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A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

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ABSTRACT

Video-Based Interventions for Teaching Calendar Skills to Individuals with Autism

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Video-Based Instruction (VBI) is an evidence-based practice that has been used for teaching new skills to individuals with disabilities for over two decades. VBI involves the use of pre-recorded videos to teach new skills. Benefits of VBI include flexibility in when the instruction is provided to students and allows students to receive instruction while the teacher is working with another person. A multiple baseline across participants design was used to evaluate the impact of the independent variable of VBI, upon the dependent variables of (a) the percentage of steps completed correctly to make novel calendar entries; (b) the timeliness of arriving for scheduled meetings; and (c) timeliness of completing the scheduled tasks (sending text messages).

Three female students aged 25 to 31 with Autism Spectrum Disorder (ASD) living at a residential transition program for adults with ASD and Learning Disabilities participated in the study. One of three participants met criteria (80% accuracy) to correctly make novel calendar entries. Two of the three participants needed an additional prompt to meet criteria (80% accuracy) to correctly make novel calendar entries. One of three participants increased and maintained timeliness for arriving for scheduled meetings. Each participant improved the timeliness of completing the scheduled tasks (sending text messages). This study supports the effectiveness of VBI for the instruction of daily living skills to individuals with ASD. Implications for practitioners, limitations and suggestions for future research are also discussed.

ACKNOWLEDGMENTS

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DESCRIPTION OF THESIS STRUCTURE

This thesis, *Video-Based Interventions for Teaching Individuals with Autism Calendar Usage Skills,* is written in a hybrid format. The hybrid format brings together traditional thesis requirements with journal publication formats. This thesis was written to target the journal *Research in Developmental Disabilities (RIDD)*.

RIDD is an international journal focused on original research for addressing problems for those with developmental disabilities. Articles submitted to RIDD reflect the style guidelines set forth by the American Psychological Association. Articles submitted to RIDD are limited to 8000 words including references, figures, and tables. The preliminary pages of the report reflect university requirements for thesis submission as outlined by the David O. McKay School of Education. The remainder of the report is presented as a journal article, with specific requirements aligned for submitting research articles to RIDD.

The literature review is contained within Appendix A; Appendix B contains information regarding Institutional Review Board (IRB) approval and the research consent form; and Appendix C contains the instruments including the guided interview format, surveys, and task analyses. In addition, this thesis contains two reference lists. The first reference list is for and included in the journal-ready article, and the second includes all citations used in the Appendix entitled "Review of the Literature."

Introduction

Individuals with Autism Spectrum Disorder (ASD)

According to a 2015 Centers for Disease Control and Prevention press release, 10.6% of adult Americans have difficulties with cognitive tasks such as concentrating, remembering, or decision making. Six and one-half percent have difficulties completing independent living tasks including scheduling and keeping appointments, shopping, and social activities (Press Release, 2015). Such limitations once relegated individuals with developmental disabilities to hospitals and institutions to be cared for by others (Amado, Stancliffe, McCarron, & McCallion, 2013). Since 1967, individuals with developmental disabilities have been moving from residential treatment settings to community living environments (Amado et al., 2013; van Asselt-Goverts, Embregts, & Hendriks, 2013; van Asselt-Goverts, Embregts, & Hendriks, 2015). Physically living within a community does not automatically result in social inclusion for an individual. Living in a community setting can still lead to a form of social isolation for the person who needs support developing social behaviors. This leaves many individuals feeling devalued and demoralized (Thorn, Pittman, Myers, & Slaughter, 2009).

Wagner, Newman, Cameto, Garza, and Levine (2005) reported that adults with autism spectrum disorder (ASD) are not likely to be socially engaged after exiting the school system and its related activities. Research has shown that social networks of people with disabilities are typically limited to their family members and the professionals providing them with services (Amado, et. al., 2013; van Asselt-Goverts et al., 2015; Thorn et al., 2009; van Asselt-Goverts et al., 2013). While they want to be able to pass as "normal" (Amado et. al., 2013), they are the least likely to be employed or participate in social gatherings (Wagner et al., 2005). All individuals need to feel connected, integrated, and empowered in order to increase their quality

of life and have a psychological sense of community (Asselt-Goverts et al., 2015; O'Grady, 2008; van Asselt-Goverts et al., 2013). Social skill acquisition by individuals with ASD necessitates additional supports and instruction requires (Wagner et al., 2005). This may include explicit instruction regarding the skills needed for positive employment and social engagement outcomes (Apple, Billingsley, Schwartz, & Carr, 2005).

Barriers to Employment and Social Engagement

Previous research has found task and time management, limited literacy, numeracy, and communication skills to be the primary barriers to employment for individuals with ASD (Lemaire & Mallik, 2008; Mechling & Savidge, 2011; Shattuck et. al., 2012; Wagner et al., 2005; Winn & Hay, 2009). These self-determination skills have been shown to increase the quality of life for individuals with ASD (Test et al., 2009). Being able to advocate for personal wants and needs, decision making, and employment have been found to improve quality of life and psychological sense of community for individuals with ASD. Flores, Schloss, and Alper (1995) found that students with developmental disabilities felt a greater sense of empowerment and pride when they took responsibility for tracking their tasks and activities in a paper planner. Calendar usage and text messaging are two specific skill sets which require literacy and numeracy skills. They also contribute to planning, time management, fulfilling personal responsibilities, and social engagement thus improving the overall quality of life of individuals with developmental disabilities (Flores et al., 1995).

Along with being able to schedule tasks and attend events, individuals with ASD need to be able to communicate with family, friends, and employers about tardiness or needing to reschedule events. These acts demonstrate respect and social reciprocity (Burke, Andersen, Bowen, Howard, & Allen, 2010; Carter, Owens, Trainor, Sun, & Swedeen, 2009). In today's

American culture this type of communication is commonly completed via text messaging. Smith (2011) reported that 73% of adults with cell phones send and receive text messages. Young adults, ages 18-29, send and receive an average of 87 messages per day and prefer texts to voice calls (Smith, 2011). Communicating via text message has been a new reality of social engagement for the early 21st century.

Video-Based Instruction (VBI)

According to Rayner, Denholm, and Sigafoos (2009), VBI includes activities which use pre-recorded videos to teach new skills or improve performance on previously acquired skills. Video Modeling (VM), video self-modeling, Video Prompting (VP), computer-based video instruction, and multimedia can all be included under the term VBI (Alberto, Cihak, & Gama, 2005; Rayner, Denholm, & Sigafoos, 2009). With VBI, the learner watches a video demonstrating the desired skill (Mechling, Gast, & Seid, 2009; Ramdoss et al., 2012; Sigafoos et al., 2007). Then the person performs the task as demonstrated. The video may be watched multiple times prior to the learner attempting to demonstrate mastery of the skill (Ramdoss et al., 2012).

Various studies address the usefulness of VBI for teaching individuals with ASD independent living and academic skills (Alberto et al., 2005; Bereznak, Ayres, Mechling, & Alexander, 2012; Mechling & Collins, 2012; Mechling et al., 2009; Mechling, Pridgen, & Cronin 2005; Rayner et al., 2009; Sigafoos et al., 2007). Time management skills are pivotal to establishing positive relationships with employers and friends through demonstrating dependability and ability to follow through with obligations (Falkenberg & Barbetta, 2013; Winn & Hay, 2009). However, only a limited number of studies were found in relation to using digital

or paper resources for teaching task and time management skills (Bauer & Ulrich, 2002; Flores et al., 1995; Mechling & Savidge, 2011).

Statement of Purpose

VBI has previously been shown to be successful in helping individuals with ASD develop skills in cooking, cleaning, laundry, and communication (Graves, Collins, Schuster & Kleinert, 2005; Mechling et al., 2009; Mechling et al., 2005). Individuals with ASD need to be taught explicit time management and communication skills (Apple et al., 2005; Lemaire & Mallik, 2008; Winn & Hay, 2009). It is proposed that VBI will be effective in teaching individuals with ASD calendar usage skills including scheduling and timeliness.

Research Questions

In this study, VBI was used to teach three adult females with ASD how to schedule new entries in their iPhone calendar. The study explores the effect of VBI on the following: (a) the percentage of correct steps to make a calendar entry; (b) the time difference for receipt of the text message and when it was scheduled to be sent; and (c) the time difference for arriving to meeting and when it was scheduled. VBI was also used to encourage participants to complete tasks (send a message, attend a meeting) in a timely manner.

This study sought to extend previous research on VBI by examining the effects of VBI in teaching time management tasks and supporting improved timeliness for individuals with ASD. It also included a social validity questionnaire about using VBI. The key questions for this study were as follows:

1. What is the effectiveness of using VBI Intervention Package (independent variable) for teaching calendar usage skills to individuals with ASD? This study looked at the change of (a) percentage of steps completed correctly to make novel calendar entries; (b)

timeliness of completing the scheduled tasks; and (c) the timelines of arriving for scheduled meetings.

2. What is the social validity of using VBI to teach calendar usage skills to students with disabilities in a transition program?

Method

Participants

Three female students from a residential transition program, referenced by pseudonym, for adults with ASD and Learning Disabilities participated in the calendar usage study. Participants qualified for the study based on the following criteria: (a) diagnosed with an ASD, (b) already owned and used an iPhone, (c) were in a transition program and (d) had previously established goals related to employment, independent living, and social engagement. The participants were all previously diagnosed with ASD (see Table 1). Institutional Review Board (IRB) approval was obtained prior to beginning the study, and all participants gave informed and voluntary consent appropriate to their level of cognitive functioning. The participants were offered a $30 gift card for completing the intervention cycle.

Setting

The study took place at a day facility consisting of school and residential buildings. The students of the transition program have the option to live on- or off-campus. At the beginning of the study, all of the participants lived and worked on-campus. By the conclusion of the study, all participants had transitioned their work to off-campus internships. One participant had also transitioned to living alone in an off-campus apartment, which required learning the bus schedule for arriving on time.

Research activities took place in three primary locations: the waiting area next to the reception desk, a loft next to second-floor clinical offices, and a gathering area in the residential building. All of these areas can be accessed by students, staff, and visitors at any time. They are well lit, relatively quiet, and research activities were completed without significant interruption. In order to increase dependency on calendar notifications, and increase effective time and location management, participants met with the primary investigator (PI) in one of the three locations, which was randomly selected with different times for each meeting.

Pre-Study Observations/Assessments

Prior to beginning the study, participants were introduced to study activities and asked to give informed voluntary consent in accordance with ethical guidelines for doing research with human subjects. A guided interview was completed with the participants to establish their existing skills in using a mobile device. This included asking them to locate and using their calendar and messaging apps. Each participant also completed an assessment which demonstrated their level of basic calendar knowledge. The assessment asked them to identify the date, month, and year from a given date. It also asked the day of the week for holidays from a given calendar. These activities established a baseline for measuring impact and to determine where intervention needed to begin.

All of the participants demonstrated an ability to navigate their personal mobile device and completed the assessment of basic calendar knowledge with 100% accuracy. Each participant was able to send a text message to the PI, indicating they did not need the "Sending a Text Message" VBI and could begin with the 'Calendar Entry" VBI. A questionnaire about calendar and mobile device usage was completed by participants to examine the perceived importance of calendar usage skills and social validity of VBI prior to beginning the activities.

Experimental Design

A multiple baseline across-participants design was used to evaluate the impact of the independent variable of VBI, upon the dependent variables of (a) the percentage of steps completed correctly to make novel calendar entries; (b) the timeliness of arriving for scheduled meetings; and (c) timeliness of completing the scheduled tasks. This type of design is used in single-subject studies to evaluate the effect of an independent variable, VBI, for behavior change over a similar period of time. It is considered to be a reasonable research design when having the participants return to baseline is impractical, unethical, or impossible (Kennedy, 2005). Meeting frequency and location was intentionally inconsistent to mitigate habitually from being a factor of timeliness for the meetings.

Materials and Equipment

VBI. Three videos were developed for this research study, all related to the use of an iPhone: (a) the creation of a new calendar event using the iOS calendar app; (b) the sending of a text message in iMessage; and (c) the response to calendar entry notifications to attend meetings with the PI and to send scheduled text messages.

Raw video footage was captured of these tasks being performed on an iPhone. The video showed the iPhone 5C and the hand of the person operating the phone. This was edited and appropriate voiceover added. The content was divided into sections which pause automatically, enabling participants to review steps individually or all together (see Table 2). The development of the VBI was done using iPhone 5C, iPad Mini 2, iMovie for iOS 2.2, and VideoTote 0.8.4 technologies.

Task analysis. A task analysis was created for entering a new event into the iPhone calendar app. Tasks analysis, or behavior chains, break a task into manageable steps. These steps could then be taught one at a time or in chunks (Bancroft, Weiss, Libby, & Ahearn, 2011; Rayner et al., 2009, Sigafoos et al., 2007). This technique has been used in previous studies to support teaching activities such as setting the table, making sandwiches (Ayres & Cihak, 2010), using a day planner (Flores et al., 1995), and washing dishes (Sigafoos et al., 2007).

iPhones. Each participant had an iPhone (see Table 1) and provided their phone number to the PI at the onset of the research study. Participant's contact information was labeled with their pseudonym in the PI's iPad to maintain confidentiality. Messages sent between the participants and the PI were sent through iMessage.

In addition to research-specific tasks, messages were also sent between the PI and participants to reschedule meetings and to confirm that the participant would be attending a scheduled appointment. These inquiries were sent if the participant was late for more than 10 minutes. The PI discussed receipt of scheduled text messages (or lack thereof) with the participants the next time they met in person. At the conclusion of the study, the PI discontinued sending or receiving messages with the participants.

Data Collection and Measures

Baseline, intervention, and maintenance data were collected on the three dependent variables conjointly across participants. There was no expectation for text messages to be received with timeliness before the participants were introduced to the calendar entry VBI. Therefore the connection of data regarding timeliness for receiving text messages was not initiated until after the first participant had moved into to the calendar entry VBI phase (see Table 3).

Calendar entry percent correct. Initially, calendar entry data was collected using a paper task analysis data collection form. Correct step completion was indicated with a plus (+) sign and steps completed incorrectly were marked with a negative (-) sign. After the first few sessions it was determined expedient to create an online form for data collection. Responses on this form were indicated as "Yes or N/A" for correct step completion or "No" for incorrect step completion. Percent of steps completed correctly was calculated by dividing the number of correct steps by total steps. Data were collected (5 to 15 times per week) until the participant achieved a minimum of 80% accuracy over four consecutive entries.

Timeliness. Participants made a calendar entry on their phones that prompted them to send a text message at a specific date and time (see Figure 1). The receipt of the text message, and its timeliness was documented. Participants were given a time to send the messages. They were not given a window of time to send the messages. Timeliness was measured by calculating the difference between the time the text message was received by the PI and the time it was scheduled by the participant. For purposes of visualization, text messages that were not received were recorded at 15 hours with an "x." Participant attendance and timeliness for in-person meetings were also measured. If the participant was more than 15 minutes late for a scheduled appointment they were reminded by text message. Situations where they did not arrive were graphed with and "x" at 30 minutes.

To further explore the effect of interventions on timeliness for text message receipt, the percentage of received messages was calculated for each phase of the intervention. Each participant established appointments to send a text message to the PI at specific times. The successful receipt of these messages as related to the number of anticipated messages is recorded in Table 4. This was measured both at the time of expected delivery as well as within a one-hour

margin of the event.

Interrater agreement. An additional rater (all graduate research assistants) was utilized to demonstrate the reliability of data collection. An additional rater attended 29.25 % of the sessions held with the participants. In conjunction with the PI, they reviewed the calendar entries made by the participants. The data collection sheets indicated whether it was completed by the additional rater or the PI. Interrater agreement was calculated by counting the number of task analysis steps the interrater and PI responses identically marked for the calendar entry steps. This number was then divided by the number of steps possible. The average percent of interrater agreement during the study was 92.7%.

Intervention fidelity. A fidelity checklist was used throughout the study to ensure consistent intervention implementation. The checklist was maintained in a spreadsheet and referenced throughout the study. Twenty-nine percent of the sessions included an interrater. Intervention sessions throughout the study were completed with 100% fidelity.

Social validity survey. A social validity survey was completed by the participants before and after participating in the research study. The survey explored if: (a) calendar usage skills were considered to be a valuable skill for students; and (b) whether the VBI was considered (a) easy to learn/ use; (b) something students enjoy using; and (c) something students/teachers feel matched the learning activity.

Procedures

Baseline conditions. At the onset of research, the PI sent each participant a message to verify their phone number and provided them with contact information for sending text messages as scheduled. During each meeting, the participants were given a text card (see Figure 1) and asked to schedule the event using their iPhone calendar. Each card had a different (a) word, (b)

date and (c) time for when the text message was to be sent. Each session they were asked to schedule between one and six separate and unique calendar entries to send texts messages to the PI. In most cases, these messages were scheduled to be sent to the PI prior to their next meeting. Meetings occurred two or three times a week and lasted less than 10 minutes. The participants would complete the task and then hand their iPhone to the PI and interrater (if one was there) who would score the entry completion with the task analysis. Before participants left they scheduled their next session with the PI.

Intervention implementation. As an introduction to the use of VBIs the participants were told the video would stop at different spots. To continue watching the video they needed to tap the screen. Participants were given the option to watch the video all the way through before starting the task or to follow along with the video step-by-step. The participants were provided with an iPad by the PI to watch the VBI. Participants were handed the iPad with VideoTote open and set to the correct video. The video for making a novel calendar entry was the first VBI introduced to the participants. After viewing the video, the participant was asked to make a novel calendar entry from a text card.

Baseline data pertaining to the receipt of text messages began when the first participant moved into the calendar entry VBI phase (see figure 2). The VBIs for sending a text message and responding to a notification were used as additional interventions for increasing timeliness for receipt of text messages. Throughout the course of the study, modifications were made to further promote the receipt of scheduled text messages from the participants within less than on hour of their scheduled time.

Participants also scheduled their next intervention sessions with the PI. This was done through verbal dialogue at the end of the given session. Participants were not prompted to make

calendar entry for the upcoming session. Data were kept on when the session was scheduled and when the participants arrived in minute intervals. Data were also maintained on whether or not the PI reached out via text message to remind the participant to attend a session.

Maintenance. As the research participants demonstrated consistent accuracy for task completion they moved into the maintenance portion for the phase. These included (a) four consecutive calendar entry data points at or above 80% of steps correct, and (b) 70% of scheduled text messages received. During the maintenance stage, they were asked to continue demonstrating the skills without the VBI to direct their completion. Abigail and Miranda progressed into maintenance for calendar entry and timeliness of text messages received. Alycen moved into maintenance for calendar entry. Due to the extended duration of the research study, the team decided to conclude with Alycen without a maintenance phase for sending text messages.

<div align="center">

Results

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Calendar Entry VBI

Baseline. Calendar entry baseline data showed (see Figure 3) the participants had a working knowledge of their calendar application. Each was able to make a calendar entry with at least 70% accuracy. None of the participants consistently completed the calendar entries at or above the predetermined accuracy level of 80%, across four consecutive entries.

Abigail's baseline consisted of three entries with her percent of calendar entry steps completed correctly was 93%. Her next six entries showed a regression to 79%. Her average was 83%. She did not have an accuracy level of 80%, across four consecutive entries. Miranda had 26 baseline entries with her percent of calendar entry steps completed correctly ranging from

57% to 79%, and an average of 78%. Alycen had 45 baseline entries with her percent of calendar entry steps completed correctly ranging from 0% to 100%, and an average of 70%.

Viewing method and performance. Abigail chose to view the calendar entry VBI as a video model (all the way through before creating an entry) which saw her accuracy for the percentage of steps completed correctly of 14 entries range from 79% to 100%, without four consecutive entries at or above 80%. Miranda also chose to view the calendar entry VBI as a video model. Her accuracy for the percentage of steps completed correctly of eight entries stayed at 79%. She did not meet the criteria to progress to the next study phase. Alycen chose to view the calendar entry VBI as a video prompting system, completing each step with the video. This resulted in 93% steps completed correctly across 10 consecutive entries.

Verbal prompt. Due to Abigail demonstrating inconsistent completion of calendar entries at or above 80% steps completed correctly, she was given a verbal prompt (told by the PI) to "set the alert." This resulted in 100% steps completed correctly across seven consecutive entries. She had met the criterion for moving on to the next phase of the study.

Due to Miranda's inattention to the VBI, it was modified by chunking steps she completed accurately. Across an additional six entries, her accuracy for the percentage of steps completed correctly held constant at 79%. She was then given a verbal prompt to "set the alert." This resulted in 100% steps completed correctly across 27 consecutive entries with scores ranging from 79% to 100%, and an average of 98%; she met the criteria to progress to the next study phase.

Maintenance. Following the verbal prompt to set the alert, Abigail's percentage of steps completed correctly across an additional 15 entries moved to 100% accuracy for the duration of the study. Following the verbal prompt, Miranda's percentage of steps completed correctly on an additional 19 entries moved to 100% accuracy for the duration of the study. Viewing the VBI following a video prompting method resulted in Alycen making sufficient progress to move to the next phase of the study. Her percentage of steps completed correctly across an additional five entries held at 93% accuracy for the duration of the study.

Timeliness

Baseline data for meeting attendance and the receipt of text messages were collected across calendar entry and timeliness phases of the study. Successful calendar entries were considered to be a prerequisite skill to the timeliness of text message receipt and meeting arrival. Therefore, the calendar entry VBI was considered interventions for receipt of text messages and arrival for meetings with PI. Data for receipt of text messages on Table 4 data shows the percentage of scheduled text messages received. Data for arriving at meetings with the PI on Figure 4 were graphed in minute intervals. The top line is labeled PI and is marked with an "x." This means the participant did not arrive at the meeting until the PI reached out to them via text message. Table 5 shows the percentage of scheduled text messages received within an hour of their scheduled time. Table 6 data shows the percentage of scheduled meetings the participants arrived at without the PI reminding them.

Receipt of Text Messages

Baseline. Notes kept by the PI showed each participant was able to send messages prior to receiving the "send a text message VBI." None of the participant's messages were sent or received by the PI at the onset of data collection. After 12 calendar entries, the PI had not received text messages from the study participants. At this point, the PI added "reminded the participants to send their scheduled text messages" as a step in each session fidelity checklist. Abigail's baseline consisted of six scheduled and no received text messages. Miranda scheduled four text messages during baseline. One was received by the PI within 0.40 of an hour. Three were not received. Alycen had 24 baseline messages scheduled, none were received.

During calendar entry VBI. Abigail's ability to complete a calendar entry correctly had no effect on her sending text messages as scheduled. Miranda sent all 13 scheduled messages during her the calendar entry phase. However, her receipt times ranged from 0.07 hours to 12 or more hours. A total of 38% of her text messages were received within the hour of their scheduled time. Alycen's skill acquisition for completing the calendar had no effect on her sending text messages as scheduled.

Modification to the calendar entry VBI for Miranda across an additional five scheduled text messages increased her average time of receipt from the schedule to 4.6 hours ranging from 2.5 hours to 12 or more hours. A full 100% of her messages were received. Zero were received within an hour of their scheduled time. Giving the verbal prompt to "set the alert" with the modified calendar entry VBI resulted in the average time for receipt of Miranda's text messages decreasing to 4.5 hours, ranging from 0.05 hours to 12 or more hours. A total of 93% of her messages were received. Of Miranda's scheduled messages 56% were received within an hour of their scheduled time.

Additional interventions. To support receipt of Abigail's scheduled text messages she was introduced to the "send a text message" VBI. This had no effect. Implementation of regular reminders by the PI to "send text messages" led to the receipt of 70% of her 10 scheduled messages being received and within the hour of their scheduled time. There was an average for text message receipt of 4.5 hours. The receipt times ranged from 0 (on time) to 12 or more hours.

In an attempt to further improve receipt of Abigail's scheduled text messages the notification VBI was introduced. This resulted in an average of 3.9 hours for receipt of text messages. Over eight messages receipt times ranged from 0.0 hours (on time) to X-not received. Abigail sent 75% of her messages, all within an hour of their scheduled time. Likewise, Alycen was presented with the notification VBI. This produced no change in the pattern of received text messages. None of her messages were received.

Next, the PI clarified with Alycen that she was to send the scheduled text messages to the same contact as other correspondence with the PI. Over seven scheduled messages receipt times one was received within 0.5 hours, six were not received. The average time moved to 12.9 hours. At this point, the PI asked Alycen if knowing there would be a response to her messages would encourage her to send them. She agreed. This resulted in an average of 7.5 hours for receipt of text messages. Over 24 messages receipt times ranged from 0.06 hours to X-not received. The PI received 71% of her messages. Alycen sent 33% of her messages within an hour of their scheduled time.

Text message receipt. Following the introduction of the notification VBI, the average time for receipt of Abigail's last 24 text messages was 4.2 hours with the majority received on time. Receipt times ranged from 0.0 hours (on time) to X-not received. The PI received 75% of her messages. Abigail sent 58% of her messages within an hour of their scheduled time. Following the verbal prompt the average time for receipt of Miranda's last 19 text messages was 6.2 hours. Receipt times ranged from 0.0 hours (on time) to X-not received. The PI received 95% of her messages. Miranda sent 31% of her messages within an hour of their scheduled time.

Meeting Attendance

Baseline. Meeting attendance baseline refers to the number of scheduled sessions each participant attended prior to beginning the calendar entry VBI. Abigail's baseline consisted of three scheduled meetings with an average arrival time of 15 minutes within the scheduled time. Her times ranged from 28 minutes early to 15 minutes late. Miranda had 13 baseline meetings with most being missed or needing to be reminded by the PI. Alycen had a baseline of 21 scheduled meetings with an average of arriving at 3 minutes within schedule time.

During calendar entry VBI. The calendar entry task with at least 80% of the steps completed correctly moved Abigail's average meeting arrival time to 14 minutes, ranging from 23 minutes early to missing or needing to be reminded. Miranda's 3 scheduled messages during her initial exposure of the calendar Entry VBI resulted with the receipt of her text messages from 11 minutes early to on time. Completing the calendar entry task with at least 80% of the steps completed correctly corresponded with Alycen's average arrival time increasing to 5.6 minutes, ranging from 5 minutes early to coming with a text reminder from the PI.

Given the verbal prompt to "set the alert" calendar entry VBI resulted in the average time for Abigail's arrival to meetings increased to 6.7 minutes, arriving at 57% of her meetings

without reminders. Miranda's arrival to meetings increased to 8.7 minutes, arriving at 75% of her meetings without reminders.

Maintenance. After demonstrating the ability to complete the calendar entry task with at least 80% of the steps completed correctly, the participants moved into a maintenance phase. Abigail's arrival to meetings increased to 9 minutes, arriving at 63% of her meetings without reminders. Miranda's arrival to meetings increased to 9 minutes, arriving at 100% of her meetings without reminders. Alycen arrival to meetings returned to 5 minutes, arriving at 33% of her meetings without reminders.

Social Validity

Social validity was measured through surveys completed by the participants before and after the intervention. The surveys contained a series of questions to which the participants responded with (a) yes/always, (b) most of the time, (c) some of the time, (d) no/never, or (e) do not know. For the purpose of quantitatively analyzing the data, the responses were assigned a number value (4) yes/always, (3) most of the time, (2) some of the time, (1) no/never, and (0) do not know. Responses from the three participants were averaged for each question (see Table 7).

Participants indicated they have mobile devices (4.0), which they keep within arm's reach most of the time (3.76), and use to send text messages (4.0). Respondents also indicate they felt being able to text and use a calendar are valuable skills to have (3.3). While all three participants had a mobile device only two of them indicated using a calendar (2.67).

The participants indicated they both enjoyed (3.0) and were able to independently watch the research study videos (3.0). Participants also agreed they would use videos to learn new skills (3.0). Study participants indicated a positive attitude toward using videos to learn (3.0 exit). They specifically indicated after the study that video was a good way to learn how to make calendar

entries (3.3) and send text messages (3.0). Every participant indicated they were able to learn how to use the calendar app using the video (4.0). Miranda stated using the alert function to receive notifications really helped her do things on time.

Discussion

Results suggest the VBI intervention package was successful at effecting positive change on the dependent variables of (a) the percentage of steps completed correctly to make novel calendar entries as originally designed for one of the three participants. Modifications to the Calendar Entry VBI phase resulted in positive change for (b) the timeliness for the receipt of text messages for two of the three participants. A significant impact was not shown to generalize to (c) the timelines of arriving for scheduled meetings (1 out of 3). Responses to the social validity questionnaire show a positive acceptance for the usefulness and willingness for students to use VBI to learn new skills.

Calendar Entries

Modifications to the calendar entry VBI were needed for the two women who chose to view it following the VM protocol. Upon implementation of the calendar entry VBI, Abigail's progress was inconsistent, Miranda showed no gain. These results are inconsistent with previous research completed on the effectiveness of VM (Kellems & Edwards, 2015; Mechling & Collins, 2012; Rayner et al., 2009)

Alycen selected to follow the VP protocol. Consistent with previous research she gained and maintained the required growth to progress to the next study phase (Graves, et al., 2005; Mechling et al., 2009; Mechling & Savidge, 2011; Sigafoos et al., 2007). These combined results are consistent with the conclusions drawn by Mechling's (2007) literature review of assistive

technology for self-management. As a form of prompting, one VBI system will not fit all learners and all situations.

Abigail watched the VBI without obviously doing other things. Miranda was inattentive, often telling the PI about her day instead of watching the VBI. Alycen was attentive to the VBI, completing the calendar entry one step at a time along with the video. Upon reviewing initial intervention data revealed Abigail and Miranda failed to included steps 15, 16, and 17 to set an alert. Abigail's first intervention modification was to give a verbal prompt to "set the alert." This allowed her to accurately complete calendar entries. She moved into maintenance for the calendar entry phase after seven consistent qualifying entries.

Chunked calendar entry VBI combined the first 14 VBI steps to play through, pausing only before (a) "Scroll to alert," (b) "Tap alert" and (c) "Select time preferred for notification." (Rayner et al., 2009; Sigafoos et al., 2007). Sigafoos et. al. (2007) used "chunking" as a means for fading prompts. The steps Miranda consistently completed were chucked together. This did not draw her attention to the steps to set an alert. She was then given a verbal prompt to "set the alert." This resulted in her consistently completing those steps. She did sporadically miss a step here and there while talking animatedly with the PI. In those instances, she was asked to double check specific information. After six qualifying calendar entries, she moved into the maintenance phase.

Abigail and Miranda chose to watch the calendar entry VBI all the way through before making a new calendar entry. Their choice made their experience with the VBI congruent with video modeling practices (Kellems, & Edwards, 2015; Mechling, 2007; Mechling & Collins, 2012; Mechling et al., 2009; Sigafoos et al., 2007). Each of these women required a verbal prompt to complete calendar entries with 80% or more steps correct. Alycen chose to follow a

VP protocol and complete the calendar entry step by step along with the VBI (Kellems, & Edwards, 2015; Mechling, 2007; Mechling & Collins, 2012; Mechling et al., 2009; Sigafoos et al., 2007).

The variance of results between Abigail, Miranda, and Alycen highlight the power of VP. Abigail and Miranda followed the VM format by watching the VBI all the way through before attempting to replicate the task. Following along step by step in the VP model allowed Alycen to reach the standard 80% of the steps completed correctly without an additional prompt. This study finds that the VP model was more effective than the VM model in long-term behavioral impact.

Abigail and Miranda's lack of progress was inconsistent with research published on VM as a form of VBI. Mechling and Collins (2012) examined the effects of VM. All their participants showed growth in completing the tasks. Alycen's growth is consistent with research published on VP as a form of VBI (Rayner et al., 2009). The difference between the participants who used VM and VP may be a result of efficacy expectation. Their choice of the VM model may have stemmed from a belief that they already knew how to complete the task accurately.

The deviance from prior findings with VM protocols could be due to the accuracy in performing the task during baseline. Miranda's talking through the VBI implied an over-confidence in her ability to complete the task without additional training. By not being attentive to the VBI she did not become aware of her inabilities. Through using a VP process, Alycen correctly completed more steps than Abigail and Miranda did following a VM process. Taking the time to pause between steps allowed her to reduce the amount of information active in working memory.

VP may be a preferred option for someone who has difficulty remembering multiple steps, or who has difficulty paying attention to a longer video (Sigafoos et al., 2007). It may also

increase the opportunity for them to learn a more complex skill. It should be asked if the information provided in the VBI had sufficient meaning for the participants. During baseline, nonverbal cues suggested they already knew how to complete the task of making a calendar entry. Their self-efficacy level did not translate into completing the task with accuracy.

The social validity questionnaire showed all participants felt calendar usage skills were important. Future research may look into efficacy expectations about needing to improve the calendar usage skills proficiency. Research about efficacy expectations for a given task would extend the understanding of what led Abigail and Miranda to require a verbal prompt when Alycen did not.

Text Message Timeliness

VBI had a positive impact on Abigail's timeliness for sending text messages. The calendar entry VBI and send a text message VBI showed no impact for Abigail; the VBI to respond to phone notifications lead to a jump of 0% to 70% of messages received, all with timeliness (text messages received within an hour). Miranda's timeliness was most significantly impacted by the verbal prompt to "set the alert" for her calendar entries. It did not impact Alycen's pattern for sending text messages.

Abigail's timeliness was more dependable than Miranda's. Utilizing the phone notification VBI increased Abigail's percentage of text messages received while maintaining timeliness. It took multiple intervention modifications to show a change in the likelihood of Alycen sending scheduled text messages. The verbal prompt to "set the alert" resulted in a significant increase for Abigail to send text messages. The same verbal prompt increased Miranda's sending messages within the hour.

Alycen demonstrated her ability to send messages through previous message exchanges with the PI in intervention sessions and outside intervention sessions to communicate about scheduling changes. Efforts made to promote Alycen sending text messages included (a) the regular reminders to send scheduled messages, (b) send a text message VBI, (c) clarifying contact information, (d) the PI agreeing to respond to scheduled text messages, and (e) the PI responding to scheduled text messages Clarifying contact information was done because Alycen struggled to internalize the concept of sending a text message to the same contact she used for communicating with the PI about meetings. She had been attempting to send scheduled messages to the PI's name rather than find the contact she used to otherwise communicate with the PI. Nevertheless, she continued to neglect to send text messages. By having the PI respond to scheduled text messages, Alycen's rate of sending messages increased dramatically. Her probability for sending text messages within the hour also increased.

Meeting Timeliness

The timelines of arriving for scheduled meetings was evaluated to see if the participants connected making calendar entries and responding to notifications. Meeting attendance without a reminder from the PI waned as the study ran its course. This could be due to the artificial nature of the study. There were no natural consequences for not following through. Appropriate social reciprocity recommends communicating for needing to miss or reschedule a meeting.

PI meeting notes include the following: Abigail made calendar entries for scheduled meetings and showed them to the PI. During calendar entry baseline she set the alerts for one to two days prior to the meeting. If there was a change in schedule and she would be absent or late, she did not inform the PI in advance. Miranda also made calendar entries for the next scheduled meeting. She did not show these entries to the PI. She did communicate if there was a change in

her schedule and was not able to make it. She did not inform the PI if she was going to be late. Alycen did not make calendar entries for future meetings with the PI, nor did she reach out if was would be late or would not be able to make it.

Research has shown individuals with ASD have difficulties generalizing skills from one setting or task to another (Ayres & Cihak, 2010). Miranda and Abigail making calendar entries for meetings showed a level of generalizing the use of a meeting on time requires a cognitive and physical shift. Miranda maintained the highest rate of attending meetings without reminders. This could be due to her new internship. The addition to her schedule limited when she could meet with the PI. This led to the time she met with the PI being a regular activity in her schedule. Abigail and Alycen continued to be tasked with artificially shifting from one task to another.

Limitations

Study limitations include generalization to authentic tasks and generalization to population. The research participants were all adult females with a diagnosis of ASD. They also came from families with an inclination and the resources to send them to a private school for adults with ASD. Being in this setting meant their environment was seeded with staff to teach and re-emphasizes the importance of follow-through and independent living skills.

Results for the effectiveness of these interventions were limited by the amount of time the participants were available to participate. This included working around school, internship, and volunteer schedules. Responses to the social validity questionnaire indicate the participants recognize the importance of calendar usage skills. The text messages for the study were artificial.

Generalizability across population would require this study to be replicated with a greater variety of participants including males and adolescents. Individuals with ASD also have high

comorbidity with anxiety, depression, and ADHD. Future research may include more subjects with comorbid diagnosis.

The research activities they were asked to participate in were artificial--they did not have real consequences attached to failure. They were given a gift card. Being late or completely skipping a meeting with the PI did not come with the natural consequences of disappointing a friend or family member, or disciplinary action one might receive at school or work. Scheduled text messages only held authentic meaning to the PI for the purpose of collecting data. The importance of research activities paled in comparison to new internship responsibilities or family events.

Future Research

Further research may look at whether a level efficacy expectation about the task alters attentiveness to the VBI or willingness to adjust performance to improve the accuracy of task completion. Does a high level of task accuracy at baseline conversely or inversely affect the individual's success with a VBI? Mechling (2007) found the use of Palmtop personal computers helped prevent students from missing or mis-sequencing steps. Further research may be done to analyze the variance of the percentage of steps completed correctly in sequence between VM and VP protocols.

Working with individuals to manage authentic tasks may yield different results. For future research consider the type of VBI and identified tasks. Will the VBI follow a VP or VM procedure? Are there tasks which are better suited for one over the other? Do students have a preference or need for one over the other? Completing another study with authentic tasks would expand the findings of calendar usage and timeliness of task completion.

Implications for Practitioners

  Timely arrival or task completion (i.e. work, class, appointment) are important enough to American society that caregivers are inclined to prompt and over prompt individuals with ASD to be prepared and arrive on time. Gaining independence requires a reduced dependence of caregiver prompts. Mobile devices allow this to happen more readily than ever before. It is natural to continue research into the use of smart phones, watches and homes to increase the independence of individuals with ASD (Bereznak et al., 2012; Grynszpan, Weiss, Perez-Diaz, Gal, 2014; Mechling, 2011; Mechling & Savidge, 2011). Things to consider when identifying tasks for the student and setting, is it (a) novel to the student, (b) important to the student and their goals, and (c) authentic with natural and logical consequences?

  In summary, this study supports the effectiveness of VBI for the instruction of daily living skills to individuals with ASD. It also highlights the need for skill generalization to be explicitly designed. It is important the skills individuals are instructed in add value to their life and ability to be independent.

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Tables

Table 1

Participant Demographics

Name	Age	Race	Phone	*GIA	**Broad Reading	**Broad Math	Diagnosis
Alycen	25	White	iPhone 5s	83 SS	90 SS	84 SS	Autism Spectrum Disorder, Generalized Anxiety Disorder, Depression, Attention Deficit/Hyperactive Disorder, Slow Processing Speed, Obsessive Compulsive Disorder, Expressive and Receptive Language Disorder, Specific Learning Disability
Abigail	27	African American	iPhone 5	93 SS	102 SS	95 SS	Autism Spectrum Disorder
Miranda	31	White	iPhone 6s	88 SS	95 SS	84 SS	Autism Spectrum Disorder, Depression, Attention Deficit/Hyperactive Disorder, Slow Processing Speed, Non Verbal Learning Disorder

* Woodcock-Johnson III Tests of Cognitive Abilities (WJ III COG)
**Woodcock-Johnson III Tests of Academic Achievement (WJ III ACH)

Table 2

VBI Details

Name	Task Analysis Steps	Length	Chapters
Calendar Entry	18	62.8 sec	11
Send A Text Message	7	35.37 sec	7
Notification	--	5.07 sec	2

Table 3

Intervention Package

Phases	Completion Criteria
Calendar Entry VBI	80% steps correct
Text Message VBI	70% text messages received
Notification VBI	75% text messages received within an hour

Table 4

Percent (%) of scheduled text messages received

Name	Baseline	Calendar Entry VBI	Set Alert VP	Notification VBI	Chunked VBI	Clarify Contact	PI Respond	Maintenance
Abigail	0%	0%	70%	75%	--	--	--	75%
Miranda	25%	100%	93%	--	100%	--	--	95%
Alycen	0%	0%	--	0%	--	14%	71%	--

Table 5

Percent (%) of scheduled text messages received within an hour

Name	Baseline	Calendar Entry VBI	Set Alert VP	Notification VBI	Chunked VBI	Clarify Contact	PI Respond	Maintenance
Abigail	0%	0%	70%	75%	--	--	--	58%
Miranda	25%	38%	56%	--	0%	--	--	31%
Alycen	0%	0%	--	0%	--	14%	33%	--

Table 6

Percent (%) scheduled meetings attended

Name	Baseline	Calendar Entry VBI	Set Alert VP	Maintenance
Abigail	100%	86%	57%	63%
Miranda	80%	100%	75%	100%
Alycen	90%	75%	--	33%

Table 7

Social Validity Survey Results

Question	Entry	Exit	Difference
Do you have a smartphone or tablet (iPhone, iPod, iPad)?	4.00	4.00	0.00
How often do you keep your mobile device you (in pocket, hand, or within arm's reach)?	3.67	3.67	0.00
While getting ready for the day do you have to be prompted many times?	1.67	2.67	1.00
Do you have a job, or place you volunteer?	4.00	4.00	0.00
Can you get to work on time without promptings?	4.00	2.33	-1.67
Do you use a calendar?	3.00	2.67	-0.33
Do you think using a calendar would be a valuable skill for them to have?	3.33	3.33	0.00
Do you send text messages?	4.00	4.00	0.00
Do you think sending text messages is a valuable skill for you to have?	4.00	4.00	0.00
Do you enjoy watching videos?	3.67	3.67	0.00
Do you watch videos to learn new skills?	2.33	2.67	0.34
Are videos a good way to learn to skills and knowledge?	4.00	3.00	-1.00
Did you find the video about how to use a calendar app enjoyable?	--	3.00	--
Did you find the video about how to send a text message enjoyable?	--	3.00	--
Were you able to watch the videos independently?	--	3.00	--
Were you able to learn how to use the calendar app by watching the video?	--	4.00	--
Do you think a video is a good way to learn how to use a calendar app?	2.67	3.33	0.66
Were you able to learn how to send a text message by watching the video?	--	3.67	--
Do you think a video is a good way to learn how to send a text message?	3.33	3.00	-0.33
Were you able to learn how to learn more about calendars by watching the video?	--	3.67	--
Do you think a video is a good way to learn more about calendars?	4.00	3.33	-0.67

Figures

Text "Loafer Mountain" to
Miss Glasgow
On Friday April 21, 2017 at
9:00 AM

Figure 1. Text Card.
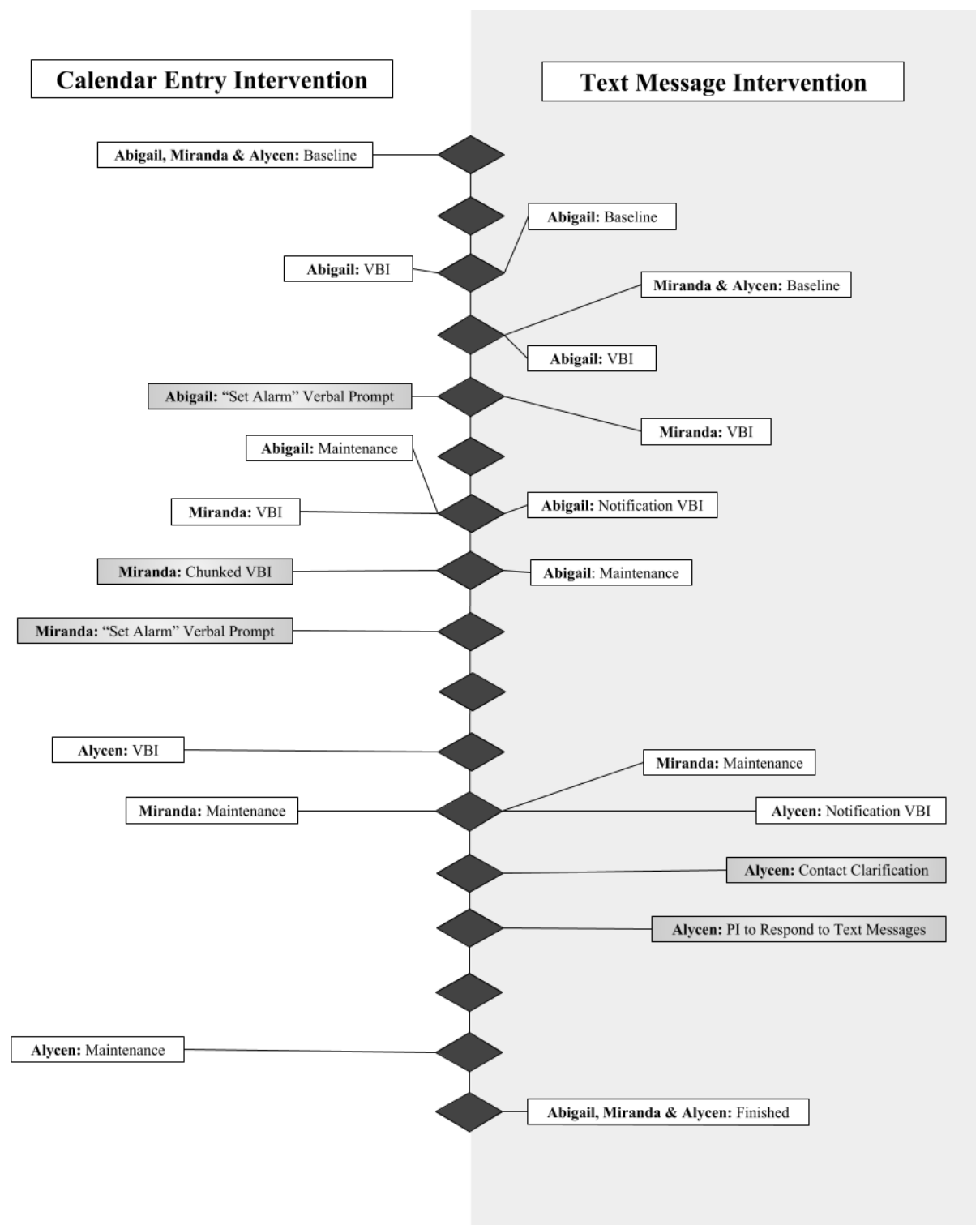
Figure 2. Intervention Timeline.
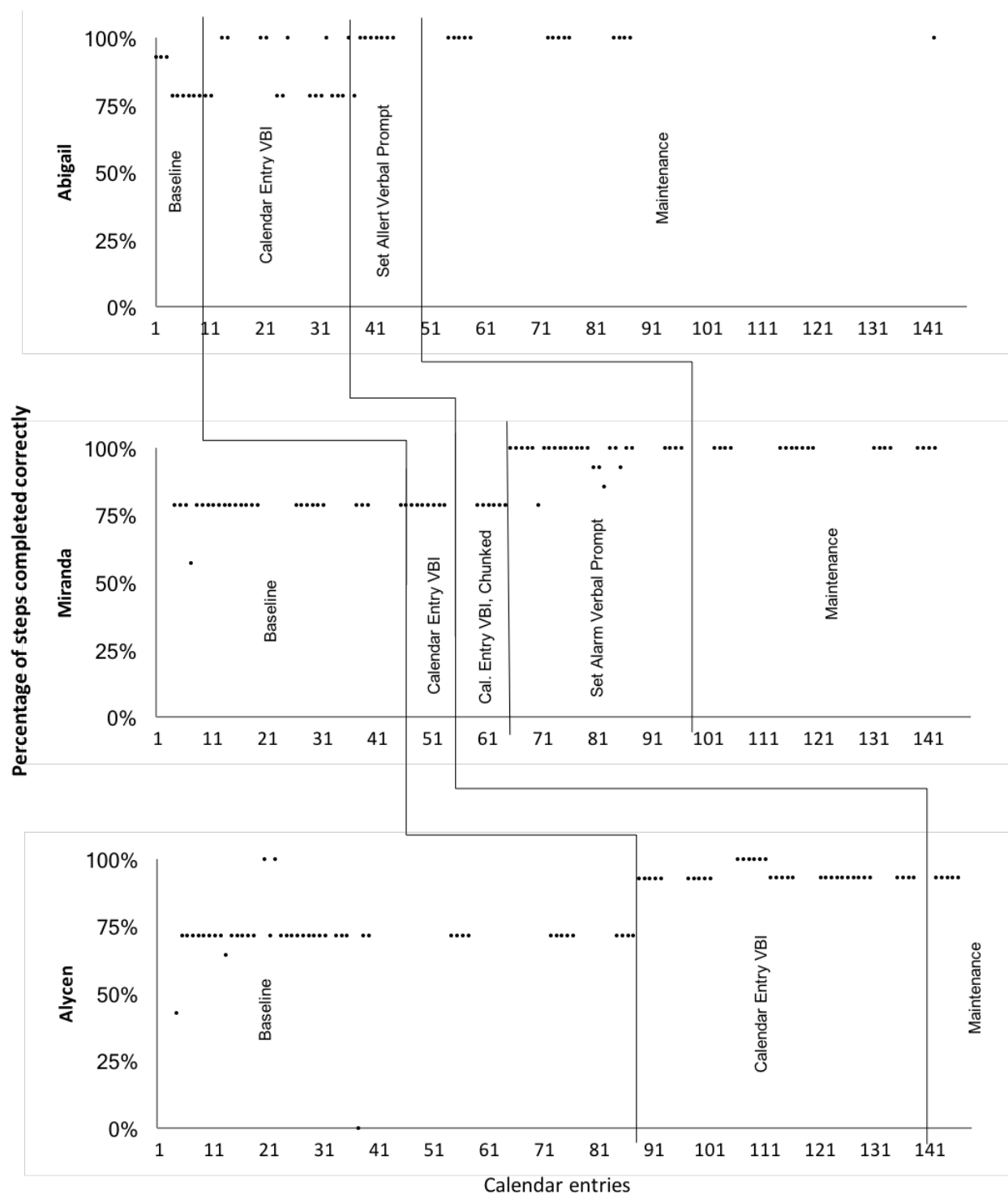
Figure 3. Percentage of steps completed correctly.
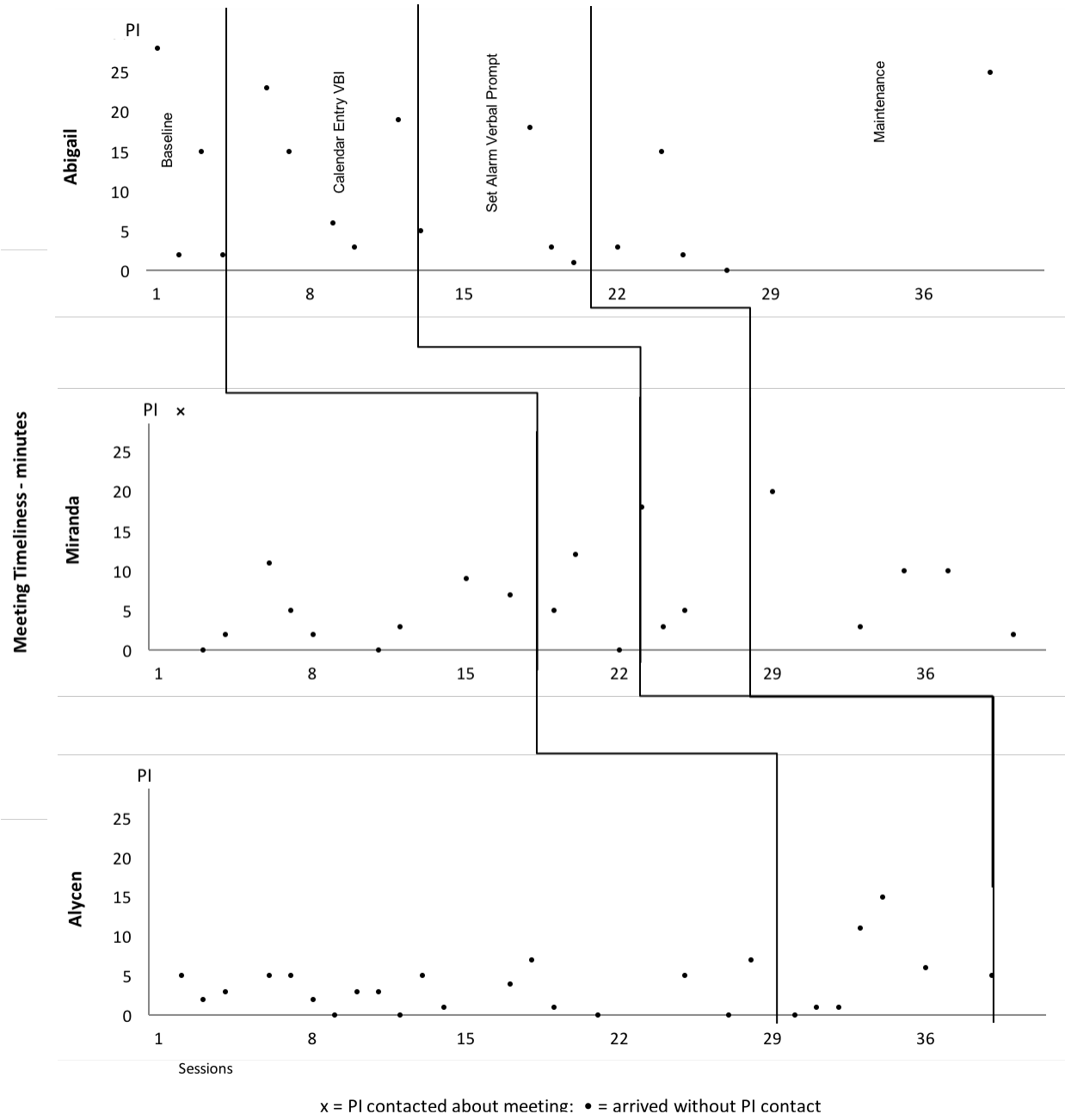
Figure 4. Meeting Timeliness.

APPENDIX A: Review of Literature

Have you ever wanted a personal assistant? Someone there to remind you of all of your appointments? Not only remind you about them at the beginning of the day, but also give you an hour, half hour, or 5-minute warning. If you are a parent, teacher or paraeducator you may feel like you are a personal assistant or executive secretary to a number of children. How do you keep track of your appointments and assignments? Have you used a day planner or personal digital assistant (PDA)? Chances are you have moved on to a smartphone or other mobile device for all of your task management needs.

How do you feel when you are running late? Compare that to how you feel when you mark your final task of the day, done. Consider your clients or students. Are we doing enough to provide the skills and tools necessary to enable individuals with disabilities to be the executive managers of their lives? Individuals with Intellectual and Developmental Disabilities (IDD) need to be explicitly taught skills which enable employment and social engagement.

Individuals with Intellectual and Developmental Disabilities (IDD)

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) lists neurodevelopmental disorders as (a) intellectual disabilities (ID), (b) communication disorders, (c) autism spectrum disorder (ASD), (d) attention-deficit/hyperactivity disorder (ADHD), (e) specific learning disorder (SLD), and (f) motor disorders (APA, 2013). Skill deficits among individuals who qualify for these diagnoses are related to executive functioning skills including (a) social-emotional reciprocity, (b) attention to task, (c) planning (d) initiation, (e) inhibition, (f) integrating environmental information, and (g) shifting in and between tasks (APA, 2013; Bellini, Peters, Benner, & Hopf, 2007).

According to the National Center for Education Statistics (NCES) "The Condition of Education 2014" report, 6.4 million (13%) of public school students received special education services. During the 2011-12 school year about 23% of students served under the Individuals with Disabilities Education Improvement Act (IDEA, 2004), Public Law 108-446, as reauthorized in 2004 qualified for services under categories related to intellectual and developmental disabilities. IDD includes those with ASD (8%), intellectual disability (ID; 7%), developmental delay (6%), and multiple disabilities (2%; Kena et al., 2014)

"After high school: A first look at the post school experiences of youth with disabilities. A report from the National Longitudinal Transition Study-2" (NLTS2) was conducted over a period of 10 years and involved over 11,000 students whose ages ranged from 13-16 years. They were receiving special education services through 12 disability categories and, as of December 1, 2000, they were in the 7th grade or above. The study followed these students with IEPs for up to 10 years after they left school.

The NLTS2 indicated that students with IDD are least likely to graduate with a regular diploma, attend post-secondary training, work, or regularly engage in social activities. This study also found that individuals with IDD are more inclined to become parents and purse independent lives with limited support systems (Wagner, Newman, Cameto, Garza, & Levine, 2005).

The NLTS2 (2005) also indicated that individuals with ASD, traumatic brain injuries (TBI) and multiple disabilities are more likely to have difficulties with self-care tasks. Furthermore, they are in close third (56%) behind those with IDD (52%), multiple disabilities (54%) for lowest rates of engagement. In contrast students with ASD, visual, hearing, or orthopedic impairments are more likely to graduate from high school with a regular diploma.

The NLTS2 (2005) researchers identified skill areas significantly related to whether an individual was likely to be socially engaged (gather with friends about once a week) or employed. Identified domains are self-care skills, functional cognitive skills, and social skills (Wagner et al., 2005). NLTS2 used a parent rating tool to measure various aspects of their student's abilities. When comparing functional skill levels of individuals with IDD and ASD individuals with IDD rated an 84.2 in self-care and 42.3 for cognitive skills. However, those with ASD rated at 66.0 in self-care and 72.2 for cognitive skills. It is interesting to note that individuals with IDD are more inclined toward self-care skills while those with ASD are more inclined toward cognitive skills. Despite this difference, the collective groups of individuals with IDD are shown to have limitations in skills needed for meaningful employment and social engagement.

Functional cognitive skills were evaluated by NLTS2 based on the individual's perceived ability to complete four skills which are used for daily activities of reading street or other directional signs, telling time on an analog clock, counting change, and locating telephone numbers and using the telephone (Wagner et. al., 2005).

Explicit Instruction

Individuals with IDD do not develop at the same rate, or as independently, as their typical, same age peers (APA, 2013). Due to limited abilities to move about, comprehend, or interpret the world around them, those with IDD struggle to identify correct actions or complete activities associated with developing a repertoire of skills needed to make and act upon independent choices (Algozzine, Browder, Karvonen, Test, & Wood, 2001). With accommodations, supports, and repetition, these individuals are able to increase in academic knowledge, employment or vocational, interpersonal and independent living skills (Bancroft,

Weiss, Libby, & Ahearn, 2011; Flores, Schloss, & Alper, 1995; Spooner & Browder, 2014). Individuals with IDD may be able to complete daily chores, personal hygiene routines, and go to work independently with the support of a routine, visual, or video prompts (Stephens, Collins, & Dodder, 2005).

Federal mandates such as IDEA, 2004, Every Student Succeeds Act (ESSA, 2015) and the push for Common Core State Standards (CCSS, 2010) directs school systems and IEP teams to focus on academics which may not directly lean towards practical independent living skills (Ayres, Lowrey, Douglas, & Sievers, 2011). Limited numeracy and literacy skills are among the skill deficits leading individuals with IDD to need accommodations and supports. A student qualifying for services with IDD will continue to need supports and accommodations for participation in new experiences as they progress through school into work, interpersonal relationships, and diverse settings. These supports and accommodations may include supported living, cooking and cleaning instructions, financial management, and having someone check-in on them every two or three days. There is the potential to learn the skills required for sustained employment or volunteering in a preferred activity.

It is a societal expectation for students to move from high school into some form of employment or postsecondary education (Shattuck, et. al., 2012). The expectation for planning and providing supports to students with disabilities preparing to exit high school has been placed on the public school system. The 2004 reauthorization of the IDEA changed the definition of the term "transition services" to include activities "...focused on improving the academic and functional achievement of the child with a disability to facilitate the child's movement from school to post-school activities, including postsecondary education, vocational education,

integrated employment (including supported employment)..."[34 CFR 300.43 (a)] [20 U.S.C. 1401(34)].

Barriers to Employment and Social Engagement

Lemaire and Mallik (2008) stated that hygiene, regular timely attendance, ability to communicate, and money management are additional barriers to employment for individuals with ID. In their discussion of employment rates for individuals with ASD, Shattuck and colleagues (2012), mentioned that low levels of cognitive and language usage correlated with employment rates.

Further barriers to employment include deficits in time management, handling criticism, and attention to tasks (Winn & Hay, 2009). Lack of community-based resources, such as transportation, supportive staff, time, and knowledge to implement appropriate accommodations and support, present additional hurdles to successful employment for individuals with IDD (Dymond, Renzaglia, & Chun, 2008).

Trembath, Balandin, Stancliffe, and Togher's (2010) discussion of barriers to employment for adults with IDD also includes levels of literacy and numeracy. Activities related to functional cognitive skills as reviewed by NLTS2 include tasks involve reading and being able to interpret various ways numbers are used, specifically telling time on a clock and locating telephone numbers. Tied with telling time on a clock is being able to use a calendar.

Mobile phones are used to call people, send text messages and pictures. Completing these actions required being able to identify the correct contact information and generating a message appropriate for the format and relationship to the sender. Emojis allow individuals with limited literacy skills to join the conversation. Having the tools does not mean knowing how to use them. Individuals with IDD need to be taught how to use technology for its various purposes (Apple,

Billingsley, Schwartz, & Carr, 2005; Bereznak, Ayres, Mechling, & Alexander, 2012; Kagohara et al., 2013).

Time management and planning. Planning is an executive functioning skill needed in the process of self-determination (Danielsson, Henry, Messer, & Rönnberg, 2012; Grant & Ashford, 2008; McCabe, Roediger III, McDaniel, Balota, & Hambrick, 2010). Individuals with IDD may need help to identify goals (long-term or for daily achievement). Likewise, there may be a need for help with identifying steps to accomplish established goals. Passage of time, timeliness, and calendar usage skills are important when developing a plan to accomplish long-term goals.

It is a common practice for schools to have students practice using planners for the recording of special dates and homework assignments (Lenters & McTavish, 2013). There are often points awarded for getting the correct elements of the details recorded. A student planner may also be used as a simple behavior tracker and communication log between general education, special education, and primary caretakers.

According to Myles, Ferguson, and Hagiwara (2007), a Texas school system considered homework recorded correctly when the subject, date, page, and problem numbers were recorded. In their study, they worked with a student known to have Asperger's Syndrome. The student used the calendar functions of a Hewlett Packard PDA with Microsoft Pocket PC software. The primary purpose of the study was completing the assigned task of recording homework in the electronic planner rather than a paper planner. Their results indicated a change from sporadic completion of assignment recording in baseline to a consistent and high level of successful assignment entry. They considered the success of the intervention to "...be related to (a)

difference in handwriting demands, (b) ease of PDA use, and (c) motivation" (Myles, Ferguson & Hagiwara, 2007, p. 98).

There is limited research on working with individuals with IDD to manage their schedules with mobile devices or increase their timeliness for completing tasks (Falkenberg, & Barbetta, 2013; Mechling, Gast, & Seid, 2009; Myles et al., 2007). Shifting between tasks is an executive functioning skill requiring the ability to change what the mind is processing (McCabe, Roediger III, McDaniel, Balota, & Hambrick, 2010). Responding to a notification to send a text message at a specific time is a disruption to routine. This is often a skill that needs to be practiced and supported by human or VBI prompting. It requires being able to stop one task, completely for a different task, and often return to the previous task.

Calendar usage skills. Calendar usage involves understanding cardinality of dates, changing of months, and various date formats, especially when the month can be spelled out, abbreviated or represented as 1 of 12 numbers. Individuals with IDD often struggle to grasp and master abstract concepts such as the passage of time and how it is measured. Using an electronic calendar with set notifications may enhance their ability to follow through with scheduled tasks, change activities, and be more aware of the passage of time (Falkenberg, & Barbetta, 2013; Flores et al., 1995; Mechling, 2007). These skills are important to an individual's ability to engage in their social, vocational, and personal obligations.

Calendar usage supports self-determination, time management, planning, task completion, and self-monitoring, communication, social engagement. Additional activities include locating the current day, planning for upcoming events, and calculating extended durations. In the Brigance Transition Skills Inventory (2010) calendar usages skills are assessed through six (6)–three-level questions. Question number one asks the participant to state the

number of days in a given month. Number two requires the participant to be able to identify which day of the week a given date falls on. In number three they are asked to identify which date a holiday, such a Labor Day or Thanksgiving, falls on. For the fourth question, they are given a start date and duration and asked to correctly identify the ending date. In the fifth question, they are given a start and end date and are asked to calculate the difference in turns of days. For the 6th question, the participants are a given a start and end date and are asked to determine the difference in terms of weeks.

Self-determination. In one of the few studies about calendar usage for a student with disabilities, Flores, Scholoss, and Alper (1995) investigated the use of a daily calendar (planners) by secondary students. The participating students had FSIQ ranging from 55-85. Three of them were considered as having intellectual disabilities; five of the students had learning disabilities. The researchers were looking at the effect of using a planner on task completion. During the study, discussions were had about "(1) carrying a calendar, (2) recording activities in the calendar, and (3) utilizing the calendar to meet responsibilities" (Flores et al., 1995, p.40). Using a multiple baseline design the first behavior data collected were the frequency the subjects were carrying their new planner. Then data were collected on the recording of events and responsibilities. Final data were collected on the percentage of obligations met by the students now using day planners. Their results yielded a "positive relationship" between calendar usage and responsibilities fulfilled. Furthermore, many of the students reported to Flores et al. (1995) that they felt pride in "planning and taking responsibility for their activities" (p. 43). This pride in taking personal responsibility can add to an individual's psychological sense of community.

Psychological sense of community as explained by O'Grady (2008) is a collective experience where individuals feel they have an influence on others, are able to get their social

and emotional needs met, and experience a sense of membership. Larger social networks provide opportunities and means for individuals to get support for practical and social needs (Hillman, et.al., 2013). Individuals with IDD are often socially isolated with only family and professionals to support them in getting needs met (Simplican, Leader, Kosciulek, & Leahy, 2015).

Individuals with IDD need to be provided with opportunities and be explicitly taught skills needed to develop social reciprocity skills. With 95% of Americans owning a cell phone and 77% owning smartphones, texting has become an often a preferred way to communicate (Mobile Fact Sheet, 2017). Looking at smartphone usages by Americans with disabilities Stock, Davies, Wehmeyer, and Palmer (2008) found individuals with IDD can operate cellphone technology. They sought to establish that cognitively accessible software may benefit individuals with IDD in being more independent and socially engaged.

Self-determination is the process wherein a person makes their own choices to determine the course of their life. Developing skills necessary to act for themselves is a natural course of growing up. Individuals display self-determination by being able to express their interests, needs and abilities, make goals, decisions, and plans, follow through, evaluate, and adjust actions to realign to purpose or efficiency (Algozzine et al., 2001; Carter, Owens, Trainor, Sun, & Swedeen, 2009). Skill deficits fall into areas such as executive functioning, personal and domestic living skills, interpersonal relationships, communication, fine and gross motor skills. Such adaptive behavior skills may be evaluated through the completion of measurements including the Scales of Independent Behavior-Revised (SIB-R; Bruininks, Woodcock, Weatherman, & Hill, 1996). or the Vineland Adaptive Behavior Scales, Second Edition (Vineland-II; Sparow, Cicchetti, & Balla, 2005).

Research shows self-determination skills to be positively correlated with post-secondary success including opportunities for employment, education, and independent living (Test et al., 2009; Wehmeyer, 2007). As individuals with IDD move beyond the scope of services provided in public school they lose daily interactions with friends at school or in extracurricular activities (Wagner et al., 2005). Meaningful careers increase person's sense of worth, identity, accomplishment, promote self-determination and may lead to friendships and improved psychological sense of community (Lee & Carter, 2012; Winn & Hay, 2009).

Self-monitoring and task completion. Self-monitoring behaviors refer to the actions individuals take to become cognitively aware of their subconscious and repetitive behaviors and develop new habits (Falkenberg & Barbetta, 2013). The purpose is to help individuals increase independent and socially appropriate behaviors and decrease maladaptive behaviors or dependence on prompts from external sources such as school, community, and residential staff or family members. Mechling and Savidge (2011) described these sets of skills as "self-operated procedures," "self-management strategies," or "personal support technologies" (p. 687).

Teaching self-monitoring skills to individuals with disabilities is an evidence-based practice (EBP) for reducing maladaptive behaviors while increasing adaptive behaviors. Parker and Kamps (2011) taught students with ASD to use a task analysis checklist to self-manage social situations (games), and increase verbalizations with their peers. One goal of video prompting systems is to provide a support system for completing tasks independently.

While looking at self-monitoring for homework completion, Falkenberg and Berbetta (2013) included an online computer program for the students to utilize. They found continuing evidence in favor of self-monitoring to support the improvement of task completion. Mechling and Savidge (2011) examined the usefulness of personal digital assistants (PDA) for tracking

assignments, transitioning between and within tasks. They found the students who used a PDA completed more tasks and were more successful at the transition between tasks.

PDAs have now been replaced with mobile devices. Mobile devices provide the ability to set notifications or reminders about an upcoming tasks or events. Various calendar applications, such as the Google Calendar app can be installed on various platforms and accessed via a web browser. Calendar applications allow multiple notifications can be set. Notifications may be set and received via the device, email or even fitness tracker. Individuals can set notifications to remind them of events minutes, hours, and days in advance. These notifications may enable the individual to transition from a current task to the next in a timely manner. According to Mechling and Savidge (2011), prior to their study, no other studies had been concluded to observe the effects of using a portable device as a prompting system.

Video-Based Intervention

According to Rayner, Denholm, and Sigafoos (2009), video-based intervention (VBI) is an inclusive term for activities using video as an independent variable. Video modeling (VM), video-self modeling, video-prompting (VP), computer-based video instruction and multimedia may all be considered under this broad term. More specifically it involves the use of pre-recorded videos to teach a new skill (Alberto, Cihak, & Gama, 2005; Rayner, Denholm, & Sigafoos, 2009). The learner watches a video with a model demonstrating the desired skill (Mechling, Gast, & Seid, 2009; Ramdoss et al., 2012; Sigafoos et al., 2007). The video may be watched once or multiple times prior to the learner attempting to demonstrate their skill acquisition (Ramdoss et al., 2012).

The benefits of VBI include visual and auditory instructions. Jargon or words specific to a group of people or activity, used during instruction can hinder the novice's learning. However,

when this is paired with a demonstration comprehension increases. VBI also allows the learner to select the time for learning. The pause button allows the learner to complete steps at their rate (when the activity allows). Mobile devices increase the opportunity for independent skill acquisition to be completed in a variety of settings (Mechling, 2011; Stephenson & Limbrick, 2015).

Rayner et al. (2009) outline options for VM including video feedback; video-self modeling; subjective point of view; and interactive video instruction. Mechling and Collins (2012) looked into the effectiveness of VM for instructing students with intellectual disabilities with and without the use of verbal cues. Their goal was to answer questions about specific components of VM and identify if the process requires all parts to be effective. Mechling and Collins examined the component of verbal cueing. The participants were divided into two groups, one group viewed the videos provided with the verbal cues, the other group viewed the videos without the verbal cues (the laptop was muted). All participants showed growth in completing the tasks. However, the verbal cues were more effective for most of the students, specifically for tasks where a repetition was involved. The counting prompt provided in the verbal cues enabled two of the participants to master those steps.

Due to their bulk, using a desktop computer for VM or VP systems limits the locations for which novel skills can be independently developed. Mechling, Gast, and Seid (2009) used a PDA with still pictures, audio, VM, and VP to teach individuals with ASD to learn a new cooking skill. Their purpose in using a PDA was to increase location and environment options for where VM and VP systems can be used to support skill development in those with disabilities. Technology advancements are continually making mobile devices lighter, with larger memory stores, longer battery life, and applications for creating, utilizing, and promoting the

feasibility and social validity of VBI (Kagohara et al., 2013; Mechling, 2011; Stephenson & Limbrick, 2015)

Additionally, Mechling et al. (2009) provided various levels of prompts to enable gentler fading from using VM / VP system to a less restrictive prompt type. They wanted to determine if students with IDD would independently alter the prompt tool (use only pictures rather than video) as they developed their ability to complete the tasks. According to results the use of the PDAs was associated with an immediate increase in the student's ability to complete the cooking tasks independently. Furthermore, the students self-adjusted the level of prompt system.

Along with VM, VP allows the individual to observe a new skill while hearing instructions. The key difference is that video prompting systems are a collection of videos designed to pause after a manageable step has been completed. This way the learner may watch the first step being performed, mimic the step and then proceed to the next video for the next step (Mechling, 2007; Mechling & Collins, 2012; Mechling et al., 2009).

VP may be a preferred option for someone who has difficulty remembering multiple steps, or who has difficulty attending to a longer video (Sigafoos et al., 2007). It may also increase the opportunity for them to learn a more complex skill. VP has been successfully used to teach students with disabilities to cook various items including Ramen Noodles, Mac n Minutes (Graves, Collins, Schuster, & Kleinert, 2005), wash dishes (Sigafoos et al., 2007), and use a Personal Digital Assistant (Mechling et al., 2009).

Conclusion

Executive functioning skills enable individuals to successfully navigate their social relationships, vocational and independent living responsibilities (Falkenberg, & Barbetta, 2013; Flores et al., 1995). Individuals with IDD need explicit instruction in the use of these

technologies (Mechling, 2007). Computer technologies have been used and developed to support management of the many aspects of executive functioning skills including planning, shifting, initiation, and task completion (Bereznak et al., 2012; Grynszpan, Weiss, Perez-Diaz, Gal, 2014; Knight, McKissick, & Saunders, 2013; Mechling, 2011; Mechling & Savidge, 2011).

Mobile calendar applications are just one of the tools which have been developed to support productivity. Developers strive to make an intuitive interface for the managing the abstract faucets of time passage. Calendar apps may also help support the instruction of calendar usage skills for individuals with IDD (Bauer & Ulrich, 2002; Flores et al., 1995). This study has been designed to examine the possibility of using VBI to teach individuals with IDD to use calendar apps to increase timeliness of task completion.

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APPENDIX B: IRB & Consent

Appendix B1. IRB Approval

Institutional Review Board
for Human Subjects

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678 S. 2700 West E 308
Springville, Utah 84663

Re: Video Based Interventions for teaching students with intellectual developmental disabilities calendar usage skills

Dear Malinda Glasgow

This is to inform you that Brigham Young University's IRB has approved the above research study.

The approval period is from 11-10-2016 to 11-9-2017. Your study number is X16254. Please be sure to reference this number in any correspondence with the IRB.

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

1. A copy of the 'Informed Consent Document' approved as of 11-10-2016 is enclosed. No other consent form should be used. It must be signed by each subject prior to initiation of any protocol procedures. In addition, each subject must be given a copy of the signed consent form.

2. All protocol amendments and changes to approved research must be submitted to the IRB and not be implemented until approved by the IRB.

3. The enclosed recruitment advertisement has been approved. Advertisements, letters, Internet postings and any other media for subject recruitment must be submitted to IRB and approved prior to use.

4. A few months before this date we will send out a continuing review form. There will only be two reminders. Please fill this form out in a timely manner to ensure that there is not a lapse in your approval.

If you have any questions, please do not hesitate to call me.

Sincerely,

Robert Ridge, PhD, Chair
Sandee Aina, MPA, Administrator
Institutional Review Board for Human Subjects

Appendix B2. Consent To Be a Research Subject

Consent to be a Research Subject (readability, 6.3 grade)

Introduction
My name is Malinda Glasgow. I am a student at Brigham Young University. I am working with Ryan Kellems. We are doing a study to test if videos are good for learning new skills. You are invited to take part because you are a student at ScenicView Academy. You are also building employment and independent living skills.

Procedures

If you want to take part, you will use your iPhone or iPad to track meetings and tasks. You will:

- Do a brief survey before staring
- Complete tasks with your iPhone or iPad
- Watch videos to learn new skills
- Do the skills as seen in the videos
- Do a brief survey at the end
- Spend 10 hours over 12 weeks, in 10 minutes meetings
- Allow me to know test scores (IQ) and diagnosis for her report.

Risks/Discomforts
If you do not have unlimited texting, you may receive charges for sending text messages. I have set up an iMessage account to reduce charges. You may feel frustration with learning a new task. I will reduce frustration by answering your questions.

Benefits
There will be no benefit to you. It is hoped you will help us learn about using videos for teaching students.

Confidentiality
All data will have names removed. It will be kept in a secure location. The computer will be password protected. Only Dr. Kellems and I will have access to the data. At the end of the study, data will be kept in the researcher's locked office. Your real names will not be stored. You will be given a number for record keeping.

Compensation
You will be given a $30 gift card after you have finished the study.

Participation
Taking part in this study is up to you. You do not have to take part in the study. You can quit at any time. It will not affect your place at your school.

Institutional Review Board	
11-10-2016	11-9-2017
Approved	Expires

Questions about the Research

If you have questions you may email **Malinda Glasgow** at **mee.glasgow@byu.edu** or call **Ryan Kellems** at **801-422-6674**.

Questions about Your Rights as Research Participants

If you have questions contact:

IRB Administrator
(801) 422-1461
A-285 ASB
Brigham Young University
Provo, UT 84602
irb@byu.edu

Statement of Consent

I have been given a copy of this form to keep.

I want to take part in this study.

Name:
Signature:
Date:

	Institutional Review Board	
BYU	11-10-2016	11-9-2017
	Approved	Expires

Appendix B3. Teacher/Staff Recruitment

Teacher / Staff Recruitment

Introduction

A research study is being conducted by Malinda Glasgow, School Psychology Graduate Student at Brigham Young University to determine viability of using video based intervention systems for teaching calendar usage skills to individuals with intellectual and developmental disabilities. She is working under the direction of Ryan Kellems, Assistant Professor at Brigham Young University in the Department of Counseling Psychology and Special Education. Your students / clients with goals related to employment and social engagement may qualify for participation in this study. We are looking for individuals who qualify for transition services under the categories of intellectual disabilities, Autism Spectrum Disorders, or multiple disabilities.

Procedures

If you and your student agree to participate in this research study, the following will occur:

- Your student will be asked to complete multiple activities without instruction to collect baseline data
- Your student will be asked to watch video prompting systems for instructional purposes
- Your student will be asked to complete the tasks as seen in the video prompts
- Your student will be asked to complete probes about information in the videos
- Your student will be asked to complete brief pre- and post-surveys concerning the intervention
- Your students total time commitment will be 10 hours over 12 weeks
- You will be asked to complete brief pre- and post-surveys concerning the intervention
- You will be asked to help obtain correct eligibility categories and IQ scores
- Your total time commitment will be 10 minutes

The study consists of about 12 weeks of interventions and will take approximately 10 hours over the 12 weeks to complete. Intervention sessions will take less than 15 minutes at 2-3 sessions per week.

Risks/Discomforts

There are minimal risks for participation in this study. If your students do not have unlimited texting they will receive charges for sending text messages. The participate may experience frustration due to the novelty of tasks and difficulties in learning a new skill. The researcher will seek to minimize risks, through providing reinforcements and making the videos direct and relevant.

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 kept in the researcher's locked office.

Benefits
There will be no direct benefits to you or your student / client. It is hoped, however, that through their participation researchers will learn about video-based instruction as an instructional tool for students with intellectual and developmental disabilities.

Confidentiality
The research data will be kept in a secure location and on a password protected a computer. Only the researcher and their advisor will have access to the data. At the conclusion of the study, all identifying information will be removed and the data will be kept in the researcher's locked office.

The primary investigator has set up a Google Voice number to be used by the participants for the purpose of the study. At no time during the study will the researcher respond to text messages or phone calls from the research participants. Identifiable information about the participants will not be stored in the Google system. Each participant will be given a pseudonym for regular record keeping and contact information labels. After the study has been completed the number will be canceled the primary investigator will no longer receive text messages at that number.

Compensation
Participants will receive $30 in gift cards at the completion of intervention sessions.

Participation
Participation in this research study is voluntary. You have the right to withdraw at any time or refuse to participate entirely without jeopardy to your position or relationship with the university.

Questions about the Research
If you have questions regarding this study, you may contact **Malinda Glasgow** at **mee.glasgow@byu.edu** for further information.

Ver. 12/12

	Institutional Review Board
BYU	11-10-2016 11-9-2017
	Approved Expires

Appendix B4. Note To Teachers

Note to Teachers

Dear Teachers,

Thank you for your support for my research project to help students develop time management and calendar usage skills. For the purpose of the research, we want to make sure the conditions are fairly well-controlled to be able to say with a relative degree of confidence that a change in performance for the students was a direct result of activities related to the research procedures. At the completion of the project, we will be pleased to share the videos with you as a continued resource for you and your students.

In order to do that, here are a couple of things for you to keep in mind.

- We do not want to interfere with business as usual in your classroom or academy.
- Please keep your routines and curriculum the same throughout the duration of the project.
- Specifically, since we are looking at calendar usage and time management, do NOT change the way you utilize calendars in your classroom or other settings throughout the student's day.
- Also, do NOT change any programming you have in place for teaching and supporting your students in keeping appointments, following through with tasks, or other time-management skills.

As the researcher, I will not tell the students who the other participants are. It is likely the students will talk about what they are learning and their frustrations or successes. Thus, they may figure out who the other participants through this manner. We will not instruct the students not to talk about it. Talking about what they are learning will help them more fully implant the concepts into long-term memory and help them to generalize the tasks. I do ask that you not provide specific feedback or instruction to the students.

At the completion of the study, we will be pleased to provide you with a couple of our videos and data collection sheets for your continued use.

Thank you again for your support to me and your students.

Malinda Glasgow
BYU Graduate Student

Institutional Review Board	
11-10-2016	11-9-2017
Approved	Expires

Appendix B5. Note To Teachers/Staff

Note to Teachers / Staff

My name is Malinda Glasgow. I am a graduate student at Brigham Young University studying School Psychology. I am working to develop a research project to evaluate the viability of using video-based intervention systems for teaching calendar usage skills to individuals with intellectual and developmental disabilities. I am reaching out to you as a service leader of youth / young adults who are working to build employment and social engagement skills in an effort to recruit locations and participants for my research project. Please see the attached documents for a brief description of participant criteria and research activities.

Thank you for your time.

Malinda Glasgow

Attachments:

- Participant Recruitment Script
- Potential Participant List
- Participant Recruitment Flyer
- Teacher / Staff Recruitment Flyer

Institutional Review Board
BYU
11-10-2016   11-9-2017
Approved   Expires

Appendix B6. Participant Recruitment Script

Participant Recruitment Script

Dear Students,

Malinda Glasgow, a BYU graduate student is looking for people to take part in a research study. Her goal is to help individuals with intellectual and developmental disabilities practice using a calendar app. The plan involves using video prompts. Due to this being research, we don't want to tell you too much about what the activities will involve. There are a few things to note:

- You need to have a mobile device.
- It will take about 10 hours over 12 weeks.
- You will meet with her for about 15 minutes, 2-3 times a week.
- If you are selected and complete the project, you will get a $30 gift card.

If you are interested, you may take a flyer and tell your teacher you would like to take part.

Teachers,

Please list the names and contact information for students interested in taking part in the research study.

Thank you for your cooperation.

Malinda Glasgow

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BYU	11-10-2016 Approved	11-9-2017 Expires

Appendix B7. Flyer

WANTED

Participants for a research study using video-based interventions for using a mobile calendar application.

Looking for:
→ Individuals in a transition program
→ Of any gender
→ Above the age of 18
→ Have an active IEP or service plan
→ Have one or more goals relating to employment and social engagement
→ Have a mobile device

Participation will include:

→ Completing multiple activities without instruction to collect baseline data
→ Watching video prompting system for instructional purposes
→ Completing the tasks as seen in the video prompts
→ Completing probes about information in the videos

All Participants who complete the study will receive a Walmart Gift Card for $30.

If you have questions regarding this study you may contact:
- Malinda Glasgow
- mee.glasgow@byu.edu
- (801) 477-5286

Or you may contact my mentor:
- Ryan Kellems
- 801-422-6674
- rkellems@byu.edu

If you have questions regarding your rights as a participant in research projects, you may contact:
- IRB Administrator
  A-285 ASB
  Brigham Young University
  Provo, UT 84602
- (801) 422-1461
- irb@byu.edu

Institutional Review Board
11-10-2016 Approved   11-9-2017 Expires

David O. McKay
School of Education
Brigham Young University

APPENDIX C: Instruments

Appendix C1. Mobile Device Guided Interview

1. Do you have a smartphone or tablet?

2. Will you show it to me?

3. What do you like to do on your tablet? Show me?

4. Do you use your tablet at school or work?

5. How do you use it to help you?

Appendix C2. Calendar Knowledge Assessment

8/15/16	What month is it?	
	What day is it?	
2/11/17	What month is it?	
	What year is it?	
11/11/19	What year is it?	
	What day is it?	
What day of the week is Christmas on?		
What day of the week is Halloween on?		
When is your birthday?		
How many days are in a week?		
How many months are in a year?		

July

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

September

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

October

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

November

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

December

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Why is it important to remember appointments?

Why is it important to be on time to appointments?

Appendix C3. Student Survey, Entry

	Yes / Always	most of the time	some of the time	No / Never	Do not know
Do you have a smartphone or tablet (iPhone, iPod, iPad)?					
How often do you keep your mobile device you (in pocket, hand, or within arm's reach)?					
While getting ready for the day do you have to be prompted many times?					
Do you have a job, or place you volunteer?					
Can you get to work on time without promptings?					
Do you use a calendar?					
Do you think using a calendar would be a valuable skill for them to have?					
Do you send text messages?					
Do you think a sending text message is a valuable skill for you to have?					
Do you enjoy watching videos?					
Do you watch videos to learn new skills?					
Are videos a good way to learn to skills and knowledge?					
Do you think a video is a good way to learn how to use a calendar app?					
Do you think a video is a good way to learn how to send a text message?					
Do you think a video is a good way to learn more about calendars?					

What is your phone number?	
What is your email address?	
What is your eligibility category?	

Appendix C4. Student Survey, Exit

	Yes / Always	most of the time	some of the time	No / Never	Do not know
Do you have a smartphone or tablet (iPhone, iPod, iPad)?					
How often do you keep your mobile device with you (in pocket, hand, or within arm's reach)?					
While getting ready for the day do you have to be prompted many times?					
Do you have a job, or place you volunteer?					
Can you get to work on time without promptings?					
Do you use a calendar?					
Do you think using a calendar is a valuable skill for you to have?					
Do you send text messages?					
Do you think sending text messages is a valuable skill for you to have?					
Do you enjoy watching videos?					
Do you watch videos to learn new skills?					
Do you think videos are a good way to learn to skills and knowledge?					
Did you find the video about how to use a calendar app enjoyable?					
Did you find the video about how to send a text message enjoyable?					
Were you able to watch the videos independently?					
Were you able to learn how to use the calendar app by watching the video?					
Do you think a video is a good way to learn how to					

use a calendar app?					
Were you able to learn how to send a text message by watching the video?					
Do you think a video is a good way to learn how to send a text message?					
Were you able to learn how to learn more about calendars by watching the video?					
Do you think a video is a good way to learn more about calendars?					

Appendix C5. Task Analysis

Calendar Entry Task Analysis / Data Collection

Student: _____   Observer: _____

| | Key: | Correct + | | | | | Incorrect - | | | | |

		Date:										
#	Action Steps	Sec.										
1	Open device	7										
2	Open calendar app	10										
3	Tap "+" button in the bottom right corner	7										
4	select event (red)	3										
5	Type title of event	15										
6	select "DONE"	3										
7	tap calendar name	7										
8	select desired calendar	7										
9	tap date	7										
10	find and select event date on the calendar	15										
11	tap start time	7										
12	set start time	20										
13	tap end time	7										
14	set end time	20										
15	Select "add location"	7										
16	type location, then enter (or select place)	25										
17	tap "add a notification"	7										
18	Select time preferred for notification	10										
19	Tap "SAVE"	3										
	Raw											
	Percentage											

Percentage = number correct divided by the total possible

Appendix C6. Fidelity Checklist

	Date:				
Baseline 1: Calendar Event Entry					
ask student if they want the student assessment read to them					
complete student assessment					
Baseline 2: Text Message					
... setting and time of planned for the next probe					
Baseline 3: Meetings					
ask student to send a TEXT MESSAGE					
remind student to send text message as they leave					
Interventions					
Data Collect Sheets					
iPad with instructional videos					
Social Validity					
Have student complete survey					