pudding, set 3: tuna and French fries) using either the VP procedure or static picture procedure. Tasks were counterbalanced across the students so two students were shown the first set of cooking tasks via VP and the other two students used static pictures. Prior to beginning the procedure, students were evaluated for skills such as cutting with a knife, cutting with scissors, operating an electric can opener, and turning and setting stove dials, which were steps included in the task analyses. A final treatment condition was implemented to identify the presence of carry over effects by using the most effective prompting system in isolation followed by alternating the treatment phase. The effectiveness of the prompting system alone and paired with the alternate set of tasks was recorded and then applied across both cooking tasks for a minimum of three sessions, or until data stabilized. Using visual analysis, results of the study suggest the participants experienced gains overall, regardless of the system used. Following similar findings from Mechling and Gustafson (2009), results of the study

suggest VPs were more effective in increasing participant's ability to independently complete the multi-step cooking tasks at 90.80%, compared to 61.60% of steps completed independently when using static pictures.

Personal digital assistants (PDAs). Additional research comparing static pictures to VP techniques have found similar results supporting Mechling and Gustafson (2008, 2009). For example, Mechling et al. (2010) analyzed the use of computer-based instruction via a PDA using a system of least prompts (e.g., picture, picture plus auditory, and video prompts). The particular system of least prompts chosen for the study was because previous literature has suggested future studies should incorporate the opportunity for prompting opportunities dependent on the individual's ability level as well as the difficulty of the step (e.g., van Laarhoven & van Laarhoven-Meyers, 2006). Data analysis involved measuring the percentage of cooking tasks completed independently and collecting data on the type of prompting level used to complete each step of the task analysis. Participants involved in the study were high school students with moderate intellectual disabilities and were taught three different cooking recipes. Researchers sought to expand whether the use of self-operated systems would facilitate independent task performance in high school aged individuals with moderate intellectual disabilities. A multiple probe design across three recipes and replicated across each participant was implemented in order to measure the effectiveness of the self-prompting program. Recipes were taught in isolation until criterion was reached across each participant. Analyzing the percentage of steps completed independently across cooking tasks, results of the study support previous findings that self-operating systems increase independent step completion in teaching multiple steps.

iPod Touch. In another study, Johnson and colleagues (2013) used an iPod Touch® to deliver video prompts to two high school students with moderate intellectual disabilities. Rather than the first researcher leading the study and delivering the prompts, the student's high school teacher implemented the intervention during ongoing instruction in the classroom. Researchers analyzed the student's ability to independently operate the iPod Touch® and assessed the efficacy and acceptability of delivering instruction in a high school classroom via the iPod Touch®. The teacher served as the model and was filmed using different viewpoints. Students were taught how to operate the iPod Touch®. During the intervention, students were instructed to watch the completion of a single step in the task analysis before moving on to the next step. Using a multiple probe across behaviors design, results of the study indicated the intervention was effective in increasing student's independent performance. Additionally, the implementation of the intervention by the special education teacher showed high fidelity and was successful in not disturbing other classroom activities. The results not only provide additional evidence supporting VBIs, but also suggests that VBIs can be implemented without disrupting others.

A review of the literature on teaching cooking skills using VBIs have identified multiple studies targeting individual cooking tasks or cooking related tasks. Although previous meal preparation studies support the use of VBIs as an effective tool for teaching cooking skills, few studies have analyzed whether they are successful in teaching a complete meal preparation task that involves combining multiple recipes/food items. While there are studies that involve the participant preparing a full-meal, these studies involve alternating between one meal task (e.g., Mechling & Stephens, 2009), or

achieving mastery of the meal before the introduction of a new meal task (e.g., Johnson et al., 2013; Mechling et al., 2010).

Overall, cooking literature that has focused on teaching multiple tasks have focused on including recipes that can be made on the stove, oven, or countertop, and have been items that have been chosen based on the preference of the participants or by a family member. Additionally, comparison recipes chosen in the current cooking literature are chosen based off of similar number of steps, stimuli, actions, and difficulty level. While there are a variety of studies analyzing the effectiveness of VBIs, the current cooking literature has focused on identifying an intervention that increases the independence of the participant. In fact, Schuester (1988) indicated students need to be able to use a prompting system repeatedly across different meals and settings in order to be functional.

Additionally, while previous literature has analyzed the social validity of their intervention across teachers and participants, there has been no current study that has obtained the social validity of both facilitators (those completing the intervention) and participants. Previous literature has asked participants informally whether they enjoyed using videos to learn how to cook (e.g., Mechling et al., 2010), however, no formal assessment has been previously conducted.

Current Study

The current study sought to identify whether VBIs, specifically VP procedures were effective in teaching a full-meal, two-item food preparation task to emerging adults with developmental disabilities. While exploring the effectiveness of VP, the current study also contributed to existing VBI literature through the identification of whether VP was

an effective and efficient intervention for emerging adults with developmental disabilities. Further exploration on generalizability of a task was explored across both settings and people. The current study sought to address the following research questions:

1. Would video prompting be an effective intervention to teach a two-item meal preparation task simultaneously? It was hypothesized that, on the basis of prior research using VP to teach a single cooking task (e.g., Graves et al., 2005; Johnson et al., 2013; Mechling et al., 2008; Sigafoos et al., 2005), similar results would be found when applying the procedures for a full-meal.
2. Can video prompting be used to teach cooking skills to emerging adults with disabilities? It was hypothesized on the basis of previous research using VP to teach cooking skills to adults with autism spectrum disorder (ASD; Johnson et al., 2013) that similar results would be found.
3. Can video prompting be used to effectively generalize a two-item meal preparation task across people? Although no current research to date has explored whether the intervention is effective in generalizing the skill across people, it is hypothesized that the intervention will be successful across different people, given that the focus of the intervention is on the video, rather than an "instructor"/researcher being present in the room.
4. Can video prompting be used to effectively generalize a two-item meal preparation task across settings? It was hypothesized that, given previous findings, VP would be an effective intervention in generalizing the task across settings.

CHAPTER III

METHODOLOGY

The purpose of the following study was to examine the effectiveness of video prompting to teach a full meal preparation task to emerging adults with developmental disabilities. The phrases "two-item meal preparation task" and "two-course meal" will be used interchangeably throughout the document. The study was approved by the Mississippi State University Institutional Review Board (IRB; see Appendix A for IRB approval letter).

Participants and Setting

Participants were recruited from an inclusive post-secondary program at a university in the southeastern region of the United States. Potential participants were given a recruitment letter and were provided an oral review of the study by trained graduate assistants. Ten emerging adults ranging in age from 20 years to 25 years, 8 months with a diagnosis of a developmental disability, determined by a third-party source, were selected to participate in the study. Guardian permission was required in addition to participant verbal assent for four of the participants. Guardians received a recruitment letter and were able to ask the lead researcher questions regarding the study. Once guardian permission was granted, participants were given a review of the study and were asked if they would like to participate. Participants who maintained their own guardianship/legal age, provided consent to the study. If participants said they were

interested in participating in the study, they were provided with consent forms and were screened to evaluate inclusion in the study. Individual participant information is presented in Table 1, with pseudonyms presented.

The study was conducted at a university-based setting in the southeastern region of the United States. Intervention sessions took place on campus in a kitchen setting. The kitchen included a digital stove, refrigerator, sink and had at least three feet of open counter space.

Table 1

Overview of Student Characteristics

Participant	Age	Diagnosis	IQ	ABAS-3 Conceptual Score[g]	ABAS-3 Social Score[g]	ABAS-3 Practical Skills Score[g]	Grilled Cheese	Garden Salad
Brooks	20:10	Autism	56[a]	86	95	78	No	No
Tommy	21:7	Mild Retardation	Mild[b,d]	83	92	74	No	No
Maddix	20:4	Developmental Disability	60[c]	82	106	84	No	No
Jaiden	25:7	DD, Auditory Processing Disorder, Epilepsy	65[d]	92	98	92	No	No
Sebastian	22:8	Down Syndrome	67[e]	66	63	62	No	No
Blaise	23:1	Autism	75[d]	70	71	65	No	No
Mya	24:0	Fragile-X Syndrome	89[f]	83	92	83	Yes	Yes
Khloe	25:8	Optic Nerve Hypoplasia and Sept optic Dysplasia	71[d]	78	85	76	Yes	Yes
Avery	21:4	DD, Seizure Disorder, Mild MR	58[f]	89	119	93	No	No
Trace	22:4	Intellectual Disability	82[d]	61	72	67	Yes	No

Note: Participant characteristics were obtained from the participant or guardian at the start of the study. Experience making a grilled cheese sandwich or a salad are presented as a yes/no response.

[a] Stanford Binet, 5th Edition; [b] Test scores not reported; Only description given; [c] Weschler Abbreviated Scale of Intelligence, 2nd Edition; [d] Weschler Adult Intelligence Scale, 4th Edition;

[e] Leiter; [f] Reynolds Intellectual Assessment Scales; [g] Adapted Behavior Assessment System, 3rd Edition

Inclusionary Criteria

Several inclusionary factors were considered for the study. The participant first required a chronological age between 18 years and 25 years, 11 months with a reported developmental disability from a third-party source (i.e. previous therapist, psychologist, special education record, etc.), provided by the participant and verified at the start of the study. Once participants and/or guardians provided consent for participation, trained graduate researchers reviewed written documentation and noted participants' diagnosed disability and ABAS-3 scores for the following three domain areas: Conceptual, Social and Practical Skills. Participants were also required to understand and speak English, attend to a video for at least 30 seconds, follow two-step directions, and be able to stop and start a video on an iPad.

Materials

Demographic Questionnaire

To gain a better understanding of the participant's personal information and experiences with cooking, a demographic questionnaire was created. This questionnaire was designed to collect information about the participant's age, race, gender, ability to use an iPad, ability to attend to a video for at least 30 seconds, and experience with cooking, specifically whether or not they had made a grilled cheese sandwich on the stove or garden salad. See appendix Cs for Demographic Questionnaire.

Video Equipment

Each task was recorded using an iPhone 8® and edited using iMovie 10.1.4. For time purposes, each of the identified steps in the task analysis were recorded separately

with vocal directions (adapted from Mechling et al., 2013). After editing the videos, one slide was created for each step in Keynote, which totaled up to 18 slides. Keynote is an application made for Apple products and is similar to PowerPoint, which allows individuals to create slides and edit them when needed. The video clips were imported onto a medium Apple iPad® with a rechargeable battery with a 7-inch screen into the application Keynote. Prior to starting the intervention, the videos were pulled up and ready to be watched. To view the video, the participant was required to touch the screen. After participants viewed the video clip, participants were instructed to swipe to the next step, then tap the screen to watch. The iPads® were used in "guided access" mode, which did not allow the participants to access anything other than the videos.

Video Recording

Eighteen separate video clips were recorded using an iPhone 8®. Each video clip was used in the third-person perspective, meaning the participant viewed another person completing each step, and was filmed using other as model (Mechling & Gustafson, 2008, 2009; Mechling & Stephens, 2009). Participants observed an emerging adult without a developmental disability completing each of the targeted tasks. Each video clip lasted from 2 seconds to 30 seconds with an average duration of 9.94 seconds. Some steps in the task analysis (i.e., "take knife and butter one slice of bread and put on plate") were clustered together based off suggestions from previous literature (e.g., Mechling et al., 2008). If the video clip of the clustered steps lasted for more than 15 seconds, steps were broken down into two individual clips. In addition to the model demonstrating the targeted behaviors, each video clip included one-sentence voice-over instructions (e.g.,

Cannella-Malone et al., 2006; Mechling & Gustafson, 2008, 2009; Mechling et al., 2008; Mechling et al., 2010).

Independent Variable

Video Prompting

The primary independent variable in this study was the presentation of the cooking video. The video was broken down across 18 component steps for simultaneously cooking a two-course meal (i.e., salad and grilled cheese sandwich). The video was played to the participants using an iPad® per VP procedures, similar to Cannella-Malone et al. (2006).

The video of the cooking tasks contained verbal cues corresponding to each step of the task analyses. For example, the video segment for the first step consisted of a video clip of an adult turning on the faucet, getting soap, and running their hands under water. While doing this, a voice over said, "Wash hands." There was an incorporated pause at the end of each task so the participant had the chance to complete the task independently.

Dependent Variables

The primary dependent variable was the percentage of steps performed correctly across all phases (i.e., baseline, intervention, and generalization). Participants completed a full meal preparation task simultaneously across all phases (e.g., make a grilled cheese and a salad) in one-to-one sessions. Data were collected at least twice per week and sessions lasted approximately 10-minutes. The specific dependent variable and data

collection procedures were adapted from the methods used by Canella-Malone et al. (2006) and Mechling et al. (2008).

Data Collection

Per Canella-Malone et al. (2006) data collection was taken on the number of steps each participant completed correctly across each phase of the intervention based on the task analysis. The targeted skills for the intervention are listed in Table 2. The performance of each step was recorded as "correct", or "incorrect". A correct response was defined as the participant initiating a step within 3-seconds of the initial step prompt and completing the step within 30 seconds of initiation. Incorrect responses were defined as: (a) appropriate initiation and completion within 30 seconds, but incorrectly completing the step; or (b) no response in which the participant failed to respond to verbal directions within 30 seconds after the previous step. During baseline procedures, if an incorrect or no response occurred, the session was discontinued (Canella-Malone et al., 2006). During the VP phase, only steps completed within 30 seconds after viewing the video clip were counted as correct (Cannella-Malone et al., 2006). Additionally, during the VP phase, if an incorrect response or no response occurred, the clinician covertly corrected the step while the participant watched the next clip to prevent in-vivo modeling; or did not intervene unless the incorrect response would not lead to a series of mistakes or safety concerns. The performance criterion was if the participant completed at least 15 out the 18 steps (approximately 83%) correctly for three consecutive trials across a minimum of five total trials. If the participant was unable to achieve performance criteria within 10 trials, the intervention was discontinued. Generalization data were collected using the same procedure but included a novel researcher or kitchen

setting depending on which group the participant was assigned. During baseline conditions, multiple trials were collected during the same day; however, during the intervention (VP phase), only one trial per day was conducted in order to minimize carry-over effects.

Table 2

Task Analysis for Cooking Tasks

Steps to Cook Grilled Cheese and Salad
1. Wash hands.
2. Turn stove dial to medium.
3. Place pan on stove.
4. Get two pieces of bread.
5. Take knife and butter one slice of bread and put on plate.
6. Place cheese on top of unbuttered side.
7. Take knife and butter other slice of bread and place on top of bread.
8. Place sandwich in pan with spatula.
9. Open salad bag.
10. Pour salad in bowl.
11. Put cheese on salad.
12. Use spatula to flip grilled cheese.
13. Put croutons on salad.
14. Put tomatoes on salad.
15. Pour salad dressing on salad.
16. Use spatula to put grilled cheese on plate.
17. Turn stove off.
18. Mix salad.

Design of Study

A multiple probe design (Canella-Malone et al., 2006; Horner & Baer, 1978; King, Radley, Jenson, & O'Neill, 2016) across participants was used to compare the effectiveness of the video prompting procedure with other as model to teach a full meal preparation task (e.g., salad and grilled cheese) preparation task. A multiple probe design

is a type of multiple-baseline procedure that provides the researcher with the opportunity to analyze the effectiveness of an intervention through the intermittent implementation of probes (Horner & Baer, 1978; King et al., 2016).

A multiple probe design is the commonly used design amongst research teaching cooking skills via VBIs (e.g., Rehfeldt et al., 2003; Mechling et al., 2008; Johnson et al., 2013). Importantly, the design maintains experimental control while allowing for the intervention to be effectively and efficiently compared to baseline and intervention conditions within participants, as well as across participants. The ten participants were randomly placed into two groups of five participants for the design.

Data Analysis

Graphs were created for each participant showing the results of the multiple probe design across participants and displayed the percentage of steps completed independently. Visual analysis procedures were used to analyze intervention effects. Per the standards for visual analysis of single subject design research put forth by Kratochwill et al. (2010), level, trend, variability, overlap, immediacy of effect, and consistency of patterns across similar phases will be analyzed. Secondary to visual analysis, Tau-U was calculated to measure the overlap between phases (Parker, Vannest, Davis, & Sauber, 2011; King et al., 2016). Tau-U is a non-parametric method used to measure overlap between phases and is based on Kendall's Rank Correlation and Mann-Whitney U (Parker, Vannest, Davis, & Sauber, 2009). Tau-U is a particularly useful metric of effect size as it is considered more conservative because of its capacity to account for the trend in the data, relative to other options (e.g., non-overlap of all pairs; Parker & Vannest, 2009). Scores below 0.20 indicated a small change, scores between

0.20 and 0.60 indicated moderate changes exist, scores between 0.60 and 0.80 indicated large changes, and scores above 0.80 indicated large to very large effect size existed (Vannest & Ninci, 2015).

Procedure

History Training

Prior to baseline, each participant was screened and taught how to operate the iPad and Keynote application, as similar to Mechling and colleagues (2008) to ensure any possible difficulty during intervention was not related to the participant's being unfamiliar with the technology used. To control for early exposure to the intervention, participants were shown a video that was unrelated to the cooking task (e.g., how to clean the counter).

Research assistants modeled how to operate Keynote on the iPad and instructed the students to practice using the application to familiarize him or herself. A task analysis was created for how to clean a counter. The video portrayed the same model in the VP intervention. History training discontinued once the participant could independently operate the iPad and follow the steps at 100%, three times in a row.

Baseline

Baseline procedures were adapted from Cannella-Malone and colleagues (2006). After the participants were screened for inclusion and taught how to use the iPad, participants completed the baseline phase. During this phase, participants were presented with all of the materials necessary to complete the simultaneous full meal preparation

task (grilled cheese and salad) on a counter in a kitchen located within the university. Participants were given the verbal prompt to make a grilled cheese and salad ("Make a grilled cheese and a salad"). Targeted steps for performance are those listed in Table 2. The performance of each step was recorded as "correct" or "incorrect". A correct response was defined as the participant initiating a step within 3-seconds of the verbal prompt (e.g., make a grilled cheese and a salad) and completing the step within 30 seconds of initiation. Incorrect responses were defined as: (a) appropriate initiation and completion within 30 seconds, but incorrect completion of the step; or (b) no response in which the participant failed to respond to verbal directions within 30 seconds after the previous step. During baseline procedures, if an incorrect or no response occurred, the session was discontinued (Canella-Malone et al., 2006) and data reflected 0% of steps correct. If participants correctly completed all steps, they were given a choice to consume the item.

Similar to King et al. (2017) and Cannella-Malone and colleagues (2006), five concurrent baseline trials were collected across all participants. Baseline data were collected for a minimum of five data points, or until data were stabilized. After the initial participant moved into intervention, subsequent participants remained in baseline and baseline data was collected intermittently per multiple probe design procedures. Decisions were made based on level and trend of data prior to moving subsequent participants into their own intervention phases.

Cooking Conditions

VP intervention. During this phase, participants were presented with all of the materials necessary to complete the simultaneous full meal preparation task (grilled

cheese and salad) on a counter in a kitchen. Participants were given the verbal prompt to attend to and play the iPad® video to begin the cooking task and to press play when ready for the next step. A total of 18 steps were presented during each trial using VP. The video presented another model demonstrating one step at a time with voice over instructions on how to complete the step. After each step, the video stopped to allow the participant to complete the step. Once the step was completed, the participant swiped and then touched the screen to begin the next step on the video. If the participant became distracted from the video, they received a verbal prompt to watch the video. No corrective feedback or performance-based prompts were delivered by the clinician. This sequence was repeated for all steps in the task analysis as needed. Data collection was completed as described above and until the participant reached a mastery criterion of at least three consecutive trials of 83% or higher across at least five sessions, or until the participant reached the termination criteria of ten trials below 83%. Once mastery criteria of 83% or above for three consecutive trials across five sessions was reached, the participant began the generalization phase.

Generalization probes. Once participants reached generalization, participants received generalization in the form of setting change (a different kitchen in a different location on campus) for one group, while the second group were assigned to an unfamiliar person to conduct the session (generalization across people). Assignment into group one or two was randomized at the start of the study and data collection remained same in generalization as described above in intervention.

Training, Interobserver Agreement, Integrity

Research Assistant Training

Research assistants received training on how to operate the iPad and Keynote application in the event of a technical error. Additionally, all research assistants were trained on how to conduct each trial, how to appropriately take and maintain data, how to identify if the participant completed the task correctly across baseline, intervention, and generalization sessions, and how Interobserver Agreement (IOA) data and treatment integrity were collected. During a mock intervention session, facilitators were required to implement all steps with 90% integrity in order to move forward with facilitation.

Two research assistants were assigned to each participant. Research assistants remained consistent until the generalization phase started. For example, research assistants who were paired with a participant who was randomly assigned to generalization across person were rotated to a different participant during the generalization phase. Participants who were randomly assigned to generalization across settings remained with their research assistants and changed to a new location (a different kitchen).

Procedural Integrity

Interobserver agreement (IOA). All data were collected by two research assistants, and video recording of each session took place across all phases in order to help facilitate the completion of IOA and treatment integrity. Sessions were scored independently by the secondary assistant who was trained using the same scoring procedure as the primary facilitator. IOA data were collected on at least 25% (Kratochwill et al., 2010) of trials across each condition for each participant. A point-by-

point method was used to calculate IOA by dividing the number of the facilitator and clinician agreements by the number of agreements plus disagreements and multiplying by 100 (e.g., Agreements/ (Agreements + Disagreements) x 100%). To maintain control, the same two assistants remained with the same participant until the generalization phase. There were times when only one researcher was present in the room due to schedule conflicts. The criterion for IOA was set at 90% across all sessions. If IOA fell below 90% for either condition, graduate researchers were required to be retrained on data collection procedures.

Treatment integrity. To obtain treatment integrity, the secondary assistant (when available) was also instructed to complete a treatment integrity checklist on the facilitator's accuracy of their presentation of the intervention and generalization phases. Before implementing the procedures, the clinicians received training on how to complete the treatment integrity sheet during the mock intervention sessions. Facilitators received a treatment integrity sheet indicating the steps needed to be completed at least 25% of the time across each phase of the study. Identical to IOA, two clinicians were present in the room. The secondary clinician alternated between collecting IOA and treatment integrity. To maintain control, the same two people remained with the participant until the generalization phase. All sessions were recorded in order to help facilitate the completion of IOA and treatment integrity.

Behavior Intervention Rating Scale (BIRS)

A modification of the Behavior Intervention Rating Scale (BIRS; Elliott & Treuting, 1991) was administered to all participants and researchers who participated in

the study. The purpose of administering this measure was to measure the satisfactoriness and helpfulness of the intervention. The items were rated on a 6-point Likert scale from *strongly disagree* (1) to, *strongly agree* (6). The research assistants BIRS consisted of a 24-item questionnaire measuring three factors: Acceptability, Effectiveness, and the Time. Evaluations of the BIRS (e.g., Elliot & Treuting, 1991) indicate there is good construct and content validity with a high internal consistency ($\alpha = 0.97$).

The participant BIRS consisted of a modified five-item questionnaire that was similar in style as the research assistant version. The language of the BIRS was slightly modified to ensure the participants fully understood the items. One study (e.g., Lipscomb, Anderson, & Gadke, 2018) has used a modified version of the BIRS for individuals with developmental disabilities and previous research has indicated changes in the wording or tenses do not adversely impact the properties of the measure (Sheridan, Eagle, Cowan, & Mickelson, 2001). Higher scores on the BIRS questionnaire indicated greater research assistant and participant satisfaction with the intervention. The purpose of using a social validity measure was to determine whether participants believed the intervention was successful in teaching a full meal preparation task. See Appendix E for social validity measure.

CHAPTER IV

RESULTS

The purpose of this study was to analyze the effectiveness of a video prompting intervention to teach a full meal preparation task to emerging adults with developmental disabilities. Specifically, the study sought to analyze whether the video prompting intervention would increase participant ability to cook a grilled cheese and make a salad simultaneously. Additionally, the study examined whether use of the video prompting intervention could generalize beyond the intervention setting (i.e., generalization across novel kitchen setting and person).

A multiple probe design across participants was used to address the research questions. As mentioned previously, for the purposes for the current study participants were randomly assigned into two different generalization groups (i.e., novel kitchen or novel person). Data were analyzed and considered by group. Each group had five participants. For both groups, visual analysis procedures were used to analyze intervention effects. Per the standards for visual analysis of single subject design research put forth by Kratochwill et al. (2010), level, trend, variability, overlap, immediacy of effect, and consistency of patterns across similar phases will be analyzed. In general, there were positive intervention effects moving from baseline to intervention, which remained during generalization for both groups across most participants. Graphical representation of all participants across both groups can be found in Figures 1 and 2.

Also, secondary to visual analysis, Tau-U was calculated to measure the overlap between phases (Parker, Vannest, Davis, & Sauber, 2011; King et al., 2016). Tau-U was calculated for all between phases comparisons (i.e., baseline to intervention & baseline to generalization) for each participant. Additionally, an overall omnibus Tau-U was calculated for each group. In general, each effect ranged from large to very large across all comparisons, across all participants, and across both omnibus calculations. Specific Tau-U scores can be found in Tables 4 and 6.

Novel Kitchen

Brooks, Tommy, Maddix, and Sebastian all presented with relatively low and stable baselines. Moving into the intervention phase, all four of these participants demonstrated an immediate increase in level, with stable data across the intervention phase; however, only Brooks and Tommy met the criteria out of these four to move into generalization. While Maddix and Sebastian presented with relatively stable data during intervention, both met the discontinue rule (i.e., 10 intervention sessions not meeting master criteria). Jaiden presented with mastery of the skill during the baseline condition. Moving into the intervention phase, his data were stable along a decreasing trend, however, he met criteria to move into generalization. Data for the novel kitchen can be found in Figure 1.

Three of the participants, Brooks, Tommy, and Jaden each met intervention mastery criteria, allowing them to move into the novel kitchen generalization phase. As noted previously, during this phase the participants completed the intervention in a novel kitchen environment. Notably, all three presented with stable data with levels similar to

those presenting during the intervention phase. The average and median percentages of steps completed can be found for each participant across all conditions in Table 3.

Table 3

Summary of Number of Steps Completed Correctly for Novel Kitchen

Participant	**Baseline**		**Intervention**		**Generalization**	
	Average	Median	Average	Median	Average	Median
Brooks	32.83%	41.00%	96.40%	94.00%	96.40%	94.00%
Tommy	14.50%	13.50%	82.80%	83.00%	94.00%	94.00%
Maddix	32.00%	35.50%	75.70%	74.50%	*	*
Jaiden	87.50%	88.00%	89.30%	88.00%	97.60%	100.00%
Sebastian	7.00%	5.00%	48.60%	47.00%	*	*

Note. * = Indicates generalization was not conducted

Tau-U was completed for each participant, with comparisons from baseline to intervention and baseline to generalization. Sebastian and Maddix presented with Very Large effect sizes (i.e., Tau-U greater than 0.80), while Brooks and Tommy presented with Large effect sizes (i.e., Tau-U between 0.60 and 0.80). Jaiden, who was at mastery during baseline, had only a Small effect size. Overall, the combined effect size for all participants from baseline to intervention was Large. Similar effects were noted for Brooks (Large), Tommy (Large), and Jaiden (Very Large) when comparing baseline to generalization phases. Combined effects for these three participants were Very Large. Effect size calculations for the novel kitchen scenario can be found in Table 4.

Table 4

Tau-U Statistics of Treatment and Generalization for Novel Kitchen

Participants	Intervention		Generalization	
	Tau-U compared to baseline	Qualitative Descriptor	Tau-U compared to baseline	Qualitative Descriptor
Brooks	0.800	Large	0.800	Large
Tommy	0.633	Large	0.633	Large
Maddix	1.038	Very Large	*	*
Jaiden	0.104	Small	0.975	Very Large
Sebastian	0.844	Very Large	*	*
Omnibus	0.714	Large	0.811	Very Large

Notes. * = Tau-U scores below .20 are considered small, scores from .20 to .60 are considered moderate, scores from .60 to .80 are considered large, and scores above .80 are considered large to very large (Vannest & Ninci, 2011). * = Indicates generalization was not conducted

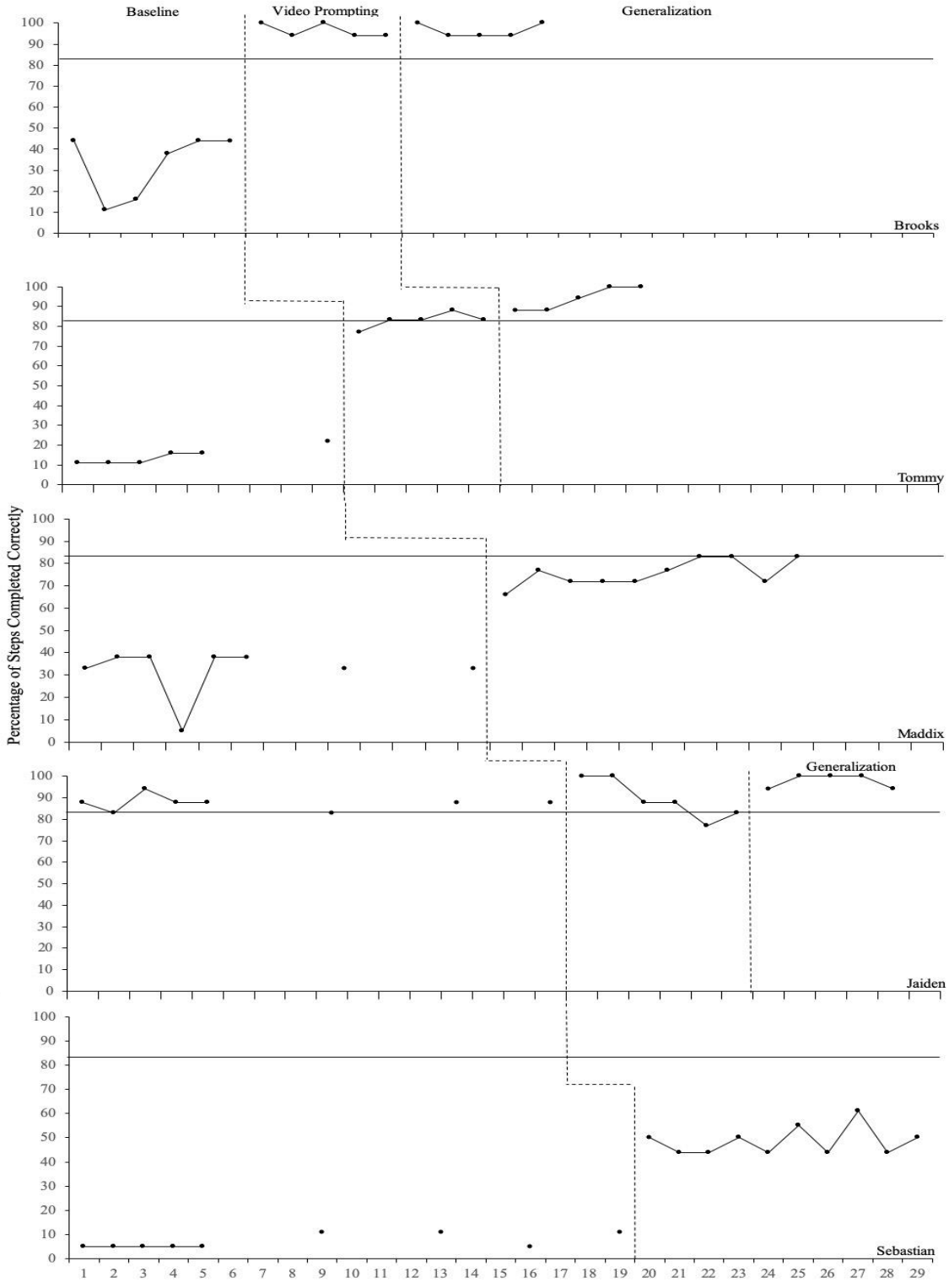

Figure 1. Graphical representation of participants in Novel Kitchen generalization group.

Novel Person

Mya, Avery, and Trace all presented with relatively low and stable baselines, with the exception of Blaise and Khloe. Blaise and Khloe presented with an immediate increase followed by a stable decreasing trend, although Khloe achieved performance criteria (i.e., 83% or above) once during the baseline condition. During the intervention phase, Blaise, Mya and Trace demonstrated an immediate increase in level, with stable data across the intervention phase. Avery demonstrated an immediate increase in level, data was somewhat variable and fell below the criteria once during the intervention phase. While Khloe met performance criteria during intervention, data was variable during the intervention phase and she did not meet mastery criteria (i.e., 83% or above for three consecutive sessions within a minimum of five sessions).

Data for novel person can be found in Figure 2.

Four of the participants, Blaise, Mya, Avery, and Trace each met intervention mastery criteria, allowing them to move into the novel person generalization phase. As noted previously, during this phase the participants completed the intervention with two new persons (i.e., trained research assistants) in the same kitchen environment as the intervention phase. Blaise, Mya and Avery presented with stable data with levels similar to those presenting during the intervention phase. Trace presented with variable levels in generalization compared to the intervention phase. At the initial introduction to the generalization phase, there was an immediate decrease in trend and data fell below the performance criteria (i.e., 83% or above). Trace's data immediately increased, and data showed similar levels to those in the intervention phase. The average and median

percentages of steps completed can be found for each participant across all conditions in Table 5.

Table 5

Summary of Number of Steps Completed Correctly for Novel Person

Participant	**Baseline**		**Intervention**		**Generalization**	
	Average	Median	Average	Median	Average	Median
Blaise	47.40%	55.00%	94.00%	94.00%	98.80%	100.00%
Mya	44.00%	44.00%	96.40%	94.00%	100.00%	100.00%
Khloe	65.43%	66.00%	80.00%	77.00%	*	*
Avery	10.43%	5.00%	84.00%	83.00%	89.40%	88.00%
Trace	18.22%	22.00%	96.40%	94.00%	88.40%	94.00%

Note: * = Indicates generalization was not conducted

Tau-U was completed for each participant, with comparisons from baseline to intervention and baseline to generalization. Blaise, Mya, Khloe, and Trace presented with Very Large effect sizes (i.e., Tau-U greater than 0.80), while Avery presented with a Large effect size (i.e., Tau-U between 0.60 and 0.80). Overall, the combined effect size for all participants from baseline to intervention was Very Large. Similar effects were noted for Blaise (Very Large), Mya (Very Large), Trace (Very Large), and Avery (Large) when comparing baseline to generalization phases. Combined effects for these four participants were Very Large. Effect size calculations for the novel person scenario can be found in Table 6.

Table 6

Tau-U Statistics of Treatment and Generalization for Novel Person

Participants	Intervention		Generalization	
	Tau-U compared to baseline	Qualitative Descriptor	Tau-U compared to baseline	Qualitative Descriptor
Blaise	0.950	Very Large	0.960	Very Large
Mya	1.00	Very Large	1.00	Very Large
Khloe	0.814	Very Large	*	*
Avery	0.800	Large	0.800	Large
Trace	1.378	Very Large	1.378	Very Large
Omnibus	0.984	Very Large	1.048	Very Large

Notes. Tau-U scores below .20 are considered small, scores from .20 to .60 are considered moderate, scores from .60 to .80 are considered large, and scores above .80 are considered large to very large (Vannest & Ninci, 2011). * = Indicates generalization was not conducted

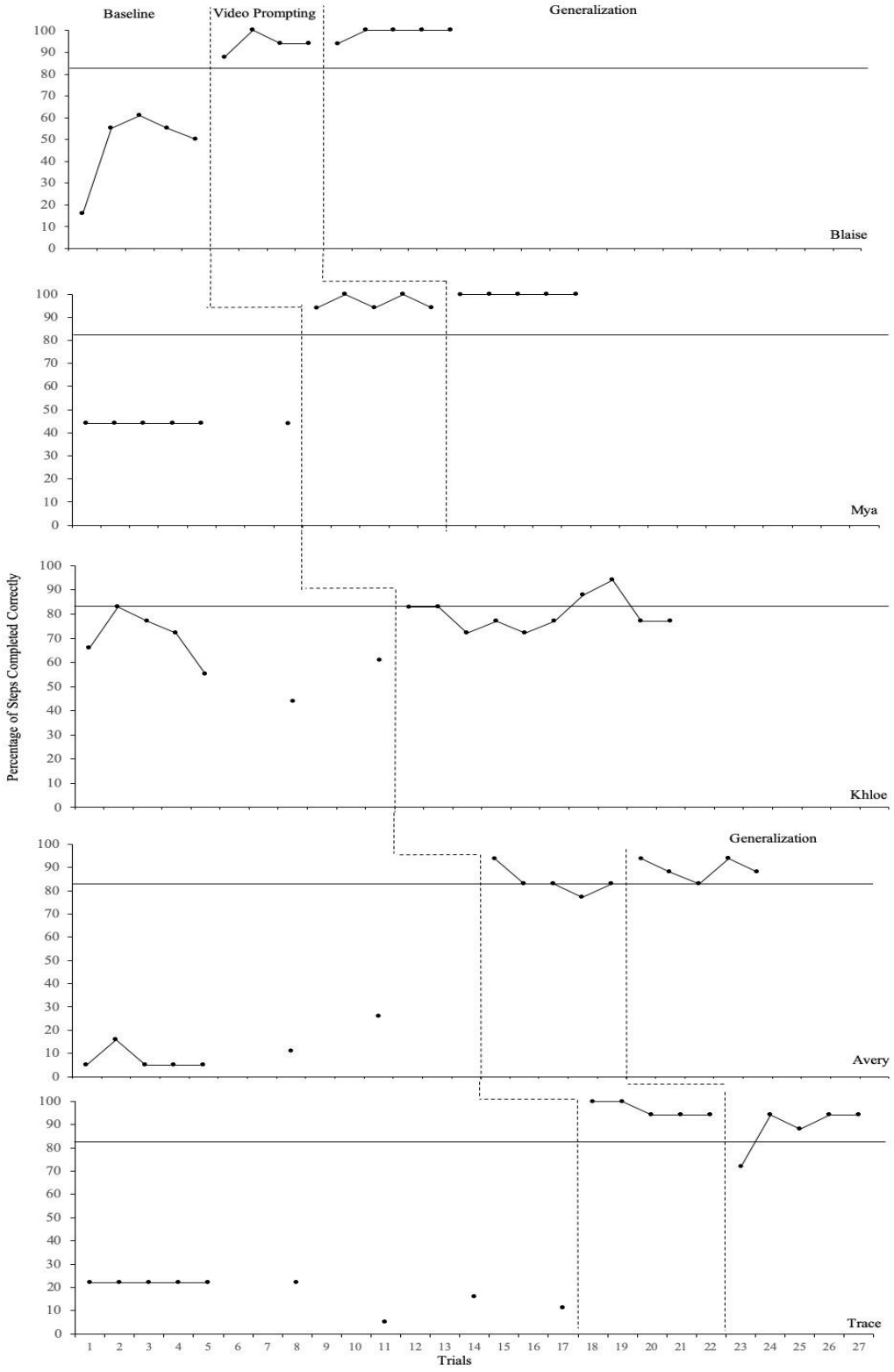

Figure 2. Graphical representation of participants in Novel Person generalization group.

Procedural Integrity

Interobserver Agreement

IOA was collected across baseline, intervention, and generalization for all participants throughout the study. IOA data collection varied across participants due to schedule conflicts. Therefore, there were times when IOA data were not collected due to the presence of only one facilitator. Both the facilitator and secondary researcher recorded the duration of each step for all participants during intervention and generalization. If IOA data fell below 90%, graduate clinicians were retrained on data collection procedures. IOA data never fell below 90%.

For baseline, IOA ranged from 98.80% to 100.00% with an overall average of 99.89%. VP (intervention) IOA ranged from 98.00% to 100.00% and averaged 99.80%. Lastly, generalization IOA for the Novel Kitchen group was 100.00% with an overall average of 100.00% and for the Novel Person group, IOA ranged from 98.50% to 100.00% and averaged 99.63%.

Treatment Integrity

Treatment integrity was measured across all three phases (i.e., baseline, intervention and generalization) during the course of the study. A trained, secondary researcher completed a treatment integrity checklist (when available) on the facilitator's accuracy of their presentation of baseline, intervention, and generalization phases. Treatment integrity checklists were followed by both the facilitator and secondary researcher to ensure proper implementation of the intervention. While researchers were required to complete treatment integrity at least 25% of the time across each phase of the study, both researchers followed and maintained protocol to ensure correct

implementation throughout the study. In total across all sessions (i.e., 171), treatment integrity was taken across a total of 78.36% of the time. Treatment integrity was 100.00% across baseline, intervention, and generalization phases.

Social Validity

Both participants and research assistants completed a modified version of the BIRS with the goal of measuring the satisfactoriness and helpfulness of the intervention. Responses were rated based on a 6-point Likert scale, with ranks from *strongly disagree* (1) to *strongly agree* (6). Acceptability, Effectiveness, and Time of the intervention was measured via questions on the research assistant's questionnaire. Higher scores on the BIRS indicated that there was a higher level of satisfaction with the intervention's procedures. Research assistant's BIRS scores were as follows: Acceptability = 5.5, Effectiveness = 5.3, and Time = 5.3, respectively. Participant's completed a modified, five-item questionnaire and the total score was used to determine the overall social validity of the intervention. Participants rated the overall intervention as an average of 5.48 (range = 4.2 – 6) indicating a high level of satisfaction for the intervention.

CHAPTER V

DISCUSSION

Research has indicated that the use of video-based interventions (VBIs) is more cost effective, less time consuming, has higher treatment integrity, and is more effective than in-vivo modeling (Charlop-Christy et al., 2000). The use of VBIs has been found to be successful in teaching a range of functional life skills to individuals ranging in age and ability. More specifically, there is growing literature on the effectiveness of VP on teaching cooking skills to individuals with developmental disabilities (Cannella-Malone et al., 2006). While cooking research supports the effectiveness of VP to teach cooking skills, research has yet to analyze the effectiveness of a VP intervention to teach a full meal preparation task to emerging adults with developmental disabilities.

While there is a plethora of literature that describes and discusses the different types of video interventions with the addition of various component packages, the purpose of this study was to analyze whether VP with voice over corrections would be effective in teaching a full meal preparation task to emerging adults with disabilities. As indicated previously, video interventions have been found to be more successful in teaching new skills compared to in-vivo modeling (Charlop-Christy et al., 2000) due to the ability to record a skill and remove the chance of inaccurate performance of the skill (Thelen et al., 1979). There are also numerous studies that suggest VBIs can lead to quicker rates of skill acquisition and increased generalization compared to in-vivo

modeling (Charlop-Christy et al., 2000). It has been stated that VBIs are effective in gaining and the holding attention of individuals with and without disabilities (Kellems & Morningstar, 2012). Videos also provide control over audio and visual stimuli (Dowrick, 1991) and have high fidelity due to greater control of the presentation of the skill (Kellems & Morningstar, 2012; Thelen et al., 1979).

An extensive review of the current literature on VBIs to teach cooking skills was conducted in order to identify the best method to evaluate the effectiveness of VP treatment packages to teach cooking skills. Although there are some mixed results on whether VP or VM is more effective for teaching new skills, there is literature to support VP is more effective when complex, lengthy tasks are needed to be broken down into simple steps (Banda et al., 2011; Cannella-Malone et al., 2013; Kellems et al., 2016). Additionally, results of the current study were expected to have a positive effect on teaching cooking skills due to previous results on using VP to teach single item tasks (Graves et al., 2005; Johnson et al., 2013; Mechling et al., 2008; Sigafoos et al., 2005).

In addition to using VP to teach a full-meal cooking task, the video in the current study was also shot in the third-person perspective using other as model. The third-person perspective is the most common perspective used in video recordings (Mason, Davis, Boles, Goodwyn, 2013). While results have indicated effectiveness in teaching skills using both first- and third-person perspective as well as using self as model or other, there continues to be mixed results on the effects of different perspectives (Ayres & Langone, 2007; Spencer et al., 2015) and model type (Cihak & Schrader, 2008). However, previous studies have suggested no significant differences in skill acquisition among perspective type or with using self as the model or other (i.e., adult) as the model

(Cihak & Schrader, 2008). However, due to the third-person perspective being the most commonly used perspective, this was chosen for the current study.

Lastly, the current study included voice over instruction across each individual step. Similar to exploring the different instruction types, there are also mixed results for using voice-over narration or no voice over narration, with results indicating there is no significant difference (Mechling & Collins, 2012; Gutierrez, et al., 2016; Bennett et al., 2017). Therefore, the use of voice over or no voice over narration as a component for video interventions continues to be explored. The current study adapted the methodology of Cannella-Malone et al. (2006) and Mechling et al. (2008).

The purpose of this study was to analyze the overall effectiveness of the VP intervention, in its simplest form, to teach a two-item meal preparation task simultaneously to emerging adults with developmental disabilities. Several research questions were addressed in the current study: (1) Would video prompting be an effective intervention to teach a two-item meal preparation task simultaneously?; (2) Can video prompting be used to teach cooking skills to emerging adults with disabilities?; (3) Can video prompting be used to effectively generalize a two-item meal preparation task across people?; (4) Can video prompting be used to effectively generalize a two-item meal preparation task across settings?

Overview of Findings

Novel Kitchen

Overall, results of the current study showed a significant increase in the percentage of steps correct immediately after the introduction of the VP intervention for

all participants across the Novel Kitchen and Novel Person groups despite variability in intellectual functioning, adaptive scores, and diagnosis. Specifically, of the five participants who were placed in the Novel Kitchen group, three of the five participants met mastery performance criteria (i.e., 83% of the steps correct for three consecutive sessions within a minimum of five sessions), only Jaiden required more than five sessions in intervention (i.e., six) to achieve mastery performance criteria. Comparison of baseline average percentages of steps completed correctly to treatment percentages indicated all participants had a higher average during intervention. Additionally, comparison of intervention percentages and generalization percentages indicated stabilization or an increase in the percentage of steps completed correctly. Even the two participants (Maddix and Sebastian) who did not meet mastery performance to move to the generalization phase showed a significant increase in average percentages from baseline to intervention. Lastly, the effect size Tau-U showed the intervention was effective across intervention and generalization phases.

There are some possible explanations for the variability in data across participants within the Novel Kitchen group during intervention and generalization. First, as outlined in the procedures a time limit required participants to complete each step in no more than 30-seconds. Analysis of Maddix and Sebastian's data indicate a majority of the steps counted as "incorrect" were the result of not completing the step within the time limit. For example, Maddix was observed to receive an "incorrect" on the first step (i.e., wash hands) across all intervention sessions, completing the step on average in 46.8 s. Sebastian was also observed to have difficulty meeting the time requirement, for example, he consistently missed the last step (i.e., mix salad) across all intervention

sessions, and completed the step on average in 1 m , 5 s. As a result, the participants may have acquired the skill; however, it would take additional time to complete each step. On the contrary, without efficiency in the completion of steps the ability to acquire the skill effectively during the intervention could have be impacted.

Another possible reason for data variability could have been interest in the intervention or previous experience with cooking. For example, one participant, Jaiden, openly reported that he did not enjoy completing each of the steps. Further, Jaiden was observed to meet minimum mastery criteria during baseline (M = 87.50%), despite variability in responding during the intervention. The variability in his data is evident when analyzing the overall effect size for baseline to intervention for Jaiden, which indicated a small effect, a result of his performance falling below baseline accuracy. While we see a very large effect size when comparing baseline to generalization, however this is due to his performance steadily being at or above (M = 97.60%) his baseline performance. Additionally, Jaiden's adaptive skills, as indicated by the ABAS-3, may suggest he is prone to quicker acquisition of skills. His overall dislike in the intervention is also supported by results on his social validity measure, which obtained a score of 4.2 (the lowest score of all participants on the social validity measure). Future studies may need to provide additional incentives for performance improvements, rather than strictly targeting skill deficits.

Brooks and Tommy, who had similar intellectual functioning, adaptive skills and limited cooking experience were the two participants whose data was stable across all three phases of the study. While not all current cooking studies have reported intellectual functioning for participants (i.e., McGraw-Hunter et al., 2006), a review of the literature

shows participants have a range in IQ between 24 and 72. Results of the current study are similar to previous results indicating VP is effective in teaching individuals with mild intellectual abilities new skills (Graves et al., 2005; Mechling et al., 2008; Taber-Doughty et al., 2011).

Novel Person

In the Novel Person group, all but one participant (Khloe) met mastery performance criteria and went to the generalization phase. Comparison of baseline average percentages for steps completed correctly and intervention average percentages show all participants had a higher average during intervention, indicating the intervention was effective. Comparison of intervention percentages and generalization percentages indicated an increase in the average percentage of steps completed correctly as well. However, Trace was the only participant who showed a decrease in the average percentage of steps completed from intervention to generalization, as indicated by a sudden decrease at the introduction of the generalization phase. This was followed up steady performance for an additional four sessions. Looking at Trace's demographic information, Trace had prior experience in making a grilled cheese, but no experience making a garden salad. However, we would have expected to see more stability in his cooking skills during the generalization phase. Although Khloe was the only participant who did not meet mastery performance to move to the generalization phase, results showed a significant increase from baseline to intervention. The effect size, Tau-U, across each participant showed the intervention was effective across both intervention and generalization phases.

There is some explanation for variability during the intervention phase for Khloe. When reviewing participant demographics, Khloe has a diagnosis of Optic Nerve Hypoplasia and Sept Optic Dysplasia. It is possible her visual impairment affected her ability to meet mastery criteria due to the possibility that her visual impairment may have affected her ability to complete tasks within the 30-second time limit. Additionally, Khloe indicated having experience in cooking both a grilled cheese and a salad, each in isolation. Previous cooking experience may have affected her overall interest in participating in the skill and therefore she may have benefited from receiving a preference assessment on specific items to cook.

Mya, who also had previous cooking experience similarly to Khloe, and whose adaptive scores are similar to Khloe's, did not show significant variability in data across the three phases. As stated with Jaiden, higher adaptive scores may indicate quicker skill acquisition. While it cannot be clearly differentiated, it is hypothesized Khloe's visual impairment may have affected her ability to meet mastery performance criteria. However, to date, this is the first study that included a participant with a visual impairment.

Lastly, Blaise and Avery, who had no prior cooking experience showed a significant increase in cooking skills at the implementation of the intervention. Blaise and Avery's intellectual functioning and adaptive skills differed from one another, which may be reflected in the results. While Blaise has a reported IQ higher than Avery, his adaptive scores are significantly below Avery's. Avery's higher adaptive scores may suggest quicker skill acquisition.

In summary, a review of the data for all participants across both generalization groups (i.e., Novel Kitchen and Novel Person) show evidence to support the effectiveness of video prompting to teach a full-meal preparation task. Visual analysis across participants indicates the introduction of the intervention lead to faster acquisition of the skill. While there were no significant differences in the average percentage of steps correct from intervention to generalization, results support generalization of the intervention across setting and person as effective. Further this study provided more robust baseline criteria of five baseline data points, as opposed to three minimum sessions (e.g., Cannella-Malone et al., 2006; Sigafoos et al., 2005), which also shows greater control.

Implications

Previous research has indicated the importance of teaching individuals with intellectual disabilities functional life skills for the purpose improving their overall quality of life (Cannella-Malone et al., 2011). There is growing literature on the teaching of functional life skills to individuals with disabilities. Over the last several years, researchers has explored the effectiveness of VBIs to teach various functional life skills, specifically analyzing VBIs to establish cooking skills. Independent skills, such as cooking and meal preparation, are needed to enhance autonomy and reduce the need and reliance on caretakers for individuals with developmental disabilities as they age (AL-Salahat, 2016; Rehfeldt et al., 2003; Shipley-Benamou et al., 2002). One limitation to the current literature on VBIs is the lack of training in teaching a full-meal preparation (more than one item being prepared simultaneously) to adults with developmental disabilities.

Previous investigations have included only one-item preparation including such as a peanut butter and jelly sandwich (Rehfeldt et al., 2003) and popcorn (Sigafoos et al., 2005).

Results of the current study provide continuing support for the effectiveness of VBIs to teach independent cooking skills to adults with developmental disabilities. Further, this investigation provides preliminary support for the use of video prompting to teach a full-meal preparation task to emerging adults with developmental disabilities. To the authors knowledge, this is the first investigation of its kind to review a two-item meal preparation using VBI intervention. This study provides several implications for not only video prompting, but VBI research as a whole. Results are consistent with previous findings that indicate VP is an effective intervention for teaching cooking tasks to individuals (e.g., Cannella-Malone et al., 2006; Graves et al., 2005; Johnson et al., 2013; Sigafoos et al., 2005). While there are few studies that have analyzed the use of VP interventions for use with individuals with developmental disabilities (e.g., Cannella-Malone et al., 2006), this study adds to the current literature, supporting the effectiveness of this intervention for this population. Additionally, results are similar to previous findings that support the use of self-operated systems to deliver VP instructions (e.g., Johnson et al., 2013; Mechling et al., 2008; Mechling & Stephens, 2009; Mechling et al., 2010; Taber-Doughty et al., 2011). Further, this study is one of the first studies to deliver instructions via an iPad®, while previous studies have used PDAs (Mechling, Gast & Seid, 2010), iPod® touch (Johnson et al., 2013), and commercial videos on YouTube (Alqahtani & Schoenfeld, 2014). Expanding use to more modern technology and across systems, continues to support the use of this intervention despite the technology-delivery

system. Additionally, while Jaiden's data was somewhat variable during the intervention phase, he appeared to consistently complete 80-100% of steps correct. Therefore, future studies may wish to continue to explore the criteria for "mastery." For data collection procedures, previous studies have used the criterion of 100% (i.e., Mechling et al., 2010) and the criterion of stability across consecutive sessions or until 100% performance is achieved (i.e., Mechling & Collins, 2012). It is questionable to know if in a typically developing population if all cooking skills are completed at 100% accuracy at all times.

This study was one of the first to explore generalization of the VP intervention across people and setting as well as analyze the social validity of the intervention for both research assistants (those delivering the intervention) and participants. In terms of social validity, previous studies have looked at the social validity of video interventions for participants (i.e., Mechling et al., 2010), however, this was done informally (i.e., informal asking of whether they enjoyed the intervention). Therefore, this study is the first study within the cooking literature to formally analyze the social validity of the intervention across both facilitators and participants. In general, facilitators and participants alike enjoyed the intervention.

Graves et al. (2005) was the first to mention the exploration of generalization of the intervention across novel persons and novel settings for cooking tasks; however, they were not able to formally assess this due to time limitations of their study. In this investigation, the intervention was generalizable across both people and settings and showed maintenance or a slight increase in the skill from intervention to generalization. Given that many individuals with developmental disabilities may receive community and family support from several different individuals depending on their living environment,

the generalization to other researchers is important. As with any instructional approach, it is favorable if the client or participant finds the intervention to be valuable and useful. The participants found the intervention to be socially valid for teaching a full meal preparation. One participant provided lower ratings; however, this participant also mostly met performance criteria for mastery in baseline, suggesting limited needed for the intervention.

Limitations

Although findings from the present study provide implications for future use of video prompting, and preliminary data support the efficacy of VP to teach a full-meal preparation task, there are several limitations that should be considered when analyzing the results. First, 30 seconds may not have been enough time to complete some of the steps in the task analysis for some participants with developmental disabilities. While most participants were able to complete each step within 30 seconds or less, some participants had more fine motor difficulties, which made it challenging to complete some tasks within the limit. A review of the data shows participants consistently had difficulty completing the following steps within the time limit: (5) take the knife and butter one slice of bread and put on plate, (7) take the knife and butter other slice of bread and place on top of bread, and (18) mix salad. Future research may need to expand the time duration to approximately one minute for each task for participants with motor concerns.

Further considering fine motor concerns and participants with visual impairments, additional accommodations may be needed to support participants identifying with such

limitations. For example, two participants (Maddix and Sebastian) were observed to have difficulty meeting the time requirements, all other participants completed each step within the required time-frame. Based on data collected, time constraints and motor and vision abilities appeared to affect the participants' ability to meet the performance criteria. Further research should consider modifications such as providing pre-cut or zip lock salad and crouton bags for easy opening, and flip top salad dressing containers, rather than a lid that must be unscrewed.

Procedures for correcting steps during intervention were adapted from Cannella-Malone et al. (2006), which involved steps completed incorrectly during the intervention phase were to be corrected while participant's backs were turned to prevent in-vivo modeling. However, the size of the kitchen prevented facilitators from being able to fix incorrect steps covertly, with the exception of one step (i.e., turn stove dial to medium). As a result, all other steps were left uncorrected to avoid the risk of providing in-vivo modeling. While this occurred infrequently, considering a kitchen arrangement that allows for the video to be behind the participants work area may be a beneficial modification for future research.

The age range for this study included participants between the ages of 20 years to 25 years, 8 months and with varying levels of intellectual ability, as a result, some data may not be generalizable to individuals outside of the current group. On the contrary, this might suggest that video prompting to teach a two-meal preparation task is effective across a wider range of intelligence than previously investigated.

Future Directions for Research

While preliminary data provide support for the use of VP to teach a full-meal cooking task, further investigation is needed to establish the effectiveness of VP with voice-over instructions. In general, there are a number of different components that could have been added to the VP intervention. For example, the current study incorporated voice over instruction and although it is possible that verbal instructions may have been responsible for acquisition of the skill, previous research has identified no significant difference exists between verbal instruction and no verbal instruction (Bennett et al., 2017; Mechling & Collins, 2012; Gutierrez et al., 2016). Additionally, correction procedures should be further explored when teaching a full-meal preparation task. Further exploration of these component strategies and comparison to other VBI types will help identify which treatment package is more efficacious for teaching and maintaining cooking skills.

Although VP has been found to lead to faster acquisition of the target behavior compared to video modeling, previous research has suggested VP may not be the most effective intervention for all skills (Charlop-Christy et al., 2000; Cannella-Malone et al., 2013). While there is mixed results on the effectiveness of VP and VM, in the current study, it appears participants whom had previous cooking experience and were higher functioning appeared disinterested in the intervention towards the end. It is assumed that those participants believed the intervention was oversimplified. Previous research suggests clustering more steps from the task analysis into one video for individuals who are higher functioning instead of using individual steps. The goal would be to increase interest and greater acquisition of mastery of the skill (Mechling et al., 2008;). Future

research may also benefit from fading VP clips when working with participants who are higher functioning by merging each clip into larger chunks, ending with one full video clip (Canella-Malone et al., 2006; Sigafoos et al., 2005).

Findings from the present study suggest participants be screened for pre-requisite motor skills as seen in Mechling et al. (2008). While most cooking literature reports a time limit of 30-seconds to complete a step (e.g., Canella-Malone et al., 2006; Mechling et al., 2010; Sigafoos et al., 2005), Mechling and colleagues (2008) allotted 1-minute to complete a step. To account for differences in ability to complete the steps within 30 seconds, future research could individualize the time limit for participants with motor and vision difficulties.

Finally, the current study differed from previous VP interventions in that the intervention was not removed once participants moved to the generalization phase (e.g., Sigafoos et al., 2005). Future studies should explore whether maintenance and accuracy of the skill will be established without use of the intervention over time. Also, the current study analyzed the effectiveness of VP for learning how to make a grilled cheese and a salad. While the recipes in the study were chosen based on previous research and level of difficulty, future research should explore the use of VP for other meals. Completing preference assessments for the type of recipe for the main course and side may be beneficial and act as a type of reinforcement for participating in the intervention (Alqahtani & Schoenfeld, 2014).

Summary

The purpose of the current study was to determine whether VP could be used to teach a full-meal preparation task (i.e., grilled cheese and a salad) to emerging adults with developmental disabilities. Results show that in its simplest form, the VP intervention was effective in teaching a full-meal preparation task, across 10 participants as well as show generalizability across settings and persons. Additionally, data provide evidence that VP is an effective treatment for emerging adults with developmental disabilities with differing functioning levels. Findings from the current study add to the VP cooking literature showing it is effective in teaching a full meal preparation task to adults with developmental disabilities. Further, modifying the time-limit for individuals with motor difficulties and vision impairments contribute to the literature by considering individualizing the time to complete each step.

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APPENDIX A

IRB APPROVAL

Approval Notice for Study # IRB-18-193, The Evaluation of Using Video Prompting to Teach a Full Meal Preparation Task to Emerging Adults with Developmental Disabilities

MSU/AA. IRB x

nrs54@msstate.edu Thu, Jun 21, 2018, 9:54 AM

to kks196, acw374, ahl45, me, dg989, lgm136, lm1255, ma697, tne1

Protocol ID: IRB-18-193
Principal Investigator: Kasee Stratton-Gadke
Protocol Title: The Evaluation of Using Video Prompting to Teach a Full Meal Preparation Task to Emerging Adults with Developmental Disabilities
Review Type: EXPEDITED
Approval Date: June 21, 2018
Expiration Date:June 15, 2019

The above referenced study has been approved. To access your approval documents, log into myProtocol and click on the protocol number to open the approved study. Your official approval letter can be found under the Event History section. For non-exempt approved studies, all stamped documents (e.g., consent, recruitment) can be found in the Attachment section and are labeled accordingly.

If you have any questions that the HRPP can assist you in answering, please do not hesitate to contact us at irb@research.msstate.edu or 662.325.3994.

APPENDIX B

SCREENING PROTOCOL

Screening Protocol

1. Potential participants for the study were identified.
2. Consent forms for participation of the study completed.
3. Participants sign an agreement indicating they understand participation in the study is contingent upon meeting the inclusionary criteria.
4. Administer demographic form.
5. Review documentation indicating the individual meets the criteria for a developmental disability.
6. Assess participant's ability to attend to a video for at least 30-seconds, follow two-step directions, ability to stop and start a video on an iPad, experience cooking a grilled cheese sandwich on the stove and a homemade garden salad.
7. Determine inclusion into the study.

APPENDIX C

DEMOGRAPHIC QUESTIONNAIRE

Demographic Questionnaire

Directions*: Please fill out the following information below.*

Participant Name: _____ Date of Birth: _____

Diagnosed Disability: _____

Researcher initial if you saw disability on their psychological record/report: _____

Circle One:

White

African American

Asian/Pacific Islander

Hispanic

Other: _____

Circle one:

Male Female

Are you familiar with using an iPad?

Yes No

Can you watch a video that is at least 30-seconds?

Yes No

Circle "yes" or "no" for the following questions:

Have you made a grilled cheese sandwich on the stove before?	Yes	No
Have you made a homemade garden salad?	Yes	No

******For Researcher to Complete ONLY***

ABAS-3 Scores:

Conceptual: _____ Social: _____ Practical Skills: _____

Criterion	Meets Criteria	Does Not Meet Criteria
Between 18:0 and 25:11 years		
Developmental Disability		
Attend video for 30-seconds		
Understands & speaks English		
Can follow 2-step directions		

Participant **DOES / DOES NOT** meet criteria into the study. _____

(Researcher initials)

APPENDIX D

DATA COLLECTION FORMS

Materials Check List

Place all items out on the counter ready for the participant.

	Pan
	Spatula
	Plate
	Mixing bowl for salad
	Butter with lid off
	Butter Knife
	Bread bag, opened
	American cheese for grilled cheese
	½ cup of salad dressing
	¼ cup of shredded cheese
	1 cup of croutons
	1 pint of cherry tomatoes, washed, with lid open
	Salad bag, with cuts 2 inches from the top on either side of bag
	Spoon to mix salad
	Data sheets, clip board, pen
	Measuring cups (1 C, ½ C, ¼ C)
	iPad (for intervention & generalization)

Baseline Session – Data Collection Form

Participant: _____ **Date**: _____

Session #:_____ **Data Collector**: _____

Instructions: Indicate whether the participant completed the step correctly or incorrectly based on the operational definition of each description. Only ONE box should be marked for each step.
Operational Definitions:

1. **Correct**: initiation of the step within 3-seconds of the verbal prompt (make a grilled cheese and a salad), and completion of the step within 30-seconds after initiation.
2. **Incorrect**: initiation of the step within 3-seconds of the verbal prompt, and completion within 30-seconds, but incorrectly completing the step OR failure to respond to verbal directions within 30-seconds after the previous step.

Steps	Correct	Incorrect
Wash hands		
Turn stove dial to medium		
Place pan on stove		
Get two pieces of bread		
Take the knife and butter one slice of bread and put on plate.		
Place cheese on top of unbuttered side.		
Take the knife and butter other slice of bread and place on top of bread.		
Place sandwich in pan with spatula.		
Open salad bag.		
Pour salad in bowl.		
Put cheese on salad		
Use spatula to flip grilled cheese.		
Put croutons on salad		
Put tomatoes on salad		
Pour salad dressing on salad		
Use spatula to put grilled cheese on plate.		
Turn stove off.		
Mix salad.		

Performance Criterion Calculation: # of correct / total # of steps X 100 = _____%

Treatment Integrity Checklist – Baseline Session

Participant: _____ Date: _____

Session #: _____ Data Collector:_____

Materials present:	Data sheet, clipboard, pen, timer, scissors, pan, knife, plate, bowl, spoon, measuring cups (1 C, ½ C, ¼ C), butter w/ top off, bread bag opened, plate, spatula, American cheese (stack), shredded cheese (1/4 C), salad bag with cuts 2 inches from the top, croutons (1 C), 1 pt. tomatoes with lid opened, salad dressing (1/2 C).	Y N
Step #	**Task**	**Check if occurred**
1	Clear off all excess materials in the kitchen (e.g., coffee cups, plates, etc.) that is not needed to complete the meal preparation task.	
2	Place all materials on a clear counter behind the stove (if possible) and avoid placing the materials in order of their usage.	
3	Set up an iPad and discretely place it in a corner where you can see the stove and counter top where the food is set up on the screen and press record.	
4	Once the participant is in the room, bring them to where the materials are set up and say: *" Make a grilled cheese and a salad. Everything you need is here (point to the materials) on the counter/table "*	
5	Mark on the data sheet whether or not the participant completes the step correctly or incorrectly throughout the session.	
6	If the participant does NOT initiate the step within the first 30-seconds, or incorrectly completes the step DISCONTINUE the trial and say: *That's okay, let's take a break and we will do it again*	
7	If the participant initiates the step CORRECTLY, mark as correct.	
8	Calculate the percentage of steps completed correctly and incorrectly	

Video Prompting Intervention – Data Collection Form

Participant: _____ **Date**: _____

Session #:_____ **Data Collector**: _____

Instructions: Indicate whether the participant completed the step correctly or incorrectly based on the operational definition of each description. Only ONE box should be marked for each step

Operational Definitions:

1. **Correct**: initiation of the step within 3-seconds of the video prompt, and completion of the step within 30-seconds after initiation.
2. **Incorrect**: appropriate initiation and completion within 30-seconds, but incorrectly completing the step OR failure to respond to verbal directions within 30-seconds after the previous step.
3. **Time to Complete Step**: write down how long it takes to complete each step.

Steps	Correct	Incorrect	Time to Complete Step
Wash hands			
Turn stove dial to medium			
Place pan on stove			
Get two pieces of bread			
Take the knife and butter one slice of bread and put on plate.			
Place cheese on top of unbuttered side.			
Take the knife and butter other slice of bread and place on top of bread.			
Place sandwich in pan with spatula.			
Open salad bag.			
Pour salad in bowl.			
Put cheese on salad			
Use spatula to flip grilled cheese.			
Put croutons on salad			
Put tomatoes on salad			
Pour salad dressing on salad			
Use spatula to put grilled cheese on plate.			
Turn stove off.			
Mix salad.			

Performance Criterion Calculation: # of correct / total # of steps X 100 = _____%

Note: Participant MUST be administered a minimum of 5 sessions, and reach at least a criterion of 83% (15/18) for THREE consecutive sessions before moving to generalization. After 10 sessions discontinue the study if the participant has not met criterion.

Procedural Integrity Checklist – Video Prompting Session

Participant: _____ Date: _____

Session #: _____ Data Collector:_____

Materials present:	Data sheet, clipboard, pen, scissors, timer, pan, knife, plate, bowl, spoon, measuring cups (1 C, ½ C, ¼ C), butter w/ top off, bread bag opened, plate, spatula, American cheese (stack), shredded cheese (1/4 C), salad bag with cuts 2 inches from the top, croutons (1 C), 1 pt. tomatoes with lid opened, salad dressing (1/2 C).	Y N
Step #	**Task**	**Check if occurred**
1	Clear off all excess materials in the kitchen (e.g., coffee cups, plates, etc.) that is not needed to complete the meal preparation task.	
2	Place all materials on a clear counter behind the stove (if possible) and avoid placing the materials in order of their usage.	
3	Set up an iPad and discretely place it in a corner where you can see the stove and counter top where the food is set up on the screen and press record.	
4	Set up the iPad so the participant's back is facing the stove and the materials in case you have to covertly correct a step during the intervention stage.	
5	Once everything is set up, bring the participant in the room and say *Turn to the iPad and look at the screen. Tap the screen and watch the video to make a grilled cheese and a salad. When the video is done playing, copy the step you just watched and come back to the iPad. To watch the next video, swipe left, then TAP the screen to play the video. Begin.*	
5	If the participant does not begin the video within 3-seconds, prompt the participant to tap the screen *If the participant becomes distracted, prompt the participant to look at the screen.*	
6	Mark on the data sheet whether or not the participant completes the step correctly or incorrectly while recording how long it takes to complete each step.	
7	If the participant does NOT initiate the step within the <u>first</u> 30-seconds, or incorrectly completes the step DISCRETELY correct the step while the participant watches the next step.	
8	If the participant initiates the step CORRECTLY, but does not automatically go back to the iPad to watch the next video, point towards the iPad.	
9	Repeat steps 5-8 as needed.	
10	Once the participant completes all steps, give the participant the option to consume the meal.	
11	Calculate the percentage of steps completed correctly and incorrectly.	

Generalization Session – Data Collection Form

Unfamiliar Person **OR** Novel Kitchen Setting

Participant: _____ **Date**: _____

Session Type & #:_____ **Data Collector**: _____

Instructions: Indicate whether the participant completed the step correctly or incorrectly based on the operational definition of each description. Only ONE box should be marked for each step

Operational Definitions:

1. **Correct**: initiation of the step within 3-seconds of the video prompt, and completion of the step within 30-seconds after initiation.
2. **Incorrect**: appropriate initiation and completion within 30-seconds, but incorrectly completing the step OR failure to respond to verbal directions within 30-seconds after the previous step.
3. **Time to Complete Step**: write down how long it takes to complete each step.

Steps	Correct	Incorrect	Time to Complete Step
Wash hands			
Turn stove dial to medium			
Place pan on stove			
Get two pieces of bread			
Take the knife and butter one slice of bread and put on plate.			
Place cheese on top of unbuttered side.			
Take the knife and butter other slice of bread and place on top of bread.			
Place sandwich in pan with spatula.			
Open salad bag.			
Pour salad in bowl.			
Put cheese on salad			
Use spatula to flip grilled cheese.			
Put croutons on salad			
Put tomatoes on salad			
Pour salad dressing on salad			
Use spatula to put grilled cheese on plate.			
Turn stove off.			
Mix salad.			

Performance Criterion Calculation: # of correct / total # of steps X 100 = _____%

Interobserver Agreement of Sessions

Participant: _____ **Date**: _____

Session Type & #:_____ **Data Collector**: _____

Instructions: Indicate whether the participant completed the step correctly or incorrectly based on the operational definition of each description. Only ONE box should be marked for each step.

Operational Definitions:

1. **Correct**: initiation of the step within 3-seconds of the video prompt, and completion of the step within 30-seconds after initiation.
2. **Incorrect**: appropriate initiation and completion within 30-seconds, but incorrectly completing the step OR failure to respond to verbal directions within 30-seconds after the previous step.
3. **Time to Complete Step**: write down how long it takes to complete each step.

Steps	Correct	Incorrect	Time to Complete Step
Wash hands			
Turn stove dial to medium			
Place pan on stove			
Get two pieces of bread			
Take the knife and butter one slice of bread and put on plate.			
Place cheese on top of unbuttered side.			
Take the knife and butter other slice of bread and place on top of bread.			
Place sandwich in pan with spatula.			
Open salad bag.			
Pour salad in bowl.			
Put cheese on salad			
Use spatula to flip grilled cheese.			
Put croutons on salad			
Put tomatoes on salad			
Pour salad dressing on salad			
Use spatula to put grilled cheese on plate.			
Turn stove off.			
Mix salad.			

Performance Criterion Calculation: # of correct / total # of steps X 100 = _____%

Interobserver Agreement Formula:

_____# of Agreements_____ :

Total # of Disagreements + Agreements

APPENDIX E

SOCIAL VALIDITY MEASURE

Name: _____ Date: _____

Behavior Intervention Rating Scale: Cooking

Please evaluate the intervention by circling the number which describes your agreement or disagreement with each statement. You must answer each question.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
Using video prompting was an acceptable intervention for teaching cooking skills.	1	2	3	4	5	6
Most teachers would find using video prompting to teach cooking appropriate for learning how to make a grilled cheese and a salad.	1	2	3	4	5	6
Video prompting was effective in helping to improve participants' cooking skills.	1	2	3	4	5	6
I would suggest using video prompting to other teachers.	1	2	3	4	5	6
The cooking skills were severe enough to warrant use of this intervention.	1	2	3	4	5	6
Most teachers would find using video prompting suitable for teaching cooking skills.	1	2	3	4	5	6
I would be willing to use video prompting to teach cooking skills again.	1	2	3	4	5	6
Using video prompting did not result in negative side effects for the participants.	1	2	3	4	5	6
This intervention would be appropriate for a variety of participants.	1	2	3	4	5	6

Using video prompting to teach cooking skills was consistent with interventions I have used previously.	1	2	3	4	5	6
Video prompting was a fair way to teach cooking skills.	1	2	3	4	5	6
Video prompting was reasonable for teaching cooking skills.	1	2	3	4	5	6
I liked the procedures used to teach cooking skills.	1	2	3	4	5	6
Video prompting was a good way to teach cooking skills.	1	2	3	4	5	6
The intervention quickly improved participants' cooking skills.	1	2	3	4	5	6
Video prompting produced lasting improvement in participant cooking skills.	1	2	3	4	5	6
Overall, this intervention was beneficial for the participants.	1	2	3	4	5	6
Video prompting improved the participants' cooking skills to the point that it noticeably deviates from other cooking skills.	1	2	3	4	5	6
Soon after using video prompting, I noticed a positive change in cooking skills.	1	2	3	4	5	6
I believe participants' cooking skills will remain at an improved level even after the intervention is discontinued.	1	2	3	4	5	6

I believe using video prompting will improve participants' cooking skills in other settings.	1	2	3	4	5	6
Comparing the cooking skills to another person's cooking skills before and after the use of the intervention, the participants' cooking skills are more alike after using videos.	1	2	3	4	5	6
Video prompting produced enough improvement in the participants' cooking skills so they can independently make a grilled cheese and a salad.	1	2	3	4	5	6
Other behaviors related to cooking improved after the video intervention.	1	2	3	4	5	6

Adapted from Elliott, S., & Treuting, M. (1991). The behavior intervention rating scale: Development and validation of a pretreatment acceptability and effectiveness measure. Journal of School Psychology, 29, 43–51

Behavior Intervention Rating Scale: Video Prompting

Please evaluate the intervention by circling the number which describes your agreement or disagreement with each statement. You must answer each question.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
It was easy to follow the video directions.	1	2	3	4	5	6
The videos helped improve my cooking skills.	1	2	3	4	5	6
I liked learning how to cook.	1	2	3	4	5	6
I would like to use more videos to teach me how to cook.	1	2	3	4	5	6
Overall, I liked watching the videos.	1	2	3	4	5	6

Adapted from Elliott, S., & Treuting, M. (1991). The behavior intervention rating scale: Development and validation of a pretreatment acceptability and effectiveness measure. Journal of School Psychology, 29, 43–51