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Using Video Modeling to Improve Hygiene Practices for Students with Significant Cognitive Disabilities

Allison Hovey
Brigham Young University

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Allison Hovey

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Ryan Kellems, Chair
Blake Hansen
Cade Charlton

Department of Counseling Psychology and Special Education

Brigham Young University

ABSTRACT

Using Video Modeling to Improve Hygiene Practices for Students
With Significant Cognitive Disabilities

Allison Hovey
Department of Counseling Psychology and Special Education, BYU
Master of Science

The purpose of this study was to determine the effectiveness of instruction delivered by video to teach hygiene skills to students with significant cognitive disabilities. The independent variable in this study is personal hygiene instruction delivered by a video model. The dependent variable in this study is the ability of a participant to complete a multi-step hygiene task. The dependent variable will be measured during each data session of intervention by two scorers using the same measures and procedures across phases. Visual analysis demonstrated a functional relationship between the hygiene skill video model intervention and an increase in the percentage of steps completed correctly in a hygiene skill task analysis. All four participants demonstrated an immediate increase in accuracy after receiving the intervention and maintained skill accuracy after the intervention was withdrawn. Direction for future research and implications for practitioners are discussed.

Keywords: video modeling, transition, hygiene, intellectual disability, significant disabilities

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DESCRIPTION OF THESIS STRUCTURE AND CONTENT

This thesis, *Using Video Modeling to Improve Hygiene Practices for Students With Significant Cognitive Disabilities*, is structured in hybrid format to meet traditional and journal publication formatting requirements. Previous pages meet university standards for thesis submission. The subsequent pages meet the length and style requirements for submitting research reports to an educational journal. Tables and figures appear at the end of the main text per the requirements of most peer-reviewed journals. Appendix A is a literature review of video modeling interventions. Appendix B is a copy of the IRB approval letter and approved permission forms used during the study. An example data collection form, participant screening rubric, intervention fidelity checklist, social validity questionnaires, and hygiene skills tasks analyses are included in Appendix C, D, E, F, and G respectively.

Introduction

Adaptive living skills are integral for accessing and navigating current and future environments (Ayres et al., 2011). Personal hygiene, for example, can limit an individual's access to enriching postsecondary employment and living situations. McConnell et al. (2021) found that self-care skills are a significant indicator of employment, higher education enrollment, and independence. Students that obtained greater independence in hygiene routines reportedly had higher rates of employment and enrollment in postsecondary education (McConnell et al., 2021). Siperstein et al. (2013) found that only 34% of individuals with intellectual disabilities between the ages of 21–64 are employed and only 18% are employed in a competitive job as cited in the U.S. Department of Labor, Bureau of Labor Statistics (2013). There is a need to research interventions that target postsecondary outcomes for individuals with significant cognitive disabilities. Deficits in working memory, motor-skill challenges, and unique communication needs make learning multi-step skills, such as personal hygiene skills, extremely challenging for individuals with disabilities (Agran et al., 2020; Kleinert et al., 2009; Pellegrino et al., 2003). Thus, many individuals exit the public school system without the necessary skills to prepare them for post-secondary success (McConnell et al., 2021).

Review of Literature

Significant Cognitive Disabilities

Individuals with significant cognitive disabilities (SCD) are those who (a) require long-term support and intensive individualized instruction and (b) those who use substantially adapted materials to access information and obtain new skills (National Center and State Collaborative Partners–Assessment FAQ, 2012). In education, students with SCD are administered alternate assessments, involving multiple adaptations and supports, so that educators may gain a more

accurate depiction of the student's academic abilities (Kleinert et al., 2015). Under the Individuals with Disabilities Education Act only 1% of students qualified to receive alternate assessments (Kleinert et al., 2015; U.S. Department of Education, 2005). Though individuals with SCD occupy a small percentage of special education, the group represents an extremely heterogeneous subset of students. The term SCD was coined in 2005 by the U.S. Department of Education to describe students with a wide range of disabilities who receive special education services, including those with autism, intellectual disabilities, and multiple disabilities (Erickson & Geist, 2016).

Kleinert et al. (2009) notes that students with SCD have highly individualized needs for support and often struggle with short-term and long-term memory retrieval relative to their same-aged peers (Bergeron & Floyd, 2006; Pellegrino et al., 2003). Such challenges impact a students' ability to complete multi-step tasks, academic skills, and life skills (Agran et al., 2020; Kleinert et al., 2009; Pellegrino et al., 2003). Further, researchers found that an individual's ability to live independently and care for their own health issues was an indicator of quality of life for individuals with SCD and their caretakers (Heal & Rusch, 1995; Rossetti & Hall, 2015).

Post-Secondary Outcomes for Individuals with SCD

In the United States, entering employment is a substantial marker of success, however, researchers find that young adults with SCD often leave high school "without the skills, supports, and connections that lead to meaningful employment" (Carter et al., 2012, p. 58). Baer et al. (2011) found that students with significant intellectual disabilities have substantially poorer post-secondary outcomes than their peers with other disabilities. Additionally, McConnell et al. (2021) found that students with disabilities who were integrated into classrooms with general education peers, had higher functional academic skills, and could complete 3-step tasks, were

more likely to obtain higher education and employment after high school (Baer et al., 2011; Foley et al., 2013). Furthermore, Carter et al. (2012) found that the odds of obtaining employment nearly tripled when young adults with disabilities were adept in self-care skills.

Blustein et al. (2016) list several independent living skills that parents voice as their primary concerns for their children with SCD. They include feeding, dressing, preparing meals, cleaning, and mobility. Grooming and personal hygiene are cited as the primary barrier to employment by the majority of employers among people with SCD (Graffam et al., 2002; Gushanas & Thompson, 2019). Chan et al. (2017) found that individuals with SCD adept in hygiene skills were more likely to obtain and maintain employment. Maintaining competitive employment is often associated with a higher quality of life, therefore a lack of hygiene skills may pose a barrier to increased happiness and mental health in the SCD community (Gushanas & Thompson, 2019).

Hygiene Practices

"Hygiene" is defined as any practice that promotes the health and wellness of an individual. An individual's ability to meet his or her health and wellness needs, including feeding, dressing, and bathing is "self-care" (Akca-Ay, 2013; Konuk-Sener et al., 2019). Personal hygiene and self-care skills can facilitate a greater life-quality by improving an individual's access to employment and education (Kraemer et al., 2003; Miller & Chan, 2008).

Access to living arrangements and support services is significantly influenced by an individual's ability to perform daily personal care tasks such as dressing and toileting (Landmark et al., 2010). In many communities, access to employment, social events, and stimulating leisure activities is dependent on an individual's ability to obtain an independent living situation. Failure

to learn hygiene and daily living skills limits an individual's ability to choose and increases dependence on caregivers. (Lancioni et al., 2009).

Gushanas and Thompson (2019) reviewed the importance of hygiene in the workplace. They found that having employees with clean clothes, hair, nails, mouth, ears, eyes, nose, and skin was important to a majority of employers as cited in Department of Health and Social Care (2010). Employers noted that when an employee lacks personal hygiene, it may distract other employees and lead to isolation from others in the workplace as cited in Employment Office (2013). Additionally, researchers have found that individuals with SCD that require help with intimate hygiene are more likely to encounter physical and sexual abuse (Basile et al., 2016; Byrne, 2018).

People with SCD often experience difficulty learning skills necessary for hygiene and daily living (McLay et al., 2021). Individuals with SCD often struggle with gross and fine motor skills, such as non-verbal reasoning, attentional control, memory, planning, and sequencing (Danielsson et al., 2012). Such difficulties make learning multi-step skills like hand washing and brushing teeth arduous (McLay et al., 2021).

Interventions Targeting Hygiene Practices

A deficit in adaptive living skills, such as personal hygiene, is highly correlated with limited independence in people with significant disabilities (Farley et al., 2009). There is a need to research interventions that target hygiene skills to enrich postsecondary outcomes for individuals with SCD.

Video Modeling

In video modeling (VM), students are presented with a demonstration of desired behaviors through video (Bellini & Akullian, 2007). Video modeling was pioneered by Albert

Bandura's research on social learning theory (Bandura, 1962). According to his theory and subsequent research, children can learn various skills and behaviors through observational learning through social models—typically represented by videos (Crain, 1992). Recently, video modeling has been used to teach social skills and correct problem behaviors to children with autism spectrum disorders (Delano, 2007). Studies have also shown effectiveness in teaching group play skills (Charlop et al., 2018; Macpherson et al., 2015), anti-bullying intervention (Rex et al., 2018), athletic activity (Carter et al., 2017), independent living skills (Wynkoop et al., 2018), and math skills (Kellems & Edwards, 2016)

Effectiveness of VM for Improving Hygiene Practices

Keen et al. (2007) conducted a study to assess the effectiveness of video modeling on "daytime urinary control" of five young participants with autism spectrum disorder. The study found that video modeling improves frequency and consistency of in-toilet urination. At the end of the study parents of the participants indicated that their children exhibited more frequent toilet visits and greater independence during toileting, including increased independence in dressing and undressing. Although the target behavior, toilet training, was never met, the subjects were able to gain independence in approximations of the behavior.

Piraneh et al. (2023) conducted a study comparing the effectiveness of video modeling and social stories on oral hygiene of individuals with autism spectrum disorder. The result indicated that participants treated with the video model had better oral hygiene when compared to participants treated with a social story. Based on a questionnaire provided by the parents of participants, researchers concluded that the participants in the video modeling group were more engaged than the participants in the social story group, possibly explaining why a video model might be more effective than a social story for a student with autism spectrum disorder.

Sharaf Almalki (2022) examined the effects of video modeling on dressing and undressing skills of individuals with multiple disabilities. In the study, 44 students with multiple disabilities were classified into two experimental groups, both of which received five sessions of 50-minute video modeling instruction. A research assistant conducted a pre-test assessment of clothing skills. After training with the VM, the participants significantly improved their clothing skills. The students' motivation was boosted, their performance increased, they became more independent and self-reliant. Most importantly, the participants were able to generalize their new-found clothing skills to different settings (i.e., bedrooms at home).

Statement of the Problem

Research demonstrates that students with significant disabilities have substantially poorer post-secondary school outcomes than their peers without disabilities (Baer et al., 2011). McConnell et al.'s (2021) study found that a significantly lower percentage of individuals with SCD enrolled in education post-high school and obtained competitive employment compared to their peers without disabilities. Self-care skills are a significant indicator of employment, higher education enrollment, and independence (Ayres & Langone, 2005; Landmark et al., 2010; McConnell et al., 2021). Therefore, the SCD population needs targeted instruction in areas related to self-care (i.e., hygiene) to bolster post-secondary school outcomes. Research in evidence-based practices, such as video modeling, is needed to determine practical and effective methods of instruction.

Statement of the Purpose

The purpose of this study was to identify if a functional relationship exists between instruction delivered by video model and improved hygiene practices of individuals with SCD.

Research Questions or Research Hypotheses

The study was guided by the following research questions:

1. Can young adults with significant cognitive disabilities (ages 14–22) use video modeling (independent variable) to increase independence in hygiene related tasks (dependent variable) as measured by the number of steps in a hygiene task analysis completed correctly and independently?
2. After receiving video modeling instruction in a hygiene-related task, can young adults with significant cognitive disabilities maintain the skills they acquire?
3. Is video modeling a socially valid way to teach hygiene skills to young adults with significant cognitive disabilities according to participants and caregivers?

Method

This section contains a description of the study's setting, participants, and procedures. The participants were obtained ethically by providing both parents and subjects with consent and assent forms (respectively) approved by the IRB. APPENDIX A contains all IRB-approved forms used in the study.

Setting

The study was conducted at a public high school in Central Utah. It is located in a mid-sized city that is home to about 120,000 residents. The community's median household income is $57,943, with 24.9% of the population living in poverty. 92.8% of the population has a high school diploma and 44.4% have a bachelor's degree or higher. The high school serves approximately 2,300 students in grades 9 through 12. The community's ethnic and socioeconomic makeup is reflected in the school; 69.3% Caucasian, 20.4% Latino, 5.4% Pacific

Islander, 3.7% Asian, and 1.2% from other multicultural groups. Of the students, 22% are considered economically disadvantaged and receive free and reduced lunch.

The high school serves 24 students who receive specialized instruction in the special education classroom for 30% or more of their day. These students have significant disabilities including, but not limited to, autism, intellectual disabilities, and other health impairments. The nature of these students' disabilities negatively impacts their ability to access curriculum in the general education setting. The 24 students are separated in two classrooms and are taught by two certified special education teachers and a team of six paraeducators (1:3 teacher, student ratio). The classrooms are conjoined by a hallway that contains two restrooms, a kitchen, and a laundry area. All data sessions were conducted in this hallway and students used the classroom's facilities to complete hygiene tasks. The information above was retrieved from the school's website and the "U.S. News & World Report". The citations were not included in the references to preserve the confidentiality of the research setting.

Participants

Participants were recruited from the high school described above. The researcher initiated contact with the special education teacher, a personal acquaintance, via text message. The teacher expressed interest in the study, prompting the researcher to provide her with a set of recruitment flyers that succinctly outlined the research. Following distribution, several flyers were returned to the teacher, marked with a checkbox indicating a desire for further details. In response, the researcher equipped the teacher with comprehensive permission slips, elucidating the study intricacies, for dissemination to those seeking more information. Ultimately, six students returned signed permission slips, granting the researcher access to review their educational records.

Selecting Participants

In order to participate in the study, participants were required to meet the following criteria: (a) range in age from 14–18; (b) have a current diagnosis of intellectual disability, autism, or another pervasive developmental disability; (c) below average scores in adaptive behaviors as evidenced by the Vineland Adaptive Behavior Scale or another adaptive behavior test and/or a score of 70 or below on a full-scale IQ test; and (d) instructors and caregivers report that the participant has major deficits in adaptive skills compared to peers of the same age and would benefit from an intervention targeting hygiene practices. All six students met study requirements.

Screening

The researcher screened the six participants to ensure that the students had the necessary prerequisite skills to benefit from a video modeling intervention. Kellems and Edwards (2016) explain that in order to benefit from a video modeling intervention, the student must have the ability to (a) visually and cognitively attend to the video, (b) imitate behaviors shown in the VM, (c) correctly match an item presented in the video to the actual item, and (d) hear audio.

To assess the six potential participants, the researcher presented each student with an VM unrelated to hygiene skills (organizing silverware) and observed how each participant interacted with the video. Observations were recorded on a rubric created by the researcher, based on Kellems and Edwards (2016) article. In order to qualify in the study, the student was required to score a 3 or higher in each category on the rubric. Five students scored 3 or higher in each category of the rubric.

Attrition

The study experienced a 20% attrition rate, with four out of the five selected participants successfully completing the entire study. One of the selected students participated in the study for 2 weeks, but had to withdraw due to an illness that spanned several weeks. Data for the individual who withdrew from the study was consistent with the other participants' performances, but only data from participants who completed all parts of the study were included. Below are the detailed descriptions of the four participants who successfully completed the study. Pseudonyms have been utilized to safeguard the confidentiality and privacy of the individuals involved in this study.

Billy

Billy is a 15-year-old white male in 10th grade. His primary language is English and English is spoken in his home. He comes from a low socioeconomic background. He is diagnosed with autism spectrum disorder. In 2010, Billy was administered Module 1 of the Autism Diagnostic Observation Schedule (ADOS) by a clinical psychologist. The results of the ADOS indicated that Billy scored within the range of autism for Social Communication and for Reciprocal Social Interactions. The overall score on the ADOS was an 18, which is within the range of autism. Most recently, Billy was administered The Gilliam Autism Rating Scale-2 (GARS-2) in 2012. Billy's scores fell into the "very likely" range, indicating that he qualifies for special education services under the label of Autism according to state IDEA criteria.

Billy attempted the nonverbal portion of the Stanford-Binet 5. However, Billy was unable to follow testing procedures required to answer questions and obtain a scaled score. Additionally, Billy was administered the Vineland Adaptive Behavior Scale, Second edition. He received a standard score of 49 and 64 on the teacher rating scale and the parent/caregiver rating scale

respectively, indicating that his adaptive behavior skills fall into the “low range” compared to his peers.

Lauren

Lauren is a 15-year-old white and Pacific Islander female in 10th grade. Her primary language is English and English is spoken in her home. She comes from a middle socioeconomic background. She is diagnosed with Down syndrome and is eligible for special education services under the IDEA label, Intellectual Disabilities. Lauren was administered the Kaufman Assessment Battery for Children, Second Edition (KABC-II) in 2013 by the school’s psychologist to assess her cognitive ability. Lauren received a standard score of 43 which is in the “extremely low range.”

Additionally, Lauren was administered the Adaptive Behavior Assessment System, Second Edition (ABAS-II) in 2013 by the school’s psychologist and received a standard score of 43 and 81 from the teacher form and the parent form respectively. Her scores indicate that her adaptive behavior skills fall into the extremely low range compared to her peers.

Alexa

Alexa is a 17-year-old white-Hispanic female in 12th grade. Her primary language is English and English is spoken in her home. She comes from a low socioeconomic background. She is diagnosed with Down syndrome and is eligible for special education services under the IDEA label, Intellectual Disabilities. Alexa was administered the Wechsler Nonverbal Assessment (WNV) in 2022 by the school’s psychologist. She received a standard score of 38, which falls in the “extremely low range.”

Additionally, Alexa was administered the Vineland Adaptive Behavior Scales, Second Edition in 2012 by the school psychologist. She received a standard score of 54 and 61 on the

teacher rating scale and parent rating scale respectively. Her scores indicate that her adaptive behavior skills fall into the extremely low range compared to her peers. Specifically, Alexa scored 50 in the Daily Living Skills section involving person care tasks, which is in the low range.

Andrew

Andrew is a 14-year-old white male in 9th grade. His primary language is English and English is spoken in the home. He comes from a middle socioeconomic background. He is diagnosed with Down syndrome and is eligible for special education services under the IDEA label, Intellectual Disabilities. He was administered the WNV in 2018 by the school's psychologist to assess his cognitive ability. He received a standard score of 38, which falls within the "clinically low range."

Additionally, Andrew was administered the Vineland Adaptive Behavior Scales, Third Edition. He received a standard score of 36 and 22 on the parent/caregiver rating scale and the teacher rating scale respectively. His scores indicate that his adaptive behavior skills fall into the "extremely low range" compared to his peers. Specifically, Andrew scored 22 in the Daily Living Skills section, involving personal care tasks, which is in the "extremely low range."

Intervention Agent

The intervention was conducted by the researcher of this study. The researcher is a White, 25-year-old female with a bachelor's degree in special education, and 2 years of teaching experience. The researcher taught Andrew and one of Billy's siblings previously, therefore rapport with Andrew, Billy, and their families existed before the study began. Due to the researcher's educational experience, no further training was required to implement the

intervention. Implications of the researcher acting as the intervention agent are discussed below in the Limitations section.

Target Tasks

The methodologies of Peterson et al. (2023), Piccin et al. (2018), Wertalik and Kubina (2017), were followed to compile a list of target hygiene skills. After which, an informal interview with the classroom teacher was conducted to determine the hygiene skill task interventions that would be most beneficial for her students. Below is the final compiled list:

1. Washing Hands
2. Brushing Teeth
3. Applying Deodorant
4. Flossing
5. Washing Face

Materials and Videos

The school's bathroom and kitchen sink area were utilized in baseline, intervention, and maintenance phases. The VMs were presented to the participants on a laptop. The researcher opened and played the VMs for the students. Implications of this procedural decision are discussed in the Limitations section. An iPhone and tripod were used to film the observation sessions to aid in the interobserver agreement process.

Data Collection Sheets

Each hygiene skill listed above was task-analyzed into small, observable steps (See Appendix G). An individual not involved in the study (male, age 24) was asked to perform the tasks while strictly following the steps in the task analysis to ensure all the necessary steps were addressed and clearly stated. The individual gave feedback and the task analysis was adjusted.

After which, another individual not involved in the study (female, age 20) performed the hygiene tasks with the revised task analysis. No feedback was given on the revised task analyses. The task analyses were transcribed on a data collection sheet. More details on the data collection process are described in the Measures and Data Collection section.

Videos

Videos were filmed using an iPhone and tripod in the researcher's home. In the VMs, the researcher performed as the model and strictly followed the tasks-analyses to complete the target hygiene skill. Voice-over instructions were added and necessary edits were made with iMovie in post-production. The instructions were voiced by the researcher and closely followed the task-analyses.

Participant Materials

Each participant was given a personal set of hygiene materials that was identical to the set of hygiene materials used in the VMs. The materials used for each target skill are listed below:

1. Washing Hands: hand soap, paper towel, trash can
2. Brushing Teeth: toothbrush, toothpaste, small cup, towel
3. Applying Deodorant: deodorant
4. Flossing: floss pick
5. Washing Face: two towels, facial soap, facial moisturizer, bin

Measures and Data Collection

Participant performance was measured using a task analysis. Task analysis creation is described above, in the Data Collection Sheet section. The researcher observed the participants and recorded the number of steps in the task analysis the participant performed correctly. If the

participant performed the step correctly the researcher inputted a score of 1 on the data collection sheet. If the participant attempted the step incorrectly, skipped a step, or performed the step incompletely, the researcher inputted a score of 0 on the data collection sheet. The order in which the participant completed the step was not prioritized. For example, in the teeth brushing interventions, if the student effectively brushed both the top and bottom halves of their mouth, they received full credit for both steps, no matter the order. At the end of the observation session, the researcher determined the percentage of steps completed correctly.

Procedures

Selecting a Skill

Participants were asked to perform each target hygiene skill three times to sift out hygiene skills that had been mastered. If the student scored an average of 75% or higher on the skill, the skill was considered mastered and removed from the participant's intervention schedule. Each participant's unmastered hygiene skills were assigned numbers and with a random number generator were assigned three hygiene skills. The hygiene skills interventions were presented to each participant in ascending score order.

Baseline

The researcher was present at the data session with a task analysis data recording sheet and a video recording device to film the participant so that another observer could verify that data was collected properly. The student was brought to an area where all the materials necessary to complete the task had been set out. The researcher provided the participant with one verbal prompt to complete the hygiene task. For example, in a tooth brushing intervention, the researcher said, "brush your teeth." The researcher recorded the steps that the student completed correctly on the task analysis data recording sheet. After the observation session is complete, the

observer calculated the percentage of steps the participant performed correctly. The baseline phase continued until a stable baseline was achieved with a minimum of 6 data points.

Intervention

After the baseline phase was completed, in the same location and with the same materials, the researcher presented the participant with the video model displayed on a computer. The researcher gave the participant one prompt, "watch the video." and then pressed play for the participant. It was determined by the researcher that operating the video presentation for the participant would be ideal for the learning of the participants due to the nature and significance of their disabilities. When the video was complete the researcher provided the student with one prompt, "now it's your turn." and removed the computer. The researcher recorded the number of steps the student performs correctly on the task analysis data recording sheet. If the observer noticed that the participant is engaging with the materials in a way that was not demonstrated in the VM or if the participant stops moving, the researcher prompted the student to use technology, "do what you saw in the video." The researcher delivered this prompt as many times as was necessary to redirect the student to the task, but no physical prompting was permitted. The intervention phase spanned at least six data sessions or until mastery criteria was met (80% steps performed correctly).

Maintenance

The researcher repeated baseline procedures to determine the number of steps in a hygiene task the student can perform correctly without the aid of a video model and prompts to use technology: the researcher brought the participant to an area with materials set out to complete a hygiene task. The researcher gave the participant one prompt to complete a hygiene task. For example, if the hygiene task was to apply deodorant, the researcher provided the

participant with the prompt, “put on deodorant.” The researcher, then, recorded the number of steps the student performed correctly on the task analysis data recording sheet. The maintenance phase continued until stable data was achieved, with a minimum of 3 data points.

The researcher began the study in November and due to time constraints with the school’s winter break, the maintenance phase began as soon as 3 days after some intervention phases had been completed and stable data was not always achieved. Implications of this circumstance are discussed in the Limitations section.

Implementation Fidelity

A fidelity checklist was created to ensure that procedures, prompts, and data collection were consistent across all phases of the intervention. The checklist contained scripted prompts, a procedure for setting up the intervention materials, a list of steps specific to each phase of the intervention, and data collection procedures. The intervention fidelity checklist was checked off at every data collection session to ensure that all phases of the intervention were implemented precisely. The researcher acted as the observer in this study and self-monitored intervention fidelity with the checklist. The fidelity checklist was followed with 100% accuracy across phases and participants. Observation sessions were filmed so that multiple observers could verify fidelity of the intervention. Implications of the researcher acting as the intervention agent are discussed below in the Limitations section; however, a singular observer in a singular setting streamlined the intervention fidelity verification process.

Additionally, the researcher monitored the dosage of the intervention with a timer. The classroom teacher and researcher decided that observation sessions would not exceed 30 minutes in total per day. An observation schedule was developed and followed by the researcher to ensure that participants avoided fatigue and did not miss academic instruction time.

Internal Validity

The independent variable in this study is personal hygiene instruction delivered by a video model. Each video model presented an individual completing a task analysis. The video models were created by the researcher.

The dependent variable in this study is the ability of a participant to complete a multi-step hygiene task. The dependent variable was measured during each data session of intervention by two scorers using the same measures and procedures across phases.

Research Design

This study utilized a multiple baseline across behaviors design with multiple participants (Kennedy, 2007). The intervention focused on skill development, making the reversibility highly unlikely. Thus, experimental control was established by examining the effect of video modeling on hygiene skill acquisition of four participants with significant cognitive disabilities. The four participants were assigned hygiene tasks randomly, described in the Selecting a Skill section above. Multiple baseline designs have several advantages: an intervention does not need to be withdrawn in order to establish a functional relationship between variables and they are fairly straightforward to conceptualize in applied settings. This design does, however, require more time and resources since treatment must be withheld during the extended baselines of the second and third hygiene skills to determine whether the effects are due to the intervention or simply to the passage of time (Kennedy, 2007).

Interobserver Agreement

Overall interobserver agreement was 95%. Each data session was recorded to aid in calculating interobserver agreement. 33% of sessions in each phase (baseline, intervention, and maintenance), for each participant, were randomly selected to be scored by a separate researcher.

The individual chosen has experience with special education and was trained in data collecting procedures prior to scoring the recordings. Interobserver agreement was then calculated using the interval agreement method (Kennedy, 2007). The researcher looked at each task analysis and determined the number of steps both researchers agreed upon. The total number of agreements was divided by the total number of steps in the task analysis and multiplied by 100 to determine the percentage of agreement. The breakdown of percent agreement for each phase and each participant is displayed in Table 2.

Social Validity

The intention behind this study was to teach students with disabilities socially significant skills to prepare them for independence in post-secondary life. Fawcett (1991) explains that "applied researchers hope that the behavioral goals they select for study are significant … and that the effects produced are important for clients." To assess whether the study's outcomes were significant and important to the clients, participants were presented with a short questionnaire. The nature of the participants' disabilities impacts their ability to read and verbally express themselves. To accommodate for these needs, the researcher developed a picture-supported social validity questionnaire. Informal interviews were conducted with the classroom teacher and parents/caregivers via telephone to gauge their views on the intervention. Their responses and the participants' responses were recorded and summarized as overall positive or negative and considered in the evaluation of the study's effectiveness.

Data Analysis

Data was analyzed with visual analysis in accordance with Horner et al.'s (2005) procedures. Analyzing the graphs allowed the researcher to interpret patterns and potential functional relationships.

Results

Percentage of Steps Completed Correctly

To address the first research question, three targeted hygiene tasks per participant were examined to determine how the dependent variable (percentage of steps completed correctly) related to the independent variable (the intervention). Below are the individual results for the selected tasks:

Billy

During the baseline phase of the brushing teeth task, Billy completed 3% of the steps correctly over six sessions. After watching the VM in the intervention phase, Billy completed 31% of the steps correctly. After three sessions, Billy reached 100% performance accuracy for three consecutive data sessions. In session nine of the brushing teeth intervention, Billy did not wait until the VM had finished to start the hygiene task. Instead, he followed along with the video.

During the baseline phase for the face washing task, Billy completed 3% of the steps correctly over nine data sessions. After the introduction of the intervention, Billy's performance accuracy increased to 18%. After two data sessions, Billy was able to complete 100% of the steps correctly for three consecutive data sessions. In sessions 11 and 13, Billy, again, followed along with the VM during the intervention phase of washing his face instead of waiting for the VM to finish.

During the baseline phase for the applying deodorant task, Billy completed 5% of the steps correctly across 10 data collection sessions. After receiving the intervention, Billy's performance accuracy immediately rose to 81%. He achieved 90% accuracy for five consecutive sessions in the intervention phase.

Lauren

During the baseline phase for the face washing task, Lauren completed 9% of the steps correctly in the first observation session and then increased her accuracy to 12% of the steps correctly for five consecutive sessions. Her performance accuracy in the intervention phase immediately increased to 97% for six consecutive sessions in the intervention phase.

During the baseline phase for the flossing task, Lauren initially performed the task with 42% accuracy for two consecutive sessions. After which her accuracy decreased to 26%, rose to 32% for three consecutive sessions, and then decreased again to 26% for three consecutive sessions. After receiving the intervention, Lauren's accuracy increased to 89%. She achieved 100% accuracy in the second session of the intervention phase.

During the baseline phase for the teeth brushing task, Lauren initially performed 83% of the steps correctly. In subsequent sessions, Lauren's performance decreased to 55% and then eventually to 48% for four consecutive sessions. Due to her variability in performance, the researcher determined that the intervention would still be beneficial. Immediately after receiving the intervention, Lauren increased her performance accuracy to 97%, she maintained 97% accuracy for four sessions in the intervention phase.

Alexa

During the baseline phase of the applying deodorant task, Alexa's performance was 0% for six consecutive sessions. Her accuracy immediately increased to 100% in the intervention phase and maintained at 100% for the final three sessions in the intervention phase.

During the baseline phase of the teeth brushing task, Alexa completed 3% of steps correctly for nine consecutive sessions. Her performance accuracy in the intervention phase

immediately increased to 97%. After three observation sessions, she obtained 100% performance accuracy for three consecutive sessions.

During the baseline phase of the hand washing task, Alexa completed 21% of the steps correctly for seven consecutive sessions. After receiving the intervention, her performance accuracy increased to 86%. She was able to reach 100% accuracy for four consecutive sessions.

Andrew

During the baseline phase for the hand washing task, Andrew had a 0% performance accuracy for six consecutive sessions. When the intervention was delivered, his accuracy increased to 64%. After nine intervention data sessions, Andrew was able to obtain a 93% performance accuracy.

During the baseline phase for the teeth brushing task, Andrew performed 3% of the steps correctly for three consecutive sessions and then 0% of the steps correctly for seven consecutive sessions. When the intervention was introduced, his performance accuracy increased to 83%. After three data sessions, he was able to perform 86% of the steps correctly.

During the baseline phase of the deodorant task, Andrew initially performed the task with 19% accuracy, but his performance decreased to 0% for eight consecutive sessions. After receiving the intervention, his performance accuracy immediately increased to 48%. After five intervention data sessions, Andrew reached mastery criteria, performing with 86% accuracy for two consecutive sessions. To reach mastery criteria, Andrew required up to three prompts per data session to “do what you saw in the video.” He performed with 86% accuracy for the three final data sessions in the intervention phase.

Task Maintenance

To address the second research question, the researcher withdrew the intervention to determine whether the participants were able to maintain their skills without the aid of a VM or prompts to use the technology. Due to time constraints with the school's winter break, the maintenance phase, in some cases, began as soon as 3 days after intervention phases had been completed. Stable data was not always achieved. The individual results for the selected tasks' maintenance are shown below:

Billy

During the maintenance phase of the teeth brushing task, Billy initially completed 97% of the steps correctly. In the maintenance phase, in the second maintenance data session, Billy performed 76% of the steps correctly, which falls slightly below the mastery criteria. In the final maintenance data session, his performance accuracy returned to 97%. During the maintenance phase of the face washing task, Billy performed 88% of the steps correctly. His performance accuracy increased to 94% in the final two data sessions. During the maintenance phase for the applying deodorant task, Billy performed with 90% accuracy for three consecutive sessions.

Lauren

During the maintenance phase of the face washing task, Lauren performed 97% of the steps correctly initially. She performed with 92% accuracy for the final two data sessions. During the maintenance phase for the flossing task, Lauren performed the steps with 89% accuracy initially. She performed with 95% accuracy for the final two data sessions. During the maintenance phase for the teeth brushing task, Lauren performed with 86% initially. She scored 83% accuracy on the second maintenance data session and 97% on the final maintenance data session.

Alexa

During the maintenance phase for the applying deodorant task, Alexa performed 95% of the steps correctly initially. She performed with 90% accuracy for the final two maintenance data sessions. During the maintenance phase for the teeth brushing task, Alexa performed 97% of the steps correctly for three consecutive sessions. During the maintenance phase for the hand washing task, Alexa performed 100% of the steps correctly for three consecutive data sessions.

Andrew

During the maintenance phase for the hand washing task, Andrew performed 93% of the tasks correctly initially. In the second data session, he performed the steps with 86% accuracy. In the final data collection session, his performance accuracy returned to 93%. During the maintenance phase for the teeth brushing task, Andrew performed the steps with 83% accuracy for three consecutive data sessions. During the maintenance phase for the applying deodorant task, Andrew initially performed the steps with 81% accuracy. In the final two data sessions, he performed the steps with 86% accuracy.

Social Validity Summary

To address the third research question, a social validity survey was given to the participants, their parents, and the classroom teacher to determine whether the individuals and stakeholders in this study felt that the intervention was useful and practical.

Participants

Overall, the participants responded positively to the intervention. Each participant answered three picture-supported questions. Participants with greater expressive language ability were given time to make additional comments. All four participants indicated that they enjoyed watching the videos. Lauren mentioned that she “really liked” the videos and that they were

"funny to watch." All four participants indicated that they had a good time during the intervention. Lastly, three out of the four participants indicated that they would like to keep using the videos in the future. Billy, however, said that he thought that the videos "were boring" and that he would not want to use the videos again. When asked for further details on what he specifically found boring about the videos, Billy answered "I don't know." The researcher asked if we had used the videos too many times and Billy answered "yes." Perhaps Billy would have benefitted from watching the videos and practicing the skills less frequently.

Parents

When parents were asked if they had seen an improvement in their child's hygiene skills, three out of four parents indicated that they saw an improvement. Andrew's mom noticed that Andrew brushed his teeth more independently. Lauren's parents saw her putting deodorant on more frequently and with less prompting. Alexa's parents noticed that she washed her hands more frequently. Billy's mom did not notice any specific improvements; however, she explained that Billy is really private and does not like his mom hovering over him. Next, parents were asked if they would ever use videos as a way to teach their children new skills at home. All parents indicated that they would use videos as an instructional tool in the future. Billy's mom explained that he uses videos to teach himself new skills, like how to draw his favorite characters, already. Andrew's mom indicated that she would use videos to teach Andrew new skills, but she would not likely make the videos herself. We talked about the availability of instructional videos on the internet. Both Alexa and Lauren's mothers explained that they had never given much thought to using videos as instructional tools, but they would like to try it.

Teacher

Overall, the classroom teacher was enthusiastic about the intervention. She felt that the video models would be easy to make and would be engaging to the majority of her students. She enjoyed having someone work one-on-one with her students and mark their progress daily. She explained that she finds it very difficult to collect data on student progress outside of their individualized education plans. She wants to continue the intervention in her classroom with one of her paraeducators; however, she wishes that she had more help in her classroom because there is not always a paraeducator to spare. After the intervention had been completed, the teacher and the researcher chose videos of each participant to show to parents. The classroom teacher explained that she wants to film her students' progress more often because many of her students cannot express their achievements to parents at home.

Discussion

The purpose of this study was to determine the effectiveness of using VM to teach hygiene skills to participants with significant cognitive disabilities. The results of this study add to the expansive literature supporting the effectiveness of VM to teach life skills to individuals with disabilities (Keen et al., 2007; Kellems & Edwards, 2016; Piraneh et al., 2023; Sharaf Almalki, 2022). Specifically, this study provides additional evidence that VM is an effective tool to teach hygiene skills including, washing hands, brushing teeth, applying deodorant, flossing, and washing the face. These findings also support the claim that VM is a potent instructional tool in a classroom setting (Field, 2009) and can be used effectively to prepare students for post-secondary education (Stanfield, 2019).

Keeping in mind that the maintenance phase was abbreviated due to time constraints with the school's break schedule, the maintenance results provide additional evidence to the durability

of VM delivered instruction. All participants maintained their skills above the mastery level criteria for two or more maintenance data sessions. These results are consistent with the findings of Boudreau and D'Entremont (2010). They demonstrate the accuracy of skills taught by VM to individuals with disabilities is either maintained or decreased slightly when the VM is withdrawn; however, the accuracy of the individual's skills persists at a level surpassing observation in baseline conditions. Additionally, in the social validity survey, three out of four parents indicated that they noticed an improvement in their child's hygiene skills at home. These findings are consistent with that of Bellini and Akullian (2007) that skills taught by VM are maintained over time and are transferred across persons and settings.

The study's social validity findings are consistent with the findings of Wilson (2023), demonstrating that instruction delivered by VM is seen as an "acceptable and practical intervention tool" by practitioners. The classroom teacher involved in this study observed the researcher implement the intervention and indicated in the social validity survey that she would like to continue VM interventions in her classroom in the future. Additionally, consistent with the findings of Kellems and Morningstar (2012), all four participants indicated that they enjoyed watching the videos. When interventions are perceived as meaningful and relevant, participants and stakeholders are more likely to be invested in and benefit from the process (Sundel, 1994). The positive feedback provided by the participants indicates that VM is a socially valid method of instruction and thus an effective way of increasing the engagement of students.

Limitations

Several limitations were identified in this study. To begin, the researcher acted as the interventionist. While this circumstance aided in the implementation fidelity of the intervention, the researcher's direct involvement as the interventionist in a school-based study precludes the

opportunity to gauge the ease with which teachers and paraeducators could execute the intervention and the level of training required to ensure fidelity. The absence of data on intervention implementation by educational professionals undermines the study's ability to provide insights into the intervention's broader applicability and the resources necessary to support its effective deployment beyond the research context.

The interventionist's decision to initiate the VMs for the participants, rather than conduct pre-training sessions to teach participants to start the VMs independently, was influenced by time constraints on the study. The study began in early November 2023 and due to the teacher's and researcher's schedules was required to end at winter break, the end of December 2023. The lack of pre-training leaves uncertainty regarding the participants' proficiency in initiating the videos unprompted. Consequently, the study's methodology may obscure the true impact of the intervention and limit the ability to draw robust conclusions about its efficacy in real-world settings where independent usage is essential.

Additionally, the time constraint imposed on the study limited the maintenance phase of the intervention to just three observation sessions per participant. This abbreviated timeframe posed challenges in achieving stable data and hindered the study's ability to assess maintenance of skill accuracy in the long-term. Consequently, the study's findings may provide only a partial understanding of the intervention's effectiveness in sustaining behavioral improvements over time.

Suggestions for Future Research

Future research should consider utilizing classroom teachers and staff as implementers and data collectors when studying school-based VM interventions to identify the feasibility of creating videos and presenting VMs to students with disabilities. Additionally, future research

should examine effective pre-training procedures for VM interventions so that students are able to obtain greater independence in the skills they are practicing. Lastly, future research should assess the durability of skills taught by VM by extending the maintenance phases of interventions.

Implications for Practitioners

Independence in hygiene skills opens an individual's access to enriching postsecondary education, employment, and living opportunities (Ayres & Langone, 2005; McConnell et al., 2021). Individuals with significant cognitive disabilities typically have deficits in working memory, motor-skill challenges, and unique communication needs. These circumstances make learning multi-step skills, such as personal hygiene skills, extremely challenging (Agran et al., 2020; Kleinert et al., 2009; Pellegrino et al., 2003). VM is an evidenced-based practice (Bellini & Akullian, 2007; Field, 2009). Therefore, the present study's intervention can be considered as an effective tool for practitioners targeting hygiene skills.

Conclusion

The present study examined the effect of a VM intervention on the acquisition of hygiene skills of individuals with significant cognitive disabilities. By comparing the participants' baseline performance accuracy to maintenance performance accuracy established a functional relationship between the dependent and independent variables. All students showed significant improvement in their performance accuracy after receiving a VM intervention for three hygiene related tasks. The participants' skills were maintained after the VM was removed. Participants, parents, and the classroom teacher responded positively to the intervention, providing evidence for the social validity of VM interventions. Further research is needed to determine the durability

of skills taught by VM and the feasibility of VM interventions conducted by school staff in the classroom setting.

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Tables

Table 1

Participant Information

Participant	Age	Classification Category (IDEA)	Adaptive		Cognitive	
			Test	Score	Test	Score
Billy	15	ASD	Vineland	49	Stanford-Binet 5	Unable to test
Lauren	15	ID	ABAS-II	43	KABC-II	43
Alexa	17	ID	Vineland	54	WNV	38
Andrew	14	ID	Vineland	36	WNV	38

Note. This table displays composite standard scores from teacher rating scales on adaptive assessments and standard scores on cognitive assessments. A score of 85 or higher is considered typical for the adaptive and cognitive assessments listed above.

Table 2

Average Individual Percentages of Interobserver Agreement

Participant	Hygiene Skill	Baseline	Intervention	Maintenance
Billy	Brushing Teeth	97%	93%	97%
	Washing Face	95%	97%	94%
	Applying Deodorant	90%	95%	100%
Lauren	Washing Face	93%	96%	94%
	Flossing	89%	98%	100%
	Brushing Teeth	99%	99%	100%
	Applying Deodorant	98%	95%	100%
Alexa	Brushing Teeth	84%	92%	90%
	Washing Hands	88%	93%	100%
Andrew	Washing Hands	100%	93%	95%
	Brushing Teeth	100%	93%	90%
	Applying Deodorant	100%	97%	86%

Table 3

Average Individual and Overall Percentage of Performance Accuracy

Hygiene Skill	Participant	Baseline	Intervention	Maintenance
Brushing Teeth	Billy	3%	81%	90%
	Lauren	59%	96%	89%
	Alexa	3%	97%	97%
	Andrew	1%	87%	83%
	Overall	17%	90%	90%
Washing Face	Billy	3%	75%	92%
	Lauren	12%	97%	94%
	Overall	8%	86%	93%
Applying Deodorant	Billy	5%	89%	90%
	Alexa	0%	97%	92%
	Lauren	3%	74%	84%
	Overall	3%	87%	93%
Washing Hands	Alexa	18%	95%	100%
	Andrew	0%	72%	91%
	Overall	9%	84%	96%
Flossing Teeth	Lauren	32%	97%	93%

Table 4

Number of Steps on Hygiene Skill Task Analyses and Length of VM

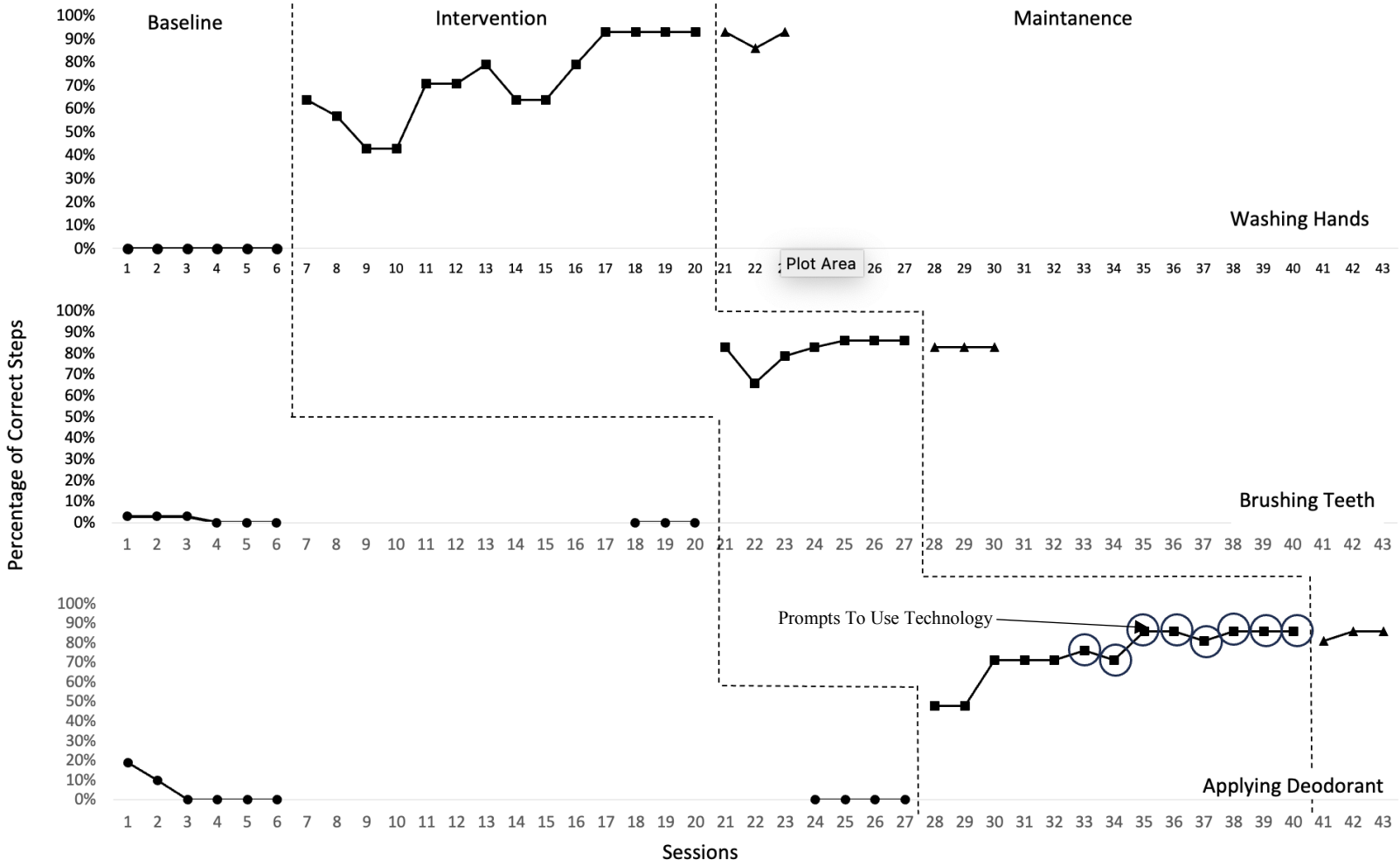
Hygiene Skill	Number of Task Analysis Steps	Length of VM (minutes)
Washing Hands	14	1.34 m
Brushing Teeth	29	3.08 m
Applying Deodorant	21	1.15 m
Flossing	19	1.55 m
Washing Face	34	3.24 m

Note. See APPENDIX G for each hygiene skill's task analyses.

Figures

Figure 1

Percentage of Steps Completed Correctly by Andrew



Prompts to Use Technology	
Session	# of Prompts
33	1
34	2
35	3
36	2
37	1
38	3
39	3
40	3

Figure 2

Percentage of Steps Completed Correctly by Alexa

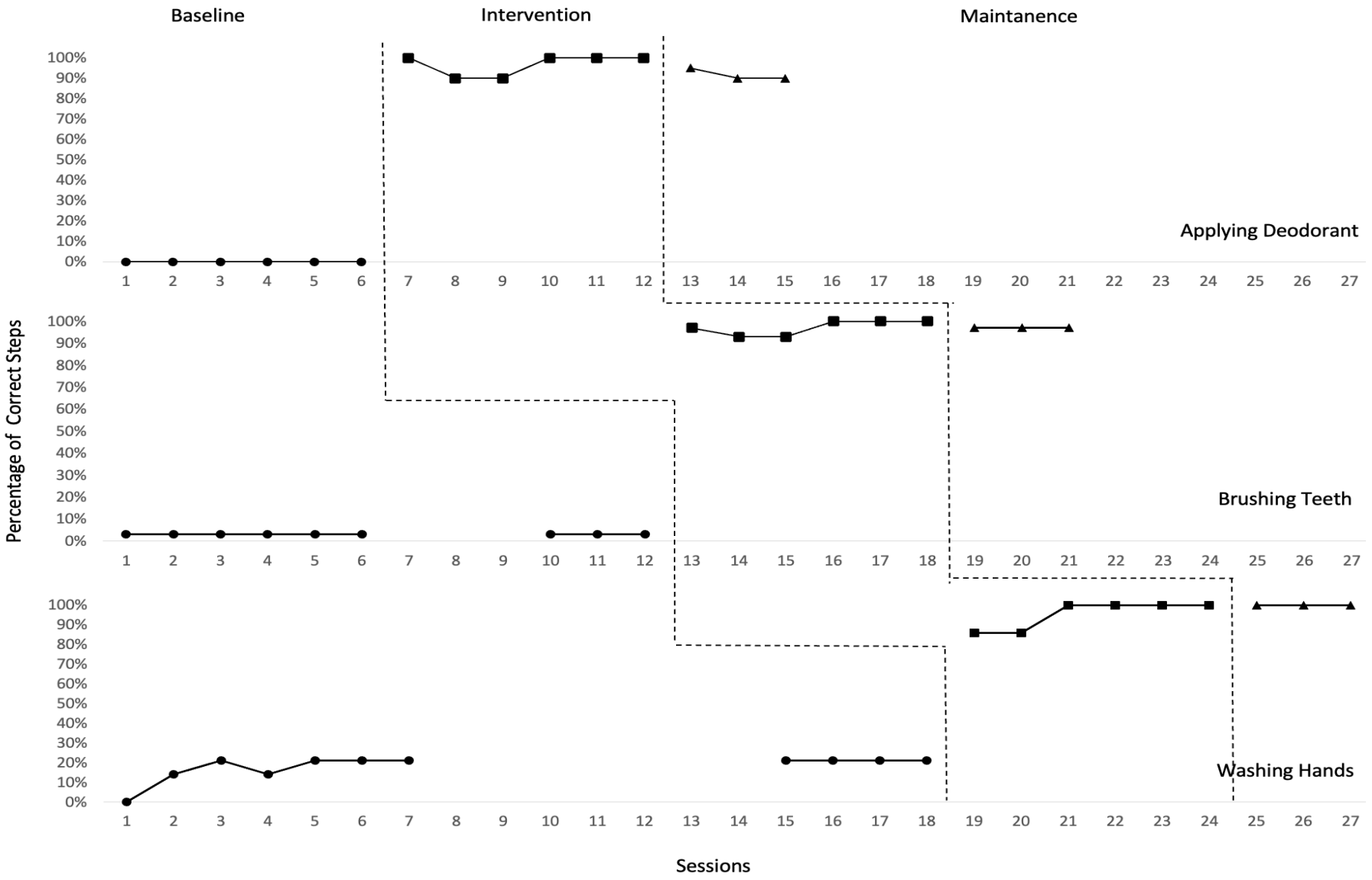


Figure 3

Percentage of Steps Completed Correctly by Lauren

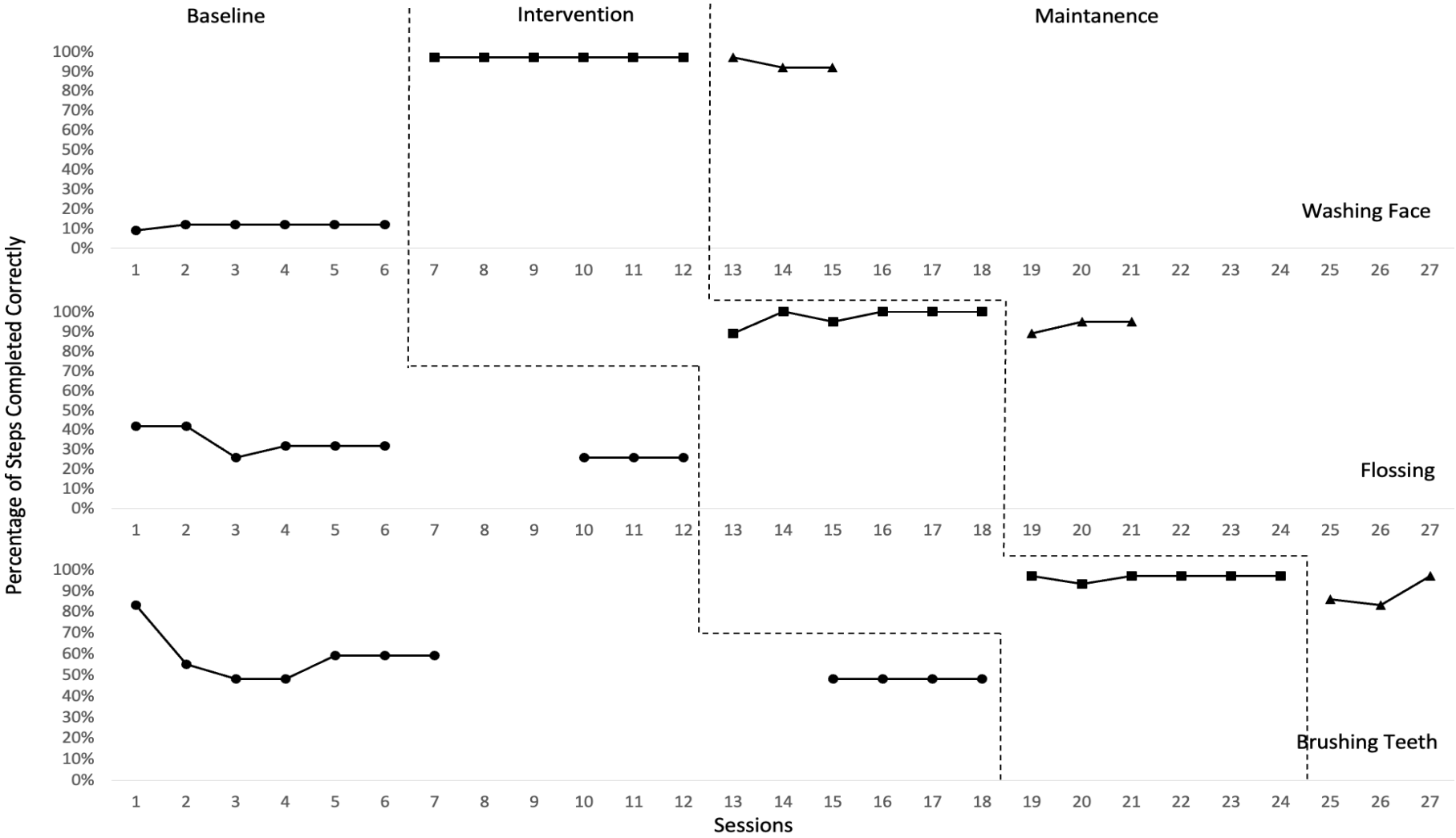
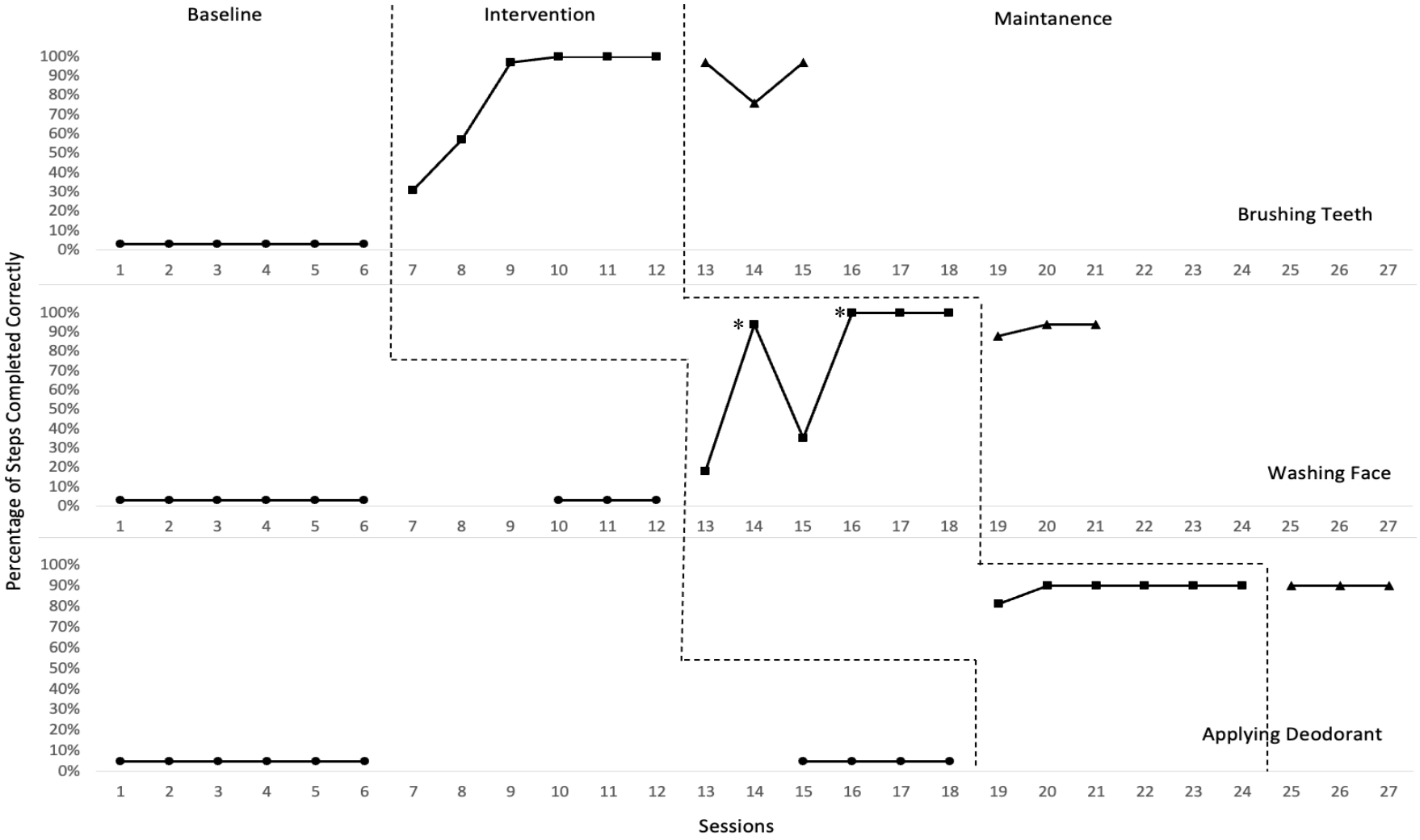


Figure 4

Percentage of Steps Completed Correctly by Billy



Note. Sessions in which Billy completes the hygiene task while following along with the VM are marked with an asterisk (*).

APPENDIX A

Review of Literature

Introduction

Adaptive living skills are integral for accessing and navigating current and future environments (Ayres et al., 2011). Personal hygiene, for example, can limit an individual's access to enriching postsecondary employment and living situations. McConnell et al. (2021) found that self-care skills are a significant indicator of employment, higher education enrollment, and independence. Students that obtained greater independence in hygiene routines such as hand washing, tooth brushing, and toileting, reportedly had higher rates of employment and enrollment in postsecondary education (McConnell et al., 2021). Siperstein et al. (2013) found that only 34% of individuals with intellectual disabilities between the ages of 21–64 are employed and only 18% are employed in a competitive job as cited in the U.S. Department of Labor, Bureau of Labor Statistics (2013). There is a need to research interventions that target postsecondary outcomes for individuals with significant cognitive disabilities. Deficits in working memory, motor-skill challenges, and unique communication needs make learning multi-step skills, such as personal hygiene skills, extremely challenging for individuals with disabilities (Agran et al., 2020; Kleinert et al., 2009; Pellegrino et al., 2003). Thus, many individuals exit the public school system without the necessary skills to prepare them for post-secondary success (McConnell et al., 2021).

Significant Cognitive Disabilities

Individuals with significant cognitive disabilities (SCD) are those who (a) require long-term support and intensive individualized instruction and (b) those who use substantially adapted materials to access information and obtain new skills (National Center and State Collaborative–

Assessment FAQ, 2012). In education, students with SCD are administered alternate assessments, involving multiple adaptations and supports, so that educators may gain a more accurate depiction of the student's academic abilities (Kleinert et al., 2015). Under the Individuals with Disabilities Education Act only 1% of students qualified to receive alternate assessments (Kleinert et al., 2015; U.S. Department of Education, 2005).

Though individuals with SCD occupy a small percentage of special education, the group represents an extremely heterogeneous subset of students. The term SCD was coined in 2005 by the U.S. Department of Education to describe students with a wide range of disabilities who receive special education services, including those with autism, intellectual disabilities, and multiple disabilities (Erickson & Geist, 2016). Unique and varying communication needs demonstrates one aspect of variability in the SCD community. A survey conducted by McConnell et al. (2021) suggests that 70% of students with SCD used symbolic language to communicate, including verbal or written words, signs, Braille, or language based augmentative systems to request. Only 17% of students communicated intentionally on a non-symbolic level, using "gestures, pictures, and objects." Of those surveyed, 13% of students used no clear communication system, relying, primarily, on cries and facial expressions to self-advocate (2021). Additionally, Students with SCD commonly experience a broad range of motor abilities and sensory needs (Towles-Reeves et al., 2012; Kleinert et al., 2015). The U.S. Department of Education estimates that about 10% of the SCD population is defined as having the "most significant cognitive disabilities." These students, in addition communicating at a pre-symbolic level, exhibit low levels of engagement, limited motor skills, and multiple sensory impairments (2005). Additionally, students in the category often have health issues that impact regular school attendance (Kearns et al., 2011; U.S. Department of Education, 2005). In a study conducted by

The Colorado Alternate Assessment Collaborative, researchers collected information from teachers concerning student performance and need for physical movement support. Of the 165 students surveyed, physical support needed to complete an academic task ranged from significant physical support to no physical support, further demonstrating the dynamic nature of the SCD community (Kleinert et al., 2009).

Kleinert et al. (2009) notes that students with SCD have "highly individualized capabilities and needs for support." Many instructional strategies and assessments are not designed to uncover such capabilities and fail to produce an accurate picture of a student's capabilities. In addition to unique communication a motor needs, individuals with SCD often struggle with short-term and long-term memory retrieval relative to their same aged peers (Bergeron & Floyd, 2006; Pellegrino et al., 2003). Although researchers have developed strategies targeting memory retention in individuals with SCD (Mastropieri & Scruggs, 2004), deficits in learning to complete multi-step tasks academic and life skills still pose a significant challenge (Agran et al., 2020; Kleinert et al., 2009; Pellegrino et al., 2003).

Post-Secondary Outcomes for Individuals With SCD

Quality of life for individuals with SCD, historically has been based on objective health assessments. As a result, the subjective matters of health, such as mental health and emotional states, have largely been overlooked, especially for individuals who are less- or non-verbal. (Lyons & Cassebohm, 2010). Recently, more research has appeared, targeting interventions aimed at improving quality of life in the SCD community. McConnell et al. (2021) conducted an extensive literature review to identify nonacademic skills, behaviors, expectations, and experiences that improve post-secondary outcomes for students with SCD; however, they recognized that several supports and assessments had been developed to improve the transition

experience for individuals with mild and moderate disabilities, but these resources rarely applied to students with SCD (2021). The Baer et al. (2011) study further explained that students with significant intellectual disabilities have substantially poorer post-secondary outcomes than their peers with other disabilities. The study compares post-secondary outcomes of students with" intellectual disabilities and students with learning disabilities, emotional disabilities, and other health impairments." They found that 17% of the students they sampled with intellectual disabilities enrolled in education after high school and 29% obtained employment. 40% of students with other disabilities sampled in the study enrolled in education after high school and 39% obtained employment.

McConnell et al. (2021) found that students with SCD who could read were often integrated into classrooms with peers of the same age. These students were also reported to have higher functional academic skills and had a higher likelihood of completing 3-step tasks (Baer et al., 2011; Foley et al., 2013). When individuals with SCD search for employment, they require more than just work experience. They require social and professional networks to locate employers that are willing to hire them (Brolin et al., 1975). In the United States, entering employment is a substantial marker of success, however; researchers find that young adults with SCD often leave high school "without the skills, supports, and connections that lead to meaningful employment" (Carter et al., 2012, p. 58). Additionally, young adults with disabilities who could easily communicate were four times more likely to be employed after high school (Carter et al., 2012; Lipscomb et al., 2012). The odds of employment nearly tripled when young adults were adept in self-care skills, including, independently navigating outside of the home and high ratings of classroom skills given by teachers (Carter et al., 2012).

Additionally, self-care skills are a significant indicator of employment, higher education enrollment, and independence (McConnell et al., 2021). Blustein et al. (2016) lists several independent living skills that parents voice as their primary concerns for their children with SCD. They include, feeding, dressing, preparing meals, cleaning, and mobility. Further, researchers found that an individual's ability to live independently and care for their own health issues was an indicator of quality of life for individuals with SCD and their caretakers (Heal & Rusch, 1995; Rossetti & Hall, 2015).

Grooming and personal hygiene are cited as the primary barrier to employment by the majority of employers among people with SCD (Graffam et al., 2002; Gushanas & Thompson 2019). Chan et al. (2017) found that individuals with SCD adept in hygiene skills were more likely to obtain and maintain employment. Maintaining competitive employment is often associated with a higher quality of life, therefore a lack of hygiene skills may pose a barrier to increased happiness and mental health in the SCD community (Gushanas & Thompson, 2019).

Hygiene Practices

"Hygiene" is defined as any practice that promotes the health and wellness of an individual. An individual's ability to meet his or her health and wellness needs, including feeding, dressing, and bathing is "self-care" (Akca-Ay, 2013; Konuk-Sener et al., 2019). Personal hygiene and self-care skills can facilitate a greater life-quality by improving an individual's access to employment and education (Kraemer et al., 2003; Miller & Chan, 2008).

Access to living arrangements and support services is significantly influenced by an individual's ability to perform daily personal care tasks such as dressing and toileting (Landmark et al., 2010). In many communities, access to employment, social events, and stimulating leisure activities is dependent on an individual's ability to obtain an independent living situation. Failure

to learn hygiene and daily living skills limits an individual's ability to choose and increases dependence on caregivers. (Lancioni et al., 2002).

Gushanas and Thompson (2019) reviewed the importance of hygiene in the workplace. They found that having employees with clean "clothes, hair, nails, mouth, ears, eyes, nose, and skin" was important to a majority of employers (as cited in Department of Health and Social Care, 2010). Employers noted that when an employee lacks personal hygiene, it may distract other employees and lead to isolation from others in the workplace (as cited in Employment Office, 2013).

Additionally, researchers have found that individuals with SCD that require help with intimate hygiene are more likely to encounter physical and sexual abuse (Basile et al., 2016; Byrne, 2018). In a study conducted by Sullivan and Knutson (2000), 50,000 school aged children in the United States were examined and researchers found that individuals with intellectual disabilities were 3.4–7.6 times more likely to be abused than their nondisabled peers. Byrne (2018) conducted a study and discovered that children with behavioral difficulties and intellectual disabilities were more likely to experience sexual abuse than children without disabilities. Furthermore, a study conducted by Casteel et al. (2008) demonstrated that women with severe disabilities that impacted daily living skills were more likely to experience sexual abuse.

People with SCD often experience difficulty learning skills necessary for hygiene and daily living (McLay, 2021). Individuals with SCD often struggle with gross and fine motor skills, such as non-verbal reasoning, attentional control, memory, planning, and sequencing (Danielsson et al., 2012). Such difficulties make learning multi-step skills like hand washing and brushing teeth arduous (McLay et al., 2021). The inability to physically manipulate the

environment in the same way as the general population inhibits an individual's learning. A child with SCD might observe a parent washing their hands and accessing reinforcement by completing the task. When the child attempts to imitate the parent's behavior by turning on the faucet, for example, motor and cognitive impairments may prohibit the child from doing so. The task might even become aversive to the child due to the amount of energy it requires and the lack of reinforcement it yields. As a result, the individual with SCD is inhibited from building a repertoire of hygienic behavior and must depend on a caregiver for assistance (Farley et al., 2009).

Interventions Targeting Hygiene Practices

A deficit in adaptive living skills, such as personal hygiene, is highly correlated with limited independence in people with significant disabilities (Farley et al., 2009). There is a need to research interventions that target hygiene skills to enrich postsecondary outcomes for individuals with SCD.

Behavior Change Model

Researchers have used interventions that integrate behavior change models to increase healthy habits in individuals with and without disabilities by utilizing behavioral principles such as shaping and differentially reinforcement (Davis et al., 2015). Behavior changes interventions target the capacity, opportunity, and motivation of participants (Waldron et al., 2019). In the context of oral hygiene, a capacity-based intervention might teach the physical skills involved in tooth brushing (i.e. holding the toothbrush, squeezing the toothpaste, using circular motions on the teeth). Opportunity-based interventions, considers elements beyond the individual, teaching individuals with ID how to perform oral hygiene practices in different settings. It is important to expose individuals with disabilities to different settings where a repertoire of behavior may be

useful in order to promote generalization. Researchers have observed that individuals with disabilities often have difficulty generalizing, or relating new stimuli to past reinforcement experiences (De Marchena, 2015).

Visual Verbal Integration Model

Zhou et al. (2019) conducted a study examining the visual-verbal integration model (VVIM) and its effectiveness in teaching elementary students how to dispense a proper amount of toothpaste on a brush. Visual aides are a research base strategy of prompting. They allow the instructor to fade more invasive verbal prompts and equip students with greater independence.

Visual aids were constituted by a group of photographs, showing various amounts of toothpaste dispensed on a kids' toothbrush. For those who dispensed inappropriate amounts of toothpaste, visual aids were used to show them how much toothpaste should be dispensed at Phase I. If the visual aids were insufficient to control the toothpaste amount, verbal instructions were provided at Phase II. After the intervention, almost 85% participants achieved the expected amount of toothpaste.

Focusing the Intervention on Caregivers

Binkley et al. (2014) conducted a study aiming to improve the oral health of residents in assisted living situations by providing education to employed caregivers. First researchers required caregivers to sign a behavioral contract which required caregivers to commit to improving the oral health of their clients. Next, researchers provided caregivers with a PowerPoint presentation explaining proper oral health techniques. Caregivers then watched a professional hygienist clean a client's teeth. Afterwards, researchers targeted the assisted living home's environment to create a calmer atmosphere, thus improving likelihood of compliance of clients. Lastly, caregivers were regularly observed by a dental hygienist. The results of this study

indicate that caregivers' supervision of oral hygiene among people with disabilities improved after the intervention. Knowledge presented in the slide show acted as a stimulus for increased oral hygiene behavior.

Faulks and Hennequin (2000) conducted a study involving both the client and the caregiver. The program began by presenting a slideshow presentation to paid caregivers about the effects of plaque and dangers of poor oral hygiene. Afterward, a dentist met with the caregivers' clients and identified plaque on the clients' teeth and then provided instruction on plaque removal. The intervention led to an increase in daily teeth brushing performed by the caregivers and a decrease in the amount of plaque present on the client's teeth.

Motion Controlled Video Game

Researchers have also utilized game-based training to teach individuals with SCD hygiene skills. Game-based training typically involves using a video game to help students virtually practice a real-world task in an engaging way (Amon & Campbell, 2008; Kang & Chang, 2019). In addition to requiring focus and attention, gameplay motivates users to practice skills they might normally find uninteresting and gives the player a sense of accomplishment when a task is completed (Chang et al., 2013). Many children have a positive history of reinforcement with video games and, unfortunately, many children have a history of punishment with academic and hygiene skills. By presenting hygiene skills in a game format, students are able to associate their positive experience of playing a video game with completing hygiene tasks, thus increasing the likelihood of engaging in the hygiene task. Kang and Chang (2019) conducted a study to improve handwashing hygiene in four elementary aged students with intellectual disabilities using a video game called "Soap and Water!" The four participants displayed an improvement in the rate of washing their hands independently (63%, 70%, 170%

and 219%). The skills in the task analysis were maintained across all the four participants without the video game.

Using visual support during instruction is an evidence-based practice and can be used to teach adaptive and academic skills to individuals with disabilities (Ayres & Langone, 2005; Kellems & Edwards, 2016). Video modeling is another form of visual support often used by researchers to teach academic and life skills.

Video Modeling

In video modeling (VM), students are presented with a demonstration of desired behaviors through video (Bellini & Akullian, 2007). According to Kellems and Edwards (2016), VM can include simple VM, video prompting (VP), video self-modeling (VSM), and point-of-view modeling (PVM). In simple VM, a student views a model other than the individual participating in the intervention. Skinner explains the behavioral principles that underpin video modeling in his book, *Science and Human Behavior* (1953). Discrimination is a three-part contingency, in which a stimulus begins to elicit a specific behavioral response due to a history of reinforcement. As an individual watches another person engages in a behavior and receive reinforcement, the individual is likely to engage in the same behavior in order to access the reinforcement. Baer and Sherman (1964) conducted a study on imitation in young children and demonstrated that imitation can be generalized to other stimuli. In the study, children interacted with a puppet and received social reinforcement for imitating certain behaviors. The puppet then engaged in another behavior and the children imitated the puppet without being prompted or reinforced. Researchers concluded that due to a history of reinforcement from imitating behaviors, the children generalized the stimulus to another inimitable behavior and the act of imitating became secondarily reinforcing. In video modeling, a similar process takes place. As

learners imitate actions in the video model, they are able to access reinforcement, thus strengthening the imitated behaviors and allowing the learner to generalize the contingency to other areas of their life.

This type of video modeling is easy for instructors to create and is therefore the most often used in instructional settings. (Kellems & Edwards, 2016). VSM involves watching a video that demonstrates the skill correctly performed by the student. In PVM, the video model shows a student how to perform a task from his or her own perspective. VP is a type of VM that breaks the desired skill into small pieces that the student watches one at a time, performing the desired action before moving on. As students become increasingly familiar with tasks presented in the video, VP is faded to increase student independence (Kellems & Edwards, 2016). Prompt fading increases independence in learners. Prompts are defined as "a supplemental stimulus that evokes correct responding" (Cengher et al., 2018, p.156). In other words, prompts are used to help learners emit a behavior so that they can access reinforcement. For example, if a parent is teaching a child to clap, she might say "clap," provide a prompt by modeling a clap, and then praise the child for clapping on their own. Prompting is integral to an individuals' learning, especially for those who have disabilities; however, it is easy for a learner to become dependent on those prompts. Video prompting gradually fades away prompts as the student masters each step in a skill. Eventually, when all prompts are faded the student is able to complete the task with independence.

Video modeling was pioneered by Albert Bandura's research on social learning theory (Bandura, 1962). According to his theory and subsequent research, children can learn various skills and behaviors through observational learning through social models-typically represented by videos (Crain, 1992). Recently, video modeling has been used to teach social skills and

correct problem behaviors to children with autism spectrum disorders (Delano, 2007). Studies have also shown effectiveness in teaching group play skills (Charlop et al., 2018; Macpherson et al., 2015), anti-bullying intervention (Rex et al., 2018), athletic activity (Carter et al., 2017), independent living skills (Wynkoop et al., 2018), and math skills (Kellems & Edwards, 2016)

Effectiveness of VM for Improving Hygiene Practices

Keen et al., (2007) conducted a study to assess the effectiveness of video modeling on "daytime urinary control" of five young participants with autism spectrum disorder. The study found that video modeling improves frequency and consistency of in-toilet urination. During the maintenance phase of the study, ⅗ participants maintained the toileting skills they acquired during the intervention phase. ⅖ participants maintained the toileting skills they acquired during the intervention phase and were able to generalize the skills to a new setting. At the end of the study parents of the participants indicated that their children exhibited more frequent toilet visits and greater independence during toileting, including increased independence in dressing and undressing. Although the target behavior, toilet training, was never met, the subjects were able to gain independence in approximations of the behavior.

Piraneh et al. (2023) conducted a study comparing the effectiveness of video modeling and social stories on oral hygiene of individuals with autism spectrum disorder. The result indicated that participants treated with the video model had better oral hygiene when compared to participants treated with a social story. Based on a questionnaire provided by the parents of participants, researchers concluded that the participants in the video modeling group were more engaged than the participants in the social story group, possibly explaining why a video model might be more effective than a social story for a student with autism spectrum disorder.

Sharaf Almalki (2022) examined the effects of video modeling on dressing and undressing skills of individuals with multiple disabilities. In the study, 44 students with multiple disabilities were classified into two experimental groups, both of which received five sessions of 50-minute video modeling instruction. A research assistant conducted a pre-test assessment of clothing skills. After training with the VM, the participants significantly improved their clothing skills. The students' motivation was boosted, their performance increased, they became more independent and self-reliant. Most importantly, the participants were able to generalize their new found clothing skills to different settings (i.e. bedrooms at home).

Conclusion

Research demonstrates that students with significant disabilities have substantially poorer post-secondary school outcomes then their peers without disabilities (Baer et al., 2011). McConnell et al. (2021)'s study found that a significantly lower percentage of individuals with SCD enrolled in education post-high school and obtained competitive employment compared to their peers without disabilities. Self-care skills are a significant indicator of employment, higher education enrollment, and independence (Ayres & Langone, 2005; McConnell et al., 2021; Landmark et al., 2010). Therefore, the SCD population needs targeted instruction in areas related to self-care (i.e., hygiene) to bolster post-secondary school outcomes. Research in evidence-based practices, such as video modeling, is needed to determine practical and effective methods of instruction. The purpose of this study was to identify if a functional relationship exists between instruction delivered by video model and improved hygiene practices of individuals with SCD.

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APPENDIX B

IRB Approval Letter with Approved Assent and Consent Forms

Memorandum

To: Ryan Kellems
Department: BYU - EDUC - Counseling, Psychology, & Special Education
From: Sandee Aina, MPA, HRPP Associate Director
Wayne Larsen, MAcc, IRB Administrator
Date: September 28, 2023
IRB#: IRB2023-286
Title: Using Video Modeling to Teach Hygiene Skills To Students with Disabilities

Brigham Young University's IRB has approved the research study referenced in the subject heading as exempt, Categories 2 and 3. This study does not require an annual continuing review. Each year near the anniversary of the approval date, you will receive an email reminding you of your obligations as an investigator and to check on the status of the study. You will receive this email each year until you close the study.

The study is approved as of 09/28/2023. Please reference your assigned IRB identification number in any correspondence with the IRB.

Continued approval is conditional upon your compliance with the following requirements:

1. A copy of the approved informed consent statement can be found in iRIS. No other consent statement should be used. Each research subject must be provided with a copy or a way to access the consent statement.
2. Any modifications to the approved protocol must be submitted, reviewed, and approved by the IRB before modifications are incorporated into the study.
3. All recruiting tools must be submitted and approved by the IRB prior to use.
4. Instructions to access approved documents, submit modifications, and report adverse events can be found on the IRB website, iRIS guide: https://irb.byu.edu/iris-training-resources
5. All non-serious unanticipated problems should be reported to the IRB within 2 weeks of the first awareness of the problem by the PI. Prompt reporting is important, as unanticipated problems often require some modification of study procedures, protocols, and/or informed consent processes. Such modifications require the review and approval of the IRB. Please refer to the IRB website for more information.

Youth Assent (13-17 years old)

.....

What is this study about?

My name is Allison Pacheco. I am from Brigham Young University. I would like to invite you to take part in a research study. Your parent(s)/guardian know we are talking with you about the study. This form will tell you about the study to help you decide whether you want to participate. In this study, we want to learn about how videos on an iPad can help you learn to complete hygiene tasks with greater independence.

What am I being asked to do?

If you decide to be in the study, we will ask you to perform a hygiene skill that you might not know how to do—it's okay if you don't know it, because later, we will ask you to watch a video teaching you how to do that task. This will take about 20 minutes or less, and we will come back a few times to watch you complete the task. We may record you completing the hygiene skill, but we will not do so without your parent's permission. When we are finished with watching the videos, we will ask you a few questions about how you felt during the study.

How will being in this study affect me?

Taking part in this research study may help you to learn important new skills. There are not a lot of risks involved in this study, but you might get embarrassed or feel nervous about doing the tasks in front of me or other people who might observe. If you feel uncomfortable, you can stop and choose not to participate.

Who will see the information collected about me?

We won't tell anybody that you are in this study and everything you tell us or show us will be kept private. Your parents may know that you took part in the study, but we won't tell them anything you said or did, either. When we tell other people or write articles about what we learned in the study, we won't include your name or that of anyone else who took part in the study. The information collected about you during this study will be kept safely locked up. Nobody will know it except the people doing the research. The study information about you will not be given to your parents or teachers. The researchers will not tell your friends.

What if I have questions?

You can also take more time to think about being in the study and talk some more with your parents about being in the study. Please feel free to have your parents contact Allison Pacheco (allison@hovey.org) or Ryan Kellems (rkellems@byu.edu) with questions regarding the study.

If you want to be in this study, please sign and print your name.

☐ Yes, I give my permission to have my voice recorded

☐ No, I do not give my permission to have my voice recorded

Name (Printed): _____ Signature: _____Date: _____

Parental Consent for a Minor

.....

Introduction

My name is Allison Pacheco. I am a graduate student from Brigham Young University. I am conducting a research study about the effects of video modeling interventions on hygiene skill acquisition for individuals with disabilities. I am inviting your child to take part in the research because he/she/they could potentially benefit from developing greater independence in hygiene skills.

Procedure

If you agree to let your child participate in this research study, the following will occur.

1. The investigator will request verification of your child's qualification for special education services by reviewing their IEP (Individualized Education Plan) and any additional psychological assessment information (such as but not limited to IQ, adaptive behavior, and academic achievement) through the school.

2. **Pre-Training**: Your child will watch a video model that instructs the student to complete a task unrelated to hygiene (for example, popping popcorn). A researcher will observe how your child responds to the video model to determine if he/she/they have the prerequisite skills required to benefit from a video modeling intervention. Such skills include the ability to attend to the video, to imitate behaviors shown in the video, and to correctly match an item presented in the video. Pre-training will occur when the student is scheduled to receive special education services related to Transition to Post-Secondary Life Skills. Pre-training will last for 3 sessions, each 20 minutes or less.

3. **Baseline data collection**: Next your child will be asked to perform a hygiene task (for example, brushing teeth). The student will be brought to an area where all the materials necessary to complete the task have been set out. An observer will provide the participant with one verbal prompt to complete the hygiene task. For example, in a tooth brushing intervention, the observer would say "brush your teeth." An observer will record the number of steps your child is able to perform. Additionally, your child will be filmed so that multiple observers can verify the data collected after the session. Baseline data collection will occur when the student is scheduled to receive special education services related to Transition to Post-Secondary Life Skills. The baseline phase will continue until a stable baseline is achieved with a minimum of 6 data sessions, each session lasting 20 minutes or less.

4. **Intervention**: Your child will be brought to an area with material set out to complete a hygiene task. Then he/she/they will be shown a video model that provides instruction on completing a hygiene task. When the video is complete your child will be asked to perform the hygiene task. An observers will record the number of steps your child is able to perform. Additionally, your child will be filmed so that multiple observers can verify the data collected after the session. The intervention phase will occur when the student is scheduled to receive special education services related to Transition to Post-Secondary Life Skills. The intervention phase will span at least 6 data sessions, or your child can perform 80% steps performed correctly, each session 20 minutes or less.

5. **Generalization and fading supports**: A few days after the intervention stage, researchers will repeat intervention procedures to determine whether the effects of video modeling will be maintained overtime. The generalization phase will occur when the student is scheduled to receive special education services related to Transition to Post- Secondary Life Skills. The generalization phase will continue until a stable data is achieved, with a minimum of 6 data sessions, each session 20 minutes or less.

6. **Brief Survey**: Last, your child and your child's teacher will be given a brief 3-5 question survey that will gauge their feelings towards the intervention, including how much they liked the intervention, if they felt the intervention was successful, and if they would like to use this type of intervention in the future.

Risks

If you agree for your child to participate in this study, your child might experience some anxiety during the data collecting sessions. The anxiety might occur when the researcher observes your child. Preparation on how to use the iPad should minimize the risks associated with the intervention. There is a risk of loss of privacy, which the researcher will reduce by not using any real names or other identifiers in the written report. The researcher will also keep all data in a locked file cabinet in a secure location. Only the researcher will have access to the data. At the end of the study, data will be.

Confidentiality

Any information that is obtained in connection with this study and that can be identified with your child will remain confidential. Your child's name will not be associated in any way with the information collected about your child or with the research findings from this study. The researchers will use a study number or pseudonym instead of your child's name. The researchers will not share information about your child unless required by law or unless you give written permission. This information will be used by the investigator for a period of two years from the study's start date. Your permission indicated that this information will be kept open to the investigator and her team for that time, but your child's name and any identifying information will not be shared or distributed through this study. The information will be stored on a password protected computer and a locked file. After the two-year period, the information will be destroyed.

Benefits

The researcher cannot guarantee that you or your child benefit from this study; however, your child could potentially benefit from this study as they practice important daily living skills.

Compensation

There will be no compensation for you or your child for participating in this study.

Questions about the Research

Please direct any further questions about the study to Allison Pacheco at 908-644-0041 and allison@hovey.org. You may also contact Ryan Kellems at 801-422-6674 and rkellems@byu.edu.

Questions about your child's rights as a study participant or to submit comment or complaints about the study should be directed to the Human Research Protection Program, Brigham Young University, at (801) 422-1461 or send emails to BYU.HRPP@byu.edu.

You have been given a copy of this consent form to keep.

Participation

Participation in this research study is voluntary. You are free to decline to have your child participate in this research study. You may withdraw you child's participation at any point without affecting your child's grade or standing in the school.

By signing this, I understand that the researcher will ask my child's school to access his/her/their academic files.

Child's Name: _____

Parent Name: _____ Signature: _____Date: _____

APPENDIX C

Data Collection Form

Student Name: _____

Task: _____

KEY: 1- Step completed correctly 0– Step not completed correctly

Dates										
1. Task Analysis Steps										
2.										
3.										
4.										
5.										
6.										
7.										
(B) Baseline / (I) Intervention/ (M) Maintenance										
Percentage of steps completed correctly										

APPENDIX D

Participant Screening Rubric

Prerequisite Skill	1	2	3	4	5
Visually and Cognitively Attend to the VM	Student attends to other stimuli throughout the entire VM, student walks/moves away from video and does not return after prompting	Student attends to other stimuli for about 75% of the VM, student walks/moves away from the video and returns after prompting for no more than seconds	Student attends to other stimuli for about 50% of the VM, student walks/moves away from the video and returns after prompting for close to a minute	Student attends to other stimuli for about 25% of the VM, student walks/moves away from the video and returns after prompting for a minute or more	Student attends to 90% of the VM (or more) and does not attend to other stimuli
Imitate the behaviors shown in the VM	When prompted multiple times to imitate the video, the student does not move or attends to other stimuli	With one or more prompts, the student imitates movements presented in the VM with about 25-0% accuracy	With one or more prompts, the student imitates movements presented in the VM with about 50% accuracy	With one prompt, the student imitates movements presented in the VM with about 75% accuracy	With one prompt, the student imitates movements presented in the VM with about 90% accuracy (or higher)
Correctly match an item presented in the video to the actual item	When asked to match 4 objects to items presented in the video the student matches 0/4 items correctly	When asked to match 4 objects to items presented in the video the student matches 1/4 items correctly	When asked to match 4 objects to items presented in the video the student matches 2/4 items correctly	When asked to match 4 objects to items presented in the video the student matches 3/4 items correctly	When asked to match 4 objects to items presented in the video the student matches 4/4 items correctly
Hear the audio	Student does not attend to auditory stimuli presented in the video (turning head, leaning in, etc.)	Student attends to auditory stimuli presented in the video at a high volume (turning head, leaning in, etc.)	Student attends to about 50% of auditory stimuli presented in the video at typical volume (turning head, leaning in, etc.)	Student attends to about 90% of auditory stimuli presented in the video at typical volume (turning head, leaning in, etc.)	Student attends to about 90% of auditory stimuli presented in the video and follows the instruction

APPENDIX E

Intervention Fidelity Checklist

Baseline

Step 1: Set out materials in as similar a formation to the VMs as possible

a. Washing Hands: hand soap, paper towel, trash can
b. Brushing Teeth: toothbrush, toothpaste, small cup, towel
c. Applying Deodorant: deodorant
d. Flossing: floss pick
e. Washing Face: two towels, facial soap, facial moisturizer, bin

Step 2: Set up the recording device so the participant is in full view and press play

Step 3: Deliver appropriate prompt:

a. "Wash your hands, please."
b. "Brush your teeth, please."
c. "Put on deodorant, please."
d. "Floss your teeth, please."
e. "Wash your face, please."

Step 4: Observe the student and score their performance with the data collection sheet

Step 5: When the participant stops or indicates they are finished, turn off recording device

Step 6: Thank the participant, but refrain from commenting on or reinforcing the behavior

demonstrated in observation

a. "Thanks for doing that!"
b. "Thanks for working with me!"
c. "Thanks! Let's go back to class."

Intervention

Step 1: Set out materials in as similar a formation to the VMs as possible

a. Washing Hands: hand soap, paper towel, trash can
b. Brushing Teeth: toothbrush, toothpaste, small cup, towel
c. Applying Deodorant: deodorant
d. Flossing: floss pick
e. Washing Face: two towels, facial soap, facial moisturizer, bin

Step 2: Set up the recording device so the participant is in full view and press play

Step 3: Pull up the VMs on the laptop

Step 4: Say “Let’s watch this video!” press play

Step 5: Deliver appropriate prompt:

a. “Now it’s your turn! Wash your hands, please.”
b. “Now it’s your turn! Brush your teeth, please.”
c. “Now it’s your turn! Put on deodorant, please.”
d. “Now it’s your turn! Floss your teeth, please.”
e. “Now it’s your turn! Wash your face, please.”

Step 6: If the student stops, prompt: “Do what you saw in the video” and record how many prompts were given (all other types of prompts are prohibited)

Step 7: Observe the student and score their performance with the data collection sheet

Step 8: When the participant stops or indicates they are finished, turn off recording device

Step 9: Thank the participant, but refrain from commenting on or reinforcing the behavior demonstrated in observation

a. “Thanks for doing that!”
b. “Thanks for working with me!”

Maintenance

Step 1: Set out materials in as similar a formation to the VMs as possible

a. Washing Hands: hand soap, paper towel, trash can
b. Brushing Teeth: toothbrush, toothpaste, small cup, towel
c. Applying Deodorant: deodorant
d. Flossing: floss pick
e. Washing Face: two towels, facial soap, facial moisturizer, bin

Step 2: Set up the recording device so the participant is in full view and press play

Step 3: Deliver appropriate prompt:

a. “Wash your hands, please.”
b. “Brush your teeth, please.”
c. “Put on deodorant, please.”
d. “Floss your teeth, please.”
e. “Wash your face, please.”

Step 4: Observe the student and score their performance with the data collection sheet

Step 5: When the participant stops or indicates they are finished, turn off recording device

Step 6: Thank the participant, but refrain from commenting on or reinforcing the behavior

demonstrated in observation

a. “Thanks for doing that!”
b. “Thanks for working with me!”
c. “Thanks! Let’s go back to class.”

Collecting Data

- Use the Task Analysis Data Collection Sheet for the appropriate hygiene task
- Score of 1: participant completes the step as described in the task analysis
- Score of 0: participant skips the step or performs the step incorrectly
- Add the number of steps performed correctly and calculate the average number of steps completed correctly
    - (# steps correct/total # steps) x 100
- **Baseline**: continue for 6 data points or until a stable baseline is established, reestablish a stable baseline before beginning each new intervention
- **Intervention**: continue for at least 6 data points until mastery criteria level (80% accuracy) is achieved for 3 consecutive data points
- **Maintenance**: continue for 3 data points or until a stable baseline is established

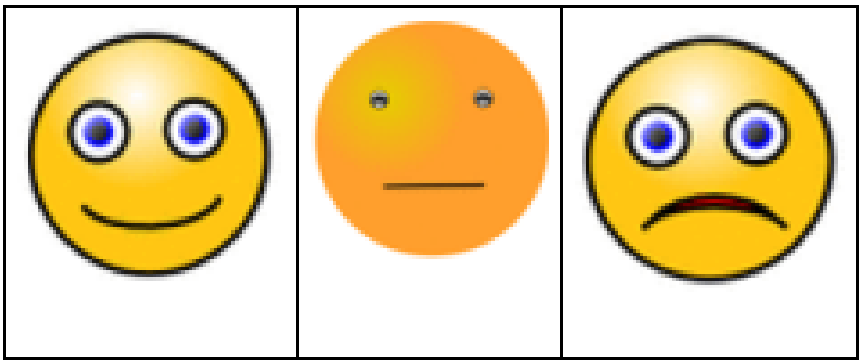
APPENDIX F

Social Validity Questionnaires

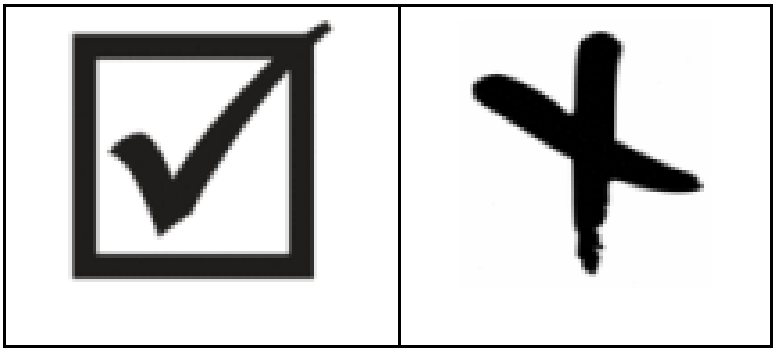
Participant Social Validity Questionnaire

Date: _____

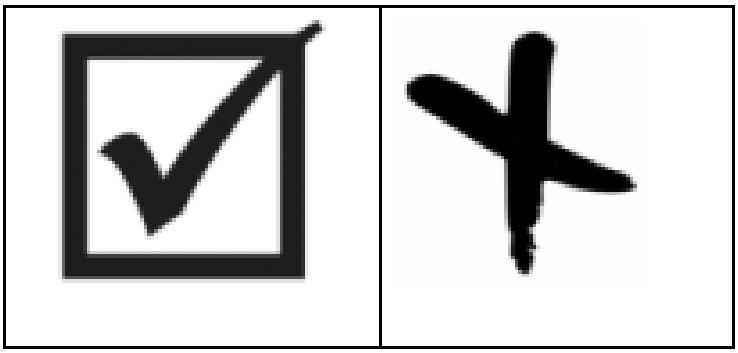
1. Did you like the videos?



2. Did you have a good time?



3. Do you want to keep using the videos?



(Picture supports taken from public domain, PDClipart.org)

Teacher and Parent Social Validity Questionnaire

1. Teacher: Did you feel like the intervention was effective?	(No) 1 2 3 4 5 (Yes)
2. Teacher: Would you implement this type of intervention in the future?	(No) 1 2 3 4 5 (Yes)
3. Parent: Did you notice an improvement in your child's hygiene skills at home?	(No) 1 2 3 4 5 (Yes)
4. Parent: Would you use videos as a tool to teach your child skills in the future?	(No) 1 2 3 4 5 (Yes)

APPENDIX G

Hygiene Skills Task Analyses

Note: Participants did not have to perform the task analysis steps in order

Washing Hands

turn on water
put hands under
move hands around
pull out hands of water
squirt soap on hands
rub hands together
work soap into lather
scrub abt 20 s
put hands under water
wash off all soap
shut off water
get towel
dry hands
put towel in trash

Brushing Teeth

pick up tooth brush
turn on cold water
put toothbrush under water
turn off water
pick up toothpaste
open toothpaste
put a little toothpaste on brush
close toothpaste
put toothpaste down
brush top half of teeth for 10 s
brush top half of teeth for 10 s
brush bottom half of teeth for 10 s
brush bottom half of teeth for 10 s
Brush tongue
spit only in sink
turn on cold water
rinse toothbrush under the water
put toothbrush down
pick up small cup
fill with water
turn off water
take sip
swish
spit only in sink
rinse out sink with rest of the water
pick up towel
dry face
dry hands
put towel back

Applying Deodorant

Pick Up Deodorant
Remove Cap
Put Cap Down on Counter
Twist Bottom of Deodorant
Only a Little Product showing
Lift one arm
Lift shirt
Put Doedoant on Arm Pit
Swipe
Take Deodorant Out
Switch Deodorant to other Hands
Twist Bottom
Only a Little Product Showing
Lift Other Arm
Lift Shirt
Put Deodorant on Armpit
Swipe
Take Deodorant Out
Pick Up Cap
Put Cap on Top
Put Deodorant Down

Flossing

take a floss pick
open mouth
put floss pick between front two teeth
wiggle on one side
wiggle on other side
move to the next two teeth
wiggle on one side
wiggle on other side
continue going between each tooth
move to other side of the mouth
go between each tooth and wiggle
put floss pick between bottom two teeth
wiggle on one side
wiggle on other side
move to the next two teeth
continue going between each tooth
move to other side of the mouth
go between each tooth and wiggle
Throw floss pick away in trash

Washing Face

turn on water
pick up towel
put towel under running water
squeese out extra water
turn off the water
put towel over one hand
put one pump of blue soap on towel
put soapy towel on face
swipe across forehead
swipe down cheek
swip across chin
swipe up other cheek
swipe over eyes
swip across mouth
turn on water
rinse soap off towel
squeeze out extra water
turn off water
put towel on one hand
put wet towel on face
swipe across forehead
swipe down cheek
swip across chin
swipe up other cheek
swipe over eyes
swip across mouth
throw dirty towel in bin
take dry towel
dry face
dry hands
throw dirty towel in bin
squirt a little moisturizer on hands
rub moisturizer in hands
rub on face until there is no more white