Effects of Video Prompting to Teach Daily Living Skills to Elementary Students on the Autism Spectrum

Thesis

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Abbygale Watson

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Thesis Committee

Matthew Brock, PhD

Tiffany Wild, PhD

Abstract

Many children on the autism spectrum have difficulty independently performing daily living skills. Using a multiple baseline across participants design, this study examined the effects of video prompting to teach dishwashing skills to three elementary students on the autism spectrum in a classroom setting. Point-of-view video prompting consisted of seven short video clips created for the 24-substeps of the dishwashing task. Effects were demonstrated across all three students, establishing a functional relation between video prompting and skills acquisition. Findings corroborate previous findings that video prompting is an effective means for teaching daily living skills to people on the autism spectrum and extended this evidence to elementary aged children. High levels of maintenance suggest that the effects of video prompting were sustained later after withdrawing the intervention. I offer suggestions for how educators and paraeducators can feasibly and effectively use video-based instruction to increase the independence and acquisition of daily living skills for elementary students on the autism spectrum.

Dedication

Dedicated to all educators who pour their passion into the field of special education and who continue to teach and learn alongside their students daily. To my students, you continuously empower me to be a better educator.

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Vita

May 2017……. Lancaster High School

May 2021……. B.S. Special Education, The Ohio State University

2022 to present……. Dublin City Schools

Fields of Study

Major Field: Educational Studies

Areas of Specializations: Special Education- Applied Behavior Analysis; Visual Impairments

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Chapter 1. Introduction

Most children naturally learn daily living skills over time through observation and incidental learning. Daily living skills include washing dishes, sorting laundry, putting away groceries, and cooking. Through the process of incidental learning, children observe activities occurring around them and learn how they are performed without deliberate instruction (Allman & Lewis, 2014). In a similar sense, Albert Bandura's Social Learning Theory (SLT) postulates that children learn through observation and modeling (Apkan & Kennedy, 2019). Observational learning involves observing others' behavior through live models (i.e., another person displaying or acting the behavior), verbal instructional models, (i.e., descriptions and explanations of the behavior), and symbolic models (i.e., observing characters demonstrating behavior in books, films, television, or other media) (Apkan & Kennedy, 2019). Modeling involves demonstration of the behavior for the learner or the learner observing and imitating the displayed behavior (Apkan & Kennedy, 2019). Typically developing children are able to learn daily living skills by observing others around them, imitating what they are observing, and receiving feedback from adults.

Additionally, most children are engaged and naturally motivated to learn new skills that help them to be more independent in their daily lives. At an early childhood age, typically developing children tend to master daily living skills (e.g., self-feeding,

bathing, dressing, personal hygiene) independently, albeit at different proficiency and maturity levels in different age groups (Case-Smith & O'Brien, 2015). Typically developing children sustain attention to what is occurring around them, retain information from the behavior around them, are physically and intellectually capable of re-enacting the behavior and are extrinsically (e.g., extent to which the model has been capturing the attention and elicit the engagement of learners) or intrinsically motivated (e.g., the perception and interest of the learners toward the tasks or activities) to re-enact the behavior (Apkan & Kennedy, 2019).

Acquisition of daily living skills usually begins at preschool age and matures through the development of gross motor, fine motor, cognitive, and social–emotional skills during the early years of life (CaseSmith & O'Brien, 2015; Dosman et al., 2012; Schum et al., 2002). However, children on the autism spectrum experience difficulties performing daily living skills independently (Chiang et al., 2017; Jasmin et al., 2009) and may fall behind with natural development with these skills. These challenges stem from deficits in executive functioning and adaptive behavior skills (Delisio & Isenhower, 2020). Executive functions (EFs) are a set of cognitive processes that are involved with a variety of higher-level mental processes and are utilized when concentration or attention is needed to complete a given action or task (Diamond, 2013). Deficits in executive functioning (EF) can impact an individual's performance of various skills and tasks. Deficits in adaptive behavior can be defined as "significant limitations in an individual's effectiveness in meeting the standards of maturation, learning, personal independence,

and/or social responsibility that are expected for his/her age level and cultural group" (Grossman, 1983, p. 11).

Therefore, children on the autism spectrum who have deficits in EF and/or adaptive behavior may not be able to naturally sustain attention to observe others around them, retain information, and imitate what they are observing like typically developing children. Individuals who display deficits in adaptive skills may find it harder to fully interact and participate in their community, create meaningful interpersonal relationships, have limited living arrangement options, and may place elevated levels of stress on family members (Haverman et al., 1997; Sigafoos et al., 2005). Increasing an individual's adaptive skill level may increase independence and reduce the need for direct care, allowing them to participate more fully in the community (Cannella-Malone et al., 2013). Therefore, children on the autism spectrum need more intensive and systematic instruction to acquire daily living skills and increase independence.

Learning daily living skills is important because it can foster independence for individuals with disabilities. Without such skills, an individual's potential to flourish in educational, vocational, and domestic settings is limited (Pierce & Schreibman, 1994). Additionally, this can lead to dependency on guardians or caregivers which can cause stress (Estes et al., 2009). Interventions targeting acquisition of daily living skills are needed to support individuals on the autism spectrum to increase independence. Effective interventions have the potential to improve the quality of life for children on the autism spectrum, as well as for their guardians and caregivers.

One promising avenue for teaching daily living skills to children on the autism spectrum—particularly those with more intensive support needs—is video prompting. Video prompting may be effective because of the nature of the instruction, combining imitation of observed behaviors with observational learning (Clark et al., 1992). Video prompting (VP) is the breakdown of a complex task into simpler steps through short clips with pauses inserted, during which the viewer attempts that step before watching subsequent steps. VP allows students to repeatedly watch the video as well as to watch only one step at a time (Minshew & Williams, 2008; Poirier et al., 2011), which may be best suited for more complex or multistep tasks, such as daily living skills. The benefit of the short clips followed by the individual immediately performing that step of the task is related to deficits that many students on the autism spectrum may have in executive functioning (EF) and adaptive behavior (Delisio & Isenhower, 2020). Additionally, presenting information through a video model may increase motivation (Charlop-Christy et al., 2000) and attention can be focused on just the most important visual aspects of the task and extraneous cues are reduced, therefore, reducing demands on attention (Shipley-Benamou, et al., 2002). Video models also allow the same behavior to be seen repeatedly without variation and give children on the autism spectrum the ability to practice that behavior (Cardon & Azuma, 2012).

A handful of single-case design studies have demonstrated that video prompting can be an effective means to teach daily living skills to people with disabilities. Sigafoos et al. (2007) evaluated video prompting and fading procedure for three adults on the autism spectrum to wash dishes. The intervention was implemented by a researcher, in a

kitchen of a vocational training center with participants that ranged from 28 to 33-years-old. Video prompting consisted of nine video clips ranging from 4 to 30 s with a one-sentence voice over instruction of the step (e.g., “now put the dishes in the sink”). All three participants showed large and immediate increases in the percentage of steps performed correctly as soon as video prompting was introduced. Participants reached and maintained high levels of performance (90-100%) after less than 10 exposures to the video prompting procedure. However, following acquisition of dishwashing, video prompting was withdrawn, and performance deteriorated. Sigafoos and colleagues then ‘‘chunked’’ the videos together in order to fade the prompts and increase independence. A 3-step fading procedure was implemented, where separate videos were combined to form larger video clips, each clip consisting of an increased number of steps. Performance reached 80-100% correct independence responses when the video prompts were reapplied and then faded. Prompting was removed again at a 3-month follow up, in which performance then decreased but stabilized at 80-90% correct when the third step in the fading sequence was reinstated. Though time-consuming, the video fading procedure proved effective in facilitating independence.

In another example, Cannella-Malone et al. (2013) examined effects of self-directed video prompting using an iPod Touch to teach four adolescents with moderate-to-severe intellectual and developmental disabilities table washing and vacuuming. This intervention was implemented by researchers, in a specialized school setting for students with moderate to severe disabilities (e.g., cafeteria, main lobby) and with participants that ranged from 15 to 17-years-old. In the first phase, students were taught to wash a table

using instructor-delivered video prompts. Each video clip was filmed from the perspective of a spectator and provided an auditory prompt stating what the student was to do in that step (e.g., “First, pick the spray bottle up off of the cart and go to the table). After reaching 80% correct independent responses for at least three consecutive sessions, most-to-least prompting procedure was used to teach students to use the iPod Touch and a video prompting app called inPromptu independently. In the final phase, students used inPromptu on the iPod Touch to teach themselves to vacuum with self-directed video prompts. All four participants learned to wash a table using self-directed video prompting, and two maintained the skill at 2- and 3-week follow-up. Moreover, all four participants made progress learning to use the inPromptu app independently to provide their own prompts, two participants were able to use inPromptu to teach themselves to vacuum the floor and one participant was beginning to teach herself to vacuum the floor (Cannella-Malone et al., 2013).

A third similar study was conducted by Sigafoos et al. (2005) using VP to teach three adults with developmental disabilities to microwave popcorn. The intervention was implemented by the researcher, in a kitchen of a participant’s vocational training program and participants that ranged from 34 to 36-years-old. Video prompting consisted of 10 video clips that were 4 to 12 s in length. Using video prompting and positive reinforcement, two of the three participants acquired the skills necessary to make popcorn and increased their percentage of correct responses within 5 sessions. The third participant did not acquire the task, even with continued video prompting, as it appeared the participant was not reinforced by popcorn over time. The two participants who

demonstrated acquisition continued to independently perform 80%-100% of the steps, even when video prompting was withdrawn and up to 10 ten weeks following initial intervention. Sigafoos et al. (2005) demonstrated that video prompting could be withdrawn following acquisition with no apparent evident impact to performance. These findings support the use of video prompting when teaching daily living skills to adults with developmental disabilities.

While these studies make very important contribution to the literature, there are still limitations to what is known about the effects of video prompting to teach daily living skills. First, most of the existing video prompting literature is focused on adolescents and adults, with relatively few studies focused on elementary-aged children. This raises questions about whether video prompting would be as effective for this age group. Second, only a subset of existing studies occurred in the context of public schools, and of those studies, video prompting is most often implemented by a researcher who is external to the school. This raises questions about whether video prompting would be similarly effective if implemented by teachers in public school classrooms.

I designed the current study to address the aforementioned limitations in the research literature. Specifically, I designed a study to test the effects of teacher-implemented video prompting for elementary students on the autism spectrum with significant support needs in a public-school classroom. This study was designed to address the following research questions:

1. What are the effects of video prompting on acquisition of dishwashing for elementary students on the autism spectrum?

2. What are the paraeducators' perceptions of the feasibility, impact, and value of the intervention package?

Chapter 2. Method

Participants

Three students with developmental disabilities with daily living skills were recruited from a public suburban elementary school in a Midwest state. The school's population was about 50% White, 20% Asian, 10% Hispanic, 10% Black, and 10% two or more races. One-fifth of students qualified for free and reduced lunch. Students were eligible to participate if they had a disability label of autism, scored one standard deviation below the mean on a test of adaptive behavior, and had low performance on (i.e., <60% of steps correct) of the specific daily living skill targeted in this study (i.e., washing dishes). Participants included Natalia, an 11-year-old Asian girl with autism; Jacob, an 8-year-old White boy with autism; and Bentley, an 8-year-old White boy with autism. Standardized scores of adaptive functioning and the focus of Individualized Education Program (IEP) goals related to daily living skills are included in Table 1.

In addition to student participants, paraeducators were recruited to participate in a social validity survey at the end of the study. Paraeducators were eligible to participate if they were working in the participating students' classroom and present during research activities or working with participating students in similar contexts (i.e., work with students on handwashing outside of the study). Paraeducators included Willow, a 40-year-old White woman with 2 years of experience; Betty a 41-year-old White woman

with 1 year of experience; and Massy, a 28-year-old White woman with 6 years of experience working in special education.

Name	Age	Grade	Sole disability label	Adaptive behavior	Focus of IEP Goals Related to Daily Living Skills
Natalia	11	5	Autism	40– DP-4	Prevocational work tolerance, initiating and completing a task
Jacob	8	3	Autism	66– ABAS-3	Initiating and completing a task
Bentley	8	3	Autism	40– DP-4	Initiating and completing a task

Note. ABAS-3= Adaptive Behavior Assessment System, Third Edition; DP-4 = Development Profile

Table 1. Student Demographics and Goals

Materials and Classroom Setting

The intervention took place in a self-contained special education classroom with a sink. Desks were arranged as individual workspaces with two common spaces for group instruction. Students worked one-on-one with paraeducators or in small groups while the interventionist provided one-on-one instruction of dishwashing. Seven, 2-18s video clips that portrayed each discrete step of dishwashing, were presented on 13-inch Apple laptop. The materials used were a sink with running water, dish soap, a sponge, a blue square bowl, and drying rack. All participants had access to these same materials throughout baseline and intervention.

Interventionist

The interventionist was a graduate student in special education who had six years of experience working with children and adults with autism and intellectual and developmental disabilities as a paraprofessional, intervention specialist, and registered behavior technician. The experimenter had a bachelor's degree in special education and an educator license as an intervention specialist for students with moderate to intensive disabilities in grades K-12.

Dependent Variable

The primary dependent variable was the percentage of 24 steps of a dishwashing task that students completed independently. Table 2 provides the task analysis for the 24-step dishwashing task and the duration of each video clip. Data were collected at times that children would naturally be washing dishes, including following lunch or an afternoon snack. Students were asked to "wash their bowl" after eating and would transition to the sink.

Dishwashing	Duration
Turn on water	2.93 (Step 1)
Pick up bowl	
Rinse inside of bowl	8.44 (Step 2-5)
Pour water out of bowl	
Set bowl down	
Grab sponge	10.33 (Step 6-8)
Put sponge under water	
Turn off water	
Grab soap	
Squeeze “pea” size of soap on sponge	9.37 (Step 9-11)
Put down soap	
Pick up bowl	
Wipe inside of bowl on 1st side with soapy sponge	
Wipe inside of bowl on 2nd side with soapy sponge	
Wipe inside of bowl on 3rd side with soapy sponge	11.86 (Step 12-18)
Wipe inside of bowl on 4th side with soapy sponge	
Wipe bottom of bowl with soapy sponge	
Put down sponge	
Turn on water	
Rinse bowl until clean of soap inside	
Flip bowl over	
Rinse bottom of bowl until clean of soap	18 (Step 19-23)
Turn off water	
Put bowl on drying rack	2 (Step 24)
Total duration	62.93 (Step 1-24)

Table 2. Task analysis and step duration in seconds

Interobserver Agreement and Procedural Fidelity

Interobserver agreement was calculated for a minimum of 20% of sessions. A second independent observer, a doctoral student in special education, collected data on the dependent variable. Before collecting data, the observer was trained by (a) reviewing a coding manual through oral instruction, (b) practicing taking data in a role play, and (c) achieving at least 95% agreement during a live observation. Point-by-point agreement

was calculated. Average overall agreement across variables was 99.44% (range = 98.33% – 100%) for the dependent variable fidelity.

A second observer, a doctoral student in special education, was present for at least 20% of training sessions to assess procedural fidelity. Procedural fidelity of the video prompting intervention was measured using a 24-step checklist. Average procedural fidelity was 100% across all sessions for the video prompting intervention.

Experimental Design

A multiple baseline across participants design was used (Gast et al., 2018). All participants began in a baseline condition. The baseline continued for at least 5 data points, and longer if participant responses were not stable based on visual analysis of trend and level. Then the intervention was introduced for the first participant. The intervention was introduced for the second participant after the first participant demonstrated acquisition of the intervention skills (i.e., 80% of greater mastery of the steps to perform the skill) and data were stable for all participants. Timing of the intervention for the third participant was based on the same criteria.

Procedure

Baseline. Each student began in a baseline, or business-as-usual, condition. Each student was observed engaging in dishwashing. No other assistance or prompts were provided. Baseline continued for at least 5 data points, when the data was stable or showing a downward trend.

Intervention. After each student completed baseline, I used video prompting to teach each the target skill in a one-to-one instructional context. This instruction occurred

during the time of day when students were typically receiving instruction. Instruction occurred twice a day, in the morning once students ate breakfast or a morning snack and again in the afternoon, following lunch or an afternoon snack. Students were asked to "wash their bowl" after eating and would transition to the sink. At the sink, the students would begin dishwashing with a 24-step breakdown through the use of video prompting. The video prompting was presented on a MacBook Air, placed on the right side of the sink and drying rank, as the students performed the task. The videos were presented in a point of view method where the clip resembled what the students would see themselves doing (i.e., just the hands completing the task). Every video clip included a voice-over of the step(s) to be completed, for a total of seven videos. Video prompts were combined to make smoother transitions throughout the task. Immediately before the students performed each step, they were shown a video exemplar of that step. I said, "do your best to copy what you see in the video" and showed the clip. As the students completed the task, a 24-step task analysis with error correction and procedural fidelity was used to measure the number of steps completed independently. The error correction procedure of least-to-most prompting was used. Least-to-most prompting involved a hierarchy of prompts ordered from the least intrusive prompt (e.g., verbal direction) to most intrusive (e.g., full physical guidance; Collins et al., 2018). I first provided a combination of a verbal prompt and a gestural prompt, before providing a physical prompt. Prompting stopped when the student completed the step successfully. Error correction occurred 5 seconds after the video prompt, or until the student responded without any prompt. If the step was completed incorrectly, or if the 5 seconds passed without student response,

students were prompted using a verbal and a gestural prompt (e.g., “turn on water” while pointing to the water faucet knob). If the step was completed incorrectly again, or if 5 seconds passed without student response, students were prompted using a physical prompt. Positive reinforcement, in the form of specific verbal praise (e.g., “great job turning on the water), was given following each correct step throughout the task.

Maintenance. Maintenance was probed for Jacob and Bentley at 3 weeks post intervention to determine if retention of the dishwashing skill occurred. Maintenance was not able to be assessed for Natalia, as the probe occurred after she had left the study. Maintenance data were collected similar to baseline. Students did not receive assistance or error correction from the researcher in order to complete the task. Students were given the choice to perform the dishwashing task with or without the use of video prompting. One student requested the use of the video prompts, which were provided, however no error correction was utilized. Each student was timed when performing the dishwashing to measure efficiency, along with accuracy.

Jacob selected to perform the dishwashing task without the use of the video prompting and demonstrated independent correct responses for 100% of the steps to complete the dishwashing task. Time to complete dishwashing totaled 1 minute and 44 seconds. This probe found that Jacob can accurately and efficiently perform the task of dishwashing, without the use of video prompting after 3 weeks post intervention. Overall, Jacob demonstrated maintenance of the dishwashing task, without the use of video prompting within 10 sessions.

Bentley selected to perform the dishwashing task with the use of the video prompts. Bentley demonstrated independent correct responses for 100% of the steps to complete the dishwashing task. Time to complete dishwashing totaled 1 minute and 26 seconds. This probe demonstrated that Bentley can accurately and efficiently perform the task of dishwashing, with the use of video prompting after 3 weeks post intervention.

Social Validity. To determine the social validity of the intervention, a survey was distributed to all paraeducator participants to evaluate the acceptability, feasibility, and value of the respective interventions participants received. The survey included 9 items that were rated using a Likert scale from 1 (strongly disagree) to 5 (strongly agree) and 2 items that were short response.

Chapter 3. Results

Based on visual analysis, I concluded that students increased their independence of dishwashing skills after receiving the video prompting intervention. Therefore, I conclude that a functional relation exists between the use of video prompting and increasing independence of dishwashing skills. Data for each student is displayed in Figure 1. Below, I explain my visual analysis in terms of level, trend, variability, and immediacy of effect for each student.

Student Progress

Natalia. In baseline, Natalia's percent of correct independent responses for dishwashing was zero across the phase. Her data were stable with no trend. After Natalia received instruction through the use of video prompting, Natalia's percentage of correct responses immediately increased. Natalia's percentage of correct independent responses was an average of 75% (SD = 14; range = 42-92%). The percentage of correct responses for independent responses were at a higher level, with no overlapping data between intervention and baseline, for the entire phase compared to baseline with an overall increasing trend. Natalia met mastery criteria for one session of the intervention, however, left the district and therefore, left the study, before she could demonstrate full mastery.

Jacob. In baseline, Jacob completed one step of the dishwashing task independently. Jacob's data were stable with no trend for independence with dishwashing, with a level between 0 and 4% and a baseline average of 0.5%. Jacob's data were stable when the intervention was introduced with Natalia. After Jacob received instruction through the use of video prompting, Jacob's percentage of correct responses immediately increased. Jacob's percentage of correct independent responses was an average of 85% (SD = 6, range = 79-100%). The percentage of correct responses for independent responses were at a higher level, with no overlapping data between intervention and baseline, for the entire phase compared to baseline with an overall increasing trend. Jacob demonstrated the mastery criteria for dishwashing, with three sessions of 90% correct independent responses. Jacob reached mastery criteria after 5 sessions of video prompting and demonstrated complete independence of the task after 9 sessions of video prompting.

Bentley. In baseline, Bentley completed five steps of the dishwashing task independently. Bentley's data were with no trend for independence with dishwashing, with a level between 0 and 16% and a baseline average of 2%, holding constant while intervention was introduced for the previous students. After Bentley received instruction through the use of video prompting, Bentley's percentage of correct responses immediately increased. Bentley's score for independent correct responses was an average of 79% (SD = 24, range = 46-100%). The percentage of correct responses for independent responses were at a higher level, with no overlapping data between intervention and baseline, for the entire phase compared to baseline with an overall

increasing trend. Bentley demonstrated mastery criteria for dishwashing, with three sessions of 90% correct independent responses. Bentley reached mastery criteria after 3 sessions of video prompting and demonstrated complete independence of the task after 5 sessions of video prompting.

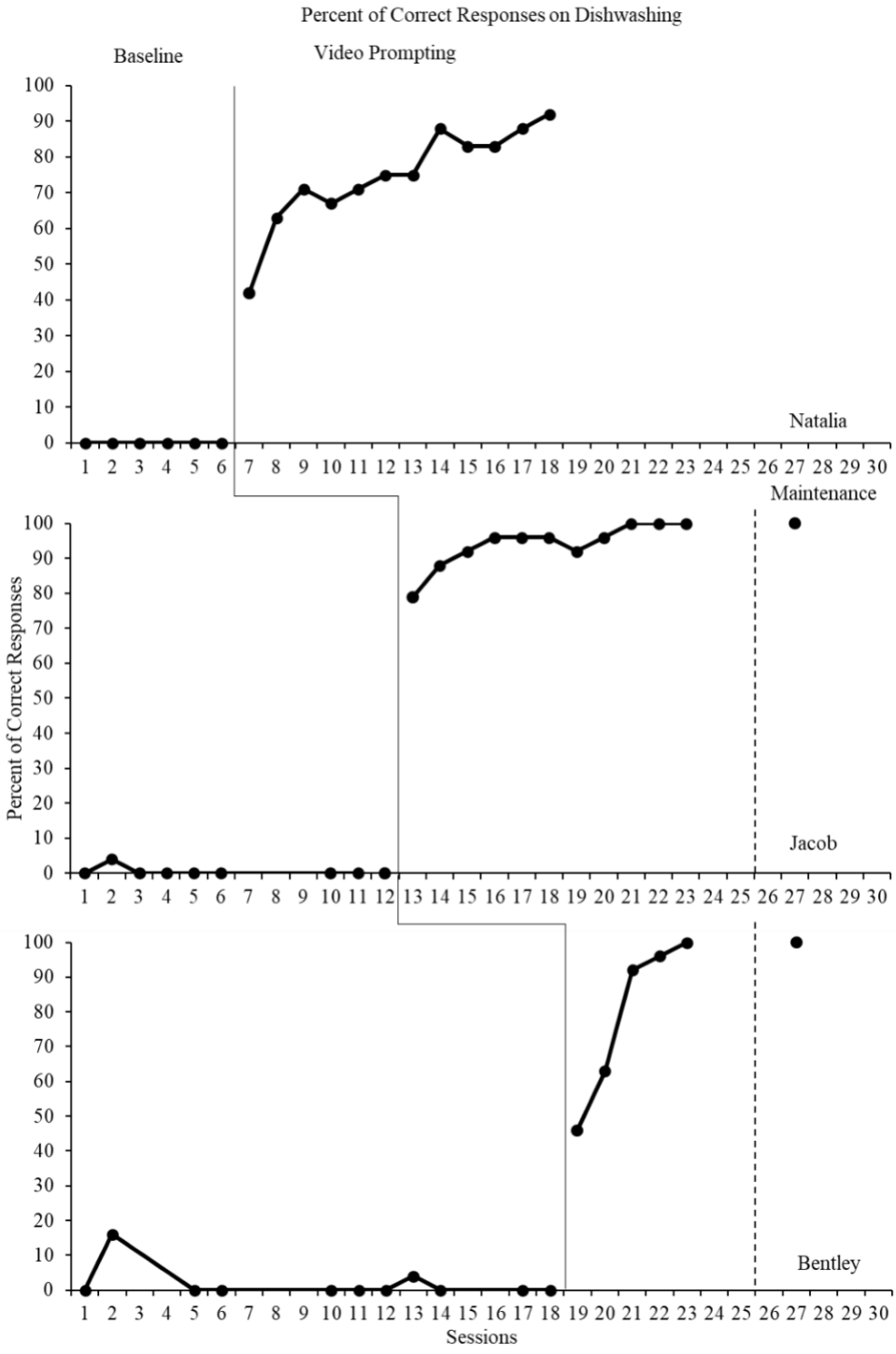

Figure 1. Percentage correct for dishwashing across baseline, video prompting for Natalia, Jacob, and Bentley. Maintenance was collected 3 weeks later for Jacob and Bentley.

Social Validity. After the intervention, paraprofessionals completed a social validity questionnaire of video prompting. The paraprofessionals' questionnaire assessed the acceptability of intervention goals, procedures, and outcomes. All three paraprofessionals reported that they "strongly agree" that it is important for students to have self-care skills. All three paraprofessionals reported that they "strongly agree" that it is important for students to be able to perform self-care skills independently. All three paraprofessionals reported that they "strongly agree" that it is important for educators to use interventions that increase independence. All three paraprofessionals reported that they "strongly agree" that it is important for educators to use interventions that allow students to acquire self-care skills. Two out of three paraprofessionals reported that they "strongly agree" that showing students a video model of each step is an effective way to help students learn a skill. The third paraprofessional reported that they were "neutral". Two out of the three paraprofessionals reported that they were "neutral" when asked if they believe that video prompting is an effective method for teaching students with all developmental disabilities self-care skills. The third paraprofessional reported that they "strongly agree". Two out of the three paraprofessionals reported that they "strongly agree" when asked if they believe that video prompting is a good fit for the students within their classroom. The third paraprofessional reported that they "agree". Two out of the three paraprofessionals reported that they "strongly agree" when asked if video prompting helped students acquire a new self-care skill. The third paraprofessional reported that they "agree". Two out of the three paraprofessionals reported that they "strongly agree" when asked if video prompting helped students be more independent

during self-care tasks. The third paraprofessional reported that they “agree”. When asked if there was anything in particular that they liked about the intervention, paraprofessionals reported “the videos were concise and easy to understand and follow”, “seeing the growth in skill with the students” and “I felt the video modeling was beneficial for my students”. When asked if there was anything that they did not like about the intervention or something that they think would be helpful for future interventions, two out of the three paraprofessionals had no response to the question. One out of the three paraprofessionals stated “no, it was wonderful. It was wonderful seeing growth!”

Chapter 4. Discussion

Many children on the autism spectrum have difficulty independently performing daily living skills. The purpose of this study was to evaluate whether video-based instruction would increase independence and acquisition of dishwashing skills with elementary students on the autism spectrum. Findings showed that following implementation of video prompting, all students increased their independence of dishwashing skills from baseline. In addition to this, students benefited from video prompting with a voice over component. Voice over helped sustain the attention of students when completing the dishwashing task and served as a natural redirection given the distractions of the classroom. These findings extend the literature regarding the use of video modeling procedures to increase the independence and acquisition of daily living skills for elementary students on the autism spectrum in several ways.

First, this study replicated previous findings that video prompting is an effective means for teaching daily living skills to people on the autism spectrum and extended this evidence to elementary aged children. These findings further the evidence of efficacy, extending the results of previous studies that used similar VP techniques (e.g., Sigafoos et al., 2007) and provide initial insight on how VP can be implemented with elementary aged students within a public-school setting. All three students increased their

independence of dishwashing skills after receiving the video prompting intervention. Jacob and Bentley demonstrated mastery criteria of the dishwashing task analysis after 3-5 sessions of video prompting and complete independence of the task after 5-9 sessions of video prompting. Although Natalia did not meet full mastery criteria before leaving the study, she did demonstrate one session of 92% independence of the dishwashing task, after 12 sessions of video prompting. These findings show that video prompting can increase independence of a daily living task in a short amount of time.

Second, this study provides evidence that a classroom teacher can feasibly and effectively implement video prompting with their students. Within this study, video prompting was designed and delivered by a classroom teacher within a classroom setting. Creating video prompts on a computer or iPad often requires 15 minutes or less, making it a practical and realistic strategy for educators to implement. Some teachers may need initial training in using technology for creating video models. Time cost upfront to prepare video prompts for this intervention of dishwashing totaled 1 hour 30 minutes. This time included preparing materials, recording the video clips for each step(s), creating a PowerPoint presentation to display each video, and adding voice over to each sequence of videos. The upfront time cost of preparing the videos may seem thorough, however these videos can be used in the future with other students. Additionally, this intervention is easy for the teacher to create and then pass off to paraeducators.

Paraeducators also agreed that video prompting was an effective and feasible approach. All paraeducators reported that video prompting helped students acquire a new daily living skill, that video prompting helped the students be more independent during

daily living tasks, and that video prompting is a good fit for the students within their classroom. The results of the social validity assessment indicate high agreement that the intervention was feasible not only for the current students, but for other students with similar needs. These findings show that video prompting is effective and valuable to increase independence and the acquisition of dishwashing skills for elementary students on the autism spectrum within a public-school setting.

Third, high levels of maintenance suggest that the effects of video prompting were sustained later after withdrawing the intervention. Two students demonstrated maintenance of dishwashing skills. Findings from this study suggest similar findings to Sigafoos et al. (2005), in which one participant, Jacob, demonstrated acquisition of dishwashing skills and independently performed 100% of the steps, even when video prompting was withdrawn. These findings show that video prompting could be withdrawn following acquisition with no apparent evident impact to performance after a 3-week follow up. Findings also suggest that for some students it may be possible for VP to be faded after maintaining mastery for 3 consecutive sessions. Other findings from this study suggest that students on the autism spectrum may benefit from fading procedures of VP to teach a daily living skill and promote less prompt dependence. One student, Bentley, requested the use of VP during the maintenance probe, however, demonstrated a high level of maintenance of the dishwashing skill. This suggests that although high levels of maintenance were attained, fading procedures may be beneficial to further promote independence of daily living skills. Sigafoos et al. (2007) successfully used a 3-step fading procedure, called “chunking” to combine video clips into larger segments and

promote more independence when performing a daily living skill. For future research, fading procedures could be incorporated into intervention and increase independence of the dishwashing skills.

Lastly, the effectiveness of the intervention should be considered within the context of a classroom setting. This study is representative of a teacher-implemented intervention in which clear expectations, positive behavioral supports, and rapport with each of the participants was established prior to the study. These contextual factors may be a pre-requisite for effective implementation.

Considerations for Applying this Intervention for Students with Visual Impairments

Similar to students on the autism spectrum, students with visual impairments may need deliberate and thoughtful instruction to acquire information critical for effective and successful functioning in childhood and into adulthood (Allman & Lewis, 2014). This section is for students with developmental disabilities and a coexisting visual impairment. I offer a number of suggestions of how VP can be considered an applicable intervention for students with visual impairments.

First, a promising feature that can be used in addition to VP is the use of audio, such as Voice Over. Voice Over is one of the most widely used built-in accessible features for Apple operating system (iOS) and TalkBack for Android as a screen reader (Senjam, 2021). Both features have been shown to be tremendously useful to perform activities of daily living for visually impaired or blind users (Senjam, 2021). I incorporated the use of audio within this study, with a voice over that corresponded to the

step(s) within each video clip. Video and audio played simultaneously as they were presented via PowerPoint allowing each of the participants to hear the step(s), as they watched them. The playback speed of the audio could be adjusted to best meet the needs of the learner, and audio could be repeated. The step numbers (e.g., step 1, step 2-5) were also displayed on the screen, which correlated with the task analysis used for data collection. Within future research, depth of descriptions for each step within the dishwashing task should be considered to further meet the needs of students with visual impairments. Additionally, the compatibility and accessibility of other audio supports (e.g., MyPicsTalk, Voice Over Video) could be evaluated for video-based instruction to teach daily living skills to students with visual impairments.

Second, magnification software or apps with a magnification feature can be used to support VP on an electronic device to teach daily living skills. Cullen et al. (2017) demonstrated the effectiveness of a self-directed VP using iPads to improve accuracy of employment tasks for a 20-year-old adult with an intellectual and developmental disability and a coexisting visual impairment. Cullen and colleagues selected the use of an iPad and the MyPicsTalk app as the tool for intervention to teach three different employment tasks (e.g., coding sheet, assembling a dental tray for cleaning, cleaning a breakroom). MyPicsTalk allowed for the video prompt to be shown the entire width of the screen, to deliver audio prompts, and included navigation features such as swiping and tapping. The magnification feature allowed the participant to access the videos at an appropriate width to complete the task. Cullen and colleagues found improvement of accuracy for all three employment tasks, for accuracy of navigation, and app usage.

Further research should consider video-based systems with built-in magnification features (e.g., MyPicsTalk) to teach daily living skills to students with visual impairments.

Lastly, a VP intervention for students with visual impairments can incorporate other accessibility features such as color, contrast, and illumination. Corn & Erin (2010) support that modifications in color, contrast, and illumination are an important means of enhancing an individual's use of functional vision. This includes selecting primary colors or other colors with high levels of saturation, a high degree of contrast between the object used and its surroundings, and appropriate illumination (e.g., screen brightness, elimination of glare) based on functional vision (Corn & Erin, 2010). Within this study, video clips were placed on a black background and words were displayed in white for high contrast. However, these features may not be beneficial to all vision conditions. Using assessments, one can further investigate if video prompting is an accessible and appropriate intervention to increase independence of daily living skills for students with visual impairments.

Two assessments that may be administered by a teacher of the visually impaired (TVI) to determine accessibility and appropriateness of an intervention are a Functional Vision Assessment (FVA) and a Learning Media Assessment (LMA). An FVA can be used to determine an individual's use of vision in a variety of tasks and settings, including measures of near and distance vision, visual fields, eye moments, and responses to specific environmental characteristics, such as light and color (Holbrook et al., 2017). The report from this assessment includes recommendations for instructional procedures,

modifications, or adaptations. An LMA assesses a student's use of sensory information or the way in which one uses vision, touch, hearing, and other senses, either singularly or in combination, to gain access to information (Corn & Erin, 2010). The information gathered from this assessment will support the selection of general learning media which includes both instructional materials and teaching methods most appropriate for the student. Classroom teachers can work collaboratively with a TVI to administer and further discuss the findings of these assessments to best support students with visual impairments. Determining various accessibility features and applications that can serve as assistive technology for the blind or visually impaired can facilitate independent living, daily activity performance, engaging in education, societal activities, accessing information and ultimately, support in enhancing the overall quality of life (Senjam, 2021).

Implications for Practice

Findings from this study have implications for practice. First, educators and paraeducators can effectively implement video-based instruction to increase the independence and acquisition of daily living skills. Second, teachers can embed interventions to increase independence of daily living tasks into the context of natural routines in the classroom. Third, these interventions had high social validity. All paraeducators reported that video-prompting helped students acquire a new daily living skill, that video prompting helped the students be more independent during daily living tasks, and that video prompting is a good fit for the students within their classroom. Fourth, researchers should continue to link video-based instruction to increased

independence and acquisition of daily living skills for elementary students on the autism spectrum.

Limitations and Future Directions for Research

Limitations to this study suggest avenues for future research. First, results in this study were not consistent across all three participants for meeting mastery criteria. One of the participants left the school district, and therefore the study, before demonstrating mastery. In future studies, researchers might recruit more participants. Second, the study did not probe for fading procedures of VP to teach dishwashing skills, therefore, long-term outcomes of independence for the skill were not assessed. In future studies, researchers might consider implementing fading procedures over time to assess the continued independence with daily living skills. Third, this study examined only one skill (i.e., dishwashing). In future studies, researchers might consider implementing video prompting across skills to assess independence with various daily living skills.

Conclusion

In this study, I found that point-of-view video prompting can increase the independence of daily living skills for elementary students with developmental disabilities. High levels of maintenance suggest that the effects of video prompting were sustained later after withdrawing the intervention. There was high social validity for this intervention, with all paraeducators reporting that video-prompting helped students acquire a new daily living skill, that video prompting helped the students be more independent during daily living tasks, and that video prompting is a good fit for the students within their classroom. Additionally, this study provides evidence that a

classroom teacher can feasibly and effectively implement video prompting with their students. These findings contribute to the depth of research on video-based instruction procedures to increase the independence and acquisition of daily living skills for elementary students with developmental disabilities.

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