Evaluating Video Modeling to Teach a Block Schedule Trial-Based Functional Analysis

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Evaluating Video Modeling to Teach a Block Schedule Trial-Based Functional Analysis

by

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Applied Behavior Analysis Department of Child and Family Studies College of Behavioral and Community Sciences University of South Florida

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ABSTRACT

Functional analyses (FAs) are considered the gold standard for determining the function of behavior. However, behavior analysts have cited several perceived barriers that hinder the use of FAs, particularly a lack of time, dedicated space, and trained staff to conduct the analysis. Analyses such as the trial-based FA have been adapted from the traditional session-based FA in order to overcome some of these barriers. The block schedule trial-based FA (Gonzalez, 2018) has had one of the highest correspondence rates between the trial-based and the session-based FA to date. Research from past studies suggest that video modeling is an effective way to teach FA procedures while being cost effective, minimally labor intensive, and has the capability to be disseminated remotely. Therefore, the purpose of this study was to evaluate the effectiveness of video modeling on teaching the procedures of the block schedule trial-based FA to behavior analysts. The results of this study demonstrate that video modeling was more effective than written instruction alone, yielding high procedural fidelity for both participants.
CHAPTER ONE:
INTRODUCTION

The functional behavioral assessment (FBA) is an umbrella term used to describe different techniques used to assess the maintaining functions of problem behavior (Roscoe et al., 2015). Determining the function of problem behavior is important as it allows behavior analysts to implement a function-based treatment rather than relying on default technologies, such as potent, unnatural reinforcers, or punishment, to decrease behavior (Mace, 1994). The usage of these default technologies as behavior interventions can be intrusive and pose ethical implications. Restrictive and aversive techniques involve superimposing reinforcement and punishment contingencies on problem behaviors without eliminating the existing three-term contingency maintaining the behavior (Mace, 1994). Although sometimes efficient as a short-term answer, it is likely that once the contrived contingencies are removed, the behavior will re-emerge (Cooper, 2014, p.513). In contrast, treatments based on function(s) derived from FBA do manipulate the three-term contingency, either by weakening the response-reinforcer relationship or strengthening a response-reinforcer relationship for appropriate behavior that replaces the function of a maladaptive one (Mace, 1994). As a result, function-based treatments can be more effective than interventions that do not account for maintaining variables (Filter & Horner, 2009).

FBAs may include indirect assessments, descriptive assessments, and functional analyses (FAs; Roscoe et al., 2015). Indirect assessments include conducting open-ended interviews, structured interviews, and questionnaires (Iwata et al., 2013). Descriptive assessment involves
direct observation of the antecedents and consequences of the behavior in the natural environment without manipulation of the environment (Roscoe et al., 2015). Although indirect assessment and descriptive assessment can provide valuable information regarding the target behavior, they cannot identify the functional relationship between the behavior and specific contingencies in the environment. In addition, research has shown that both indirect and descriptive assessments have low reliability and correspondence with FAs (Iwata et al., 2013; Thompson & Iwata, 2007).

On the other hand, FAs do require the manipulation of the environmental variables to test the effects that different, isolated conditions have on the behavior (Hanley et al., 2003). Due to the manipulation of variables through a series of control and test conditions, FA is the only type of functional assessment that can yield a cause and effect relationship. This, combined with the research suggesting low reliability for indirect and direct assessments, makes FAs the gold standard when determining the function of behavior (Mace, 1994).

Although a considerable amount of evidence supports the usage and value of FA methodology, many Board Certified Behavior Analysts (BCBAs) do not use this tool in practice. Roscoe et al. (2015) surveyed practitioners in the state of Massachusetts on the usage of FBA and found that 67.3% of respondents have conducted a functional analysis as the primary implementer, and 15.1% of respondents were involved in the procedure as data collector or therapist. Although two-thirds of those surveyed consider FAs to be the most informative method, only 34.6% of respondents report typically running an FA, and only 10.2% reported FAs as the functional assessment method used most frequently. This disparity between principle and practice may suggest some perceived barriers when it comes to implementing an FA, and proves problematic for the effort within the field of applied behavior analysis to practice function-based
treatment. Several commonly reported barriers are a lack of trained staff, inadequate time, and space (Roscoe et al., 2015).

Many researchers have adapted FAs in order to address these concerns. For example, the trial-based FA, first described by Sigafous and Saggers (1995), was proposed to address the latter concern regarding the controlled environment required to implement an FA. Bloom et al. (2011) later expanded upon this methodology and compared it to the traditional session-based FA. Bloom et al. recommended conducting 10 trials consisting of two, 2 min segments: a control and a test segment (or two test segments in the case of the test for automatic function). Trials are embedded into the client’s natural environment as opposed to a contrived setting where more standard FAs are typically conducted. This overcomes the barrier of a lack of controlled environment as a dedicated space without other students is not necessary for this assessment.

Additionally, the assessment portion of trial-based FAs are sometimes found to take less time than that of a standard FA (Saini et al., 2020). The results of a meta-analysis comparing the efficiency of six different FA types, including both trial-based and multielement designs, found trial-based to have the second shortest overall duration and the shortest duration per function required to meet visual inspection criteria. However, as discussed in Bloom et al. (2011), though trial-based assessment time may be more efficient, it may take longer in terms of calendar days because the analyst must wait for the appropriate opportunities in which trials can occur in the natural environment.

Although efficient, questions have been raised regarding the accuracy of trial-based FAs. For instance, Bloom et al. (2011) found correspondence between trial-based and traditional FA results for 60% of individuals. Similarly, a meta-analysis conducted in 2014 found correspondence rates to be an average of 59% (Rispoli et al., 2014). A more recent systematic
review reports a slightly lower correspondence of 45% (Ruiz & Kubina, 2017). The cumulation of these comparative analyses between the trial-based and the traditional FA suggests there is only moderate correspondence between the two methodologies.

In an attempt to increase correspondence between the trial-based FA and the traditional FA, a recent study conducted by Gonzalez (2018) used an adapted trial-based methodology. The FA was designed to be implemented in “blocks”. Each block consisted of three trials of one condition. The blocks were implemented in a specific sequence (ignore, attention, tangible, and escape) before being repeated. The researchers hypothesized that by running several trials of a single condition back-to-back, it would simulate the session-based approach of having multiple opportunities for the client to contact the reinforcing contingency. The fixed sequence of conditions also assists in controlling the motivating operations, helping to establish EOs which can ultimately lead to more differentiated responding between conditions (Hammond et al., 2013). The results showed 85% correspondence between the trial-based and session-based FAs, which is higher than the previous correspondence rates discussed previously for traditional trial-based analyses. It should be noted that this adaptation was designed to be conducted in a controlled setting, although it has not been evaluated for its feasibility in classroom or other settings.

Another barrier behavior analysts cite for not conducting FAs is a lack of trained staff or the complexity of the procedures (Roscoe et al., 2015). However, trial-based FAs have even been used effectively by non-behavior analytic caregivers or staff when given proper training (e.g., Lambert et al., 2013; Rispoli et al., 2015). It has also been demonstrated that effective training in general FA methodology need not be long; undergraduate students were found to be able to accurately implement FA conditions after just 2 hr (Iwata et al., 2000). There have been many
interventions used to teach FA implementation including didactic teaching, rehearsal, in-situ feedback, and video modeling (e.g., Kunnvatana, et al., 2013; Rispoli et al., 2015).

Video modeling is cost effective, can be implemented remotely, and is not labor intensive (after videos are initially produced). Video modeling usually involves participants imitating a behavior demonstrated by an expert in a video (Nikopoulos & Keenan, 2004). It has been used with moderate to high success to train individuals how to implement FAs with procedural integrity. While failing to meet 90% mastery criteria for all conditions, all participants in Alnemary et al. (2015) were able to master at least two conditions. In a similar study, eight out of nine participants met 80% mastery criteria for all FA conditions after video modeling (Moore & Fisher, 2007). Finally, all participants within the study conducted by Pauline in 2019 were able to implement all conditions of a trial-based FA with 100% procedural integrity using video modeling alone. The collective findings suggest that video-modeling can be an effective and appropriate intervention for teaching trial-based FA procedures.

The use of video modeling to train implementation of FAs may also prove to be helpful in addressing the underutilization of FA methodology in practice. Video models, once created, can be used time and time again and can be delivered remotely. Remote training is important not only to widen the dissemination of behavioral services and training to isolated areas, but also for contactless training in this time of social distancing related to the COVID-19 pandemic. In addition, video modeling can also be viewed by a large group of people at once and do not require an expert to be present, unlike some other training methods that require more staff and resources.

Using video modeling to train the implementation of trial-based FA procedures may ease the concerns surrounding FA procedures previously cited. Video modeling would ensure staff
are trained, while the use of a trial-based design has the potential to be more efficient than a traditional multi-element FA. Although trial-based FAs have been shown to have only moderate levels of correspondence to their traditional FA counterparts, the adapted methodology from Gonzalez (2018) had promising results (85% correspondence). The purpose of the current study was to extend the findings of Pauline (2019) by using remote video modeling to train BCBAs (instead of in person video modeling to train undergraduate students) to conduct a modified trial-based FA, as described by Gonzalez (2018). Thus, this study differs from previous research in two ways: (1) using a fully remote video training model delivered via a telehealth format, and (2) training a modified block schedule trial-based FA, as opposed to a trial-based FA designed to embed trials into ongoing activities.
CHAPTER 2:
METHOD

Participants and Setting

Two BCBAs were recruited for this study through fliers, social media, and word of mouth. The participants were provided the pseudonyms May and Kylie to ensure confidentiality. BCBAs with prior experience conducting a trial-based FA were excluded from participating; however, BCBAs with experience conducting a different type of FA other than trial-based were permitted to be included. An 11-question screening survey (Pauline, 2019) was used to assess participant eligibility (see Appendix F). If participants answered “yes” to questions 11, 12, or 13 they were excluded from participation. Additionally, if an individual met mastery criteria for all four conditions in baseline they would have been removed from the study. This did not occur.

All correspondence, written FA instructions, and video modeling content were delivered to the BCBAs electronically. Any physical materials required for roleplay (stimuli, data sheets, etc.) were delivered contactlessly, in accordance with safety protocols necessitated by the COVID-19 pandemic. Roleplay sessions between the researcher and the BCBAs took place via telehealth video conference (Microsoft Teams). In addition, all sessions were audio and video recorded.

Materials

The video models used were the ones used in Pauline (2019). There were four video models, one for each condition (ignore, attention, tangible, and escape) depicting both the test
and control segments. The video models showed two adults sitting at a table, one playing the role of the implementor and the other playing the role of the client exhibiting problem behavior. The adults that appeared in the videos were not a part of this study’s research team and were unfamiliar to the participants. Models displayed each of the correct steps to implement the condition with written instructions on screen; the instructions specified to ignore all non-target problem behavior, and if and when to provide or remove: attention, tangible items, and demands. The model also demonstrated ending each segment upon the occurrence of problem behavior and recording data for that trial.

In addition to video models, an instructional PowerPoint was also used in the Video Modeling + Block Schedule phase. The PowerPoint consisted of flow-chart diagrams to visually represent the organization of the block schedule. The diagram had four boxes, each a different color, to represent the four FA conditions (ignore, attention, tangible, and escape). Inside each box was a vertical, numbered list of one to three, with the condition labeled on each of the three lines to signify the three trials within one block. For example, the first box (block) had “1. Ignore; 2. Ignore; 3. Ignore” vertically on separate lines.

Scripts adapted from Kunnavatana, Bloom, Samaha and Dayton (2013) were used by the researcher during roleplays with the participants to ensure consistency across roleplays (see Appendix A). There was a script per condition with problem behavior occurring at a specified time within the trial. Task analyses for each trial condition were used to assess the procedural fidelity of the BCBAs’ FA implementation (see Appendix B; Kunnavatana, Bloom, Samaha & Dayton, 2013). Each task analysis included both the test and control segments for the conditions.

Other materials needed by the participants included a computer, laptop, tablet, or smartphone that transmits video and audio in order to conduct telehealth sessions with the researcher.
Various toys were arbitrarily chosen to serve as the highly preferred and moderately preferred items during roleplay (squishy ball and Play-Doh, respectively). Both the participant and the researcher had an identical version of these toys to facilitate a seamless remote roleplay. Data sheets and a writing utensil were provided for the BCBAs to record trial data (see Appendix C). These items were contactlessly delivered to the participants.

**Response Measurement**

The task analyses described above were used to record procedural fidelity of the participants. The number of steps completed correctly was divided by the number of total steps and multiplied by 100 to yield a percentage. This procedural fidelity percentage served as the dependent variable to be compared between baseline and intervention to evaluate the effectiveness of the training procedure.

**Assessing Reliability of the Observation System**

A second observer independently collected data for 36.59% of sessions for May, and for 31.71% of sessions for Kylie. Interobserver agreement (IOA) was calculated by dividing agreements of steps completed correctly by agreements plus disagreements, and multiplying by 100 to get a percentage. Average IOA was to remain at or above 80% throughout the study. If IOA would have fallen below 80%, both observers would have received additional training. May’s IOA was as follows: average Baseline IOA was 90.75% with a range of 80-100% (Ignore = 100%, attention = 100%, tangible = 83%, escape = 80%); Video Modeling and Block Schedule IOA were 100% across all four conditions; IOA for Feedback condition was 100%. Kylie’s IOA was 100% across all conditions in all phases.
Treatment integrity was calculated for the researcher’s correct implementation of roleplaying during 36.59% of trials for May, and 31.71% of trials for Kylie. A task analysis for each condition was provided to a second observer to collect data on the number of steps the researcher performed correctly (see Appendix D). The number of steps completed correctly was divided by the number of total steps and multiplied by 100 to yield a percentage. The average treatment integrity was 100% across both participants for all phases.

Procedures

Design

A multiple baseline across participants experimental design was used in this study. Participants were taught using video modeling to implement trial-based FA procedures. If participants failed to meet mastery criteria with video modeling, a feedback component was introduced. After mastery criteria was met in the video modeling phase, participants conducted the FA in the block design outlined in Gonzalez (2018).

Trial-Based Functional Analysis

The trial-based FA taught in this study was based on the recommendations in Bloom et al. (2011). Four conditions were tested: ignore, attention, tangible, and escape. Each trial had two segments, a control and a test, with the exception of the ignore condition which had two test segments. For all other conditions, the control segment was run first. All segments ended after 2 min or the occurrence of problem behavior, whichever came first. For the ignore condition, all segments lasted 2 min regardless of problem behavior occurrence or lack thereof.

As described in Gonzalez (2018), trials were organized into blocks. Each block contained three trials of a single condition. The blocks were run in a fixed order of ignore, attention,
tangible, and escape. This order was repeated a total of three times. Accordingly, there were
three blocks per condition for a total of 12 blocks. There were nine trials of each condition
because there were three blocks, each with three trials.

During the initial training condition (Video Modeling), participants were not trained in
the block formatting, as they were learning how to conduct each type of trial. During the Video
Modeling phase, trials of one condition were not conducted three in a row as they would in
blocks. However, the conditions were still conducted in a fixed sequence of ignore, attention,
tangible, and escape. After participants met mastery criteria for conducting trials with fidelity,
they graduated to an additional phase (Video Modeling + Block Schedule) in which trials were
then formatted into blocks.

**Ignore.** For the ignore condition two test segments were conducted back-to-back. As
previously mentioned, these segments were 2 min in duration regardless of problem behavior.
The BCBA was on video call with the client confederate but provided no attention, demands, or
items. All behavior, including appropriate and inappropriate behavior, was ignored. The second
test segment began as soon as the first terminated. This was the test for an automatic function.

**Attention.** The control segment began with client confederate access to moderately
preferred leisure items. For telehealth purposes, this was verbalized by the participant using a
phrase like “Here, you can play with the Play-Doh”. If the BCBA did not make such a statement,
it was assumed that the client confederate was not permitted access to the tangible.
Noncontingent attention was provided at least every 30 s. Upon the occurrence of problem
behavior, the BCBA did not provide attention and ended the segment. The test segment then
began when the analyst stated “I’m going to be busy doing some work over here” and occupied
themselves with work materials such as paperwork or a book. Attention was only given in
response to the first occurrence of target problem behavior in the form of a statement such as “No, don’t do that!”. The test segment was then terminated. This was the test for a social positive function in the form of attention.

**Tangible.** First, the control segment started with the client confederate having access to highly preferred items. For telehealth purposes, this was verbalized by the participant using a phrase like “You can have the squishy ball”. If the BCBA did not make such a statement, it was assumed that the client confederate was not permitted access to the tangible. Neutral attention was provided every 30 s. (e.g., “You are playing with the squishy ball”). The control segment ended at the onset of problem behavior, or after 2 min elapsed, whichever happened first.

Second, the test segment began. The BCBA removed access to toys and provided a statement signaling that the toys are no longer available (e.g., “All done with squishy ball”). All appropriate requests for toys were ignored. If problem behavior occurred, the segment was completed and toys were returned to the client for a minimum of 30 s. Again, granting access to the tangible was verbalized by the BCBA (e.g., “Here’s the ball”). This was the test for a social positive function in the form of access to tangible items.

**Escape.** For the control segment, the analyst did not provide attention, demands, or leisure items. If problem behavior occurred, the control segment ended and the test segment began. In the test segment the BCBA placed demands continuously, having an inter-response time of 5 s or less between subsequent demands or prompts. Praise or other reinforcement were not provided for correct responses. Least to most prompting strategies were used in the event that the client confederate did not comply with demands. For telehealth roleplay purposes, the participants used a least to most prompting hierarchy of verbal, model, and physical prompts. Given that participants could not physically prompt via telehealth, a verbalized statement of
“physical prompt” was accepted. Upon the occurrence of the target problem behavior, demands were removed immediately and the segment was terminated. Additional demands were not placed for at least 30 s after the trial was terminated. This was the test for a social negative function in the form of escape from demands.

**Baseline**

Participants received the Bloom et al. (2011) article via email at least 48 hr before their initial baseline session. Additionally, the participants were provided a reading period of 10 min prior to each baseline session to review the article. If the participants attempted to ask questions regarding the FA procedure, they were advised to consult the article. After the reading period the researcher did a materials check, in which the participant displayed their items to ensure all materials were accounted for.

During baseline sessions, participants roleplayed the implementation of each of the four conditions with the researcher via telehealth. The researcher, using scripts, played the role of the client. The script informed the participant which condition they were about to roleplay and the target problem behavior, which the researcher modeled. The BCBAs were responsible for selecting any materials needed for each trial, including a timer, tangible items, and data sheet(s). The participants were asked to show which materials, if any, they were using for that trial. Additionally, because of the telehealth training model, participants were reminded that they would need to verbally describe both providing “pretend” access to and removal of any items if needed (i.e., moderately preferred items in the attention condition and highly preferred items in the tangible condition). This reminder was provided for all conditions, even for those that did not require leisure items (ignore and escape) to avoid serving as a prompt for specific conditions (attention and tangible).
Once the researcher concluded reading the script, the participant was asked if they were ready to begin the roleplay. After verbal affirmation, the roleplay began. Upon the termination of a trial, the researcher asked the participants to hold up their data sheet (if one was used) and then to put away any materials used for that condition. The researcher then read the script for the next trial. This process was repeated until the participant roleplayed each condition at least three times.

Trials were conducted in the fixed sequence order of ignore, attention, tangible, and escape. If any given trial duration lasted 10 min or more it was to be terminated by the researcher, however this did not occur. No performance feedback was provided to the participants either during or after baseline sessions. Data were collected on the number of steps implemented correctly using task analyses.

**Video Modeling**

At the beginning of each video modeling session the researcher did a materials check, in which the participant displayed their items to ensure all materials were accounted for. Prior to roleplaying the implementation of each trial, the BCBAs were shown the corresponding condition’s video model. For example, before conducting an ignore trial, the analysts had access to the ignore video model. They were able to pause, rewind, and replay the video as many times as they wished. If a viewing period exceeded 10 min, the researcher was to terminate the viewing and begin roleplays. However, this did not occur. If participants asked questions regarding the FA procedure, they were advised to consult the video models.

After this viewing period, participants roleplayed the implementation of the first trial (i.e., ignore condition) with the researcher via telehealth. The researcher played the role of the
client using the same scripts and procedures as in Baseline. Once this trial was completed, another viewing period was provided before the analyst ran the subsequent condition’s (i.e., attention) trial. This continued until all conditions were completed.

Data were collected on the number of steps implemented correctly for each trial using task analyses. No corrective feedback was provided during or after implementation in this phase. In order to reach mastery criteria, three consecutive trials needed to be conducted at 90% fidelity or above, with the last trial being 100%. Mastery criteria needed to be met for each of the four FA conditions.

**Video Modeling + Block Schedule**

After participants demonstrated mastery for conducting each FA condition in the fixed sequence, they were then instructed on how to use the block design. As previously described, one block consists of three trials of a singular condition. In other words, three trials of one condition will be conducted in a row before conducting a block for the next condition in the fixed sequence. The procedures in this phase are the same as those in Video Modeling; the only addition is the use of an instructional PowerPoint prior to viewing the video models. Participants had a viewing period prior to the roleplay of each block, rather than before each trial.

While displaying the PowerPoint, the researcher briefly described the rationale for the block design and provided verbal instruction for how to implement it (i.e., “During each block you will conduct the condition three times in a row. As a reminder, each trial consists of two segments.”). Participants were then shown the exact same video model as in the Video Modeling phase. The participants were permitted to pause, rewind, etc. If the participants asked questions
regarding FA procedures or the block schedule, they were redirected to the instructional PowerPoint and video models.

After the viewing period, blocks were roleplayed just as they were in Baseline and Video Modeling conditions with the researcher using the same scripts. The script was read before each block and was not read in between individual trials. Thus, the BCBAs were expected to watch the presentation and corresponding video model, listen to the script, and conduct the roleplay of an entire block without breaks in between the three trials. Upon the termination of a block, the presentation, relevant video model, and script were provided again before the next condition’s block was conducted.

As in the Video Modeling phase, data were collected on the number of steps implemented correctly for each trial using task analyses. Mastery criteria remained the same: three consecutive trials must be at least 90%, with the final trial meeting 100% procedural fidelity. Therefore, a participant potentially could reach mastery criteria by conducting only one block of each condition.

*Feedback*

If participants did not meet mastery criteria for one or more conditions in either the Video Modeling or Block Schedule phase, an additional feedback component was implemented. Therefore, feedback could have been implemented after either phase, if required. In this phase, the participant roleplayed the condition(s) with the researcher by following the procedures of the phase that immediately preceded it. That is to say, if feedback was implemented after Video Modeling, the video model would be shown and scripts would be read before each and every
trial; if feedback was implemented after the Block Schedule, the block schedule presentation, video model, and script would be presented only at the beginning of the block.

Participants received behavior specific, constructive feedback following the reading of the script but before the roleplay began. Praise for correctly implemented steps was not provided. For example, if the participant failed to terminate the segment after the occurrence of problem behavior during the roleplay, the researcher said something along the lines of “In this segment, you did not turn off the timer and end the segment immediately after the problem behavior occurred. Remember that in a trial-based FA the segment ends after the problem behavior occurs or 2 min elapses, whichever comes first. Next time, be sure to turn off the timer to signify you have ended it.” Mastery criteria for this phase was the same as those outlined in the Video Modeling and Block Schedule conditions.

Social Validity

A social validity survey was provided to participants electronically at the conclusion of the study (see Appendix E). The survey consisted of eleven Likert-like scale questions and four open-ended questions adapted from Pauline (2019). Questions assessed whether the participants enjoyed the intervention, found it helpful in learning FA implementation, if their confidence in running a trial-based FA improved, enjoyed the telehealth modality, and if they believe their skills would generalize to an in-person roleplay scenario.
CHAPTER THREE: RESULTS

Figure 1 depicts the data in all phases for both participants. May’s data are relatively stable in baseline, with a range of 20% to 55% steps completed correctly across all four conditions. A considerable and immediate level change occurred between Baseline and Video Modeling, with all conditions at or above 80%. May immediately reached mastery criteria for three out of the four conditions; two additional attention trials were conducted to meet mastery in the attention condition. There is no level change between Video Modeling and the Block Schedule phases for three out of four conditions, as May immediately met mastery criteria again with 100% procedural fidelity. However, a decrease in level can be seen for the attention block, with the average procedural fidelity dropping to 70%. Feedback was introduced for this condition and May then roleplayed the block with 100% fidelity.

Kylie’s data in Baseline are stable with little variability, with the exception of the attention data path. Her baseline data range from 20% to 90%, a larger range than in May’s data. However, similarly to May, three out of the four conditions immediately had an increase in level change after the video model intervention is begun. Interestingly, Kylie implemented attention trial 18 with only 50% fidelity, equal to her highest attention fidelity in baseline. However, in trial 22, the subsequent attention trial, she performed with 100% fidelity. She continued to implement all further trials for all conditions with 100% fidelity, including in the Block Schedule phase. Thus, Kylie reached mastery criteria by implementing only one block of each condition and a feedback component was not required.
Social Validity

Both participants received the social validity survey upon completion of data collection. Kylie indicated a rating of 5 (i.e., strongly agrees) on all questions, while May’s responses ranged from 3 to 5 (i.e., neutral to strongly agrees). Based on participants’ ratings, they enjoyed participating in this study (average score of 5), enjoyed the use of video modeling (average score of 5), thought the video modeling was simple to understand (average score 4.5; range of 4 to 5) and did not take too much time (average score of 4.5; range of 4 to 5), and would recommend the use of video modeling to a colleague (average score of 5).

Regarding the remote delivery, both participants enjoyed telehealth (average score of 4.5; range of 4 to 5), would choose telehealth if given the option if participating in a similar study in the near future (average score of 4.5; range of 4 to 5), and overall agreed that the skills they learned via telehealth would generalize to an in-person roleplay (average score of 4; range of 3 to 5). Lastly, both participants highly agreed (score of 5) that they are more confident in their ability to implement a trial-based FA than prior to the study, and that they would use a trial-based functional analysis in their clinical practice.

The short answer responses allowed the participants an opportunity to provide specific feedback. Participants praised the video models for being clear and providing detailed instruction, noting that the written instructions on screen that aligned with the model were particularly useful. Both participants liked the fact that telehealth was convenient for scheduling, they did not have to travel for training, and it kept them safe during the COVID-19 pandemic. However, one participant disliked the remote learning due to it being less personal. Other criticisms included that some of the Block Schedule roleplay trials were lengthy, and that more instruction could have been provided regarding how long one block would be and how the
transition between trials within one block would look. Finally, one participant would have liked to have received immediate feedback after trial roleplays as to how many steps she performed correctly.

Figure 1. Results for all participants.
CHAPTER 4
DISCUSSION

The purpose of this study was to evaluate the use of video modeling via telehealth as a means to teach BCBAs how to implement a block schedule, trial-based FA with procedural fidelity. The immediate level changes between baseline and intervention for two participants suggests that video modeling was effective at teaching these skills. To elaborate, video modeling led to higher procedural fidelity when implementing trial-based FA than written instructions (which were provided in baseline) alone yielded. These conclusions are important as it demonstrates that written instructions may not be enough to result in adequate implementation of FAs. In contrast, video modeling is a cost effective and efficient way to teach BCBAs how to implement FAs with fidelity.

Another important aspect of this study is that video modeling and all correspondence occurred entirely via telehealth. This demonstrates that FA training can be made accessible to those who may not have access to training otherwise, such as during COVID-19 when physical contact is limited. Remote training also can assist in the dissemination of ABA knowledge and procedures to rural or developing communities. The results from the social validity survey also illustrate that the participants enjoyed the use of remote video modeling to learn FA procedures, noting that it was more convenient for scheduling purposes and enabled them to stay safe during the COVID-19 pandemic.
The findings of this study support existing research that have shown video modeling to be effective in teaching FA procedures, such as Alnemary et al. (2015), Moore and Fisher (2007), and Pauline (2019). However, this study also contributes to existing literature in several ways. While Pauline (2019) demonstrated that video modeling was effective in teaching trial-based FA procedures, this study extends those findings to a block schedule trial-based FA. Additionally, this study is the first of its kind to evaluate fully remote video modeling delivery.

There are several reasons why video modeling may have been effective in this study, first being the nature of the videos themselves. The videos were shorter compared to other studies, with the longest video being 4 min, and the other three videos averaging around two min. Each video taught only one condition at a time, and the viewing period was immediately before the roleplay. In contrast, videos in Digennaro-Reed et al. (2010) were over 7 min in duration, contained several interventions, and were viewed up to 45 min prior to implementation; results from this study were mixed, with all three participants requiring performance feedback to consistently implement 100% of steps correctly. Another study by Lambert et al. (2014) embedded video models into a 2.5 hr instructional presentation; intervention did not lead to improved procedural fidelity for most participants. These comparisons suggest that the duration and complexity of the video models, as well as the immediate roleplay without delay, may have contributed to their efficacy.

In addition to the design of the video models, the background of the participants may have also contributed to their skill acquisition, given that they are BCBAs. Although the participants were screened using a questionnaire prior to participation in the study to ensure neither had observed, collected data for, or implemented a trial-based functional analysis, BCBAs would be familiar with both basic principles of ABA and FBA. This knowledge may
have contributed to the rapid level change between Baseline and Video Modeling, as well as consistent performance at 100%, even without a feedback component (except for one condition for one participant).

Despite video modeling being largely effective for both participants, one participant, May, was unable to master the attention condition using video models alone. She consistently made the same mistake during attention trials throughout the study by posing questions to the client confederate during the control segment. Although they were friendly questions such as “What are you going to make with the Play-Doh?”, any questions asked may be considered to be a demand by some participants and should be avoided. Despite the written instructions in the attention video model specifying not to place demands or ask questions, feedback was required for May to successfully reach mastery. This suggests that feedback may be a necessary component for some participants to implement a block schedule trial-based FA with 100% procedural fidelity.

Although this study suggests that video modeling is an effective way to teach BCBAs how to implement a block schedule trial-based FA with fidelity, it is important to note that participant implementation was assessed via roleplay. Despite participant report on the social validity questionnaire that they believe their skills would generalize to an in-person roleplay, one cannot be sure that the skills participants learned would generalize to a setting with an actual client engaging in problem behavior. Additionally, this study did not include any follow-up data to assess maintenance of skills. Future research should be conducted to determine the generalizability and lasting effects of video modeling as a teaching procedure for trial-based FAs. Regardless, this study provides preliminary evidence that remote video modeling is an
effective means for teaching behavior analysts to conduct block schedule trial-based FA procedures with high procedural fidelity.
REFERENCES


Lambert, J. M., Lloyd, B. P., Staubitz, J. L., Weaver, E. S., & Jennings, C. M. (2014). Effect of an automated training presentation on pre-service behavior analysts’ implementation of

http://doi.org/10.1007/s10864-014-9197-5


http://doi.org/10.1901/jaba.2007.24-06


https://doi.org/10.1901/jaba.2004.37-93


http://doi.org/10.1177/1098300715577428


Appendix A: Trial-Based FA Training Roleplay Scripts

Adapted from Kunnavatana, Bloom, Samaha and Dayton (2013)

Each roleplay is intended to assess the procedural integrity of the subject during the control and test segments of each condition. Please implement these scripts as written. Note, the subjects may use their handouts as guides if they wish.

The scripts use hypothetical problem bx’s. They will be replaced with the bx of the subject. The materials should also be replaced with the client’s reinforcers that were identified in the MSWO assessment.

Attention

Materials: puzzle, timer

Roleplay:

“In this roleplay, I will be acting as the child and you will be conducting the trial-based functional analysis. The target behavior is property destruction, which is defined as throwing items at least 1 foot. For the next few minutes you will be conducting an attention trial with both the control and test segments. Here is a timer for you to use during the roleplay. When I say start, please start your timer and begin the trial. 1, 2, 3, Start.”

Control
1. The Therapist should provide attention to the child throughout the segment, but not ask the child to do any work.

2. **The child should engage in property destruction 30 s into the segment.**

3. There should be no consequences for property destruction, but the segment should end once the child engages in property destruction.

*Test*

1. The Therapist should turn away from the child and/or state “I have to work.”

2. The Therapist should ignore the child throughout the segment unless addressing property destruction and not ask the child to do any work.

3. **Child should engage in property destruction after 10 s.**

4. Contingent on property destruction, the Therapist should turn to child, make statement of concern and briefly touch the child, then stop the trial.
Tangible

Materials: toy cars, timer

Roleplay:

“In this roleplay, I will be acting as the child and you will be conducting the trial-based functional analysis. The target behavior is self-injury in the form of biting, which is defined as the child’s teeth making contact with the child’s own arm. You have determined that toy cars are highly preferred. For the next few minutes you will be conducting a tangible trial with both the control and test segments. Here is a timer for you to use during the roleplay. When I say start, please start your timer and begin the condition. 1, 2, 3, Start.”

* Child: When you start, interact with the toy cars.

Control

1. The Therapist should allow child to continue playing with the preferred item for the duration of the segment and not ask the child to do any work.

2. Child should engage in self-biting 30 s into the segment.

3. There should be no consequences for self-biting, but the segment should end once the child has engaged in self-biting.

Test
1. The Therapist should remove the preferred item and keep it from child’s reach unless self-biting occurs, and the child should not be asked to do any work.

2. **Child should engage in self-biting after 10 s.**

3. The Therapist should immediately return preferred item, and then end condition.
**Escape**

Materials: marker, paper, timer

Role-play:

“In this role-play, I will be acting as the child and you will be conducting the trial-based functional analysis. The target behavior is aggression in the form of pinching, which is defined as the child squeezing another’s skin between their thumb and forefinger. Currently, the child is learning to write his/her name. For the next few minutes you will be conducting an escape trial with both the control and test segments. Here is a timer for you to use during the role-play. When I say start, please start your timer and begin the trial. 1, 2, 3, Start.” Note to child: don’t pinch too hard! Pinch very, very lightly and don’t hurt anyone!

**Control**

1. During the control segment, no instructions should be delivered to the child and the child should have no materials.

2. **Child should engage in aggression 30 s into the segment.**

3. There should be no consequences for aggression, but the segment should end once the child engages in aggression.

**Test**
1. The Therapist should place marker and paper in front of child and tell the child “write your name”.

2. **Child should not initiate writing name.**

3. The Therapist should provide model prompt then physical prompt.

4. The Therapist should instruct child “write your name.”

5. **Child should engage in aggression.**

6. The Therapist should immediately remove the materials and give the child a break.
**Ignore**

Materials: timer

Role-play:

“In this role-play, I will be acting as the child and you will be conducting the trial-based functional analysis. The target behavior is self-injurious behavior (SIB) in the form of head hitting, which is defined as the child’s hand making contact with the child’s head from a distance of 6 inches or more. For the next few minutes you will be conducting an ignore trial with consecutive test conditions. Here is a timer for you to use during the role-play. When I say start, please start your timer and begin the trial. 1, 2, 3, Start.”

**Test 1**

1. The Therapist should move away from the child so that he/she is seated alone without materials (or work).

2. **Child should engage in SIB 3 times during segment.**

3. There should be no consequences for SIB.

4. The segment should be 2min total.

**Test 2**

1. The Therapist should stay away from the child so that he/she is seated alone without materials (or work).

2. **Child should engage in SIB 2 times during segment.**
3. There should be no consequences for SIB.

4. The segment should be 2 min total.
## Appendix B: Trial-Based FA Procedural Fidelity Task Analysis


<table>
<thead>
<tr>
<th>Segment</th>
<th>Step</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Therapist provided continuous, contextually appropriate (e.g., responded to questions), attention (no more than 10 s between interactions) to the child until the child engaged in target problem behavior or until 2 min elapsed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Therapist ignored non-target problem behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Therapist did not present demands or questions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Therapist allowed access to moderately preferred items</td>
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</tr>
<tr>
<td>Test</td>
<td>Therapist turned away from child and stopped providing attention (and did not issue any demands) within 5 s of target problem behavior or after 2 min elapsed in control segment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Therapist allowed access to moderately preferred items</td>
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</tr>
</tbody>
</table>
Therapist ignored child until the child engaged in target problem behavior or 2 min elapsed

If target problem behavior occurred, Therapist made statement of concern within 5 s

Therapist ended the trial after statement of concern or after 2 min elapsed

Therapist collected data that corresponded with observer’s data

CORRECT STEPS: /

% OF CORRECT STEPS:
<table>
<thead>
<tr>
<th>Segment</th>
<th>Step</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Therapist allowed child to interact with all available materials and make highly preferred items available until the child engaged in target problem behavior or until 2 min elapsed</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Therapist delivered attention at least once every 30 s and never withheld attention if the child initiated conversation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Therapist did not present demands or questions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Therapist ignored non-target problem behavior during control segment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test</td>
<td>Therapist removed materials within 5 s of target problem behavior or after 2 min elapsed in control segment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Therapist delivered attention at least once every 30 s and never withheld attention if the child initiated conversation</td>
<td></td>
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<tr>
<td></td>
<td>Therapist did not present demands or questions.</td>
<td></td>
<td></td>
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<tr>
<td>Therapist ignored non-target problem behavior during test segment</td>
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<td></td>
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<tr>
<td>---------------------------------------------------------------</td>
<td></td>
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<tr>
<td>Therapist kept materials out of child’s reach for 2 min unless child engaged in target problem behavior</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>If the child engaged in target problem behavior, Therapist returned materials to child within 5 s</td>
<td></td>
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</tr>
<tr>
<td>Therapist ended the trial after materials were returned or after 2 min elapsed</td>
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<td></td>
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</tr>
<tr>
<td>Therapist collected data that corresponded with observer’s data</td>
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**Data**

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<td>Step</td>
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<tr>
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<td>----------------------------------------------------------------------</td>
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<td>Control</td>
<td>Therapist did not present demands or questions</td>
</tr>
<tr>
<td></td>
<td>Therapist responded appropriately if the child initiated conversation</td>
</tr>
<tr>
<td></td>
<td>Therapist did not allow access to highly or moderately preferred leisure materials</td>
</tr>
<tr>
<td></td>
<td>Therapist ignored non-target problem behavior</td>
</tr>
<tr>
<td>Test</td>
<td>Therapist delivered a demand within 5 s of target problem behavior or after 2 min elapsed in control segment</td>
</tr>
<tr>
<td></td>
<td>Therapist provided instruction and prompts (including model and physical, if relevant) without delays over 5 s between demands, prompts, or ongoing work</td>
</tr>
<tr>
<td></td>
<td>Therapist did not allow access to highly or moderately preferred leisure materials</td>
</tr>
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<td>Therapist ignored non-target problem behavior</td>
</tr>
<tr>
<td></td>
<td>If the child engaged in target problem behavior,</td>
</tr>
<tr>
<td>Therapist removed materials and gave the child a break within 5 s</td>
<td></td>
</tr>
<tr>
<td>Therapist ended the trial after providing a break or after 2 min elapsed</td>
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<tr>
<td>Therapist collected data that corresponded with observer’s data</td>
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**CORRECT STEPS:** /

**% OF CORRECT STEPS:**
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<tr>
<th>Segment</th>
<th>Step</th>
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<th>No</th>
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<tbody>
<tr>
<td>Test 1</td>
<td>Therapist did not interact with the child</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Therapist did not allow access to any materials</td>
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<tr>
<td></td>
<td>Therapist did not provide a consequence if child engaged in target</td>
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<tr>
<td></td>
<td>problem behavior</td>
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<tr>
<td></td>
<td>Therapist did not end test segment before 2 min elapsed</td>
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<tr>
<td>Test 2</td>
<td>Therapist did not interact with the child</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Therapist did not allow access to any materials</td>
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</tr>
<tr>
<td></td>
<td>Therapist did not provide a consequence if child engaged in target</td>
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<tr>
<td></td>
<td>problem behavior</td>
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<tr>
<td></td>
<td>Therapist did not end test segment before 2 min elapsed</td>
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<tr>
<td>Data</td>
<td>Therapist collected data that corresponded with observer’s data</td>
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**CORRECT STEPS:**

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**% OF CORRECT STEPS:**

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Appendix C: Participant Data Sheets

Ignore Data Sheet

<table>
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<tr>
<th></th>
<th>Problem Behavior Occurred Y/N</th>
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<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>Test 1</td>
<td></td>
</tr>
<tr>
<td>Test 2</td>
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Attention, Tangible, and Escape Data Sheet

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<tbody>
<tr>
<td></td>
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<tr>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Test</td>
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## Appendix D: Treatment Integrity Checklists

### Baseline Checklist

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<th>YES</th>
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<tbody>
<tr>
<td>1. Participant has access to Bloom et al. (2011) at least 48 hr before session</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Participant given 10 min before roleplay to review article</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3. Researcher gave all necessary materials (i.e., data sheets) to participant before role-play session starts</td>
<td></td>
<td></td>
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<tr>
<td>4. Researcher did not answer questions posed by participant</td>
<td></td>
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</tr>
<tr>
<td>5. Researcher read explanation paragraph from the role-play script to</td>
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</tr>
<tr>
<td>participant before starting the session</td>
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</tr>
<tr>
<td>6. Researcher engaged in non-target problem behavior in test and control segment</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7. Researcher engaged in target problem behavior in test and control segment</td>
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<td></td>
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<tr>
<td>8. Researcher did not give feedback to participant</td>
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</table>
# Video Modeling Checklist

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<tr>
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</thead>
<tbody>
<tr>
<td>1. Participant given 10 minutes before roleplay to review video</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2. Researcher gave all necessary materials (i.e., data sheets)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Researcher did not answer questions posed by participant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Researcher read explanation paragraph from the role-play script to participant</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5. Researcher engaged in non-target problem behavior during role-play</td>
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</tr>
</tbody>
</table>
6. Researcher engaged in target problem behavior in test or control segment

7. Researcher did not provide feedback to the participant
Appendix E: Social Validity Questionnaire

Answer the following questions as honestly as you can. Your data is anonymous and will remain so. 1 represents highly disagree and 5 represents highly agree.

1. I enjoyed participating in this study.
   
2. I enjoyed the use of video modeling and feedback in this study.
   
3. I feel as though my skills in conducting trial-based functional analysis improved by participating in this study.
   
4. The video modeling and feedback intervention was simple to understand.
   
5. The video modeling and feedback intervention did not take too much time.
   
6. I am more confident in my ability to conduct a trial-based functional analysis than I was before this study.

   1  2  3  4  5
7. I would use trial-based functional analysis in my clinical practice.

1  2  3  4  5

8. I would recommend using video modeling and feedback as a learning method to my colleagues.

1  2  3  4  5

9. I enjoyed the telehealth aspect of this study.

1  2  3  4  5

10. If participating in a similar study in the near future and given the option of telehealth or in-person video modeling, I would choose telehealth.

1  2  3  4  5

11. I believe the skills I learned via telehealth in this study would generalize to an in-person roleplay.

1  2  3  4  5

12. What did you like about video modeling and feedback?
13. What did you not like about video modeling and feedback?

14. What did you like about participating in this study via telehealth?

15. What did you not like about participating in this study via telehealth?
Appendix F: Participant Eligibility Screening Survey

   YES                   NO

2. Have you attended a lecture or information session on functional analysis?
   YES                   NO

3. Have you observed a functional analysis?
   YES                   NO

4. Have you taken data during a functional analysis?
   YES                   NO

5. Have you ever served as a therapist in a functional analysis?
   YES                   NO

6. Are you familiar with trial-based functional analysis procedures?
   YES                   NO

   YES                   NO

8. Have you read Classroom Application of a Trial-based Functional Analysis by Bloom, Iwata, Fritz, Roscoe, and Carreau (2011)?
   YES                   NO
9. Have you read any other literature on trial-based functional analyses?
   YES   NO

10. Have you attended a lecture or information session on trial-based functional analysis?
    YES   NO

11. Have you observed a trial-based functional analysis?
    YES   NO

12. Have you taken data during a trial-based functional analysis?
    YES   NO

13. Have you ever served as a therapist in a trial-based functional analysis?
    YES   NO
Appendix G: IRB Approval Letter

UNIVERSITY of SOUTH FLORIDA

APPROVAL

January 19, 2021

Alyssa Zak
4504 W Spruce Street
APT 453
Tampa, FL 33607

Dear Alyssa Zak:

On 1/16/2021, the IRB reviewed and approved the following protocol:

<table>
<thead>
<tr>
<th>Application Type:</th>
<th>Initial Study</th>
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<tbody>
<tr>
<td>IRB ID:</td>
<td>STUDY002037</td>
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<td>Review Type:</td>
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<tr>
<td>Title:</td>
<td>Evaluating Video Modeling to Teach a Block Schedule Trial-Based Functional Analysis</td>
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<td>Funding:</td>
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<td>IND, IDE, or HDE:</td>
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</table>

Approved study documents can be found under the ‘Documents’ tab in the main study workspace. Use the stamped consent found under the ‘Last Finalized’ column under the ‘Documents’ tab.

Within 30 days of the anniversary date of study approval, confirm your research is ongoing by clicking Confirm Ongoing Research in BullsIRB, or if your research is complete, submit a study closure request in BullsIRB by clicking Create Modification/CR.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Your study qualifies for a waiver of the requirements for the documentation of informed consent for the video interviews as outlined in the federal regulations at 45 CFR 46.117(c).

Sincerely,

Institutional Review Boards / Research Integrity & Compliance
FWA No. 00001669
University of South Florida / 3702 Spectrum Blvd., Suite 165 / Tampa, FL 33612 / 813-974-5638
Katrina Johnson
IRB Research Compliance Administrator