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EFFECTS OF VIDEO-BASED INSTRUCTION USING GRADUATED GUIDANCE ON DAILY LIVING SKILL ACQUISITION FOR ADOLESCENTS WITH AUTISM SPECTRUM DISORDER

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ABSTRACT

Being able to perform life skills with independence plays a critical role in the successful inclusion of individuals with autism spectrum disorders in the community and workplace environments. Daily living tasks can be successfully taught using a variety of instructional methods, including video-based instruction. This study investigated the effectiveness of a video-based instruction package including video priming and prompting along with a graduated guidance error correction procedure to teach dish washing skills to four adolescents with autism. A multiple baseline across participants design demonstrated that three out of four participants acquired dish washing skills upon introduction of the intervention. In addition, two participants were able to generalize their performance to two novel settings and maintain their skills for up to three weeks post intervention. Future research should further explore the efficacy of error correction procedures used with video prompting and the impact that these procedures have on student learning and skill retention.

Keywords: developmental disabilities, autism spectrum disorder, video prompting, error correction, graduated guidance, daily living skills, point-of-view

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~Psalm 100~

Chapter 1

Introduction

Independence when performing everyday tasks is an important area of focus for students with autism spectrum disorders (ASD); being able to perform mastered skills with independence plays a critical role in the successful inclusion of individuals in the community and workplace environments (Carnahan, Hume, Clarke, & Borders, 2009). As independence and mastery develop over time and individuals are able to perform daily activities at home or in the workplace, they may in turn feel more empowered or more in control of their lives, therefore increasing their overall quality of life. Mastery of daily living skills may also expand future living options that are less restrictive as well as additional workplace opportunities in such areas as the hotel industry, cleaning services, or food preparation/restaurant industry.

Researchers have expressed concern over the future outcomes of adults with ASD. Howlin and colleagues (2004) reported findings from a systematic follow-up study on 68 individuals from childhood into adulthood; the majority of participants were rated as having "poor" outcomes in terms of having few friends, limited or no employment, and not living independently. Many still relied significantly on others for assistance. These findings support previous research indicating the lack of independence exhibited among adults with ASD (Gillberg, & Steffenburg, 1987; Mawhood, Howlin, & Rutter, 2000; Venter, Lord, & Schopler, 1992). Concerns about independence and future services also have been expressed by parents of adolescents with ASD (Fong, Wilgosh, and Sobsey, 1993), supporting the necessity of instruction targeting skills focused on independent living, vocational, and recreational/leisure

activities for this population of students to begin early and continue throughout their educational programs.

Instruction focused on actively engaging students with ASD through teaching methods that support some of the learning needs of this population should be a priority for educators. In addition to having impairments in communication, social interactions, and restrictive or repetitive behaviors as defined by the Diagnostic and Statistical Manual of Mental Disorders: 5th edition (DSM-V), individuals with ASD also have been described as exhibiting stimulus over-selectivity or impaired focus on the most salient features of objects (Hume, Loftin, & Lantz, 2009; Quill, 1997; Reed & Gibson, 2005), planning difficulties (Bramham et al., 2009), and impairments in verbal information processing alone (Lopez & Leekam, 2003). Supporting these learning difficulties, in addition to capitalizing on reported preferences for visual information as compared to auditory alone (Arthur-Kelly, Sigafoos, Green, Mathisen, & Arthur-Kelly, 2009; Cihak, 2011; Cihak & Schrader, 2008; Quill, 1997), can be addressed through visually-cued methods of instruction.

Quill (1997) described visually-cued instruction as, "…use of graphic cues as either an instructional prompt to aid language comprehension and communication, or an environmental prompt to aid organizational skills and improved self-management" (p. 704). Such use of visual supports can allow for simultaneous processing of both oral and graphic language, complementing the information-processing and memory abilities as well as enhancing joint attention and receptive language in individuals with ASD (Quill, 1997). Video representation is one method of visually-cued instruction that has been used to support the instructional needs of students with ASD.

Observational learning occurring through video-based instruction can be a successful technique used with individuals with ASD (Bellini & Akullian, 2007). One method of video-based instruction that is gaining popularity in research related to evidence-based practices in ASD, specifically for teaching daily living skills, is video prompting (VP) (Banda, Dogoe, & Matuszny, 2011; Gardner & Wolfe, 2013). This instructional method provides an individual with a video representation of a behavior, involving a positive and accurate version of the target behavior being modeled. Combining two evidence-based practices (i.e., modeling and visual supports) for individuals with ASD, VP is being successfully used to teach a variety of behaviors to this population.

Video prompting involves a skill sequence being broken up and taught in small chunks or often individual steps. Students are shown a video clip of a segment and then provided with the opportunity to practice that segment and receive feedback on their performance before moving on to the next step in the sequence. Researchers have used different methods to film videos including first person perspective [or point of view (POV)] or third person perspective. Point-of-view perspective has been suggested as an effective method for VP interventions (Mason et al., 2013a), as this method involves showing the hands of the performers completing the skill and in turn, eliminates extraneous stimuli that may be distracting to the viewer by focusing on what is most critical to completing the skill. Some of the proposed benefits of this instructional method include presenting information in smaller steps, opportunities for repeated skill practice with a consistent instructional model, and providing instruction in a motivating format for students. Throughout the past ten years, researchers have reported increases in student skill acquisition as a result of VP instruction in areas such as domestic skills (Cannella-Malone, et al., 2006; Gardner & Wolfe, in press; Horn et al., 2008; Sigafoos et al., 2005; Van Laarhoven &

Van Laarhoven-Myers, 2006) and cooking-related skills (Graves, Collins, Schuster, & Kleinert, 2005; Mechling, Gast, & Fields, 2008; Mechling, Gast, & Seid, 2009; Mechling, Gast, & Seid, 2010; Mechling & Gustafson, 2008; Sigafoos et al., 2007; Van Laarhoven, Kraus, Karpman, Nizzi & Valentino, 2010). Researchers have reported that some individuals may need additional support rather than only the VP when acquiring and mastering daily living skills (Goodson, Sigafoos, O'Reilly, Canella, & Lancioni, 2007); skill acquisition can be further enhanced by the addition of error correction procedures.

In a recent review of the literature, Gardner and Wolfe (2013) emphasized the importance of preventing students from learning errors by providing immediate and systematic error correction methods when using VP procedures. When providing instruction to students with more significant learning needs, use of response prompting strategies (e.g., least to most prompting, most to least prompting, graduated guidance, time delay) has shown to influence control over specific student behaviors during chained responses (Wolery & Schuster, 1997). These strategies incorporate both error correction and prompt fading to assist students with learning to perform a skill over time more independently. Goodson and colleagues (2007) were the first researchers to indicate that skill acquisition can be enhanced by video-based error correction procedures during video prompting when they taught three adults with ASD and intellectual disabilities to set a table after observing how participants were not able to acquire the skill with VP alone. Error correction consisted of the participant watching the video a second time and having the opportunity to perform the step again followed by the instructor providing a live model if an error was made after that. No maintenance data was reported for this study.

Error correction, an often overlooked but critical component of VP methodology, has been incorporated by a few researchers mainly through use of a least to most prompting

hierarchy (Cannella-Malone et al., 2011; Cannella-Malone, Wheaton, Wu, Tullis, & Park, 2012; Gardner & Wolfe, 2013; Goodson et al., 2007). A least to most prompt hierarchy typically involves the systematic application of a series of prompts (e.g., verbal, gesture, model, physical guidance) provided to students on a continuum from a less intrusive to more intrusive level depending on student performance (Demchak, 1990). More recently, researchers in two studies implemented a least to most prompt hierarchy when adolescents with ASD and moderate to profound intellectual disabilities were learning domestic skills through VP procedures (Cannella-Malone et al., 2011; Cannella- Malone et al., 2012). Results suggested that VP incorporating some method of error correction and feedback to students was more effective than both video modeling (VM) and VP without error correction, although not all students achieved mastery through VP. Cannella-Malone and colleagues (2012) suggested including an error correction procedure from the onset of intervention to help students reach mastery criterion; this will decrease the likelihood that students learn errors from the start. Maintenance data was not reported in either study.

Interestingly, none of the three VP with error correction studies described discussed specific results regarding the number of different prompt levels used with students and if less intrusive levels of prompts were needed by students over time as they learned the skill. Another important but often overlooked intervention component involves fading of video prompts over time in order to limit prompt dependency by participants and maximize the likelihood of skill acquisition and maintenance. One additional limitation of the current body of research on VP error correction methods is that only one type of response prompting procedure (i.e., least to most prompting) has been examined.

Several other response prompting methods have been suggested to be beneficial for use with chained tasks, including graduated guidance (GG) (Demchak, 1990). Graduated guidance (Azrin & Armstrong, 1973) involves providing physical assistance on a moment-to-moment basis and fading the level of assistance by the location and/or intensity of the prompt provided. Demchak (1990) describes the GG trial as proceeding uninterrupted until the response is completed. This less systematic but more fluid response prompt method has been utilized outside of the VP research field to teach students with ASD and other developmental disabilities dressing skills (Young, West, Howard, & Whitney, 1986), toileting skills (Cicero & Pfadt, 2002; Kroeger & Sorensen-Burnworth, 2009), self-help skills (Schoen, Lentz, & Suppa, 1988), use of photographic activity schedules (Bryan & Gast, 2000; MacDuff, Krantz, & McLannahan, 1993), and joint engagement skills with peers (Betz, Higbee, & Reagon, 2008). In their recent review of the literature on VP, Banda and colleagues (2011) urged future researchers to investigate whether other prompting methods, such as GG, would be effective in promoting skill acquisition for individuals with developmental disabilities.

Researchers have been urged to focus future studies on the component parts of error correction procedures used in order to determine which are most efficient or necessary for skill acquisition as well as to determine more ways to enhance the overall effectiveness of VP (Goodson et al., 2007: Cannella-Malone et al., 2012). Additional research on other response prompt methods would also expand the possibilities of error correction procedures for use with certain individuals or tasks. Researchers also need to ensure that both generalization and maintenance data are collected, as Banda and colleagues (2011) have stressed that there has been only a small number of studies collecting such important measures. Therefore, this study will expand on the current research by investigating the following research questions: (a) Is VP along

with GG as an error correction procedure an effective strategy for skill acquisition when teaching daily living skills to students with ASD?; (b) Does level of assistance needed (more intrusive prompting) decrease over time?; (c) Are students able to generalize skills learned to a new setting?; and (d) Does student performance maintain after VP procedures have been used?

Chapter 2

Methods

The purpose of this study was to examine the effects of a video prompting intervention using graduated guidance to teach students with ASD dish washing. Data were collected from direct observation of participants completing the steps in a task analysis that was developed for the study. Social validity data were collected from interviews of participants regarding their opinion of the video prompting procedure. Lastly, an interview was conducted with the classroom teacher detailing her perceptions regarding the usefulness of the intervention.

Participants

Four high school students diagnosed with ASD participated in the study. Participants were selected to take part in the study because they (a) were diagnosed as having mild-moderate ASD by a licensed professional and had an individualized education plan (IEP); (b) had deficits in adaptive and/or daily living skills as identified by their classroom teacher; and (c) were recommended by their educational teams as someone who would benefit from daily living instruction. Participant files were reviewed to collect relevant information from IEPs on present levels of performance, and educational goals and objectives. All participants' hearing and vision were within normal range. Participants had not received any formal instruction on the targeted daily living skill prior to the study. Below is a description of the participants. In order to maintain confidentiality, pseudonyms have been used. Table 1 contains demographic information for each participant.

Sarah. Sarah received supplemental autistic support services and participated in general education for 78% of her day, attending two general education classes independently. She

qualified for both the modified state assessment and extended school year services due to the significance of her needs. Although Sarah's IEP goals focused primarily on academics and social skills, her teacher and parents expressed the need for Sarah to work on gaining more independence in completing transition-related tasks, including tasks that would assist her in being able to live in an apartment in the future. In addition, Sarah was described by her IEP team as performing very low in her overall adaptive skill functioning including the Personal Living domain as measured by two assessments.

Ayla. Ayla received supplemental autistic support services and participated in general education classes for 33% of her day with the support of a paraprofessional. She qualified for both the alternate state assessment and extended school year services due to the significance of her needs. Ayla's performance with daily living skills was rated as an area of weakness as measured by the *Vineland Adaptive Behavior Scales*. She was described as someone who is motivated to complete both chores and meal preparation. Ayla demonstrated severe deficits in all areas of adaptive functioning and was in need of transition planning and instruction to further increase her independence. Transition-related goals including life skills instruction and completion of household chores were included in her IEP to support her skill development for participation in an apartment transition program the following school year.

Dave. Dave received supplemental autistic support services and participated in general education classes for 56% of his day with the support of a paraprofessional. He qualified for both the alternate version of the state assessment and extended school year services due to the significance of his needs. His teachers and parents reported that he needed more independence during task completion, especially in the workplace. Some of Dave's most recent work experiences took place at a local soup kitchen where one of his responsibilities was cleaning

dishes and putting them away, the Salvation Army, and the school district office. The following school year Dave was going to be participating in the school district's apartment program for transition training, where much of his instruction would involve independent living skills. One of his family's goals was for him to live independently after graduation. Transition planning, direct instruction in related skills, and increased opportunities for work experience were identified as primary needs in Dave's IEP. No formal assessment data were available on Dave's current adaptive skill functioning but he was selected by his classroom teacher as in need of daily living skills instruction.

Lincoln. The youngest participant (14 years old), Lincoln, was being transitioned from a separate school placement back to his neighborhood public high school after showing progress with previous displayed behavior problems. During the upcoming school year Lincoln would be receiving itinerant autistic support services and participating in general education for at least 80% of the school day. He qualified for extended school year services due to the severity of his academic and behavioral needs. Lincoln hoped to attend a 2-4 year college after graduating high school and was scheduled to begin working on transition-related activities during the upcoming school year. Lincoln's parents and teacher expressed interest in his ability to improve in his daily living skill performance, stating that this was an area of need for him for everyday functioning.

Table 1

Participant Demographic Information

Name	Age	Grade	Diagnosis	IQ	Adaptive Behavior
Sarah	18 yrs old	12th	Intellectual Disability & Autism	61 (very low range)*	Very low**
Ayla	19 yrs old	12th	Autism	40 (significantly below average) *	Low range**
Dave	18 yrs old	12th	Autism	83 (below average)*	Not available
Lincoln	14 yrs old	9th	Autism	98 (average)*	Average**

Notes: * IQ Test Scales used in order, by participant: Wechsler Nonverbal Scale of Ability; Kaufman Brief Intelligence Test- 2nd edition; Test of Nonverbal Intelligence- 3rd edition; Stanford Binet Intelligence Scales- 5th edition

** Adaptive Behavior Scales used in order, by participant: The Scales of Independent Behavior-R & Adaptive Behavior Assessment System- 2nd edition; Vineland Adaptive Behavior Scales; Scales of Independent Behavior-R

Setting

Participants attended a public high school in central Pennsylvania and received education services through an extended school year program (ESY) in an autistic support classroom. Instruction took place in a classroom that was equipped with a sink located down the hall from their typical classroom. At the back of the classroom wall was a single tub sink that was used for the intervention (i.e., washing dishes). The investigator delivered instruction to each participant individually.

Materials

The items needed to perform dish washing included a red plastic bin, sponge, two dish towels, a drying rack, a bottle of dish detergent, a teaspoon, and three items to wash (cup or mug, plate, and piece of silverware). A dish drainer was located to the right of the sink. The bottle of soap and a teaspoon to measure the soap were placed on the back left side of the sink. Two towels were placed on the counter to the left of the sink in front of the red bin containing the

three items to be washed. The video segments were shown to participants on an iPad, which was situated to the left of the sink on the counter.

Procedures

Dependent measures. Several measures were taken to assess the effectiveness of the intervention. The primary dependent variable for the study was the number of steps in the task analysis that were performed correctly. Secondary dependent variables included the number of sessions required to reach the target accuracy criterion, and the level of assistance (shadow, elbow, wrist, or hand) needed with GG for correct performance on a given step.

Task analysis development. A task analysis for dish washing was developed by the investigator (see Table 2) after consultation with the classroom teacher (utilizing her preferred method for dishwashing in the classroom), which had not been previously explicitly taught. The task analysis was used to record whether each step of the dish washing task was completed correctly on a session-by-session basis.

Video prompt development. Each step of the task analysis was recorded as a video using a Flip UltraHD video camera (8 GB, 3rd Generation). All clips were filmed from the performer's perspective, also known as point-of-view perspective (POV). Once the videos were filmed, they were edited by the author using iMovie (Apple Corp, 2009). Video clip segments were combined into logical, small "chunks" (e.g., 2-4 step segments) to enhance the natural flow or progression of the skill (Cannella-Malone et al., 2012; Kayser, Billingsley, & Neel, 1986). Although video prompting is often defined as showing individual steps of a skill and teaching each step in succession, researchers have often combined naturally flowing segments into small chunks, as appropriate while still teaching small video segments explicitly rather than an entire sequence (as is done in video modeling). At the beginning of each clip/segment, a one-sentence

voiceover instruction (i.e., verbal prompt stating the task analysis step that the participant was to perform) was given simultaneously with a visual of the hands of the researcher completing the targeted step.

Initially, a series of nine videos was used during the intervention with participants (see Table 2) (Video Set 1); however, two participants had difficulty paying attention to, and performing, several steps in succession depicted on the video, so a second series of 14 video clips was developed and used (Video Set 2). Specifically, two exhibited difficulty attending to a longer sequence of steps as initially developed in the Video Set 1's nine clips. Participant's difficulty was documented through observation/anecdotal notes and supported by teacher's recommendation. For example, when given the cue to complete what was shown in a clip, Ayla and Dave would only begin to perform the final step shown in a sequence of 2-3 steps and both were then given Video Set 2, which consisted of breaking down the steps of the task analysis presented in the videos further into 14 clips (see Table 2). Instructional procedures were identical for both video sets; the only difference was being the actual number of clips being viewed. Participants saw all steps in the dish washing task analysis during either video set. Both Video Set 1 and 2 has similar total times (2 minutes 44 seconds and 2 minutes 40 seconds, respectively).

An entire video model of washing dishes (i.e. all video clips shown in one continuous sequence) was shown to participants before viewing the clips individually. This was done to provide a model of the entire behavioral chain, with the intention that the model would better assist participants with integrating the separate steps more effectively (Cannella-Malone et al., 2006). A similar feature also was used in a previous study by the author where four adolescents with developmental disabilities rapidly acquired dish washing skills (Gardner & Wolfe, in press).

Table 2

Task Analyses for Target Skill

Washing Dishes	Video Set 1	Video Set 2
1. Put the red bin in the sink	clip 1 (5 sec)	clip 1 (5 sec)
2. Turn on the warm water (use both hot and cold faucets)	clip 2 (30 sec)	clip 2 (9 sec)
3. Measure 1 teaspoon of dish soap and pour into the bin	clip 2	clip 3 (22 sec)
4. Turn off water when you see it reach the line	clip 3 (8 sec)	clip 4 (8 sec)
5. Pick up the sponge	clip 4 (30 sec)	clip 5 (2 sec)
6. Wash all of the sides of each item	clip 4	clip 6 (24 sec)
7. Put soapy dishes in the sink	clip 4	clip 6
8. Turn on the warm water	clip 5 (24 sec)	clip 7 (6 sec)
9. Rinse the soap out of the red bin	clip 5	clip 8 (17 sec)
10. Place the bin on the counter	clip 5	clip 8
11. Rinse out the sponge and place it in the bin	clip 6 (8 sec)	clip 9 (8 sec)
12. Rinse each item until all of the soap suds wash off	clip 7 (29 sec)	clip 10 (25 sec)
13. Place each item in the drying rack	clip 7	clip 10
14. Turn off the water	clip 7	clip 11 (5 sec)
15. Put a towel in the bottom of the red bin	clip 8 (19 sec)	clip 12 (6 sec)
16. Put each item into the red bin	clip 8	clip 13 (12 sec)
17. Wipe off the area around the sink with a towel	clip 9 (11 sec)	clip 14 (11 sec)
Total Time-	2 min 44 sec	2 min 40 sec

Experimental design. A multiple baseline across participants design was used (Kennedy, 2005; Murphy & Bryan, 1980). The study consisted of four phases: baseline, intervention, video withdrawal, and generalization/maintenance. Two generalization probes were given on student reaching accuracy criterion for the skill. Maintenance (i.e., follow up) sessions were conducted at one, two, and three weeks after accuracy criterion was reached.

Response coding. During the Baseline phase, a correct response was defined as the participant initiating dish washing within 10 seconds of receiving the verbal cue to begin (Schoen et al., 1988; MacDuff, et al., 1993) and correct completion of any of the steps in the task analysis, in any order. This time criterion was set by reviewing the maximum amount of time taken to initiate a skill by a similar group of students from a previous research study conducted

by the author. If a participant did not meet the time requirements for beginning to wash dishes, the session was terminated. If the participant performed a step out of order but included it at a later point in the task analysis, he/she could still be marked as having a correct response. Additionally, a correct response could only be recorded if completion of a step was within 30 seconds of beginning that step (Canella-Malone et al., 2011; Cannella-Malone et al., 2012; Goodson et al., 2007; Sigafoos et al., 2005). Two exceptions were Step 6 (i.e., wash all sides of each item) and Step 9 (i.e., rinse the soap out of the red bin) where participants were given a one minute time allotment due to the length needed to thoroughly complete these steps.

During the intervention phase, a correct response by participants was defined as correct completion of a step in the task analysis; this meant that the participant performed the target step after watching the VP segment for a single time with no additional support. In the GG procedure, if any physical assistance/shadowing were provided to the participant to interrupt or correct an error, a correct response could not be recorded. As previously noted, a correct response could only be recorded if completion of a step occurred within 30 seconds of viewing the video prompt for that step and receiving the verbal cue to begin (Canella-Malone et al., 2011; Cannella-Malone et al., 2012; Goodson et al., 2007; Sigafoos et al., 2005). Two exceptions were Step 6 (i.e., wash all sides of each item) and Step 9 (i.e., rinse the soap out of the red bin) where participants were given a one minute time allotment due to the length needed to thoroughly complete these steps. The target accuracy criterion for the video prompting intervention was 90% of steps completed correctly (i.e., after viewing the video prompt for that step with no additional support/prompting) across four out of five consecutive sessions.

During the GG procedure, a physical prompt (P) along with the location (e.g., shadow, elbow, wrist, or hand) of the prompt(s) was recorded when used. Similar to the technique used

by Schoen and colleagues (1988), if the participant began to exhibit an error, the instructor provided physical guidance, initially minimal in terms of force/pressure, and increasing gradually until the participant started to exhibit the correct behavior. The instructor would use personal judgment based upon the student's attempted response to determine which prompting location would be most appropriate, often choosing the least intrusive one to start. A verbal prompt, consisting of the phrasing used in the voiceover instruction for that video segment, was also paired with the physical prompt/shadowing when an error was made and graduated guidance began. The instructor's pressure and location of support would fluctuate throughout the step according to the participant's responsiveness, gradually fading as they engaged in the skill. This would allow the student to regain control over their correct performance of the target behavior if they were able to start to demonstrate the correct response. The most intrusive level of prompting provided/needed for each step was recorded on the task analysis data sheet.

Video prompting implementation. Baseline and intervention sessions took place during a two-hour time period in the morning during the extended school year program. Instruction occurred four days per week for approximately 30 minutes each day per participant across six weeks; participants received two 15-minute instructional sessions each day. Sessions were separated by an hour time period to reduce any carryover effects that might occur (Barlow, Nock, & Hersen, 2008). The video segments were shown to participants on an iPad operated by the instructor that was situated to the left of the sink on the counter for easy viewing.

Baseline. In baseline, no instruction was provided to participants on how to perform the skill; participants received typical classroom instruction (i.e., no specific instruction on washing dishes). During the baseline sessions, participants were directed to stand in front of the sink area. They then were given a verbal prompt to perform the skill (e.g., "alright, (student), go

ahead and wash the dishes"). The number of steps in the task analysis performed correctly was recorded. Any errors participants made were ignored (e.g., not corrected or commented on). If a participant asked the instructor a question about what to do, the instructor would simply reply, "Just try your best" or "Just do what you normally do." At the end of the session, the participants were given a general praise statement, received a classroom reward for participation regardless of performance accuracy (e.g., various rewards were recommend by the classroom teacher and included break time tickets and candy) and returned to their normal classroom activity.

Baseline measures were taken simultaneously for each participant for a minimum of five days until stability in participant performance was demonstrated through visual analysis of level and trend in the data (Sidman, 1960). Participants were introduced to the intervention phase in a staggered format (Kennedy, 2005). When a participant's data showed an increase of at least three steps performed correctly for two consecutive instructional sessions when compared to the average of the last three baseline scores, the next participant was able to enter into the intervention phase.

Video prompting with graduated guidance error correction procedure. Participants were provided instruction in dish washing through VP with a GG error correction procedure. Participants were positioned in front of the sink area with an iPad, located directly to the left of the sink. The instructor gave the verbal cue, "Watch this." A video model of the entire dish washing procedure was shown to participants. Following this, the instructor provided another verbal cue, "Watch this" and the first video clip was shown. After the participant watched the clip, the instructor gave the verbal prompt, "Now you do it." The participant was expected to begin performing the step within 10 seconds (a time limit set based on aforementioned research)

of the verbal prompt in order to receive a correct performance on that step. If the participant correctly performed the step, the instructor provided a general praise statement (e.g., "Good job, Sarah!" or "Nice work, Lincoln!") and directed the participant's attention back to the iPad, while giving the verbal cue, "Watch this next step." After the participant watched the clip, the instructor gave the verbal prompt, "Now you do it." The same procedure continued throughout the remaining segments when participants perform a step correctly.

If a participant did not complete the target step within the given time limit (e.g., taking longer than 10 seconds to begin after given a verbal prompt or taking longer than the designated time limit of 30 seconds or 1 minute to complete a step) or if they performed the step incorrectly, the instructor used GG. When an error was being made by a participant, the instructor would immediately interrupt the error by restating the verbal prompt given in the voiceover narration during the video clip (i.e., the direction for that step in the task analysis) while simultaneously providing either shadowing or physical prompts as needed on a moment-to-moment basis (Wolery, Jones Ault, & Doyle, 1992). Possible variations of manual prompts (in a least to most intrusive order) included: (a) the instructor shadowing by moving close in proximity, but not touching, and moving her arms/hands alongside of the participant to direct them to perform the given step; (b) providing a light touch to the elbow; (c) providing a light touch to the wrist to guide completion of the step; or (d) providing hand over hand assistance to complete the step. More than one type of manual prompt could be used during error correction for a step if needed. Prompts were faded in both frequency and intensity by changing the location of the prompt given until the participant was able to perform the step to its completion. For example, if a participant needed hand over hand assistance to complete a step, the instructor faded this support by moving to providing a light touch to the wrist followed by shadowing as the participant began to

correctly complete the step. Upon completion of a segment/step, the instructor provided a general praise statement (e.g., "nice work with that, Lincoln!") and then showed the next video segment in the sequence.

This procedure was continued throughout the remaining video prompts in the task analysis sequence. At the end of the session, participants were given a general praise statement, received a classroom reward for participation (regardless of performance accuracy), and returned to normal classroom activity. Accuracy criterion for the intervention was correct performance of at least 90% of the steps in the task analysis (e.g., 16 out of 17 steps) completed correctly (i.e., after viewing the video one time) across four out of five consecutive sessions.

Video Withdrawal. Once a participant reached accuracy criterion, the video prompting intervention was removed for five sessions to determine his/her ability to correctly and independently (i.e., with no video support) wash the dishes. Procedures used in the withdrawal phase were identical to those used during Baseline. Additionally, if a participant's performance fell below accuracy criterion reached in the intervention phase (i.e., 16 steps correct), two "booster" sessions were provided to participants. These sessions consisted of providing two VP intervention sessions to aid participants in maintaining accuracy criterion. The procedures used were identical to the VP with GG intervention procedures discussed above (e.g., participants received typical classroom instruction [i.e., no specific instruction on washing dishes]); errors were not corrected and a general praise statement was provided upon completion).

Generalization and Maintenance. After a participant maintained accuracy criterion during the Video Withdrawal phase or after they completed two booster sessions, two generalization probes were conducted in novel settings (e.g., two other classrooms equipped with sinks). Procedures during the generalization probes followed those previously outlined in the

Baseline phase (e.g., no skill instruction provided to participants). Maintenance (i.e., follow up) sessions were conducted at one week, two weeks, and three weeks post-intervention without any VP. Procedures implemented were identical to those maintained during the Baseline phase (e.g., participants received typical classroom instruction [i.e., no specific instruction on washing dishes]); errors were not corrected and a general praise statement was provided upon completion).

Data Analysis

Interobserver reliability data were collected by a trained independent research assistant on the number of task analysis steps performed correctly by participants during a minimum of 25% of the sessions in all phases of the study. The observer training lasted approximately one hour and consisted of reviewing the task analysis data sheet and demonstrating how to record a correct response, including the prompt level. In addition, the observer training included practice with scoring at least three sample videos. Agreement was calculated by dividing the number of agreements by the sum of agreements and disagreements and multiplying the quotient by 100 (Johnston and Pennypacker, 2009). Percentage of agreement on number of steps in the task analysis performed correctly and type of prompt needed were collected. Interobserver agreement was 100% for Sarah, 99% for Lincoln, 97% for Dave, and 91% for Ayla.

Treatment integrity data also were collected during at least 25% of the sessions in all phases of the study. A second scorer was given a checklist of the procedures for each session and marked off whether the steps were completed correctly or incorrectly. This checklist included such things as setting up the materials properly, following the correct sequence in terms of showing the videos and providing verbal cues for the students to attend and then try to complete the step, providing general praise upon correct completion, or providing graduated

guidance upon an error. Treatment fidelity was calculated by dividing the number of procedural steps completed correctly by the total number of procedural steps and multiplying the quotient by 100. Treatment integrity across all sessions and phases was 100% for Sarah, Dave, & Lincoln and 96% (range 80-100) for Ayla.

Social Validity

Informal interviews were conducted with participants and their classroom teacher at the conclusion of the study. Participants were asked if they: a) enjoyed watching the videos to learn how to wash dishes; b) enjoyed watching videos on the iPad; c) thought the videos helped them to learn; d) felt their dish washing skills improved; and e) would like to watch more videos of other skills to help them to learn in school. The classroom teacher was also interviewed about the intervention and her students' progress. She was asked if she felt: a) students were motivated to learn through the use of video prompting; b) video prompting was helpful in teaching her students to wash dishes; c) students improved in their dish washing skills over the course of the intervention; and d) if she (or her paraprofessionals) would feel comfortable implementing a similar intervention or learning more about video prompting in the future.

Chapter 3

Results

The results of this study demonstrated that all four participants were able to improve their performance with washing dishes when VP with GG was used. Three participants reached accuracy criterion during the intervention phase; two participants were able to generalize their performance of the skill across two different settings and maintain their performance over time. Figure 1 shows the number of steps completed correctly by Sarah, Ayla, Dave, and Lincoln. Figure 2 shows the number and type of prompts needed for correct responding over time for each participant.

Effectiveness of Video Prompting and Graduated Guidance Procedure

Sarah. Number of steps performed correctly (i.e., after viewing the video a single time) for Sarah is presented in the top graph of Figure 1. During baseline, Sarah was able to correctly complete an average of eight (range: 7-9 steps) of the 17 steps from the task analysis for washing dishes. The trend of her baseline data was stable over time. A rapid increase in correct performance of steps was observed when the VP with GG was introduced; Sarah was able to perform 100% of the steps correctly during the first intervention session and maintained this performance (meeting accuracy criterion) in four sessions. No error correction was needed during intervention sessions. When the VP intervention was withdrawn, Sarah continued to perform all 17 steps correctly across five sessions.

Ayla. Ayla's performance is shown in the second graph from the top in Figure 1. During baseline, Ayla performed one step correctly (range: 0-2) on average across five sessions and the trend of her baseline data remained stable. Ayla was most often able to turn off the water

and occasionally put the items back into the red bin. When the VP with GG intervention was introduced, Ayla's performance increased to five, seven, and eight steps respectively, correctly performed across the first three sessions. After observing Ayla's tendency to forget a step when it was shown in combination with other steps in a single video clip, it was determined that Ayla would benefit from having shorter video clips depicting fewer dish washing steps. She was then shown the Video Set 2 (14 video clip sequence) rather than the Video Set 1 (9-step sequence) originally used. When the change was made showing shorter video segments, Ayla's performance continued to steadily increase across sessions. This general trend continued as Ayla was able to perform 14 steps correct on average (range 11-16). Ayla did not achieve accuracy criterion during the intervention phase (i.e., 25 sessions), but did achieve 90% of steps for 3 out of 5 consecutive sessions before the end of the extended school year program (i.e., conclusion of the study).

Dave. Data showing Dave's performance is located in the third graph from the top in Figure 1. During baseline, Dave was able to perform five steps correctly on average (range 3-6) across nine sessions and maintained a fairly stable level of performance across baseline sessions. He typically was able to rinse items after washing them, place them in the drying rack, and turn the water off when finished. After introduction of the VP with GG intervention, his performance rapidly increased to 10 steps correct. Like Ayla, after consultation with the classroom teacher, it was determined that Dave would benefit from viewing shorter video clips due to difficulty with maintaining his attention when shown several clips combined. Across VP sessions, a steady, ascending trend was observed in the data as Dave completed 15 steps correct on average (range 13-17). The break in the data path during the intervention phase represents absences due to illness. Dave exhibited inconsistent errors across sessions by performing a step incorrectly or

sometimes taking longer than the allotted time limit. Dave met accuracy criterion after 20 VP sessions. When the VP intervention was withdrawn, Dave's performance dropped below accuracy criterion levels to 13 steps correctly performed on the three consecutive Video Withdrawal (i.e., withdrawal) measures. No additional sessions were conducted due to the extended school year program ending.

Lincoln. Number of steps performed correctly for Lincoln is presented in the bottom graph of Figure 1. Lincoln was absent the first few days of the extended school year program so baseline probes did not begin at the same time as the other participants. During baseline, Lincoln was able to correctly complete an average of one (range 0-1 steps) of the 17 steps from the task analysis for washing dishes across five baseline sessions; the trend in his data was stable over time. The only step Lincoln was able to complete on two occasions in baseline was to put the dishes back into the bin after taking them out to wash them. He never turned on the water to wash dishes, did not use soap, and used a dish towel to "wash" the dishes. After the VP with GG intervention was introduced, a substantial increase in Lincoln's performance was observed as he completed 15 steps correctly during his first session. He met accuracy criterion in five days, maintaining a stable performance of 15-17 steps correct across five consecutive sessions.

When the VP intervention was withdrawn, Lincoln's performance ranged from 14-16 steps correct across five sessions, thus maintaining accuracy criterion levels of performance. Since Lincoln dropped below 90% accuracy during the start of the Video Withdrawal phase, he was given two booster sessions and scored 17 and 16 steps correct respectively.

Level of Prompt Assistance

As seen in Figure 2, two participants (Sarah and Lincoln) required little to no graduated guidance support throughout the study. After introduction of the VP with GG intervention for

Sarah, correct performance of all steps in the task analysis was attained and maintained until accuracy criterion was achieved. When looking at Lincoln's data presented in Figure 2, the number and intrusiveness of prompts provided through GG decreased across sessions; one shadowing prompt and one elbow prompt were given during the first video session and then only one shadowing prompt was provided during the final VP session.

The number of prompts provided to Dave during GG procedures decreased over time and fewer intrusive prompts were also given over time. For example, two shadow prompts, four elbow prompts, nine wrist prompts, and three hand-over-hand prompts were used during the first five sessions; four shadow prompts, three elbow prompts, and one wrist prompt were used during sessions 11-15. This decreasing trend in more intrusive prompts used continued throughout the rest of his intervention sessions.

For Ayla, fewer intrusive prompts were provided through GG over time and additionally, less intrusive prompts were used over time. For example, during the first five VP sessions, three shadowing prompts, eight elbow prompts, four wrist prompts, and 23 hand-over-hand prompts were used as compared to two elbow prompts used during sessions 16-20. However, Ayla would occasionally not earn credit for a given step due to going over the time limits imposed. After consulting with her classroom teacher, it was determined that Ayla would perseverate on certain steps and have some difficulty focusing due to not feeling well (which tended to occur during one week each month typically). After not needing any prompts to assist with correct performance of steps during sessions 18-21, Ayla's performance started to slightly decrease during the final four intervention sessions and several prompts were in turn provided to assist her in correctly performing some of the steps.

Generalization of Skills

Generalization measures were conducted with two participants, Sarah and Lincoln, as both achieved accuracy criterion during the intervention phase and also completed the withdrawal phase before the extended school year program ended. Sarah was able to generalize washing dishes to two novel settings (i.e., a home economics classroom and a life skills classroom in the same hallway that the intervention classroom was located), earning 17 steps correct during each assessment. After the booster sessions were administered to Lincoln, two generalization probes were conducted, resulting in Lincoln performing 16 steps correctly without the use of video prompts in two novel settings (e.g., the same ones listed above for Sarah).

Maintenance

Both Sarah and Lincoln were given maintenance assessments and successfully demonstrated skill maintenances for up to two and three weeks post-intervention. Sarah maintained her performance at one week, two week, and three weeks after the intervention ended; she completed 17 steps correct across all maintenance measures. Similarly, Lincoln maintained his performance at one week and two weeks after the intervention ended, completing 16 and 17 steps correct, respectively, on maintenance probes.

Social Validity

Informal interviews were conducted with participants and their classroom teacher at the conclusion of the study. All participants indicated that they liked watching the videos to learn how to wash dishes and that they enjoyed watching videos on the iPad. All participants also reported that the videos helped them learn. In addition, the four participants indicated that they felt that they improved with dish washing skills. Interestingly, when asked if they would like to watch more videos of other skills in the future to help them learn in school, only two of the four

participants indicated they would like to do so. Aside from the informal interview questions, several behaviors suggesting participant enjoyment with the activity were observed during instructional and baseline sessions, including frequent smiling, humming, singing a song, jumping up and down, laughing, and one participant (i.e., Lincoln) expressing that he was proud of himself for finally learning how to do the dishes since he had never done them before.

The classroom teacher reported that she felt that participants were both excited and motivated to participate in daily lessons. Based on her observations, she stated that the use of VP was helpful for her students in learning how to wash dishes and the videos provided a great model for participants. The teacher also stated that the participants improved in their ability to perform this skill as a result of the intervention. She indicated that she would feel comfortable implementing this sort of intervention on her own after receiving proper training in the instructional methods and that she would feel comfortable having her paraprofessionals implement the intervention after receiving training as well. Lastly, the teacher stated that VP with GG was something she would like to learn more about how to use and that it is a practice she would recommend to other professionals.

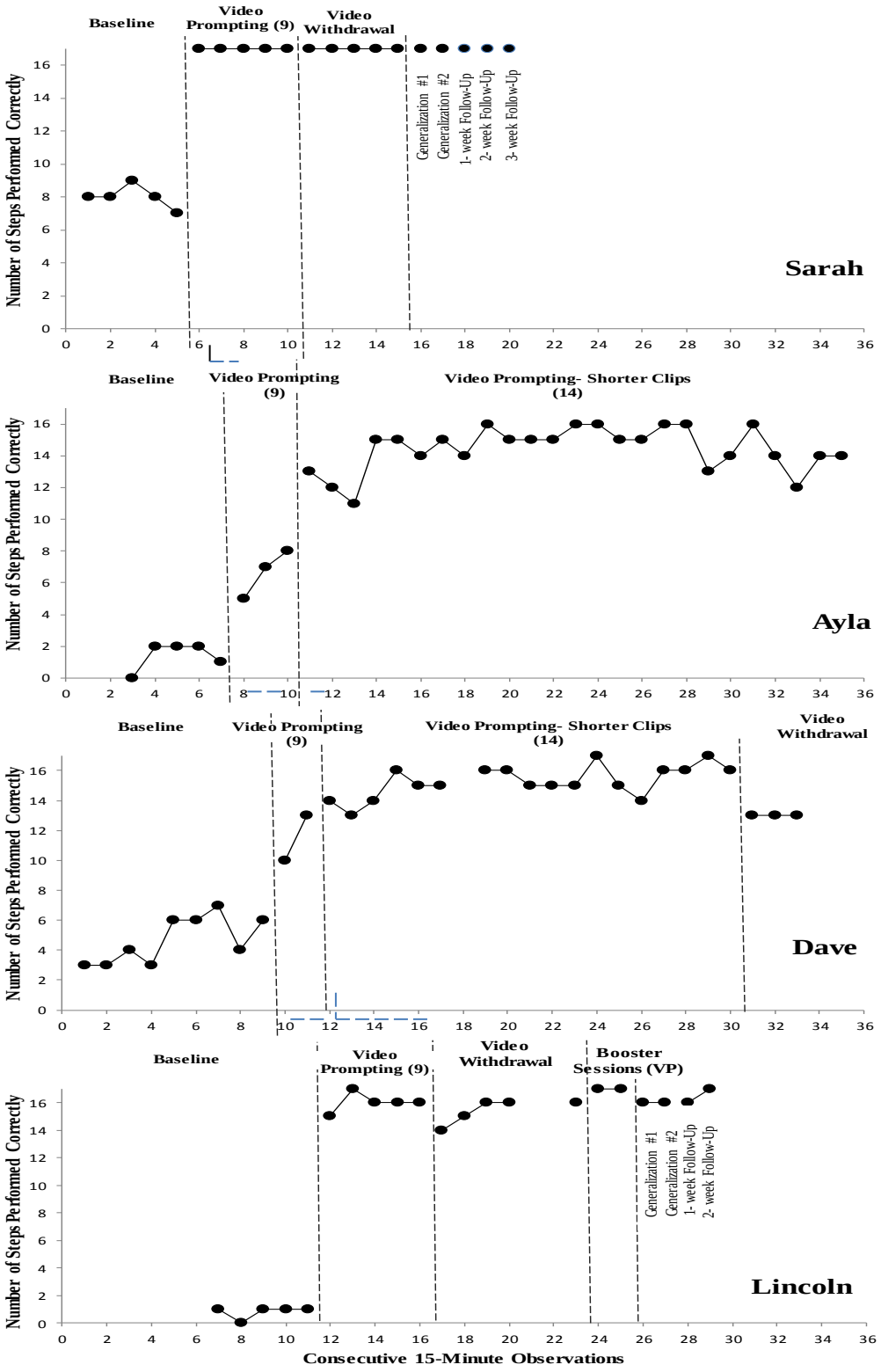
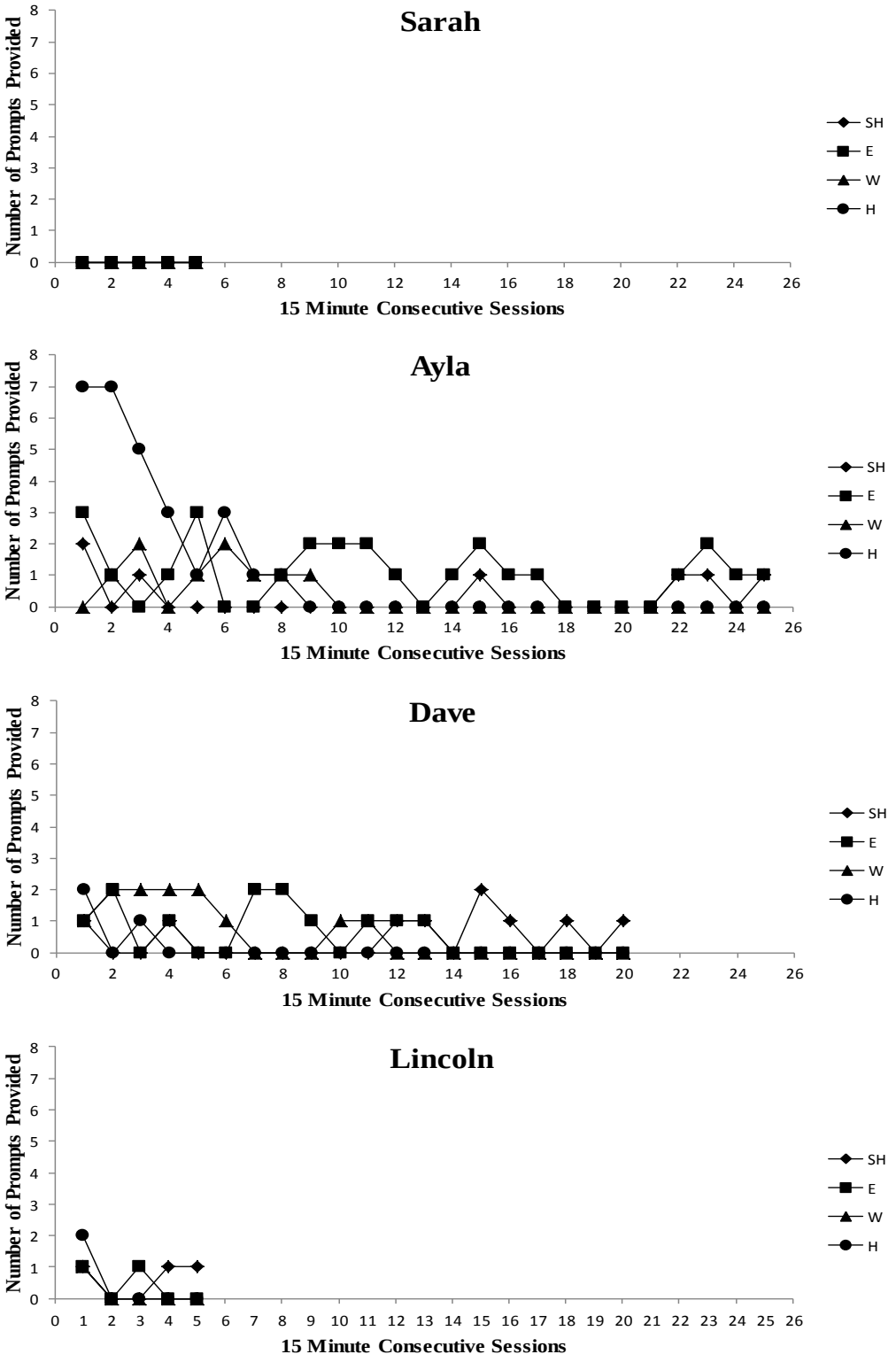


Figure 1. Number of steps performed correctly for Sarah, Ayla, Dave, and Lincoln.



Note: SH= shadow; E= elbow; W= wrist; H= hand

Figure 2. Number and Type of Prompts Provided Across Intervention Sessions for Each Participant.

Chapter 4

Discussion

Visual analysis of the data demonstrate that participants exhibited significant and rapid increases in the number of steps completed correctly after the introduction of the VP with GG intervention. Three out of the four participants reached accuracy criterion (i.e., at least 90% accuracy for 4 consecutive sessions) in less than 20 sessions; two participants achieved accuracy criterion very rapidly (i.e., 5 or fewer sessions) and made few to no errors during the intervention phase. Participants also were able to maintain their performance at two and three weeks post-intervention in addition to successfully generalizing skill performance to novel settings.

Similar to other findings, the present study adds to the current research base supporting the use of VP procedures to teach daily living skills to individuals with ASD and/or intellectual disabilities (Banda et al., 2011; Cannella-Malone et al., 2012; Gardner & Wolfe, in press; Graves et al., 2005; Mechling, Ayres, Foster, & Bryant, 2013: Mechling, et al., 2008; Norman, Collins, & Schuster, 2001; Mechling et al., 2010). Prior to the current study, GG has not be been used with VP instruction related to self-help skills. Researchers recently have begun to investigate the efficacy of GG when used with VM skills. For example, VM along with GG was found to be effective when teaching students with autism play skills and how to protect themselves from strangers (Akmanoglu &Tekin-Iftar, 2011; Akmanoglu, Yanardag, & Batu, 2014). However, the current study illustrates the effectiveness of acquisition, generalization, and maintenance of dishwashing skills to individuals having ASD as a result of VP with GG.

The effectiveness of VP may be attributed to a methodology that is grounded in "fundamental principles of teaching" for individuals with developmental disabilities that includes

elements of instruction such as task analysis, prompting, repetition, and feedback (Banda et al., 2011, p. 524). Due to multiple components, several aspects of the intervention warrant further discussion including using GG as a systematic prompting procedure, using error correction as a necessary component of a VP package; incorporating critical instructional characteristics; fading prompts over time; using of point-of-view perspective with voiceover instruction; and generalizing skills to novel settings.

Graduated Guidance and Prompting Systems

When implementing VP interventions, consideration must be given to the nature of the intervention and type of instruction provided to participants. In this study, the systematic prompting system of GG was used to deliver instruction of daily living skills to individuals having ASD. Although systematic prompting systems often are employed to teach new skills (e.g., least to most, most to least, time delay), GG provides a number of advantages for instruction related to daily living skills including the flexibility of instruction, built in fading of prompts, effectiveness with chained behaviors, and ease of implementation.

As noted previously, GG is a physical prompt system that provides prompting moment to moment rather than across trials. According to Azrin and Armstrong (1973), the hierarchy of physical support provided to an individual in GG permits greater flexibility in matching the degree of support provided to an individual's precise response within a trial rather than across trials, as is done in other prompting systems such as least to most prompting (Demchak, 1990: Schoen et al., 1988). Providing support within a trial when performing a daily living skill such as dish washing is highly beneficial to the learner so that any errors they may attempt to make are immediately corrected as the instructor guides them in performing the correct target behavior on the spot. This in turn can help maintain a smooth flow between steps in a skill sequence

where correct performance of the previous step sets the learner up with a natural cue toward performing the following step in the sequence. Graduated guidance typically has been suggested for use with more complex, physical, and chained behaviors (Schoen et al., 1988), and appeared an appropriate match for the complex and lengthy task of washing dishes in the present study.

Another advantage of GG is that the procedure contains a built-in fading component that helps to set the learner up for opportunities to attempt the skill as independently as possible. In GG, the instructor has the flexibility to adjust the intensity and location of prompts provided on a moment to moment basis as he/she determines when the learner has mastered a step and attempts to perform the target behavior at that moment in time. As the learner attempts more, the amount of support is naturally faded, resulting in learner independence.

Graduated guidance procedures also were found to be relatively simple to implement with a high degree of accuracy. Both treatment fidelity and inter-observer reliability results were high (99% and 97%, respectively), indicating consistency in administration and scoring procedures for video prompting with graduated guidance procedures. The simplicity with which GG was implemented would suggest that the procedure could easily be taught to a variety of personnel who may be working with individuals having ASD.

Benefits of Error Correction

Errorless learning has been described as one of the most effective and efficient ways to instruct students with special needs because students will both make and practice fewer errors (Kregel, 2012). Once an individual emits an error, there is a high likelihood he/she will continue to repeat the errors over time (Demchak, 1990). Kregel (2012) has asserted that errorless teaching methods help students acquire skills more rapidly, since less time and energy are spent re-teaching. One benefit of prompting systems such as GG is systematic error correction. In VP

using GG, participants are provided with a subsequent trial during the next training session to "self-correct" or modify their previous response. For example, if a student makes an error with turning on the warm water when washing dishes and is taken through an error correction procedure, on the next trial or session the student now has the chance to perform the corrected behavior independently rather than being unsure of their error made and practicing that error over time. Error correction methods used in conjunction with VP to teach daily living skills have been shown to be a critical components of instruction (Cannella-Malone et al., 2012; Gardner & Wolfe, in press; Goodson et al., 2007; Mason et al., 2013; Norman et al., 2001; Van Laarhoven et al., 2010).

In the current study, data were collected on errors made by participants via recording of the number and type of prompt needed to complete a step. As seen in Figure 2, the use of more intrusive prompts, in conjunction with the number of prompts needed overall, decreased over time for both Ayla and Dave as they exhibited increasing success with task completion. Collecting data on specific prompt levels used over time can also allow the instructor to investigate which steps students had the most difficulty with based upon the level of intrusiveness required and number of students needing prompts; this may highlight the need for a particular step to be broken down further. These data also highlight the fact that GG procedures permit fading to occur as student skill acquisition increased over time. Additionally, data can also provide information regarding how instruction can begin the following session, by taking note of the level of prompt needed the previous session (or few sessions). All of these reasons highlight the importance of data collection on prompt types, which can prove to be beneficial during instruction when data-based decision making is crucial. Future research should continue to assess the efficacy of various error correction procedures when used in conjunction with VP,

perhaps through comparison studies of systematic prompting systems, in order to provide practitioners with the most effective and efficient means to use video prompting to promote skill acquisition.

Instructional Characteristics

In order to maximize opportunities for success, researchers advise combining direct instruction methods and facilitated supports along with video based instruction (Ganz, Earles-Vollrath, & Cook, 2011). There are a number of variables that must be considered when implementing instruction. Instructional characteristics that can affect skill acquisition of video prompting include: a) how the skill sequence is presented (backward, forward, or total task); b) when the video examples of the skill is given; and c) the task analysis and number of corresponding video segments.

Total task presentation. One of the most commonly used methods to teach chained behaviors is total task presentation (Kayser et al., 1986). In the current study, participants were provided with total task presentation for the skill of dish washing. This method involves all steps being taught concurrently in a session, as opposed to forward or backward chaining where each step or behavior in a chain must be mastered before continuing to the next in the sequence (Kayser et al., 1986). Total task presentation has been suggested to more naturally mimic the actual conditions under which a complete skill, such as a daily living skill, is performed (Kayser et al., 1986). Additionally, research has suggested that showing an entire skill sequence (as in total task) better assists the learner with integrating the separate steps of a behavior chain more efficiently (Cannella-Malone et al., 2006). Total task presentation seemed to be a natural fit with the skill of dish washing for the current study, as it provided a way for individuals to learn the task sequence as it would naturally occur when performed by any other person on a given day.

Video priming. Video priming also was used in which participants were shown a visual example of the entire skill sequence before showing and providing instruction on the video prompts (i.e., steps of the skill). Priming, conducted by providing an example of a completed skill sequence before individual steps are presented, permits participants the opportunity to see the skill performed in advance. Priming has been found to result in improved performance of chained behavior (Norman et al., 2001). Interestingly, researchers have reported that individuals with ASD are more likely to imitate behavior when the function or goal is understood as opposed to typically developing children who will imitate behaviors even if they are unsure of the overall purpose (Lindsay, Moore, Anderson, & Dillenburger, 2013). The present study appears to support the importance of video priming so that individuals with ASD can see the "bigger picture" before attempting the skill.

As previously noted, participants were provided with a priming model at the beginning of each instructional session. One variation of incorporating a model before the video prompting sequence is initiated could be to show only the entire model sequence during the first instructional session (rather than at the start of each session). This may be more appropriate for use if the instructor is working with a student who has difficulty attending to a task, as including an extra priming model during each session, in conjunction with the videos for each step, may be pushing the attentional span limits for a particular individual. Modeling is one of the most common and efficient ways to present new skills (Downing & Demchak, 2008). When providing explicit instruction to students it is imperative to provide a complete and accurate model of the target skill/behavior followed by guided and independent practice (Archer & Hughes, 2010; Rosenshine, 1987). These instructional tenants reinforce the decision to provide video priming before each VP instructional session occurs. Since this study implemented an

instructional package combining video priming via VP, it cannot be determined what effect the combination of these two features had on student performance. It may be beneficial to investigate the impact of using one versus both instructional methods through a comparison study in the future.

Task analysis and video segments. Research related to the development of effective task analyses (TAs) were used to develop the TA used in the current study (e.g., the instructor performing the steps themselves when creating the sequence, consulting an "expert" when creating the steps of the task analysis & listing and subsequently teaching the steps in the same temporal sequence they naturally occur) (Carter & Kemp, 1996). Per socially valid practice, the classroom teacher provided input into the development of the TA to identify how dish washing was or would be conducted in the classroom and school. When developing the video segments, consideration was given to participant characteristics as well as the task to determine how the steps of the skill should be chunked. Variables considered included temporal sequence, importance to the task, or and confusability factors (e.g., steps that would make more sense to be chunked together rather than separated) (Carter & Kemp, 1996). Although the resulting TA was comprised of 17 steps, 9 video segments were used during instruction to maintain the "fluidity" of some steps (e.g., combining washing each item followed by placing each item in the rinse sink). Other researchers have stressed the need for individualization related to the number of steps and corresponding video segments, and how they are chunked. This consideration held true in the current study. Within a few sessions of the intervention, it was clear that both Ayla and Dave were having difficulties with maintaining attention to longer sequences of steps. When looking at the participants' data, it is evident that Ayla was beginning to show signs of struggle or very slow progression upon introduction of the intervention. Dave's difficulties

might not be as readily apparent from simple observation of his scores, as they showed a slight increase in skill performance as compared to baseline, however he was beginning to exhibit some of the same difficulties as Ayla was during instruction and it was determined along with his classroom teacher's input that he would ultimately benefit from seeing the shorter segment clips. An argument could be made that the instructor should have waited a few more sessions to see a more apparent trend in his data before making the instructional decision.

Some of the difficulties observed by Ayla and Dave included when two or three steps were combined into one sequence, both would not remember all of the steps shown. More specifically, in the original video sequence (Video Set 1), when shown Steps 12-14 (i.e., rinse each item, place items in drying rack, & turn off water), Dave would simply turn off the water. After consultation with the classroom teacher and observation of Ayla and Dave as they began the intervention phase, it was determined that the 9 video segments needed to be further divided into 14 segments. Although Ayla and Dave were the two participants who took the longest to complete (or almost complete, in Ayla's case) the intervention, the further chunking of steps was beneficial for both individuals evidenced in their progress throughout the remainder of the intervention phase.

Ideally, the number of video segments in a research intervention would remain static, however, as evidenced in the current study that was neither feasible nor preferable if data are used to guide instruction. As Horn and colleagues (2008) note, modifications related to the number of video segments may need to occur as instruction is happening and as one uses data to guide instruction. If a particular individual is showing a decrease or even plateau in his/her skill performance when provided with the initial task analysis and video sequence, there may be a need for a change in the intervention and/or step. Student errors evidenced in the data also may

signal a need for researchers to consider how data are coded. For example, both Ayla and Dave were observed becoming fixated on certain steps in the sequence, such as washing all of the sides of each item or rinsing the soap out of the red bin (e.g., both participants would become fixated with the water or perseverate on washing a particular item). Visual fixation on objects and inability to switch focus easily when preoccupied is consistent with restricted, repetitive patterns of behavior (RRBs) found in the DSM-V (American Psychiatric Association, 2013). Even if performing the steps correctly, Ayla and Dave would be coded as incorrect due to the predetermined latency. Past research related to VP has not discussed RRBs in much, if any, depth. Because RRBs are a common characteristic of individuals with ASD, attention to perseverative behaviors should be addressed in future research. Visual supports such as a visual timer, or auditory reminder/cue might be of use to help participants continue with a task or help them understand the goal of the task. For clinical practice during initial skill acquisition, it might not be imperative to have the behavior performed in a set time frame, rather that the individual is able to correctly and independently complete the behavior. Over time as greater accuracy is exhibited, more stringent time limits could be set to better improve efficiency of skill performance. Downing and Demchak (2008) suggest that for individuals who exhibit more significant cognitive disabilities that attention be explicitly directed to the target stimulus and that adequate time is provided in order for individuals to comprehend the incoming information and act upon that stimulus.

Fading of Video Prompts

If possible, researchers should strongly consider implementing prompt fading procedures into their VP intervention package in order to decrease prompt dependency and increase the likelihood of skill maintenance over time. Fading techniques may be highly beneficial for

students who exhibit rapid skill acquisition with video prompts (e.g., Sarah and Lincoln), as the ultimate goal is complete independence and skill maintenance without needed prompts over time. However, regardless of the speed of accuracy of the skill, the ultimate goal in teaching an individual a daily living skill is independent functioning, where they are able to perform skills at natural levels of performance. When considering the intervention of VP, this would mean that students are able to perform the steps of a given skill independently without any video prompts (or that they can self-manage their use of video prompts or other visual supports such as pictures or a written list of steps without any adult assistance), mimicking real life performance and expectations. Additionally, students could also be trained to self-manage their own performance of the skill over time, which will be most useful to them in the future when they won't have videos or adults to guide them.

Researchers in a few studies have started to measure the efficacy of various prompt fading techniques (Horn et al., 2008; Sigafoos et al., 2007; Sigafoos et al., 2005; Van Laarhoven and Van Laarhoven-Myers, 2006), all of which are rather different in nature. For example, Sigafoos and colleagues (2007) combined single video prompt segments as students demonstrated mastery until an entire sequence (essentially a video model) was created; this procedure was reported to be effective in limiting prompt dependency for participants. Other possibilities such as fading video prompts to picture and then later verbal prompts have also been suggested by researchers (Banda et al., 2011).

An advantage of response prompt systems such as GG is that by their nature, the systems have built in fading. For example, during the present study the investigator was able to be flexible with administration of prompts provided to students as they began to show more independence with each particular step. If a student was having difficulty with turning on the

warm water (using both hot and cold faucets), the instructor would provide the verbal prompt along with a low level prompt such as an elbow prompt to help guide the student in the direction of both faucets. If that was still unsuccessful, the instructor would increase the intrusiveness of the prompt by guiding the wrists of the participant. As the participant began to then initiate reaching toward and turning both faucets the instructor would naturally fade the location and intensity of the prompt provided by moving back toward the elbow and if that was not needed, moving to a shadow and then allowing the individual to finish the step successfully. Over time, as the instructor could analyze the data collected regarding type of prompts provided to participants for each step, she could target a lower level of prompt for the following instructional session then. As was evident in the data collected on prompting, the intrusiveness and frequency of prompts did in fact decrease over time for each participant as they all began to learn the new skill of dish washing through the VP intervention.

Future research would benefit from more in depth investigations of various fading techniques when using video based instruction, as the ultimate goal for true independent skill performance is having students perform the skill with either no videos for support (i.e., limiting prompt dependency) or being able to self-monitor their own progress after learning how to use the technology or supports to assist their performance (Banda et al., 2011). One interesting point worth discussion involves the maintenance data collected in this study for Sarah and Lincoln. Although not systematically faded, video prompts were completely withdrawn for maintenance probes for both participants. Sarah and Lincoln maintained 100% accuracy with dish washing 2 and 3 weeks post-intervention, respectively, highlighting the fact that both were able to completely be independent with dish washing (i.e., no videos were needed for support) at the conclusion of the study.

POV Perspective and Voiceover Instruction

POV perspective, as used in this study, has been suggested to depict the perspective that the viewer of the video would see with limited extraneous distractions. Point of view perspective also involves less preparation and editing time for the video editor as compared to a traditional third-person perspective (Mason, Davis, Boles, & Goodwyn, 2013a). In a recent meta-analysis investigating the efficacy of POV modeling (i.e., priming/modeling and prompting), Mason and colleagues (2013) reported large effect sizes for individuals with ASD when using POV at the secondary school level (e.g., ages 11-17) as well as for use with independent living skills. Given the success of participants in this study and other related studies (Bereznak, Ayres, Mechling, & Alexander, 2012; Gardner & Wolfe, in press; Sigafoos et al., 2005), use of POV perspective can be seen as an important component of VM and VP instruction. The POV perspective enables participants to focus in on the critical behaviors required to perform the skill in a direct format thus, limiting attention to irrelevant stimuli, an issue for some individuals with ASD (Mason et al., 2013a). Additionally, combining POV with VP allows discrete steps of a task to be isolated for repeated practice opportunities and also permits the highlighting of visual stimuli to facilitate learning, strategies that have been suggested to be highly beneficial when instructing individuals with ASD (Ayres & Langone, 2005).

Voiceover instruction also was added to the video prompts filmed with POV in which visual and verbal cues were paired during instruction. Including voiceover instruction within POV video clips has been recommended by other researchers as well to further enhance skill acquisition (Mason et al., 2013b) by serving as an additional cue to participants that the target behavior should be emitted. Further, voiceovers also may aid in vocabulary development surrounding the target task (Smith, Ayres, Mechling, & Smith, 2013). Although researchers

have indicated that individuals with ASD show a preference toward visual stimuli (Arthur-Kelly et al., 2009; Cihak, 2011; Cihak & Schrader, 2008; Quill, 1997), inclusion of focused and explicit auditory stimuli may also enhance student performance as well. When looking at comparison studies of video modeling with and without verbal cues, Mechling & Collins (2012) reported stronger, positive results in skill acquisition for students with developmental disabilities when including verbal cues (versus no verbal cues) with videos during video based interventions. Research related to variables comprising voiceover instruction currently is emerging that suggests that student preferences in hearing a person's voice or task complexity may account for any subtle differences seen when verbal cues are included or not included (Bennett, Gutierrez, & Honsberger, 2013; Smith et al., 2013). However it is implemented, the current study found support of voiceover instruction as part of an effective VP with GG intervention. As evident in most prompt hierarchies, verbal prompts are part of systematic fading with the ultimate goal being that naturally occurring stimuli occasion the appropriate behavior.

Impact on Generalization

Individuals with ASD often experience difficulty with skill generalization (Banda et al., 2011; Rayner, Denholm, & Sigafoos, 2009). Inherent characteristics of VP may serve to aid in the generalization of skills to novel settings. Specifically, Charlop-Christy, Le, and Herman (2000) argued that VP promotes skill generalization due to containing several "facilitators of generalization" based upon the work of Stokes and Baer (1977) including: common stimuli found in a child's natural environment, natural contingencies of imitating models shown in videos, and creation of a more casual (i.e., low-stress and motivating) learning environment. In their review of VP literature, Banda and colleagues (2011) reported that although only 5 of 18 studies reviewed reported generalization data, successful generalization of skills learned to novel

settings was attained in each of the five studies. In the current study, two participants (Sarah and Lincoln) participated in generalization probes and both reached accuracy criterion of levels of steps completed correctly (e.g., 17 and 16, respectively) without the use of videos for support. Data from the current study adds to previous research of successful generalization of skills taught via video prompting. Video prompting appears to include inherent generalization aspects within the intervention package itself, whether this is attributed to characteristics such as the systematic practice of the video skill sequence across multiple instructional sessions or the natural fading incorporated into error correction procedures. Future research should focus on isolating various elements of VP to see what role each may play in impacting generalization.

Comparison of Graduated Guidance to Other Prompt Methods in Video Prompting

The present study showed the effectiveness of VP using GG for dishwashing skills. Past research has shown the effectiveness of least to most prompting with VP (Cannella-Malone et al., 2011; Cannella- Malone et al., 2012; Gardner & Wolfe, in press). It is important to put the present study in the context of previous research. Specifically, an examination of similarities and differences between the prompting systems may help practitioners select the most effective system to use with VP.

In least to most prompting, the order of prompts is systematically predetermined and less intrusive prompt levels are delivered upon errors, leading to more intrusive prompts if errors persist. Gardner and Wolfe (in press) demonstrated that four participants were successful with acquiring dish washing skills when taught via POV video prompting with a least to most prompting error correction procedure. The researchers chose a hierarchy consisting of a verbal/visual, model, and physical prompt. After an error was exhibited, the instructor would immediately interrupt it and provided a verbal/visual prompting consisting of having the student

watch the video segment again and then attempt the step afterwards. If they then exhibited another error, a model prompt was implemented where the instructor would have the student watch the video again and then would model the exact behavior for the student before they were permitted to attempt the step again. Finally, if the student still made an error after seeing the model prompt, the instructor would again interrupt the error, have the student watch the video once again and then implement the physical prompt, providing hand over hand guidance to assist the participant in correct completion of the step. Next the instructor then provided a general praise statement and continued the procedure for showing the remaining video prompt steps in the skill sequence. Similarly, Cannella-Malone and colleagues (2012) reported that VP with a least to most system of prompts error correction was slightly more efficient than VP alone when teaching three students with moderate to profound intellectual disabilities how to sweep and wash a table; two students met mastery criterion with the error correction condition and none met mastery criterion when video prompting alone was implemented.

As noted previously both GG and least to most prompting involve error correction and built- in fading. The prompt systems allow for an individual to attempt an unprompted response before a prompting system is utilized and both involve a self-fading procedure (Demchak, 1990; MacDuff, Krantz, & McClannahan, 2001). In least to most prompting, the fading that occurs happens across sessions. If a student is able to perform a step in the skill sequence with the most intrusive prompt level (e.g., physical or hand over hand), during the following session the prompt hierarchy would begin over again at the least intrusive level when an error is first exhibited (e.g., verbal cue) rather than continuing again with the most intrusive prompt that was used during the previous session. When examining GG, Bryan and Gast (2000) stated that this method was easily faded and resulted in quick skill acquisition when teaching on-task and on-schedule

behaviors to elementary students with ASD. Prompts are faded on an ongoing basis by both level and/or intensity provided, as determined by the instructor's observations of the student's responses. Additionally, both least to most prompting and GG have been reported to be effective methods for teaching chained behaviors (Demchak, 1990; Schoen et al., 1988). Response prompting methods such as GG and least to most prompting also have the potential to help prevent: errors during skill acquisition; lengthy delays that interrupt the chained behavior; and stereotypies that may become intertwined in the chained sequence inadvertently (MacDuff et al., 1993). For example, if a student begins to exhibit echolalia or hand flapping during a particular step in the sequence, implementing a prompting system as a form of error correction can help to minimize the likelihood that the stereotypy may interfere with the chained skill sequence in the future.

Use of graduated guidance with video prompting. Coupling fading with error correction techniques, as is naturally embedded in GG, has been described as a beneficial method for reducing possible prompt dependence (i.e., a person responds to a prompt rather than the natural environmental cue to perform a given behavior), and maximizing student independence, with individuals who have ASD (MacDuff et al., 2001). As a student exhibits target levels of skill performance, the level and intensity of the prompting provided can be immediately adjusted, depending on the individual's needs. The learner is given the opportunity to attempt the target behavior on their own before error correction is implemented, and prompts are provided only to the extent which will assist the learner with completion of the skill. This natural progression of fading can help increase the likelihood of independent skill performance. Use of GG with VP can also result in rapid skill acquisition, as was seen in the present study for two

participants (Sarah and Lincoln), who reached accuracy criterion in 5 or fewer sessions making few to no errors during the intervention phase.

Selecting a prompt system when using video prompting. Both GG and least to most prompting have been shown to result in positive intervention effects for students with ASD performing daily living skills. Since individuals with ASD have difficulty with acquiring lengthy chained responses without use of prompts (MacDuff et al., 1993), it seems imperative to continue researching both prompting methods, since there is still a small amount of research investigating the impact of either prompt system used in conjunction with video prompting. Downing and Demchak (2008) recommend taking individual student learning styles and preferences into account as well as the skill demands when deciding on which prompting method to use. Schoen and colleagues (1988) also suggest assessing learner preferences and imitative behavior prior to the study to determine whether more complex systems of prompting are in fact necessary or not. Assessing learner preferences could involve creating a task analysis for a skill similar in difficulty and length and assessing student abilities to imitate the steps after seeing the video prompt to determine what types of prompting may be needed or observing if they exhibit any aversion to the initial prompt system chosen.

Situating the present study in past research, and examining characteristics of individuals with ASD, graduated guidance might not be as effective for a student with a significant aversion to physical touch by others. Another caution cited by Schoen, Lentz, and Suppa (1988) involves avoiding physical manipulation if possible during prompting to decrease the likelihood of learned helplessness from developing in students. Additionally, the more subjective nature and on-the-spot decision making of the instructor when using graduated guidance might make this procedure more difficult to exactly replicate in the same manner in the future; however, one of

the strengths of this method lies in the individualization and natural prompt fading that is able to occur throughout a trial. One final consideration involving prompt systems that incorporate physical manipulation may be that they are less socially valid than other systems that incorporate non-physical prompts such as verbal, gesture, picture, or modeling. In the present study, as detailed in Figure 2, in observational data, and interviews, the majority of participants did not seem to mind and/or need many full physical prompts, and for those that might have initially, these quickly decreased to zero. However, if the task is more complex and physical in nature, graduated guidance may be the best method of choice given that prompts can be provided on a moment to moment basis and naturally faded in level or intensity as a student exhibits success. In the future it would be useful to systematically compare the two prompting methods and look further into more specific student characteristics (e.g., prompting preferences, imitative ability) and task characteristics (e.g., type of task, length of task analysis) that may influence the efficacy of one method compared to the other.

Implications and Future Research

Video prompting has been shown to be an effective strategy for use with individuals with ASD, particularly when teaching functional or daily living skills. Promising student skill acquisition, maintenance, and generalization data from the current study in addition to recent VP studies highlight some of the many benefits of this methodology.

Researchers in a few previous studies have also reported satisfaction of student achievement by practitioners and enjoyment from students in social validity data reported (Banda et al., 2011). In the current study, social validity data showed that VP with GG was an effective intervention method for the classroom teacher's students with ASD, one which she herself would like to learn more about and with proper training would feel comfortable implementing or having

her support staff implement with her students. It would be interesting for future researchers to have a practitioner or support staff member implement the VP intervention, as the majority of present research involves investigators administering the intervention. Students also expressed that they liked watching the videos to learn and felt that they improved with their dish washing skills over time. However, the number of researchers assessing social validity in VP studies remains fairly small, making it difficult to obtain specific information on the feasibility of the intervention from a practitioner standpoint, gaining insight into what aspects of the intervention warrant future modifications. In the current literature base, VP has been described as an intervention that capitalizes on the strengths of students with ASD, is motivating for students to take part in, and easy to implement (both in terms of video creation and intervention implementation).

When designing and implementing VP interventions, researchers should take note of a few things. First, it may be useful to create more stringent participant criteria and tailor the specific task chosen to specific student deficits. Researchers could assess students' receptive language abilities upon introduction to the intervention as an additional factor to investigate. Task analyses should be created in conjunction with the practitioner, who ultimately knows their students' capabilities the best. If possible, videos should be individualized based upon students' cognitive abilities, including their overall attentiveness. This individualization could also simply take place through a natural process of fading the video prompts as a student exhibits mastery over time, thus decreasing the likelihood of prompt dependency from occurring. Some form of error correction must also be included to promote skill mastery and limit the chances of students practicing errors repeatedly. Future researchers should continue to investigate various forms of error correction such as least to most prompting and GG, in addition to other instructional

components (e.g., inclusion of video priming along with VP, voiceover instructions, and fading procedures) to include in VP interventions.

Limitations

A primary limitation of this study is that three out of four participants had the opportunity to demonstrate accuracy criterion ability, as the study had to end when the summer school program ended. In addition, limited generalization and maintenance data was reported for half of the participants who did complete the intervention in accordance with the summer schedule. It also would have been ideal to have the opportunity to collect maintenance data for a longer period of time after the study ending as well, as 3 weeks post-intervention was the maximum time frame assessed for this study. Additionally, one of the participants, Lincoln, entered the study with having a higher IQ and adaptive behavior scores as compared to the other participants, possibly limiting the comparability of his scores to the others. This could be argued by the fact that he did meet all selection criteria for the study and was highly recommended to participate by both his parents and his teacher due to his reported unawareness of and difficulty with performing basic adaptive skills. Interestingly, his baseline performance turned out to be the lowest of all four participants, contributing to the most dramatic improvement upon introduction of the intervention. One other limitation involving Lincoln's intervention could be that he was not given the same modified video set as the previous two students were, possibly resulting in difficulty comparing their scores on the different video clips. This decision was not considered during the intervention and it did not seem to negatively impact Lincoln's ability to find success in performing dish washing by the end of the study.

Conclusion

The findings of this study support the use of a video-based instructional package to teach daily living skills to students with ASD and intellectual disabilities. Three out of four adolescents with developmental disabilities were able to acquire dish washing skills after the introduction of a video-based intervention including video priming and VP, as well as a GG procedure; two participants were able to maintain and generalize the skill learned.

The present study was the first VP study to incorporate the response prompting system of GG as a form of error correction. Graduated guidance can be easily and accurately integrated into a VP intervention, as was evident through reliability and validity data collected. Although specific data on the effectiveness of GG in particular cannot be collected due to its integration as part of an intervention package, overall study results indicate student skill acquisition (rapid acquisition for two of the four participants), generalization, and maintenance when GG was used as part of the VP intervention for the majority of participants. Benefits of this prompting method include the potential to decrease prompt dependence, a built in system of gradual fading, and a system which promotes error correction, thereby limiting errors that occur and may potentially be learned during skill acquisition. Additionally, GG has been described as being beneficial for use when teaching chained behaviors to learners, proving to be a natural fit for lengthy, complex response chains involving daily living skills such as dish washing.

Future research should continue to build the support base for video-based instructional methodology and researchers should strive to conduct high quality studies utilizing VP with individuals who have ASD. Research further investigating and comparing efficacy of various response prompt systems including GG would add valuable information to the literature regarding which types of prompt systems might work best given certain learner or skill

characteristics. Results from this study indicated that video priming and VP along with GG positively impacted skill acquisition, maximizing student independence with performing a valuable and lifelong daily living skill.

References

Akmanoglu, N., & Tekin-Iftar, E. (2011). Teaching children with autism how to respond to the lures of strangers. *Autism*, *15*, 205-222.

Akmanoglu, N., Yanardag, M., & Batu, E. S. (2014). Comparing video modeling and graduated guidance together and video modeling alone for teaching role playing skills to children with autism. *Education and Training in Autism and Developmental Disabilities*, *49*, 17-31.

Alcantara, P. R. (1994). Effects of videotape instructional package on purchasing skills of children with autism. *Exceptional Children, 61*, 40-55.

Allen, K. D., Wallace, D. P., Renes, D., Bowen, S. L., & Burke, R. V. (2010). Use of video modeling to teach vocational skills to adolescents and young adults with autism spectrum disorders. *Education & Treatment of Children*, *33*, 339–349.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Archer, A. L. & Hughes, C. A. (2010). *Explicit instruction: Effective and efficient teaching*. New York: Guilford Press.

Arthur-Kelly, M., Sigafoos, J., Green, V., Mathisen, B., & Arthur-Kelly, R. (2009). Issues in the use of visual supports to promote communication in individuals with autism spectrum disorder. *Disability & Rehabilitation, 31*, 1474–1486. doi:10.1080/09638280802590629

Ayres, K. M., & Langone, J. (2005). Intervention and instruction with video for students with autism: A review of the literature. *Education and Training in Developmental Disabilities, 40*, 183-196.

Azrin, N. H., & Armstrong, P. M. (1973). The" mini-meal"--A method for teaching eating skills to the profoundly retarded. *Mental Retardation*, *11*, 9-13.

Banda, D. R., Dogoe, M. S., & Matuszny, R.M. (2011). Review of video prompting studies with persons with developmental disabilities. *Education and Training in Autism and Developmental Disabilities*, *46*, 514-527.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, N.J.: Prentice Hall.

Barlow, D. H., Nock, M. & Hersen, M. (2008). *Single case research designs: Strategies for studying behavior change* (3rd ed.). New York: Allyn and Bacon.

Bellini, S., & Akullian, J. (2007). A meta-analysis of video modeling and video self-modeling interventions for children and adolescents with autism spectrum disorders. *Exceptional Children*, *73*, 264–287.

Bennett, K. D., Gutierrez, A., & Honsberger, T. (2013). A comparison of video prompting with and without voice-over narration on the clerical skills of adolescents with Autism. *Research in Autism Spectrum Disorders*, *7*, 1273-1281.

Bereznak, S., Ayres, K. M., Mechling, L. C., & Alexander, J. L. (2012). Video self-prompting and mobile technology to increase daily living and vocational independence for students with autism spectrum disorders. *Journal of Developmental and Physical Disabilities*, *24*, 269-285. doi: 10.1007/s10882-012-9270-8

Bergstrom, R., Najdowski, A. C., & Tarbox, J. (2012). Teaching children with autism to seek help when lost in public. *Journal of Applied Behavior Analysis*, *45*, 191-195.

Betz, A., Higbee, T. S., & Reagon, K. A. (2008). Using joint activity schedules to promote peer engagement in preschoolers with autism. *Journal of Applied Behavior Analysis, 41,* 237-241.

Biederman, G., Stepaniuk, S., Davey, V., Raven, K., & Ahn, D. (1999). Observational learning in children with Down syndrome and developmental delays: The effect of presentation speed in videotaped modeling. *Down Syndrome Research and Practice*, *6*, 12-18.

Blum-Dimaya, A., Reeve, S. A., Reeve, K. F., & Hoch, H. (2010). Teaching children with autism to play a video game using activity schedules and game-embedded simultaneous video modeling. *Education & Treatment of Children*, *33*, 351–370.

Bramham, J., Ambery, F., Young, S., Morris, R., Russell, A., Xenitidis, K., …Murphy, D. (2009). Executive functioning differences between adults with attention deficit hyperactivity disorder and autistic spectrum disorder in initiation, planning and strategy formation. *Autism*, *13*, 245–264. doi:10.1177/1362361309103790

Bryan, L. C., & Gast, D. L. (2000). Teaching on-task and on-schedule behaviors to high-functioning children with autism via picture activity schedules. *Journal of Autism and Developmental Disorders*, *30*, 553-567.

Bryson, S. E., Wainwright-Sharp, J., & Smith, I. M. (1990). Autism: a developmental spatial neglect syndrome? *Advances in Psychology*, *69*, 405-427.

Cannella-Malone, H. I., Fleming, C., Chung, Y.-C., Wheeler, G. M., Basbagill, A. R., & Singh, A. H. (2011). Teaching daily living skills to seven individuals with severe intellectual disabilities: A comparison of video prompting to video modeling. *Journal of Positive Behavior Interventions*, *13*, 144–153. doi:10.1177/1098300710366593

Cannella-Malone, H., Sigafoos, J., O'Reilly, M., de la Cruz, B., Edrisinha, C., & Lancioni, G. E. (2006). Comparing video prompting to video modeling for teaching daily living skills to six adults with developmental disabilities. *Education and Training in Developmental Disabilities*. *41*, 344-356.

Cannella-Malone, H. I., Wheaton, J. E., Wu, P., Tullis, C. A., & Park, J. H. (2012). Comparing the effects of video prompting with and without error correction on skill acquisition for students with intellectual disability. *Education and Training in Autism and Developmental Disabilities*, *47*, 332-344.

Cardon, T., & Azuma, T. (2012). Visual attending preferences in children with autism spectrum disorders: A comparison between live and video presentation modes. *Research in Autism Spectrum Disorders*, *6*, 1061-1067.

Carnahan, C. R., Hume, K., Clarke, L., & Borders, C. (2009). Using structured work systems to promote independence and engagement for students with autism spectrum disorders. *Teaching Exceptional Children*, *41*(4), 6–14.

Carter, M., & Kemp, C. R. (1996). Strategies for task analysis in special education. *Educational Psychology*, *16*, 155-170.

Charlop-Christy, M. H., Le, L., & Freeman, K. A. (2000). A comparison of video modeling with in vivo modeling for teaching children with autism. *Journal of Autism & Developmental Disorders*, *30*, 537-552.

Cicero, F. R., & Pfadt, A. (2002). Investigation of a reinforcement-based toilet training procedure for children with autism. *Research in Developmental Disabilities*, *23*, 319-331.

Ciesielski, K. T., Courchesne, E., & Elmasian, R. (1990). Effects of focused selective attention tasks on event-related potentials in autistic and normal individuals. *Electroencephalography and Clinical Neurophysiology*, *75*, 207-220.

Cihak, D. F. (2011). Comparing pictorial and video modeling activity schedules during transitions for students with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *5*, 433–441. doi:10.1016/j.rasd.2010.06.006

Cihak, D. F. & Schrader, L. (2008). Does the model matter? Comparing video self-modeling and video adult modeling for task acquisition and maintenance by adolescents with autism spectrum disorders. *Journal of Special Education Technology*, *23*(3), 9-20.

Delano, M. E. (2007). Video modeling interventions for individuals with autism. *Remedial and Special Education*, *28*, 33–42.

Demchak, M. (1990). Response prompting and fading methods: a review. *American Journal of Mental Retardation*, *94*, 603-615.

Downing, J. E. & Demchak, M. (2008). First steps: Determining individual abilities and how best to support students. In Downing, J. E. (Ed.), *Including students with severe and multiple disabilities in typical classrooms: Practical strategies for teachers (3rd ed).*(pp. 49-89). Baltimore, MD: Paul H. Brookes Publishing Co., Inc.

Drahota, A., Wood, J. J., Sze, K. M., & Van Dyke, M. (2011). Effects of cognitive behavioral therapy on daily living skills in children with high-functioning autism and concurrent anxiety disorders. *Journal of Autism and Developmental Disorders*, *41*, 257-265.

Eaves, L. C., & Ho, H. H. (2008). Young adult outcome of autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *38*, 739-747.

Fong, L., Wilgosh, L., & Sobsey, D. (1993). The experience of parenting an adolescent with autism. *International Journal of Disability, Development and Education*, *40*, 105-113. doi: 10.1080/0156655930400204

Franzone, E. (2009). *Overview of task analysis*. Madison, WI: National Professional Development Center on Autism Spectrum Disorders, Waisman Center, University of Wisconsin.

Ganz, J. B., Bourgeois, B. C., Flores, M. M., & Campos, B. A. (2008). Implementing visually cued imitation training with children with autism spectrum disorders and developmental delays. *Journal of Positive Behavior Interventions*, *10*, 56-66.

Ganz, J. B., Earles-Vollrath, T. L., & Cook, K. E. (2011). Video modeling: A visually based intervention for children with autism spectrum disorder. *Teaching Exceptional Children, 43*(6), 8-19.

Gardner, S.J. & Wolfe, P. S. (2013). Use of video modeling and video prompting interventions for teaching daily living skills to individuals with autism spectrum disorders: A review. *Research and Practice for Students with Severe Disabilities, 38*, 73-87.

Gardner, S.J. & Wolfe, P. S. (in press). Teaching students with developmental disabilities daily living skills using point of view modeling plus video prompting with error correction. *Focus on Autism and Other Developmental Disabilities.*

Garretson, H. B., Fein, D., & Waterhouse, L. (1990). Sustained attention in children with autism. *Journal of Autism and Developmental Disorders*, *20*, 101-114.

Gaule, K., Nietupski, J., & Certo, N. (1985). Teaching supermarket shopping skills using an adaptive shopping list. *Education & Training of the Mentally Retarded, 20 , 53-59.*

Gillberg, C. & Steffenburg, S. (1987). Outcome and prognostic factors in infantile autism and similar conditions: A population-based study of 46 cases followed through puberty. *Journal of Autism and Developmental Disorders*, *17*, 273-287.

Goodson, J., Sigafoos, J., O'Reilly, M., Cannella, H., & Lancioni, G. E. (2007). Evaluation of a video-based error correction procedure for teaching a domestic skill to individuals with developmental disabilities. *Research in Developmental Disabilities*, *28*, 458–467. doi:10.1016/j.ridd.2006.06.002

Graves, T. B., Collins, B. C., Schuster, J. W., & Kleinert, H. (2005). Using video prompting to teach cooking skills to secondary students with moderate disabilities. *Education and Training in Developmental Disabilities, 40,* 34–46.

Hagiwara, T. & Myles, B. S. (1999). A multimedia social story intervention: Teaching skills to children with autism. *Focus on Autism and Other Developmental Disabilities,* 14, 82-95.

Hermelin, B., & O'Connor, N. (1970). Psychological experiments with autistic children. Oxford: Pergamon.

Hine, J. F., & Wolery, M. (2006). Using point-of-view video modeling to teach play to preschoolers with autism. *Topics in Early Childhood Special Education, 26*, 83–93.

Hodgdon, L. (1995). *Visual strategies for improving communication.* Troy, MI: QuirkRoberts

Horn, J. A., Miltenberger, R. G., Weil, T., Mowery, J., Conn, M., & Sams, L. (2008). Teaching laundry skills to individuals with developmental disabilities using video prompting. *International Journal of Behavioral Consultation and Therapy*, *4*, 279–286.

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, A., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children, 71*, 165-179.

Howlin, P., Goode, S., Hutton, J., & Rutter, M. (2004). Adult outcome for children with autism. *Journal of Child Psychology and Psychiatry, 45*, 212-229. doi: 10.1111/j.1469-7610.2004.00215.x

Hume, K., Loftin, R., & Lantz, J. (2009). Increasing independence in autism spectrum disorders: A review of three focused interventions. *Journal of Autism and Developmental Disorders, 39*, 1329-1338. doi: http://dx.doi.org/10.1007/s10803-009-0751-2

Ivey, J. K. (2004). What do parents expect? A study of likelihood and importance issues for children with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, *19*, 27-33.

Johnston, J. M. & Pennypacker, H.S. (2009). *Strategies and tactics of behavioral research (3rd ed)*. New York: Routledge.

Kayser, J. E., Billingsley, F. F., & Neel, R. S. (1986). A comparison of in-context and traditional instructional approaches: Total task, single trial versus backward chaining, multiple trials. *Journal of the Association for Persons with Severe Handicaps, 11,* 28-38.

Keen, D., Brannigan, K. L., & Cuskelly, M. (2007). Toilet training for children with autism: The effects of video modeling. *Journal of Developmental and Physical Disabilities*, *19*, 291-303. doi: 10.1007/s10882-007-9044-x

Kemper, T. L., & Bauman, M. (1998). Neuropathology of infantile autism. *Journal of Neuropathology & Experimental Neurology*, *57*, 645-652.

Kennedy, C. (2005). *Single-case designs for educational research.* Boston: Pearson.

Kogan, M. D., Blumberg, S. J., Schieve, L. A., Boyle, C. A., Perrin, J. M., Ghandour, R. M., ... & van Dyck, P. C. (2009). Prevalence of parent-reported diagnosis of autism spectrum disorder among children in the US, 2007. *Pediatrics*, *124*, 1395-1403.

Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M. & Shadish, W. R. (2010). *Single-case designs technical documentation*. Retrieved from What Works Clearinghouse website: http://ies.ed.gov/ncee/wwc/pdf/wwc_scd.pdf.

Kregel,J. (2012). Designing instructional programs. In Wehman & Kregal (Eds.), *Functional curriculum for elementary and secondary students with special needs (3rd ed).* (pp. 57-92). Austin, TX: Pro-Ed, Inc.

Kroeger, K. A., & Sorensen-Burnworth, R. (2009). Toilet training individuals with autism and other developmental disabilities: A critical review. *Research in Autism Spectrum Disorders*, *3*, 607-618.

Lasater, M. W., & Brady, M. P. (1995). Effects of video self-modeling and feedback on task fluency. *Education & Treatment of Children*, *18*, 389-407.

Libby, S., Powell, S., Messer, D., & Jordan, R. (1997). Imitation of pretend play acts by children with autism and Down syndrome. *Journal of Autism and Developmental Disorders*, *27*, 365-383.

Lindsay, C. J., Moore, D. W., Anderson, A., & Dillenburger, K. (2013). The role of imitation in video-based interventions for children with autism. *Developmental Neurorehabilitation*, *16*, 283-289.

López, B., & Leekam, S. R. (2003). Do children with autism fail to process information in context? *Journal of Child Psychology and Psychiatry*, *44*, 285–300. doi:10.1111/1469-7610.00121

MacDuff, G. S., Krantz, P. J., & McClannahan, L. E. (1993). Teaching children with autism to use photographic activity schedules: Maintenance and generalization of complex response chains. *Journal of Applied Behavior Analysis*, *26*, 89-97.

MacDuff, G. S., Krantz, P. J., & McClannahan, L. E. (2001). Prompts and prompt-fading strategies for people with autism. In Maurice, Green, & Foxx (Eds.), *Making a difference: Behavioral intervention for autism* (pp. 37-50). Austin, TX: Pro-Ed, Inc.

Mason, R. A., Davis, H. S., Boles, M. B., & Goodwyn, F. (2013a). Efficacy of point-of-view video modeling: A meta-analysis. *Remedial and Special Education, 34*, 333-345. doi: 10.1177/0741932513486298

Mason, R. A., Ganz, J. B., Parker, R. I., Boles, M. B., Davis, H. S., & Rispoli, M. J. (2013b). Video-based modeling: Differential effects due to treatment protocol. *Research in Autism Spectrum Disorders*, *7*, 120-131.

Matson, J. L., & Kozlowski, A. M. (2011). The increasing prevalence of autism spectrum disorders. *Research in Autism Spectrum Disorders*, *5*, 418-425.

Mawhood, L., Howlin, P., & Rutter, M. (2000). Autism and developmental receptive language disorder- a comparative follow-up in early adult life. I: Cognitive and language outcomes. *Journal of Child Psychology and Psychiatry*, *41*, 547-559.

McCoy, K., & Hermansen, E. (2007). Video modeling for individuals with autism: A review of model types and effects. *Education and Treatment of Children*, *30,* 183–213.

Meadan, H., Ostrosky, M. M., Triplett, B., Michna, A., & Fettig, A. (2011). Using visual supports with young children with autism spectrum disorder. *TEACHING Exceptional Children*, *43*(6), 28-35.

Mechling, L. (2005). The effect of instructor-created video programs to teach students with disabilities: A literature review. *Journal of Special Education Technology*, *20*(2), 25–36.

Mechling, L. C., Ayres, K. M., Foster, A. L., & Bryant, K. J. (2013). Comparing the effects of commercially available and custom-made video prompting for teaching cooking skills to high school students with autism. *Remedial and Special Education*, *34*, 371-383.

Mechling, L. C. & Collins, T. S. (2012). Comparison of the effects of video models with and without verbal cueing on task completion by young adults with moderate intellectual disability. *Education and Training in Autism and Developmental Disabilities*, *47*, 223-235.

Mechling, L. C., & Cronin, B. (2006). Computer-based video instruction to teach the use of augmentative and alternative communication devices for ordering at fast-food restaurants. *The Journal of Special Education, 39*, 234–245.

Mechling, L. C., Gast, D. L., & Fields, E. A. (2008). Evaluation of a portable DVD player and system of least prompts to self-prompt cooking task completion by young adults with moderate intellectual disabilities. *The Journal of Special Education, 42*, 179–190. doi: 10.1177/0022466907313348

Mechling, L. C., Gast, D. L., & Gustafson, M. R. (2009). Use of video modeling to teach extinguishing of cooking related fires to individuals with moderate intellectual disabilities. *Education and Training in Developmental Disabilities*, *44*, 67–79.

Mechling, L.C., Gast, D., & Seid, N. (2009). Using a personal digital assistant to increase independent task completion by students with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *39*, 1420–1434. doi:10.1007/s10803-009-0761-0

Mechling, L. C., Gast, D., & Seid, N. (2010). Evaluation of a personal digital assistant as a self-prompting device for increasing multi-step task completion by students with moderate intellectual disabilities. *Education and Training in Autism and Developmental Disabilities, 45*, 422-439.

Mechling, L. C., & Gustafson, M. R. (2008). Comparison of static picture and video prompting on the performance of cooking-related tasks by students with autism. *Journal of Special Education Technology, 23(3)*, 31–45.

Mechling, L. C., & Stephens, E. (2009). Comparison of self-prompting of cooking skills via picture-based cookbooks and video recipes. *Education and Training in Developmental Disabilities, 44*, 218-236.

Murphy, R. J. & Bryan, A. J. (1980). Multiple-baseline and multiple-probe designs: Practical alternatives for special education assessment and evaluation. *The Journal of Special Education, 14*, 325-335. doi: 10.1177/002246698001400306

Murzynski, N. T., & Bourret, J. C. (2007). Combining video modeling and least-to-most prompting for establishing response chains. *Behavioral Interventions, 22,* 147–152. doi:10.1002/bin.224

Norman, J. M., Collins, B. C., & Schuster, J. W. (2001). Using an instructional package including video technology to teach self-help skills to elementary students with mental disabilities. *Journal of Special Education Technology*, *16*(3), 5-18.

O'Connor, A. B., & Healy, O. (2010). Long-term post-intensive behavioral intervention outcomes for five children with autism spectrum disorder. *Research in Autism Spectrum Disorders, 4,* 594-604.

O'Riordan, M. A., Plaisted, K. C., Driver, J., & Baron-Cohen, S. (2001). Superior visual search in autism. *Journal of Experimental Psychology: Human Perception and Performance, 27,* 719-730. doi:10.1037/0096-1523.27.3.719

Parker, D., & Kamps, D. (2011). Effects of task analysis and self-monitoring for children with autism in multiple social settings. *Focus on Autism and Other Developmental Disabilities, 26,* 131-142.

Pierce, K. L. & Schreibman, L. (1994). Teaching daily living skills to children with autism in unsupervised settings through pictorial self-management. *Journal of Applied Behavior Analysis*, 27, 471-481.

Quill, K. A. (1997). Instructional considerations for young children with autism: The rationale for visually cued instruction. *Journal of Autism & Developmental Disorders, 27,* 697–714.

Quill, K. A. (2000). *Do-watch-listen-say: Social and communication intervention for children with autism.* Baltimore, MD: Paul H. Brookes Pub.

Rayner, C., Denholm, C., & Sigafoos, J. (2009). Video-based intervention for individuals with autism: Key questions that remain unanswered. *Research in Autism Spectrum Disorders, 3,* 291-303.

Reed, P. & Gibson, E. (2005). The effect of concurrent task load on stimulus over-selectivity. *Journal of Autism and Developmental Disorders, 35,* 601-614. doi: 10.1007/s10803-005-0004-y

Rehfeldt, R., Dahman, D., Young, A., Cherry, H., & Davis, P. (2003). Teaching a simple meal preparation skill to adults with moderate and severe mental retardation using video modeling. *Behavioral Interventions*, *18*, 209–218.

Risley, R., & Cuvo, A. J. (1980). Training mentally retarded adults to make emergency telephone calls. *Behavior Modification, 4,* 513-525.

Rosenshine, B. (1987). Explicit teaching and teacher training. *Journal of Teacher Education. 38,* 34-36.

Schoen, S. F., Lentz, F. E., & Suppa, R. J. (1988). An examination of two prompt fading procedures and opportunities to observe in teaching handicapped preschoolers self-help skills. *Journal of Early Intervention, 12,* 349-358.

Schopler, E., Mesibov, G. B., & Hearsey, K. A. (1995). Structured teaching in the TEACCH system. In E. Schopler & G. B. Mesibov (Eds.), *Learning and cognition in autism* (pp. 243-268). New York: Plenum.

Shipley-Benamou, R., Lutzker, J. R., & Taubman, M. (2002). Teaching daily living skills to children with autism through instructional video modeling. *Journal of Positive Behavior Interventions*, *4*, 165-175.

Sidman, M. (1960). *Tactics of scientific research: Evaluating experimental research in psychology*. New York: Basic Books.

Sigafoos, J., O'Reilly, M., Cannella, H., Edrisinha, C., de la Cruz, B., Upadhyaya, M., Lancioni, G...& Young, D.. (2007). Evaluation of a video prompting and fading procedure for teaching dish washing skills to adults with developmental disabilities. *Journal of Behavioral Education*, *16*, 93–109. doi:10.1007/s10864-006-9004-z

Sigafoos, J., O'Reilly, M., Cannella, H., Upadhyaya, M., Edrisinha, C., Lancioni, G. E.,… & Young, D. (2005). Computer-presented video prompting for teaching microwave oven use to three adults with developmental disabilities. *Journal of Behavioral Education, 14*, 189–201. doi:10.1007/s10864-005-6297-2

Smith, M., Ayres, K., Mechling, L., & Smith, K. (2013). Comparison of the effects of video modeling with narration vs. video modeling on the functional skill acquisition of adolescents with autism. *Education and Training in Autism and Developmental Disabilities*, *48*, 164-178.

Southwick, J. S., Bigler, E. D., Froehlich, A., DuBray, M. B., Alexander, A. L., Lange, N., & Lainhart, J. E. (2011). Memory functioning in children and adolescents with autism. *Neuropsychology*, *25*, 702-710.

Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis*, *10*, 349–367.

Stone, W. L., Ousley, O. Y., & Littleford, C. D. (1997). Motor imitation in young children with autism: What's the object?. *Journal of Abnormal Child Psychology, 25,* 475-485.

Tekin-Iftar, E., & Birkan, B. (2010). Small group instruction for students with autism: General case training and observational learning. *The Journal of Special Education, 44,* 50-63.

Thelen, M. H., Fry, R. A., Fehrenbach, P. A., & Frautschi, N. M. (1979). Therapeutic videotape and film modeling: a review. *Psychological Bulletin, 86,* 701-720.

Travers, B. G., Klinger, M. R., & Klinger, L. G.. (2011). Attention and working memory in ASD. In Fein, D. (Ed.), *The neuropsychology of autism (161-184)*. New York: Oxford University Press.

Van Laarhoven, T., Kraus, E., Karpman, K., Nizzi, R., & Valentino, J. (2010). A comparison of picture and video prompts to teach daily living skills to individuals with autism. *Focus on Autism and Other Developmental Disabilities, 25,* 195 –208. doi:10.1177/1088357610380412

Van Laarhoven, T. & Van Laarhoven-Myers, T. (2006). Comparison of three video-based instructional procedures for teaching daily living skills to persons with developmental disabilities. *Education and Training in Developmental Disabilities, 41,* 365-381.

Van Laarhoven, T., Zurita, L. M., Johnson, J. W., Grider, K. M., & Grider, K. L. (2009). Comparison of self, other, and subjective video models for teaching daily living skills to individuals with developmental disabilities. *Education and Training in Developmental Disabilities, 44,* 509–522.

Venter, A., Lord, C., & Schopler, E. (1992). A follow-up study of high-functioning autistic children. *Journal of Child Psychology and Psychiatry, 33,* 489-597. doi: 10.1111/j.1469-7610.1992.tb00887.x

Wolery, M., Ault, M. J., Doyle, P. (1992). *Teaching students with moderate to severe disabilities: use of response prompting strategies*. White Plains, NY: Longman.

Wolery, M., & Schuster, J. W. (1997). Instructional methods with students who have significant disabilities. *The Journal of Special Education, 31,* 61-79.

Wong, C., Odom, S. L., Hume, K. Cox, A. W., Fettig, A., Kucharczyk, S., … Schultz, T. R. (2013). *Evidence-based practices for children, youth, and young adults with Autism Spectrum Disorder.* Chapel Hill: The University of North Carolina, Frank Porter Graham Child Development Institute, Autism Evidence-Based Practice Review Group.

Worley, J. A., & Matson, J. L. (2012). Comparing symptoms of autism spectrum disorders using the current DSM-IV-TR diagnostic criteria and the proposed DSM-V diagnostic criteria. *Research in Autism Spectrum Disorders, 6,* 965-970.

Young, K. R., West, R. P., Howard, V. F., & Whitney, R. (1986). Acquisition, fluency training, generalization, and maintenance of dressing skills of two developmentally disabled children. *Education and Treatment of Children, 9,* 16-29.

Appendix

Review of the Literature

Reported prevalence rates for individuals diagnosed with ASD have been rising in recent years. A variety of factors have been suggested to contribute to the fluctuating yet steadily increasing rates that have been published including changing diagnostic criteria, different research methodologies utilized to determine prevalence rates, cultural differences, and increasing awareness by the public (Matson & Kozlowski, 2011). Despite controversy over varying prevalence rates, recent researchers have reported current estimates of individuals diagnosed with ASD as high as 110 per 10,000 individuals in the United States (Kogan et al., 2009). With the rising rates of diagnosis reported, professional and parental concerns continue to abound regarding their child's development at the time of diagnosis and continuing through adulthood.

Defining Characteristics of ASD

ASD can be defined as, "a group of neurodevelopmental disorders that have overlapping diagnostic criteria related to deficits in communication and socialization, and restricted interests and repetitive behaviors" (Worley & Matson, 2012, p. 965). According to the DSM-V, some of the characteristics used to diagnosis ASD can include persistent social deficits across multiple situations, failure to initiate or respond to social interactions, poorly integrated nonverbal and verbal communication, insistence on sameness, inflexible adherence to routines, ritualized patterns of verbal or nonverbal behavior, and hyper- or hypo-reactivity to sensory input or unusual interests in sensory aspects of the environment (American Psychiatric Association, 2013). In addition, some individuals with ASD have unique learning challenges such as impairments in attention (Cardon & Azuma, 2012; Quill, 1997), joint attention and imitation

(Hume et al., 2009), verbal information processing (Bryan & Gast, 2000; Lopez & Leekam, 2003), initiation (Bramham et al., 2009), planning (Bramham et al., 2009) memory (Kemper & Bauman, 1998; Southwick et al., 2011), difficulties in rapid shifting of attention between visual and auditory stimuli (Ciesielski, Courchesne, & Elmasian, 1990; Garretson, Fein, & Waterhouse, 1990), as well as impaired focus on the most salient features of objects, possibly due to over-attending to extraneous stimuli (Bryson, Wainwright-Sharp, & Smith, 1990; Hume et al., 2009; Quill, 1997).

After examining the long term outcomes of children with ASD who received early intensive behavioral interventions, O'Connor and Healy (2010) reported that participants showed no significant differences, including some reductions in performance, on adaptive skill assessments over time and in addition, parents continued to express concerns over their child's lack of ability to perform daily living skills. Daily living skills, sometimes called activities of daily living (ADL) encompass a broad range of skills. Skills in this domain have been defined as:

> …developmentally appropriate practical skills necessary to care for oneself and meet daily challenges, consisting of personal skills (ranging from dressing oneself to avoiding sick people in order to remain healthy), home or school skills (ranging from putting things away with reminders to cleaning with cleaning products), and community skills (ranging from knowing it is unsafe to accept rides from strangers to telling the time). (Sparrow et al. 1984, as cited in Drahota, Wood, Sze, & Van Dyke, 2011, p. 258)

One common set of concerns voiced by parents of individuals with ASD is whether their child will lead a safe, productive, and independent life (Ivey, 2004; Shipley-Benamou, Lutzker, & Taubman, 2002). Earlier development of independence has been suggested to lead to a greater potential to thrive in domestic and job-related settings (Pierce & Schreibman, 1994).

Researchers have for continuing comprehensive intervention throughout a child who has ASD's educational programming by addressing a broad range of issues such as social skills, daily living skills, communication, behavioral concerns, and psychological needs (O'Connor & Healy, 2010).

Success in our society can be heavily influenced by one's independent functioning, a quality that is commonly expected as an individual becomes an adult. Similarly, performing daily living skills with as much independence as possible can contribute to a person's meaningful participation in society and overall quality of life (Carnahan et al., 2009). Identifying ways to increase the independent functioning of individuals with disabilities, including those with ASD, has been cited as vitally important in special education research and practice (Shipley-Benamou et al., 2002). Instruction in a variety of essential daily living skills has been targeted in research for individuals with ASD including: self-help skills such as hand washing (Hagiwara & Myles, 1999), grooming (Charlop-Christy et al., 2000), and getting dressed (Pierce & Schreibman, 1994); home skills such as taking care of a pet (Shipley- Benamou et al., 2002), setting a table (Shipley- Benamou et al., 2002), cooking or food-prep skills (Graves et al., 2005; Mechling & Gustafson, 2008; Tekin-Iftar & Birkan, 2010), and laundry (Horn et al., 2008) and community skills such as purchasing skills (Alcantara, 1994) and safety skills (Bergstrom, Najdowski, & Tarbox, 2012).

Use of Visual Supports

Several strengths that individuals with ASD may possess also have been highlighted by researchers. Individuals with ASD have been described by some as having strong visual processing abilities (McCoy & Hermansen, 2007) in addition to showing a preference for visual information as compared to auditory alone (Arthur-Kelly et al., 2009; Cihak, 2011; Cihak &

Schrader, 2008; Quill, 1997). Similarly, individuals with ASD have been reported to respond to visual input as a primary way of receiving information (Cihak, 2011; Hermelin & O'Connor, 1970). Researchers have noted that individuals with ASD often do not show preference for facial features, but rather objects, limiting reciprocal learning opportunities that may exist in learning environments (Cardon & Azuma, 2012). Other researchers have also reported that individuals with ASD may exhibit more skilled imitations of actions on objects, as opposed to bodily or facial imitations (Stone, Ousley, & Littleford, 1997).

Visually-cued instruction and use of visual supports have gained popularity in intervention research for ASD. Some possible explanations for this interest include strong performances in visual discrimination tasks by individuals with ASD (O'Riordan, Plaisted, Driver, & Baron-Cohen, 2001) and reports of children with ASD assisted with learning when information is also presented visually (Biederman, Stepaniuk, Davey, Raven, & Ahn, 1999; Charlop-Christy et al. 2000; Keen, Brannigan, & Cuskelly, 2007; Shipley-Benamou et al. 2002). Defined as, "pictorial and graphic stimuli that enhance comprehension and learning" (Arthur-Kelly et al., 2009, p. 1475) or, "…the use of graphic cues (pictographs and/or written words) as either an instructional prompt to aid language comprehension and communication, or an environmental prompt to aid organizational skills and improved self-management" (Quill, 1997, p. 704), visual cues and supports have the potential to assist learners with ASD with understanding expectations and sequences of events (Ganz, Bourgeois, Flores, & Campos, 2008), in addition to specific task completion (Hodgdon, 1995). Some examples of visual supports are activity schedules, checklists, picture cards, personalized tangible objects, choice boards, video or animation, visual scripts, rule reminder cards, contingency maps, or visual task analyses (Arthur-Kelly et al., 2009; Meadan, Ostrosky, Triplett, Michna, & Fettig, 2011). When looking

specifically at the area of daily living skills, researchers (Pierce & Schreibmann, 1994) have suggested that using graphic cues or supports within a prompt hierarchy can benefit not only skill acquisition for students with ASD, but also with skill generalization and maintenance. Additionally, such supports can also help address difficulties students may have with focusing on relevant or critical information being presented as well as with organizing that information in memory for effective retrieval and use (Schopler, Mesibov, & Hearsay, 1995). Use of video technology, specifically VM and VP, logically appears to build on the processing preferences of individuals with ASDs, while increasing student independence through learning new skills.

Video Technology

When discussing the social learning theory, Bandura (1977) highlighted the fact that most behavior is learned through modeling or observing another person performing a given behavior. As has been described in social learning theory literature, behavior learned through this manner can then later act as a guide when individuals attempt to perform the targeted skill on their own. In addition, both motivation and attention play a critical role in the ability of and individual to effectively learn an observed behavior (Bellini & Akullian, 2007). Observational learning through video technology, including VM and VP, can serve to not only mirror the learning strengths and sometimes preferred instructional style of individuals with ASD, but rationale for the efficacy of using such visual supports can be supported by the social learning theory as well since individuals with ASD typically need direct instruction in a skill as a result of poor incidental learning abilities (McCoy & Hermansen, 2007). Video-based instruction can help address some of these core impairments that children with ASD exhibit (Delano, 2007).

In addition to a strong connection with social learning theory, the research base surrounding video modeling and prompting has been steadily growing throughout the past decade. Several literature reviews and meta-analyses have been published, reporting the positive effects that video-based technology can have on skill acquisition, generalization, and maintenance for students with ASD (Ayres & Langone, 2005; Banda et al., 2011; Bellini & Akullian, 2007; Delano, 2007; Gardner & Wolfe, 2013; Hume et al., 2009; McCoy & Hermansen, 2007; Mechling, 2005).

Video modeling. Video modeling is an instructional technique in which individuals view a short video of a model (e.g., adult, peer, self) performing a sequence of steps making up a target skill or behavior and then are directed to perform the steps viewed. Video modeling procedures, including basic video modeling, video prompting, video self-modeling, and point-of-view video modeling, have been reported as an evidence-based practice in a systematic review conducted by Wong and colleagues (2013) at the National Professional Development Center on ASD, which provides the field with levels of scientific evidence that support the wide variety of educational and behavioral treatments that currently exist and are used with individuals with ASD. Leading researchers in the field of ASD and professional reviewers from across the country analyzed the existing literature on VM, narrowing it down to 1 group design and 31 single case designs meeting qualifying evidence criteria. The National Professional Development Center on ASD reported that use of VM has showing beneficial effects for toddlers through young adults with ASD to address social, communication, behavior, joint attention, play, cognitive, school-readiness, academic, motor, adaptive, and vocational skills (Wong et al., 2013). Large effect sizes for VM interventions have also been reported in three recent meta-analyses conducted (Bellini & Akullian, 2009; Mason et al., 2013a; Mason et al., 2013b); additionally,

Bellini & Akullian determined that VM interventions meet the quality indicators for single subject research set by Horner and colleagues (2005) as being an evidence-based practice. It remains imperative that researchers strive to conduct high quality research to enhance the strength of the conclusions for interventions implemented.

Researchers have used VM to teach students with developmental disabilities and ASD a variety of functional daily living skills (i.e., domestic skills) including cooking-related skills (Mechling & Stephens, 2009; Rehfeldt, Dahman, Young, Cherry, & Davis, 2003; Shipley-Benamou et al., 2002; Van Laarhoven, Zurita, Johnson, Grider, & Grider, 2009), safety skills (Mechling, Gast, & Gustafson, 2009), mailing a letter (Shipley-Benamou et al., 2002), cleaning a sink (Van Laarhoven et al., 2009), caring for a pet (Shipley-Benamou et al., 2002), setting a table (Shipley-Benamou et al., 2002), purchasing skills (Alcantara, 1994), leisure skills (Blum-Dimaya, Reeve, Reeve, & Hoch, 2010; Charlop-Christy et al., 2000; Hine & Wolery, 2006), ordering food at a restaurant (Mechling & Cronin , 2006), making a bed (Lasater & Brady, 1995), changing batteries in household devices (Van Laarhoven et al., 2009) and grooming tasks (Charlop-Christy et al., 2000; Lasater & Brady, 1995). Researchers also have incorporated a variety of technology devices such as computers, iPads/tablets, and personal digital assistants (PDAs) when showing models to students.

Support for VM has been strengthened by research suggesting this instructional method has the potential to motivate students with ASD through the use of technology but also teach them salient features of a skill in an explicit manner (Shipley-Benamou et al., 2002). In their meta-analysis of VM and video self-modeling, Bellini and Akullian (2007) discussed how these strategies allow the instructor to cue the student to the exact details that need to be focused on, increasing the possibility that students will be able to imitate that specific target behavior more

accurately in the future. Technology enables the instructor to remove any irrelevant details from the video, which may help some children with ASD who struggle with hyper-attentiveness to irrelevant details in their environments (Bellini & Akullian, 2007).

Some additional advantages of video technology used during instruction include the reinforcing quality of video use and modes with which the video can be shown (e.g., laptop or iPad), modeling of the behavior prior to student performance, and the opportunity for immediate feedback (Mechling, 2005; Shipley-Benamou et al., 2002). Also, minimal staff training on instructional delivery needs to take place as the video is pre-recorded and may be used by a variety of staff members, contributing to the cost-effectiveness of this teaching strategy. Consistency or standardization in instruction over time is sustained as students are provided with multiple opportunities to practice the skill using the same video. Instructors can also promote response generalization through use of video technology by having the student perform the skill in different settings after watching the video, having different instructors facilitate the instructional session, or creating different videos of the same skill in various settings (Mechling, 2005). Further, video is thought to provide teachers who have limited ability to conduct instruction in naturalistic settings (e.g., limited transportation, budget, staff support, etc.) with a method of instruction that can simulate real life settings and activities and enable students time to practice skills before experiencing them in the actual setting (Alcantara, 1994).

Although modeling in general has been reported to be an "established" evidence-based practice (Wong et al., 2013), certain types of modeling may be more effective at further enhancing skill acquisition, perhaps even depending on the skill of focus. Some researchers have indicated that VM is less intrusive and time intensive than in-vivo (i.e., live) modeling because one recording of a task can be made and shown multiple times to afford the student opportunities

for repeated practice (Biederman et al., 1999; Delano, 2007); this can allow for minimal staff training and consistency in instruction over time regardless of the adult (e.g., teacher, professional, etc.) facilitating the instructional session. When discussing some advantages of VM over live modeling, Thelen, Fry, Fehrenbach, and Frautschi (1979), pointed out that VM allows for greater control over instruction because the video can be recreated or edited until the desired model is attained. More recently, VM has also been described as being more effective for rapid skill acquisition and generalization than live modeling (Allen, Wallace, Renes, Bowen, & Burke, 2010).

Similar findings have been shared by Charlop-Christy, Le, and Herman (2000) where VM was reported as resulting in faster acquisition of various task, including self-help skills, and generalization when compared to in-vivo. Video modeling may provide students with instruction that is more consistent and focused on the exact characteristics of the target behavior rather than a live model would provide. Some other hypotheses cited in the research point to VM limiting over selectivity for students with ASD by focusing on the most relevant features of the skill to be performed, videos may be intrinsically reinforcing for students with ASD, video-based instruction may be more stimulating as it provides students with a change from the typical format of instruction, and lastly that video modeling may better accommodate some of the social difficulties interacting directly with people that some individuals with autism experience. (Charlop-Christy et al., 2000). Additionally, when assessing the visual preferences of children with ASD and typically developing children, Cardon & Azuma (2012) reported that both groups of children exhibited a visual preference for a video performance versus live performance of a puppet show.

Video modeling has also been found to be effective when compared with other methods of prompting or visual supports. In one study, least to most prompting in addition to least to most prompting plus VM were both found to be effective in promoting skill acquisition by Murzynski and Bourret (2008), although authors noted that skills were learned more quickly and with fewer prompts needed with the VM intervention. In addition, in a recent review, researchers have reported VP as having stronger effects overall than picture prompting on skill acquisition (Banda et al., 2011).

Video prompting. Not only is video modeling an effective instructional method theoretically for individuals with disabilities, particularly those with ASD, but there is also versatility in the way in which VM can be implemented, specifically with regards to how the video clips are organized and shown to students, in addition to how students receive instruction (e.g., basic video modeling vs video prompting). Gaining popularly in recent years, VP slightly differs from VM in that instead of an entire skill sequence being shown and subsequently practiced by the student, short segments or steps of the skill are broken up. The student is shown each step individually and immediately after viewing each step, has an opportunity to practice and receive feedback on that step before moving on. "For some individuals, presenting segments of the video and providing an opportunity to perform steps of the target behavior determined by a task analysis may be necessary to facilitate socially significant intervention effects" (Sigafoos et al., 2005 as cited in Rayner et al., 2009, p. 300). Researchers have successfully used VP methodology to teach a variety of daily living skills to students with developmental disabilities including self-help skills (Norman et al., 2001), domestic skills (Cannella-Malone et al., 2006; Gardner & Wolfe, in press; Horn et al., 2008; Sigafoos et al., 2005; Van Laarhoven & Van Laarhoven-Myers, 2006) and cooking-related skills (Graves et al., 2005; Mechling et al., 2008;

Mechling, Gast, & Seid, 2009; Mechling et al., 2010; Mechling & Gustafson, 2008; Sigafoos et al., 2007; Van Laarhoven et al., 2010).

Benefits of using VP as an instructional approach are similar to those cited for VM, with the additional benefit of presenting information in smaller steps and teaching those explicitly to mastery (Gardner & Wolfe, 2013). In recent years, researchers have speculated whether this instructional strategy is more appropriate to teach students with ASD a particular skill set (e.g., one that involves many steps or parts). When compared to VM for teaching daily living skills, VP was slightly more effective in helping students acquire skills more rapidly and maintain those skills over time (Cannella-Malone et al., 2011; Cannella-Malone et al., 2006; Van Laarhoven & Van Laarhoven-Myers, 2006). Given limited attention span and memory of individuals with ASD, the short duration of the video prompts may be one possible explanation for their stronger efficacy, as individuals with ASD may acquire novel information more efficiently when there are limited demands placed on attention and memory (Banda et al., 2011; Travers, Klinger, & Klinger, 2011). Additionally, those with ASD may experience higher levels of difficulty and frustration when engaging in activities that involve many components as opposed to those that focus on single or separated actions (Libby, Powell, Messer, & Jordan, 1997).

Video prompts, similar to video models, can be filmed from different perspectives: the performers' perspective (i.e., first-person perspective), commonly known as point-of-view perspective (POV), the spectators' perspective (i.e., third-person perspective), or self-modeling (i.e., clips show the target individual successfully completing a task). Given that individuals with ASD often have poor attention skill and a tendency to attend to irrelevant details of a task (Travers et al., 2011), directing an individual's attention to the critical feature(s) of a given task may be beneficial in order to target critical information needed to perform the skill. Point-of-

view perspective has been gaining popularity among interventionists, as this perspective typically involves showing just the hands of the performer completing a given skill, thereby narrowing the center of focus for the viewer. In their meta-analysis on POV modeling, Mason and colleagues (2013a) reported that although POV modeling has not been investigated as thoroughly as third-person modeling, POV was determined to have "a large omnibus effect size across the 14 studies that met quality standards" (p. 341), with POV prompting indicating a larger magnitude of change than VM. Several researchers incorporating POV modeling and prompting along with voiceover instruction when each step is presented in their interventions have reported on the overall effectiveness of this combination of features when teaching daily living skills to individuals with ASD (Cannella-Malone et al., 2006; Gardner & Wolfe, in press; Graves et al., 2005; Sigafoos et al., 2007; Sigafoos et al., 2005).

Most skills in the daily living domain are comprised of multi-step or chained behaviors. Given that video modeling and prompting often target multi-step behaviors, it seems highly appropriate that such skills be taught via video techniques. Specifically, during VM and prompting instruction, skills are broken into discrete steps through task analysis procedures. Use of task analyses has been reported to be an evidence-based practice for individuals with ASD by the National Professional Development Center on ASD (Franzone, 2009). A component task analysis, appropriate for use with motor tasks and simple academic routines and frequently used with individuals with severe disabilities, provides "direct curriculum based information on individual student performance and a basis for teaching" and to assist in instructional decision making (Carter & Kemp, 1996, p. 155). Carter & Kemp (1996) describe this type of task analysis as, "…procedures concerned with breaking observable skills into subskills that are directly required for the completion of a task" (p. 157).

Using VM and VP enables students to visually learn the entire task sequence, whether these steps are shown in a continuous manner (such as in modeling) or one step at a time until the process is complete (such as with prompting). Use of task analysis to analyze skill performance has been a logical method of assessment and instruction for VM and VP. Use of videos in addition can help further emphasize the correct skill sequence for the task (Quill, 2000). For example, researchers developed a task analysis consisting of 10 steps to use for assessment and instruction for adults with developmental disabilities when making microwave popcorn. Use of a task analysis has provided researchers with the ability to break up complex skill sequences into more manageable steps (Parker & Kamps, 2011), tailoring their instruction to meet student attention and learning abilities.

Prompting and Its Effect on Behavior

Since individuals with ASD typically experience difficulty with incidental learning, it becomes important to incorporate not only multiple practice opportunities into instruction but also immediate explicit feedback, either in the form of affirmative feedback or error correction procedures (MacDuff et al., 1993). Error correction has been described by researchers as providing participants with immediate, explicit feedback to prevent them from practicing errors in the future when learning new, and especially more complex, skills (Canella-Malone et al., 2011). Individuals with ASD may experience difficulty learning new skills without exposure to explicit and structured training, including the use of extra cues, or prompts (MacDuff et al., 2001). Prompts have been defined as, "instructions, gestures, demonstrations, touches, or other things that we arrange or do to increase the likelihood that children will make correct responses" (McClannahan & Krantz, 1999, as cited in MacDuff et al., 2001, p. 38). These prompts, whether verbal, model, manual, gesture, photo or line drawings, textual (e.g., written cues, scripts,

instructions), or tactile prompts, can be provided either before (i.e., antecedent cues) or while a behavior is occurring (i.e., response cues or prompts) (MacDuff et al., 2001).

More recently, researchers have started to incorporate a variety of error correction procedures (i.e., response prompting techniques) into VP interventions to help students learn new skills without practicing errors (Cannella-Malone et al., 2011; Cannella-Malone et al., 2012; Goodson et al., 2007). Response prompting strategies (e.g., least to most prompting, most to least prompting, graduated guidance, time delay) have been shown to influence control over specific student behaviors during chained responses (Wolery & Schuster, 1997). These strategies incorporate both error correction and prompt fading to assist students with learning to perform a skill over time more independently.

Least to most prompting (Gaule, Nietupski, & Certo, 1985), currently the most common type of response prompt strategy incorporated into VP interventions, typically involves the instructor providing prompts as the student exhibits errors in a sequential hierarchy from least intrusive to most intrusive (e.g., verbal, gesture, model, then physical) until a correct response is performed; past researchers have cited some of the advantages of this method to be that it accommodates individual differences in baseline skills and rates of learning and that fading is inherently built into the procedures (Risley & Cuvo, 1980). Despite the utility in VM and inherent strengths of least to most prompting, MacDuff and colleagues (2001), suggest that some disadvantages of this prompting method include still enabling error production and may produce prompt dependence.

Other response prompting methods, such as GG, prove to be viable options for error correction techniques used along with VM and VP interventions. Graduated guidance (Azrin & Armstrong, 1973) involves providing a hierarchy of physical support to an individual, allowing

for greater flexibility in matching the degree of support provided to the individual's exact response within a trial rather than across trials (Demchak, 1990; Schoen et al., 1988). Assistance is naturally faded by reducing both the intensity and location of the prompts provided (Demchak, 1990). Schoen and colleagues (1988) stated that this method of prompting is ideal for use with more complex, physical, and chained behaviors, as they taught preschoolers self-help skills which students later were able to generalize and maintain. Graduated guidance has been successfully used when teaching use of activity schedules, as well, to individuals with autism. Bryan and Gast (2000) reported success with increasing on-task and on-schedule behaviors when pairing visual schedules with GG. Researchers in another study reported when GG was paired with use of activity schedules for four boys with ASD, participants were able to display lengthy chains of complex, functional behaviors with fewer "aberrant" behaviors as a result of the intervention and specifically noted that use of GG helped prevent errors and lengthy delays in target behavior production (MacDuff et al., 1993). One potential drawback to this method would be if a student had a significant aversion to physical touch by others; if that occurred, then another prompting method may be more viable. Coupling fading with error correction techniques has been described as a beneficial method for reducing possible prompt dependence (i.e., a person responds to a prompt rather than the natural environmental cue to perform a given behavior), and maximizing student independence, with individuals who have ASD (MacDuff et al., 2001).

Directions for Future Research

Errorless teaching methods have been suggested to be effective when teaching skills, particularly daily living skills, to individuals with ASD (Akmanoglu, Yanardag, & Batu, 2014). According to recent reviews of the literature on VM and VP, this effective instructional

component has been incorporated by just a handful of researchers mainly through use of a least to most prompting hierarchy (Banda et al., 2011; Gardner & Wolfe, 2013). Banda and colleagues (2011) have suggested that efficacy of other response prompting strategies such as GG need to be investigated as well. Few, if any, studies that do incorporate error correction procedures discuss results specific to the number of different prompt levels used with students and if less intrusive levels of prompts were needed by students over time as they learned the skill. Additionally, few VP studies have assessed for generalization and social validity, both which yield important information highlighting the ability of these interventions to aid in reported generalization difficulties of individuals with ASD and any concerns or doubts that may arise surrounding the usefulness of VP for practitioners (Banda et al., 2011).

VITA

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Education

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Publications

Gardner, S.J. & Wolfe, P. S. (in press). Teaching students with developmental disabilities daily living skills using point of view modeling plus video prompting with error correction. *Focus on Autism and Other Developmental Disabilities.*

Gardner, S. J. (2013). Book Review: Positive behavior supports in classrooms and schools: Effective and practical strategies for teachers and other service providers. *Research and Practice for Persons with Severe Disabilities, 38 (3),* 206-207.

Gardner, S.J. & Wolfe, P. S. (2013). Use of video modeling and video prompting interventions for teaching daily living skills to individuals with autism spectrum disorders: A review. *Research and Practice for Persons with Severe Disabilities,* 38 (2), 73-87.

Recent Presentations

Gardner, S. J. & Lylo, B. (2014, October) *Encouraging Reflective Thinking in Higher Education through the Use of Exit Slips.* Presentation made at The Pennsylvania Association of Colleges and Teacher Educators in Harrisburg, PA.

Gardner, S. J. & Wolfe, P.S. (2013, December). *Fostering Daily Living Skill Independence through Video Modeling and Prompting Interventions.* Poster Presentation made at the 2013 TASH Conference. Chicago, IL. Refereed Conference Presentation.

Wolfe, P.S, Domire, S. C, & **Gardner, S. J.**. (2013, December). *Sexuality Curricula: Evaluating and Adapting Curricula for Individuals Having Severe Disabilities.* Presentation made at the 2013 TASH Conference. Chicago, IL. Refereed Conference Presentation.

Professional Experience

2013-present	Susquehanna University, PA, Assistant Professor of Education
2010-2013	The Pennsylvania State University, PA, Graduate Assistant, Practicum Supervisor, Teaching Assistant
2006-2010	Bloomsburg Area School District, PA, Middle School Life Skills Teacher
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