4-2024

Teaching Classification of Environmental Events in Narrative ABC Data Using Video-based Behavioral Skills Training

Grace E. Sylvester
Western Michigan University

TEACHING CLASSIFICATION OF ENVIRONMENTAL EVENTS IN NARRATIVE ABC DATA USING VIDEO-BASED BEHAVIORAL SKILLS TRAINING

Grace E. Sylvester, M.A.

Western Michigan University, 2024

Behavior analysts often conduct ABC assessments as part of a functional behavior assessment to develop a hypothesis about the function of behavior and to help guide further treatment decisions. Antecedent-Behavior-Consequence (ABC) assessment is a descriptive assessment technique used to gather information about environmental events surrounding a specific behavioral event (i.e., antecedents and consequences). ABC assessment involves several analytical skills, including classifying antecedents and consequences. There is little to no research available on how to effectively train individuals how to classify environmental events within narrative ABC assessment. It is important that behavior analysts correctly classify events in ABC assessments to increase the likelihood that an appropriate function-based treatment be identified from the functional behavior assessment. A framework for training these nuanced skills is needed. The current study evaluated the efficacy of video-based BST on the accuracy of narrative ABC data classification of environmental events in behavior technicians at an autism center.

TEACHING CLASSIFICATION OF ENVIRONMENTAL EVENTS IN NARRATIVE ABC DATA USING VIDEO-BASED BEHAVIORAL SKILLS TRAINING

by

Grace E. Sylvester

A thesis submitted to the Graduate College
in partial fulfillment of the requirements
for the degree of Master of Arts
Psychology
Western Michigan University
April 2024

Thesis Committee:

Stephanie Peterson, Ph.D., Chair
Jonathon Baker, Ph.D.
Sacha Pence, Ph.D.

ACKNOWLEDGMENTS

I would like to extend a thank you to my research assistant, Taylor Ketelaar, for playing a very integral role in the completion of this thesis project. Without her dedication and willingness to help with the project, I would not have been able to complete it as efficiently and effectively as we did. I would also like to extend my gratitude to my mentor and advisor, Dr. Stephanie Peterson, for the role she played in this research at all phases of the study. Dr. Peterson helped guide me to stick to the intervention when I needed to and to shift gears when I needed to, in meaningful, evidence-based ways. I want to say thank you for the support given throughout the study, but also for the continued support in all personal and professional endeavors. I would also like to extend my gratitude to my committee members, Dr. Jonathon Baker and Dr. Sacha Pence for their guidance. Lastly, I would like to say thank you to my expert reviewers who all offered their expertise in narrative ABC classification and their time to do so. I would not have been able to conduct this research without them. Additionally, I would like to thank my mentors, Kelsey Stapleton and Jessica Detrick, who both played a fundamental role in the development of this project. Thank you to all who have supported me along this journey and continue to support me.

Grace E. Sylvester

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

Applied behavior analysts use functional behavior assessments (FBA) to identify the function of a behavior or set of behaviors. Assessments that a behavior analyst may conduct throughout an FBA include indirect assessments, descriptive assessments, and/or experimental assessments, such as a functional analysis (Peterson & Neef, 2020). Indirect and descriptive assessments are often conducted prior to a functional analysis or as an alternative to a functional analysis, such as when it is too dangerous to conduct a functional analysis or when there is a lack of resources available to do so (Lerman et al., 2009). Descriptive analyses are conducted by observing occurrences of problem behavior in the natural environment – an environment that is neither controlled nor systematically arranged – and their purpose is to expose naturally-occurring environmental events and behavior patterns (Peterson & Neef, 2020). ABC assessment is used to identify antecedent and consequent events that occur within temporal proximity to specified behavioral events (i.e., the targeted behavior). This information is used to generate a hypothesis about the function(s) of the target behavior (Lerman et al., 2009), which may then be tested, and the results of hypothesis testing can be used to guide function-based treatments and ongoing treatment decisions (Hanley et al., 2003). ABC assessments can provide correlational data about the relationships between environmental events and behavior and can be informative about what patterns occur in the natural environment (Peterson & Neef, 2020). The identification of these variables can lead to predictions of the function of behavior and can be an important part of the FBA process, especially in situations where more controlled analyses, like functional analyses, are difficult to employ. Therefore, it is important to continue refining ABC assessment techniques.

There are two commonly-used formats to collect ABC data: narrative and structured (or continuous) ABC data collection. Narrative ABC data collection is open-ended and requires a data collector to transcribe events as they occur, whereas structured ABC data collection requires the data collector to select among predetermined options for behaviors, antecedents, and consequences (Peterson & Neef, 2020). Narrative ABC data collection can be laborious because the data collector must write down everything they observe. Structured ABC data collection allows for quick data entry as a data collector indicates a predetermined option rather than having to write a full description of the events observed. This is advantageous when multiple events occur simultaneously or rapidly in succession. On the other hand, structured ABC data collection may not allow for the same level of analysis as the narrative format because information may be lost when a predetermined list is used. When using predetermined ABC observation systems, the behavior analyst is not able to refer back to specific information about what occurred during any individual event. For example, a narrative ABC data sheet may read "Teacher said, 'You are doing so well completing your tasks today and sitting in your seat.', whereas a structured ABC data sheet may read 'Attention' for the exact same antecedent event. The latter recording system may not provide the behavior analyst with the same level of detail for analysis due to the lack of context provided about the specific events surrounding the behavior. This can be problematic because later, if an intervention is not working well and a behavior analyst wishes to review the assessment data again to determine if, perhaps, the function of behavior was inaccurately determined, the behavior analyst may not have enough information to do so.

Collecting and analyzing ABC assessments require multiple skills. The assessor must know how to observe, record, and *classify* events, as well as form hypotheses regarding the

function(s) of problem behavior as part of the ABC assessment. For example, common environmental events recorded within structured and narrative ABC data collection may include diverted attention, social interactions, task prompts or instructions, engagement in preferred activities/items or preferred activities/items removed, no activities or attention (alone), reprimands, and removal of task demands (Peterson & Neef, 2020). Assessors must possess a generalized skill repertoire of classifying these events into categories to create hypotheses regarding the function(s) of problem behavior. Research indicates that descriptive analyses, such as ABC assessment, may not always accurately predict the function of behavior (Camp et al., 2009; Thompson & Iwata, 2007; Contreras et al., 2022).

One reason for this lack of accuracy in such assessments may be the skill level of the assessor. Thus, research on improving accuracy of ABC assessments has primarily focused on teaching people, such as teachers and paraprofessionals to more accurately observe and record ABC data using both narrative and structured data collection among methods (Lerman et al., 2009, Luna et al., 2018; Mayer & DiGennaro Reed, 2013, Pence & St. Peter, 2018, Shayne & Miltenberger, 2013, Samudre et al., 2023). The interventions evaluated typically involve group lectures, group trainings on these two different types of data collection, task clarification accompanied by verbal performance feedback, and assigned readings. For example, Samudre et al. (2023) conducted a 75-minute training for teachers on structured ABC data collection and hypothesis creation. Their training involved describing the importance of descriptive assessment and function identification, providing a model of structured ABC data collection, providing feedback for correct and incorrect collection when teachers practiced data collection, and modeling how to hypothesize function when behavioral patterns are observed. Samudre and colleagues (2023) found that this training improved teachers' accuracy of collecting ABC data

using a structured ABC format, as well as their accuracy in hypothesizing the correct function of the target behavior based on the data they collected, but not to mastery level criteria.

Other studies have shown that it can be difficult to improve accuracy of ABC data collection for a portion of participants (Lerman et al., 2009; Luna et al., 2018; Pence & St. Peter, 2018). For example, Lerman et al. (2009) used a 60-min group lecture about ABC data collection simulating "training as usual" for paraprofessionals and certified special education teachers and found that when accuracy of data collection was evaluated, participants had a difficult time identifying correct antecedent and consequent events that corresponded to behaviors observed. In this study, participant accuracy of data collection decreased when they attempted to identify antecedents and consequences compared to when they solely were documenting if a challenging behavior occurred. That is, even when participants correctly identified and recorded a behavioral event, they did not necessarily correctly identify the antecedent or consequent event associated with that behavior. This study suggests that individuals learning to collect ABC data may have difficulty identifying antecedent and consequent events related to the problem behavior. Similarly, Pence and St. Peter (2018) found that following a group training and assigned readings on ABC data collection procedures, participants consistently had a more difficult time recording the absence of an environmental stimulus (i.e., low attention and removal of task demands) rather than the presence of events (i.e., attention and demand). Both of these studies indicate that teaching individuals to correctly identify antecedents and consequences for target behavior during ABC data collection—an analytical skill embedded in ABC data collection—is difficult and that there is need for further research on how to teach these skills. Furthermore, there is little to no research on improving accuracy of ABC data collection for populations other than teachers and paraeducators, such as behavior analysts in training and behavior technicians.

Descriptive assessments consist of qualitative data. The interpretation of qualitative data, such as ABC data, requires a higher level of inference than is required for more structured and controlled assessments, such as functional analyses, that are measured quantitatively (Contreras et al., 2022; Peterson & Neef, 2020). There are a variety of ways to interpret and analyze qualitative data. One such method is referred to as "inductive content analysis," which requires the researcher to organize the qualitative data into categories in an effort to better understand the phenomenon (Elo & Kyngäs, 2008). To do this, the individual must interpret data to determine which events or characteristics of something belong in the same category and which do not (Dey, 1993). Successful analysis requires the individual to simplify and classify the data in a reliable fashion (Kyngäs & Vanhanen, 1999) and adhering to an analytical procedure or coding scheme will increase trustworthiness of the analysis itself (Hsieh & Shannon, 2005). Thus, one analytical skill behavior analysts may need for analyzing narrative ABC assessments is the specific repertoire of identifying patterns of written antecedents and consequences that surround a target behavior during the assessment. The behavior analyst must examine the antecedent and consequent event for each target behavior and *classify* them into motivational and functional categories, respectively. Behavior analysts must know how to analyze each separate antecedent and consequent event within an ABC sequence (hereafter referred to as a "strand") before they can summarize the data and make an inference regarding the function the behavior serves. Which can be conceptualized as the *classification of motivating operations (i.e., antecedents)* and the *function classification of consequent events (i.e., consequences)*. I have labeled the classification of environmental events in this manner so as not to confuse this molecular-level of analysis with the molar-level of analysis of summarizing patterns of behavior to form a hypothesis regarding the function of behavior. After classification at the molecular level has been completed for

multiple strands of narrative ABC data, these classifications can be analyzed to form a molar-level hypothesis regarding the function(s) of a target behavior. Incorrect classification of environmental events at the molecular level may lead to an incorrect/invalid hypothesis about the function of behavior at the molar level, and thus subsequent intervention implementation may not address the function of behavior.

There is little to no research on how to train novice behavior analysts how to classify environmental events when conducting narrative ABC assessments. The lack of available literature on this topic means faculty in behavior analytic programs do not have data to guide their instructional practices when teaching these skills. Behavior analysts have an ethical obligation and responsibility to their clients to ensure that they are selecting and implementing data collection procedures (BACB, Code 3.01) with integrity to do no harm and maximize their clients' benefits (BACB, Code 2.17). The consequences for not selecting, implementing, and training correct assessment procedures could result in withholding effective intervention, injury to the client or others, prolonged treatment, or the implementation of more restrictive or intrusive strategies within a behavior support plan (Rooker et al., 2015). To increase validity of interpretation of narrative ABC assessments, behavior analysts may need to be specifically trained on the prerequisite skill of classifying antecedents and consequences into their corresponding motivational and functional categories.

Behavioral skills training (BST) is a training procedure that behavior analysts have used to train individuals on behavioral principles. BST is a training procedure that includes providing written instructions, modeling, opportunities for rehearsal, and feedback, and has been the gold standard for training individuals to implement various behavioral procedures (Parsons et al., 2013). BST has been used successfully to teach a variety of diverse skills across different groups

and is effective across time (Aciu et al., 2020; Sawyer et al., 2017; Shayne & Miltenberger 2013; Jiminez-Gomez et al., 2019). Thus, BST is an instructional procedure that could be used to teach behavior analysts to classify antecedent and consequence events within an ABC assessment. However, there are barriers to implementing BST in practice. BST is often resource-intensive. Rehearsal and feedback may require an abundance of time for competency-based instruction, especially if each individual involved in the training is to perform at mastery level criteria (Parsons et al., 2013). The time commitment and high level of effort, as well as availability of trainers and trainees, is often a barrier to BST in clinical settings (Catania et al., 2009).

One way to mitigate concerns with the resource intensity of BST might be online, video-based BST. Video-based interventions are composed of several components including but not limited to video models, voiceover instructions, written instructions, study guides, practice opportunities, interactive activities, test questions, and even programmed feedback (Erath & DiGennaro Reed, 2020). These components of video-based interventions can be designed with the procedures known to be effective in BST to further improve efficacy of the training (Parsons et al., 2013). Video-based interventions have been shown to be effective at improving a variety of skills across diverse populations, including teachers, clinical staff, graduate students, undergraduate students, parents, and more (Catania et al., 2009, Collins et al., 2009, Deliperi et al., 2015, Erath et al., 2021, Erath & DiGennaro Reed, 2020; Giannakakos et al., 2017, Lipschultz et al., 2015; Samudre et al., 2023). For example, Erath et al. (2021) conducted a video-based training to teach human service staff how to implement BST. Their intervention included a video model, guided notes, and a short quiz. They found that two out of four participants could implement BST with 100% accuracy after only one video-based training session, and the remaining participants required only brief supplemental feedback to meet

mastery criteria. Thus, it appears video-based interventions can be a viable alternative to more resource-intensive, in-person training. Video-based interventions and instruction provide many advantages to in-person staff training procedures, such as being less time-consuming, more consistent, and available on demand (Erath et al., 2021). Additionally, video-based interventions may avoid procedural drift and hold training integrity constant across trainings (Collins et al., 2009). The purpose of this study was to evaluate the effects of video-based BST on the accuracy of narrative ABC data classification of environmental events in behavior technicians who worked at an autism center and wished to later study behavior analysis and become Board Certified Behavior Analysts.

METHOD

Participants and Setting

Participants were 3 behavior technicians working at an autism center in the Midwest, all of whom were familiar with the term ABC data collection, had interest in working with individuals who engage in severe challenging behavior, and had interest in continuing their education in behavior analysis in graduate school. Additionally, participants received a behavior technician training upon being hired at the center. The training specific to data collection described the different types of recording methods and stated that they would be collecting behavior data for their clients, including ABC data. The training describes that ABC data is collected on what happened immediately before and after a behavior, but no other specifics were provided. Behavior technicians might also receive feedback on data collection during supervision sessions with their clients' BCBA, but no other formal trainings are provided. Participant 1 was a 28-year-old Caucasian female who held a bachelor's degree and had been a behavior technician for about 1 year and 3 months. Participant 2 was an 18-year-old Caucasian female who had some

college experience and had been a behavior technician for about 1 year. Participant 3 was a 20-year-old Caucasian female who held an associate degree and had been a behavior technician for about 3 months. Participants were recruited through email and posted flyers within the participating autism center (see Appendix A). If participants expressed interest in the study, they met with the author to discuss informed consent and an eligibility questionnaire (see Appendix B). If participants provided signed, informed consent, they completed a questionnaire to determine whether they met further inclusion criteria. Participants began the baseline phase, and their resulting data determined whether or not they had already acquired the skills to classify antecedents and consequences for ABC data. Participants who scored at low and stable levels during baseline continued their participation in the study. If participants scored at or above 60% accuracy in baseline across two or more sessions, they would have been excluded from further participation in the study because this would indicate to the researchers that they already acquired this skill. However, all three participants met inclusionary criteria and, thus, continued in the study.

All sessions were conducted in a room within the participating autism center, a study room within the participating university, or via videoconferencing software (WebEx) depending on participant availability and the phase of the study. Each setting was equipped with all the necessary materials to engage in the study, as described below.

Materials

Materials included a questionnaire (see Appendix B) to gauge eligibility for the study, written instructions on how to classify environmental events (see below and Appendix C), unrelated narrative ABC data sheets (see sample in Appendix D), one related narrative ABC data

sheet, and a 25-minute video-based BST module with guided notes. This study also required the use of a laptop/computer, PowerPoint, Excel, and a writing utensil.

Unrelated Narrative ABC Data Sheets

I created a master list of 240 antecedent-behavior-consequence (ABC) relations that I will refer to as "strands" henceforth. Each of these strands were unrelated to and independent of each other. The 240 strands consisted of four groups of 60 strands addressing the four potential functions of behavior (i.e., 60 strands that could be classified as attention-motivation, 60 strands that could be classified as automatic motivation, 60 strands that could be classified as tangible motivation, and 60 strands that could be classified as escape motivation). At least 10% of the 60 strands in each function contained information that would allow them to be classified as more than one motivational or functional classification of behavior (e.g., attention and tangible motivation), representing situations when multiple environmental events occur simultaneously in the environment.

Prior to commencement of the study, these strands of ABC data were reviewed by multiple experts who had 3 or more years of experience conducting ABC assessment in practice. These individuals were recruited from various clinical settings from the affiliated university to ensure individuals coming from a variety of training backgrounds were represented. These individuals were asked to classify the experimenter-created narrative ABC data strands for both antecedent and consequence events. I then compared how each individual independently classified the antecedent and consequence events and determined whether or not they all agreed on their classification. I convened pairs of experts in a group videoconference and discussed each strand that did not have 100% agreement during the independent review until 100% agreement

was obtained. Sometimes, during this review the description of events in the ABC data strand were revised to obtain 100% agreement across experts.

I then created multiple data sheets, each of which consisted of 20 strands selected from the master list. The strands of data for each data sheet were selected using the number randomizer function in Microsoft Excel. I controlled how often classifications appeared on each data sheet, allowing for an average of five (range 4-6) strands per classification. If one classification of behavior was randomly selected more than 6 times, it was skipped, and a new strand was chosen using the number randomizer. This process was repeated until 20 strands were chosen. Twelve data sheets were created with no single strand ever being repeated across data sheets. When more than 12 data sheets were needed for any one participant, this process was repeated to generate 12 new data sheets. These data sheets consisted of the same 240 total strands, but the strands were in completely different sequences across data sheets. For each data sheet generated, a corresponding answer key was developed. The answer key contained the "correct" classifications for each strand, as identified by the expert review panel.

Related Narrative ABC Data Sheet

I created a second type of data sheet to be used for naturalistic probes. This data sheet was also experimenter-created, but the strands of narrative ABC data were related to each other to simulate more typical ABC data one might obtain in a clinical setting. This data sheet represented a stream of contextualized data from an actual observation. The related narrative ABC data sheet was given to one expert Board Certified Behavior Analyst to classify the strands in order to create an answer key.

Written Instructions

The written instructions included operational definitions for each classification (i.e., attention provided, tangible presented, denied access, demand presented, escape from demand, diverted attention, and alone)(Peterson & Neef, 2020) and written instructions of what activity to engage in (see Appendix C). The written instructions instructed the participants to decide which classification(s) for each antecedent and consequence event was/were relevant to the situation using the information provided. The purpose of the written instructions was to simulate information that was readily available to participants in the literature without any additional training.

Video-based Behavioral Skills Training Module

A video-based BST module was created to further teach classification of narrative ABC data to participants. The module included objectives of the training, the same definitions of the functions of behavior used in the written instructions, examples and non-examples of strands of narrative ABC data and their corresponding expertly-verified classification(s), and a video model in which the instructor demonstrated classification of antecedent and consequence classification as she analyzed strands of data. The strands of data used in the video model were similar in difficulty to the strands of data used in the study but were different from any strands of data the participants were asked to analyze in later sessions. After the video modeled the targeted response (i.e., classifying antecedents and consequences in an excel narrative ABC data sheet), the instructional video prompted the participants to engage in practice opportunities. Participants could pause the video while they completed the practice example and then play the video again to receive immediate feedback on their responses. I provided the participants with a set of guided notes on which they could write answers to 10 strands. The video model provided the answer to

each classification and prompted participants self-check and correct their answers on the guided notes as the video provided the correct answers.

Dependent Variables and Measurement

The primary dependent variable was correct classification of antecedents and consequences on the narrative ABC data sheets. A correct response was defined as the participant writing the classification, an antecedent or consequence, that matched the classification on the answer key. A response was scored as correct if it had exact point-to-point correspondence with the answer key. A response was scored as incorrect if there was not point-to-point correspondence between the participant's answer and the answer key. Incorrect responses occurred if the participant indicated one classification and the answer key identified two or more classifications per event, if there were two classifications identified by the participant and the answer key only identified one classification, if the participant identified one classification and the answer key also had only one classification but it was different from the one indicated by the participant, or if there was no response. The number of correct responses was totaled for antecedents and consequences separately, divided by 20, and the result was multiplied by 100 to obtain the percent correct for antecedents and consequences. In addition, the total percent correct was obtained by summing all correct responses, both antecedents and consequences, dividing by 40, and multiplying the result by 100. Decisions to proceed to subsequent phases were made based on the total percent correct, but data were also graphed and analyzed separately for antecedents and consequences. To meet the mastery criterion, participants needed to have at least 80% correct responses total across three consecutive sessions.

A secondary dependent variable was the number of commission and omission errors both individually and across participants. Commission errors occurred when the participants identified

a classification that was either different from or in addition to one that the experts had identified on the answer key. Omission errors occurred when participants omitted a classification that experts had identified on the answer key. For example, if a participant wrote two or more classifications for an antecedent, or consequence, in the strand, and the answer key had only one classification for the antecedent, or consequence, in that strand, a commission error was counted. If a participant wrote only one or more classifications for an antecedent, or consequence, in a strand, or they scored a completely different classification, and the key had two or more classifications, or a different classification, respectively, for the antecedent, or consequence, on that strand, an omission error was counted. The participants needed to have the exact response as the answer key to be scored as correct, thus each time a participant classification was different than the answer key, an omission or commission error was counted. For each individual participant, the omission and commission errors were calculated by adding up the total number of omitted or committed responses per data sheet and graphing that number for visual analysis. For a summary of omission and commission errors across participants, the proportion of omission and commission errors for each participant across strands of data given to them in intervention was calculated by dividing the number of omission and commission errors across participants by the total number of times the classification should have been classified across their data sheets and the total number of times the classification should not have been classified across their data sheets and graphed for visual analysis.

Interobserver Agreement (IOA) and Procedural Fidelity

Point-by-point agreement IOA was assessed for an average of 44% (range 31-75%) of participant data sheets in each phase of the study. A second experimenter independently scored participant data sheets and marked each response as correct or incorrect. Each time both

observers marked an answer as correct or incorrect an agreement was counted. Anytime one observer marked an answer as correct and the other marked it as incorrect, a disagreement was counted. Agreement was calculated by dividing the agreements by the sum of agreements and disagreements, multiplied by 100%. The average IOA was 99% (range 98.1-100%) across participants and phases.

Procedural fidelity was assessed using a procedural fidelity checklist (see Appendix F). The researcher followed the checklist during each training session. Procedural fidelity was scored by having an independent observer watch at least 20% of sessions and record on the checklist which steps were followed or not. Procedural fidelity was collected on an average of 33.5% (range 21-100%) of sessions across participants and phases. The average procedural fidelity was 99.1% (range 97.5-100%) across sessions scored.

To increase confidence that participants actually viewed the module and participated in the training activities, participants' guided notes were scored for completion and accuracy. This was done to increase confidence that the participants were exposed to the intervention (i.e., that they watched the video) and that they engaged in the practice activities. Participants would have had to review the video if they did not complete the guided notes with 100% accuracy and completion. However, each participant completed their guided notes at 100% completion and accuracy when the video-based BST module was delivered. Thus, none of the participants had to watch the module a second time.

I assessed whether the video-based BST module was functioning properly by testing it prior to each session it was provided. I did this to ensure that the technology was functioning as it should be and, therefore, the video-based BST module was delivered as it was designed to be.

The video-based BST technology worked as designed on 100% of sessions in which the module was delivered.

Experimental Design

A simultaneous-treatment design embedded within a noncurrent multiple baseline design was used to compare accuracy of responding across two different conditions (i.e., antecedent classification and consequence classification). Simultaneous-treatment designs are typically used by alternating two or more distinct treatments concurrently and used to assess their effects on the dependent variable for an individual participant (Kazdin & Hartmann, 1978). A variation in the simultaneous-treatment design is used here and conceptualized as the direct comparison of the effects of the study's independent variable on percent correct (i.e., dependent variable) of antecedent and consequence classification, separately. A simultaneous-treatment design was selected to visually analyze the relationship between antecedent and consequence classification. However, I made decisions to begin intervention, phase change, and terminate sessions based on percent correct of overall performance (i.e., number of responses with point-to-point correspondence with experts divided by the total number of opportunities to respond). A nonconcurrent multiple baseline design was selected due to participant enrollment occurring across a significantly long duration of time. Prediction and replication may still be imposed with a nonconcurrent design (Cooper et al., 2020). Participants each began the intervention when a decreasing or stable trend of responding occurred. Intervention was implemented in a staggered fashion across participants.

Procedures

Baseline

All sessions were conducted individually for each participant in a room within the participating autism center or on the university campus. During baseline, participants were given written instructions and I stated, “Please read these written instructions, I will not be able to answer any questions, but please notify me when you are finished.” Participants were given time to review the written instructions. When the participant finished reading the instructions, I provided a laptop computer with a narrative ABC data sheet displayed. The participant had continued access to the written instructions throughout the session. I stated, “Please classify each antecedent and consequence event based on the information provided in the written instructions to the best of your ability. You will not be able to ask any questions and will not be provided with any feedback. Please notify me when you are finished, or I will let you know when 30 minutes has elapsed, and the session will be terminated.” After the participant was given these instructions, I then left the room to limit observer reactivity. Classification sessions lasted for a maximum duration of 30 min and if the participant had not finished classifying the data, any unclassified events would have been scored as incorrect. This never occurred in any of the participant sessions. This process was completed for at least three or more sessions with each participant. If any participants scored at or above 60% correct (based on total percent correct across antecedents and consequences) for two or more sessions, their participation in the study would have been terminated because they were already able to perform the skill at a fairly high level. However, this never happened. Participants who scored below 60% accuracy and who engaged in stable levels or decreasing trends of responding following three or more sessions continued to intervention.

Phase 1--Video-based BST

Participants were provided with a computer with the video-based BST module loaded on it. I stated, “Please watch the video module and follow along with these guided notes. The guided notes will be scored for completion and accuracy once you are finished watching the video. Please let me know when you are finished watching the module and ready for me to look at your guided notes.” I then left the room. Immediately after the participant reported they were finished with the module and had given me their completed guided notes, I scored the guided notes for completion and accuracy. The participant would have been asked to view the training again if the guided notes were not completed or accurate, but this never occurred for any participant. When the guided notes were deemed complete and accurate, participants were given a narrative ABC data sheet and told to classify each antecedent and consequence to the best of their ability. I said, “Please classify each antecedent and consequence event based on the information provided in the video-based BST module to the best of your ability. You will not be able to ask any questions and will not be provided with any feedback. Please notify me when you are finished, or I will let you know when 30 minutes has elapsed, and the session is terminated.” Each participant was provided with their guided notes, to which they were able to refer to throughout intervention. I left the training room during sessions to limit observer reactivity. Prior to each subsequent session, the researcher informed participants of their score from the previous session, but no other specific feedback was provided about classification. This procedure continued until responding was stable at mastery level criteria (at or above 80% total correct across 3 or more sessions), if performance was improved and steady state compared to baseline, or if there was no improvement across 3 or more sessions. When participants showed little to no improvement across 3 or more sessions, as assessed by visual analysis, they were advanced to

Phase 2 of the study. All participants showed little to no improvement in Phase 1 and were advanced to Phase 2.

Phase 2--Written Feedback

If participants did not reach mastery criteria in Phase 1, more feedback was prescribed in Phase 2. The procedures in Phase 2 were the same as Phase 1, but in Phase 2, participants did not re-watch the video training or fill out the guided notes, and instead were given their previously-scored narrative ABC data sheet from the preceding session and the corresponding answer key. I stated, "Please compare and self-correct your data sheet with the answer key as you see fit. Let me know when you are finished and are ready for the next data sheet." When participants stated that they were finished reviewing their previous data sheet, they were given a new data sheet and asked to classify the data. If participants did not reach mastery level criteria in this phase across 3 or more sessions, they were advanced to Phase 3 of the study. All participants showed little to no improvement in Phase 2 and were advanced to Phase 3.

Phase 3--Question & Answer (Q & A) Session

If participants did not reach mastery criteria in Phase 2, even more feedback was prescribed in Phase 3. The general procedures were the same in Phase 3 as in the other phases mentioned previously, however, prior to each session, myself and the participant reviewed the preceding sessions' data sheet together via a videoconferencing. I stated, "Let's review the data sheet from the previous session together," and shared a screen with the participants' data sheet and the corresponding answer key. At this point, participants were given the opportunity to ask specific and general questions about narrative ABC data collection procedures and all questions were answered. Additionally, I conducted an error analysis of the participants classification of all previous intervention sessions prior to the start of Phase 3. I focused on providing specific

feedback about each of the classifications that were omitted and committed on each data sheet by each participant, but especially focused on the ones that each participant was more likely to error on given past performance. After the data sheet had been reviewed and participants had received feedback on specific classifications, they were given another data sheet and given the same prompt to classify each antecedent and consequence event as the previous sessions. I turned off the camera to limit observer reactivity. When the participant was finished classifying the data sheet, I scored the data sheet and provided the participant with their percent accuracy score. No other feedback was provided on the data sheet until the following session. (Feedback was provided in this way based on the results of Aljadeff-Abergel et al. (2017), which demonstrated that feedback was most effective when provided immediately prior to the next opportunity to perform a skill and that participants preferred some feedback immediately following their performance.) This procedure continued until responding was stable at mastery level criteria (at or above 80% total correct across 3 or more sessions), if performance was improved and steady state compared to baseline, or if there was no improvement across 3 or more sessions.

Naturalistic Probe

A naturalistic probe was delivered once during baseline and at least once following implementation of intervention, typically at the end of the study, for each participant. The same data sheet was given to each participant per naturalistic probe. The participants did not receive feedback on the naturalistic probes, so they did not ever know the "correct" answers or how well they performed on each probe.

Social Acceptability and Social Validity Measures

I sent participants a social acceptability survey at the end of their participation in the study via email and asked them to email a copy of their completed questionnaire back to me at

their earliest convenience. The survey aimed to gauge their impression of each phase of the intervention, if they felt as though they had learned from the procedures used, and how likely they would be to recommend this video-based module, or other intervention methods, to their peers on a 3-point scale (1 being “no”, 2 being “neutral”, 3 being “yes”). Overall, the survey was used to assess whether the intervention was socially important to participants and if it had, in their opinion, helped them meet the goal of improving their accuracy of narrative ABC data classification (Cooper et al., 2020). Additionally, I asked participants if they had any overall feedback on the any of the intervention components. See Appendix E for a copy of the social acceptability survey and an attached copy of participant written responses to the survey.

Additionally, following the study, a survey was sent out to the experts with strands of data in which two participants had 100% IOA with each other but did not have point-to-point correspondence with expert classifications, and therefore were scored as incorrect. The strands used in the survey were pulled from three data sheets that participants completed during Phase 3 of the study. During this phase, participants provided me with rationales for why they selected the classifications they had. I asked the experts if they would review the participant classifications and rationales and consider whether they would revise their original classification. The purpose of this was not only to gather expert agreement or disagreement on the rationales that participants were providing, but also to evaluate the experts’ acceptability of participant classifications when it did not correspond to the expert answer key (Cooper et al., 2020). To see an example of a strand of narrative ABC data sent out to experts in the survey, see Table 1. For the sample in Table 1, the original experts’ classification was solely “denied access.”

Table 1

Survey Example: Strand of Narrative ABC Data Sent out to Experts

Antecedent	MO/Antecedent Classification	Behavior	Consequence
Client was eating with a fork when another child came and grabbed the fork and ran away	Attention, Denied Access	Client ran after peer and pushed them down and retrieved the fork and asked for more food	Staff got the client new food and asked him if he wanted to clean his fork off before eating again.

RESULTS

Figure 1 shows the accuracy of both antecedent and consequence classifications across all phases of the study for all three participants. Participant 1 (top panel) had an average of 65% correct antecedent classification and 56.6% correct consequence classification across three baseline sessions. During the naturalistic probe in baseline, Participant 1 scored 20% and 40% correct on antecedent and consequence classification, respectively. After completing the video-based BST module, Participant 1's performance improved to an average of 76.6% correct and 66.6% correct for antecedent and consequence classification, respectively. Introducing written feedback did not improve performance further; however, when another naturalistic probe was conducted, performance improved relative to baseline, with 55% and 50% correct for antecedent and consequence classification, respectively. The introduction of explicit and direct feedback also did not improve performance. In fact, performance decreased to 58.8% and 61.8% correct for antecedent and consequence classifications, respectively. Interestingly, on a third naturalistic probe, performance was improved compared to baseline, but it did not improve from the previous probe. A final naturalistic probe was conducted at the end of the study. Participant 1

scored 70% and 45% correct for antecedent and consequence classifications, respectively, on this probe.

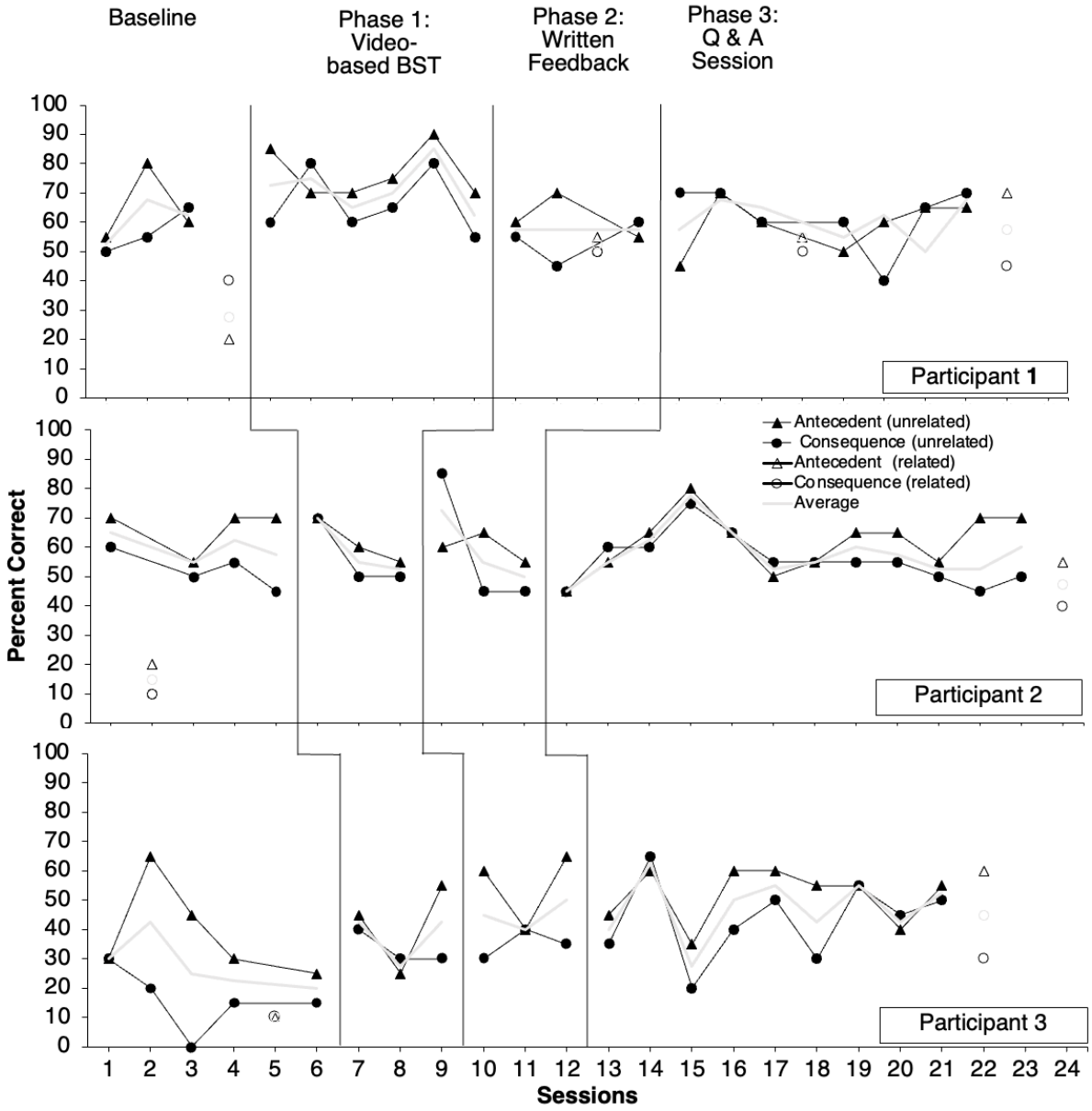
During Baseline, Participant 2 (middle panel) had on average 55% and 40% correct, for antecedent and consequence classifications, respectively, across for baseline sessions. During the naturalistic probe in baseline, Participant 2 scored 20% and 10% correct on antecedent and consequence classification, respectively. After completing the video-based BST module, Participant 2's performance improved to an average of 61.6% correct and 56.6% correct for antecedent and consequence classification, respectively. Introducing written feedback did not improve performance further and maintained average percent correct to 60% and 58%, respectively. The introduction of explicit and direct feedback also did not improve performance. In fact, performance maintained at similar levels as all phases at an average of 62% and 52% correct for antecedent and consequence classifications, respectively. A final naturalistic probe was conducted at the end of the study. Participant 2 scored 55% and 40% correct for antecedent and consequence classifications, respectively, on this probe.

Participant 3 (bottom panel) scored 42.5% correct antecedent classification and 16.2% correct consequence classification across five baseline sessions. During the naturalistic probe in baseline, the participant scored 10% correct on both antecedent and consequence classification. Next, the video-based BST module was introduced, and performance decreased for antecedent classifications (average 61.6% correct) and increased slightly for consequence classifications (average 28.33% correct). Introducing written feedback did not improve performance or accuracy of performance in a significant way. The introduction of explicit and direct feedback decreased accuracy to an average of 52.7% correct for antecedent classifications (although, still an increase from baseline) and increased accuracy of responding to an average of 41.6% correct

for consequence classifications. A final naturalistic probe was conducted at the end of the study. Participant 3 scored 30% and 15% correct, for antecedent and consequence classifications, respectively, on this probe.

Figure 1

Percent Correct: Antecedent versus Consequences

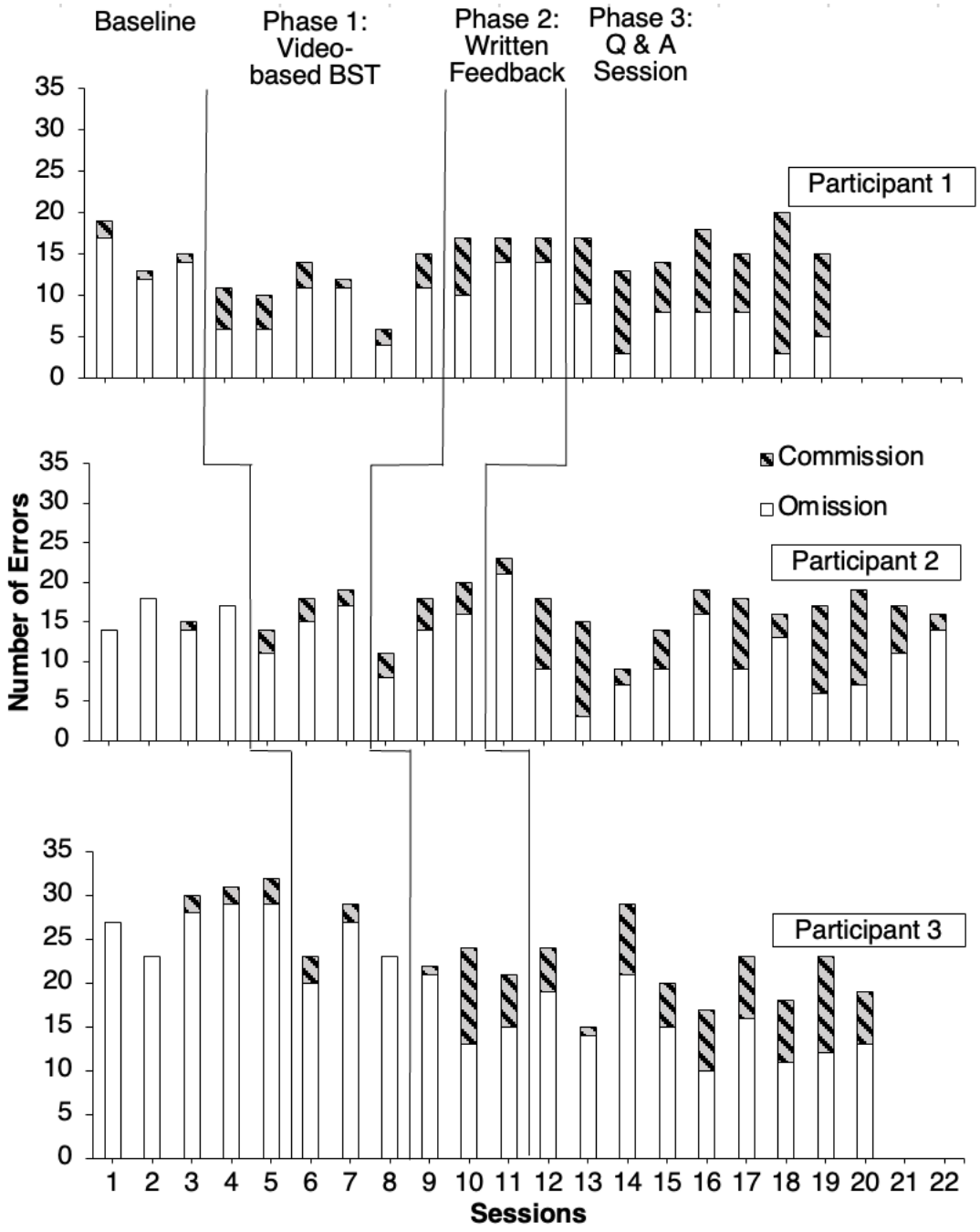


In summary, all three participants failed to meet the mastery criterion in all phases of the study. However, generally speaking, all participants had slightly higher accuracy for antecedent classification than for consequence classification. The video-based BST module was the only intervention that produced a significant increase in average percent correct from baseline and specific feedback produced slight to minimal improvement for all participants. However, visually, introduction of the video-based BST module produced only slight increase in accuracy of antecedent and consequence classification for two out of three participants (Participants 1 and 3). However, these increases were not maintained over time for Participant 1 and only modest maintenance occurred for Participant 3. All three participants demonstrated marked improvement on the naturalistic probes from baseline to the end of the study.

Figure 2 depicts the number of commission and omission errors made in each phase of the study by each participant. All three participants had mostly omission errors in baseline. Over the course of the study, as the intervention was implemented, there was a decreasing trend of omission errors for all three participants as well as an increasing trend in commission errors.

Figure 2

Number of Commission and Omission Errors per Participant

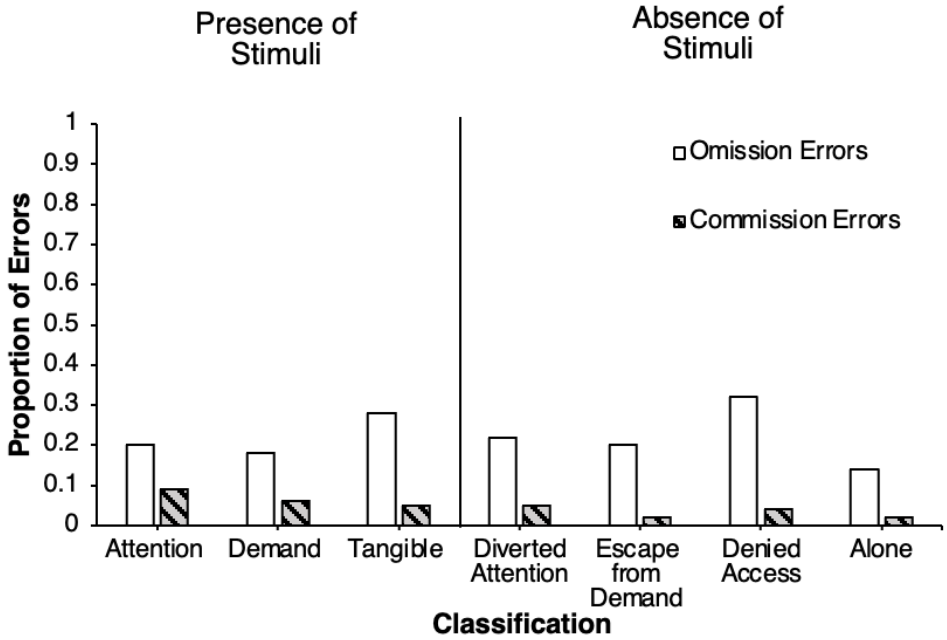


Given that Pence and St. Peter (2018) found participants were less likely to collect data accurately for events that that involved the absence of a stimulus presentation such as "escape from demand" and "diverted attention" than for events that involved the presentation of a

stimulus, I conducted an additional analysis to determine whether omission and commission errors varied based on the type of categorization (see Figure 3). I divided the categorizations into two groups: (1) categories that were based on the presence of specific antecedent or consequent stimuli (attention delivery, demand delivery, tangible delivery), and (2) categories that were based on the absence of specific antecedent or consequent stimuli (diverted attention [absence of attention], escape from demands [absence of task demands], denied access [absence of tangible items], and alone [absence of attention, task demands, and tangible items]). Results show that, on the whole, participants made more omission than commission errors across the board. There were no salient differences in omission errors across the two groups of categories. However, commission errors were slightly higher for the categories based on presence of specific antecedent or consequent stimuli. Additionally, omission errors were more likely for both the "denied access" and "tangible" classifications, respectively.

Figure 3

Error Patterns Across Participants

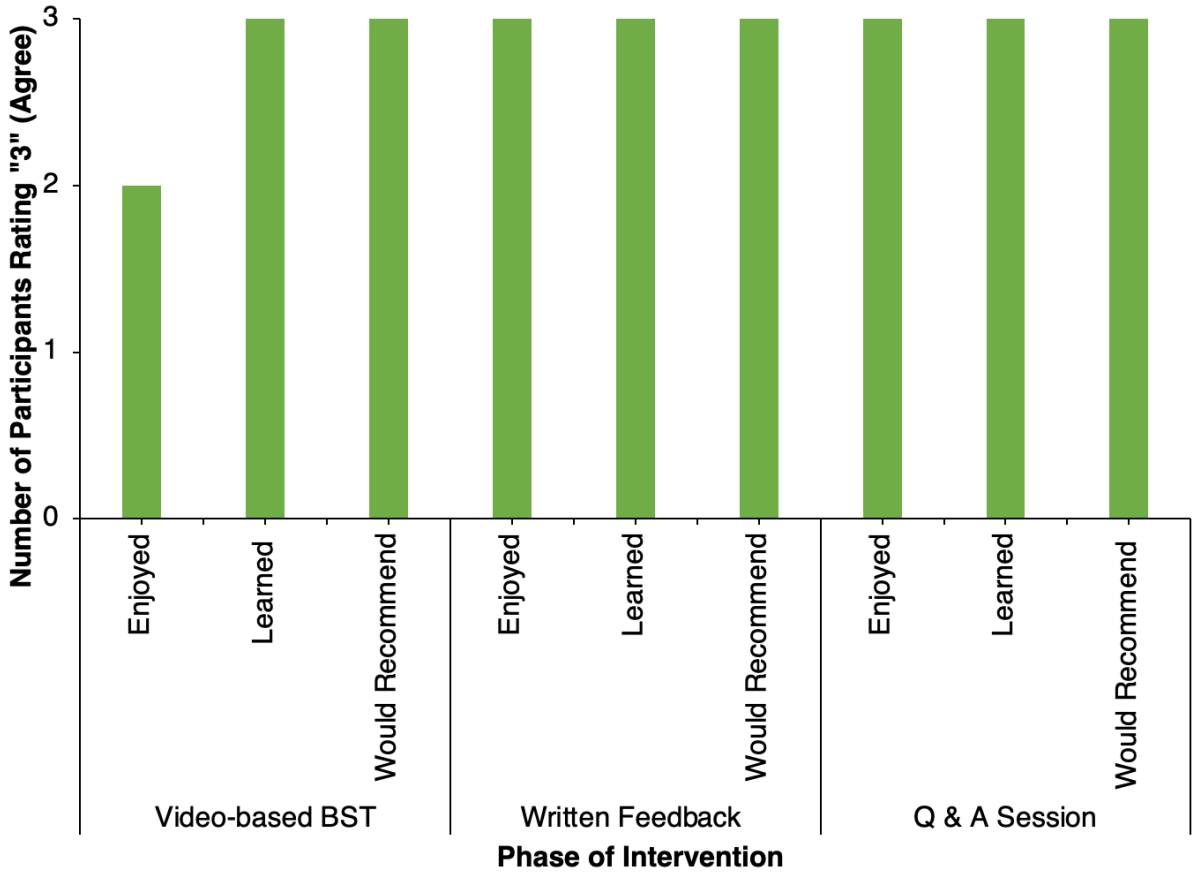


Social Acceptability and Social Validity Measures

Figure 5 shows the number of participants who agreed with each question on the social acceptability questionnaire and additional written comments can be found in Appendix E. Almost all participants agreed with all statements for all phases of the study. Overall, participants reported that they enjoyed, learned from, and would recommend the video-based BST module, self-correction written feedback, and Q&A sessions that they participated in. A few themes emerged from the comments provided. Participants generally stated that they liked the video-based formatting of the module in Phase 1 of the study because they were able to complete it on their own time and it gave a detailed list of how to engage in classification of environmental events. Feedback on Phase 2 indicated that participants thought the self-check and correct component was helpful although they had wished they would have been given an explanation for why experts selected which classifications they did or were able to ask more questions. Feedback on Phase 3 indicated that participants liked this phase mostly due to being able to ask questions and receive specific feedback from me. Participants indicated that they felt relatively comfortable classifying narrative ABC data in their practice and that this experience was very helpful with collecting ABC data in their natural environment for their job at the participating autism center.

Figure 4

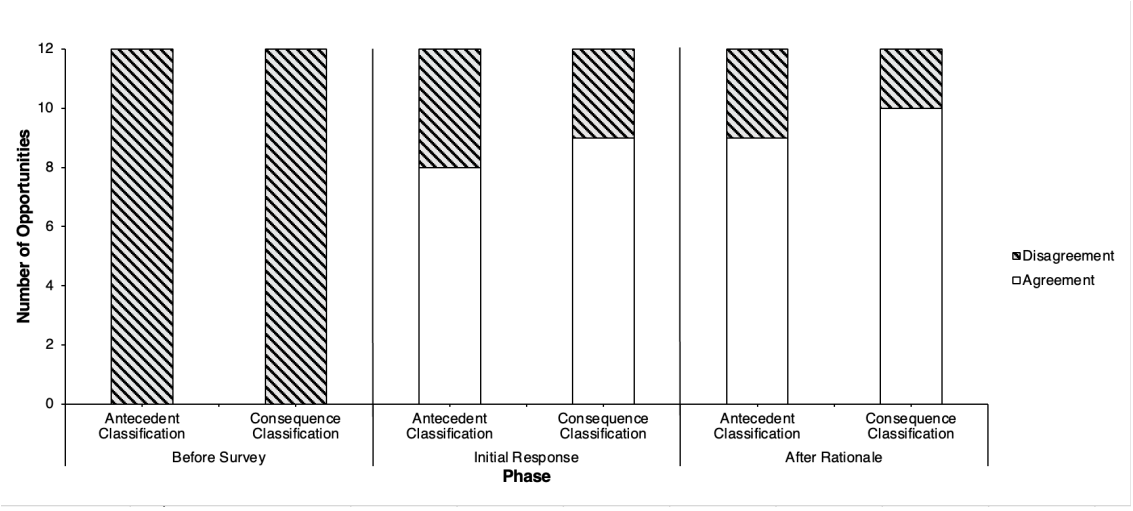
Social Acceptability Survey Results



Results from the survey sent out to experts to gather their acceptability of participant classifications is shown in Figure 6. Experts did not agree with participant classifications prior to the survey being send out (the participants classifications were scored as incorrect based on the answer key). Experts who responded to the survey (N=4) indicated that their opinion on the "correct" antecedent and consequence classification(s) did change some of the time for upon initial review and after reviewing participant rationale.

Figure 5

Expert Agreement with Participant Classifications



DISCUSSION

There is a general lack of direction in the literature on how to teach individuals to analyze narrative ABC data on a molecular level. Previous research attempted to use group trainings and assigned readings to increase accuracy of ABC data collection procedures, and even BST to increase accuracy of data collection and hypothesis creation about the function of behavior (Lerman et al., 2009, Luna et al, 2018, Pence & St Peter, 2018, Shayne & Miltenberger, 2013, Samudre et al., 2023). However, little research has been conducted to teach classification of environmental events via an asynchronous model or specifically aimed at increasing accuracy of antecedent and consequence classification of written behavioral events within narrative ABC data. This is an important analytical skill necessary for interpreting data from ABC assessments because it involves such high levels of inference. We evaluated the effects of an asynchronous video-based BST module, asynchronous written feedback, and synchronous feedback on the accuracy of narrative ABC data classification of three participants by comparing their

classifications to expert-reviewed and researcher-created narrative ABC data strands. Results indicate that training the nuanced skill of data classification is difficult and that video-based BST (at least the one I created) may not be an effective intervention at increasing accuracy of classification of environmental events. Thus, teaching behavior technicians involved in similar work-related activities aimed at assisting Board Certified Behavior Analysts ® (BCBA) by classifying narrative ABC data may be a difficult task and should be approached with extreme caution. Previous research indicates that behavior analysts should take caution when asking individuals, such as teachers, to collect narrative and structured ABC data (Pence & St. Peter, 2018). This research extends that research, suggesting that behavior technicians may have difficulty classifying data strands in an effort to support behavior analysts in conducting ABC assessments.

As discussed, several levels of specific and more intensive feedback were required to increase accuracy of classification in participants. The first phase aimed to assess whether or not participants could classify ABC data after receiving an asynchronous BST video training on how to generally engage in classification of environmental events. An asynchronous training module was attempted first because feasibility of providing synchronous in-person BST training is very labor intensive on mentors and supervisors and is often not feasible (Parsons et al., 2013). Interventions that require video trainings may require more work on the trainers' part, initially, but less response effort thereafter due to the permanent product of the training itself. It could benefit the field of behavior analysis, if it were successful, as the training could be disseminated to other behavior analysts for training purposes. Therefore, for this study, I sought to design a high-quality asynchronous training that incorporated multiple evidence-based teaching strategies, including components of BST (e.g., written instructions, modeling, examples, non-examples,

guided feedback, guided practice with feedback) and high rates of active learner responding (Hollins & Peterson, 2022). Given the number of evidence-based teaching strategies used in this training that are typically successful in in-person trainings, the lack of effectiveness in teaching ABC classification is surprising. Given the fact that people use procedures, like in-person BST, and that they have been proven effective, (Catania et al., 2009, Collins et al., 2009, Deliperi et al., 2015, Erath et al., 2021, Erath & DiGennaro Reed, 2020; Giannakakos et al., 2017, Lipschultz et al., 2015; Samudre et al., 2023), it is peculiar that we did not have the same findings in this study using similar techniques in an asynchronous format. Given the current training used both BST and written active student responding, one would predict that this training would have been effective as a stand-alone intervention. However, these were not my findings.

Given the lack of participant improvement in the first phase of the study, I added a simple self-check and correct phase to the intervention in which participants were still able to complete the task on their own time, by comparing and contrasting their answers with the corresponding answer key. The rationale for this phase was that trainers could prepare practice material and answer keys for their trainings that could still be implemented asynchronously that could provide more feedback and practice opportunities for participants. Unfortunately, this addition also did not reflect significant increases in accuracy for any the participants. In other studies where BST did not produce significant results; researchers have implemented in-person corrective feedback and praise (Erath et al., 2021; Preas et al., 2023). For example, Shayne & Miltenberger (2012) implemented corrective feedback when their BST training did not increase accuracy above 80% for accurate: ABC recording (mixed narrative and structured format), identifying a correct summary statement about the function of behavior, and identifying potential correct treatments

that matched the function. Feedback was delivered by watching back videos alongside participants and pointing out correct and incorrect responses and modeling correct responses. We tried to include a written feedback component first in an asynchronous format to improve accuracy of participant classification. The aim of this phase, particularly, was to continue to provide feedback and opportunities to practice, which are consistent with good teaching procedures, without relying on a trainer. However, we still did not see improvement of accuracy of responding to mastery level criteria.

Finally, in the third phase of the study, I conducted a synchronous training designed to allow participants to ask questions and receive highly individualized feedback on their performance and additional feedback was provided informed by an error analysis I conducted prior to Phase 3. The procedures used in the final phase were similar to previous studies using BST to improve performance of skills when the training itself was not sufficient at improving accuracy of responding (Erath et al., 2021; Preas et al., 2023; Shayne & Miltenberger, 2012). The purpose of this phase was to implement known teaching procedures that should increase accuracy of responding based on the literature. Specifically, these sessions were open-ended and led mostly by participants since they had already received the video-based BST training on how to classify narrative ABC data. Interesting, yet alarmingly, this phase also failed to produce significant increases in responding. This finding suggests that classification of ABC data is an extremely difficult and perhaps subjective task.

Furthermore, the results from the naturalistic probes and the survey sent out to expert reviewers after the study are both interesting. All participants were given naturalistic probes at least twice (once in baseline and once following termination) throughout the study, but only one participant was exposed to the naturalistic probe on two additional occasions (Participant 1; in

Phase 2 and in Phase 3). Because this participant was given the probe in the written feedback phase (Phase 2) of the study, and accuracy improved, this is an indication that the initial improvement in the accuracy score of the naturalistic probe was more than likely due to the initial training or a mixture of the video-based BST and written feedback. This is especially convincing since probe accuracy did not significantly increase in the additional two probes given throughout until the end of the study. Additionally, throughout intervention, all participants reported that they had confidence in their classifications, even if they did not have point-to-point correspondence with the experts' answer key and were making omission and commission errors. Generally, experts agreed with participant classification upon review following the study. This is considered a demonstration of the subjectivity of narrative ABC data classification, given that experts met and reviewed the data and came to a consensus on differing classifications prior to any extraneous reviews of the same data.

Moreover, this study does demonstrate that individuals can improve in some skill areas within narrative ABC data classification. Although participants' overall accuracy in responding did not increase to mastery level criteria at any point in the study, their omission errors were generally on a decreasing trend over time. In the earlier parts of the study, participants made more omission errors compared to their commission errors (i.e., they were failing to identify a potential function rather than calling out a function that was not identified by experts). Over time, they tended to have fewer omission errors and more commission errors which suggests that they were over-identifying antecedents or consequences. This finding suggests that participants missed less expertly identified classifications per data sheet over time, however, did not acquire the same selective responding that most experts possessed. It could be argued that it is better to over-identify a function of behavior rather than never identify it at all. Contreras et al. (2022)

found in their systematic review of 48 studies involving both descriptive assessment and functional analysis (FA), that descriptive analyses may be less informative when developing treatment plans because of their modest correspondence with FA results. This review also suggested that descriptive analyses are more effective at predicting the ruling out of a function of behavior in an FA than identifying the presence of one. The study concluded that, in practice, this could mean that descriptive analyses could enhance FAs in ruling out conditions for further assessment but were not as effective at predicting the function of behavior. However, this is assuming that the data collector and interpreter has the skills to identify all potential antecedents and consequences in the natural environment and select which ones are relevant to the assessment. This issue demonstrates the importance of identification of potential antecedents and consequences in narrative ABC data, rather than omitting them, as this could mean the difference in identifying the function of a behavior and missing it if it is not included for further assessment when it should have been.

Pence & St. Peter (2018) found that participants were less likely to collect data accurately for events that that involved the absence of a stimulus presentation such as “escape from demand” and “diverted attention” than for events that involved the presentation of a stimulus. Contrarily, Lerman and colleagues (2009) found that “demand presented,” “escape from demand,” and “attention” were the most commonly omitted and committed classifications within ABC data collection by participants in their study. The present study found that participants were more likely to omit “denied access” and “tangible” classifications and were slightly more likely to commit classifications that involved the presentation of a stimulus than the absence of a stimulus presentation. However, they were much less likely to omit classifications than commit them overall. Participants in previous studies were educators and participants in this study were

behavior technicians. The specific population and learning histories of the participants may be a contributing factor to the differences in error patterns observed in this study, or it could be another indicator that classification is a subjective task.

Although this study did not examine structured ABC data formatting techniques, the same precautions likely should be taken when analyzing these data. When structured ABC data is employed, the data collector is essentially asked to classify the antecedent or consequent events in the moment. This means that within structured ABC data, collectors are being asked to engage in the skill being assessed in this study immediately, rather than at a later time. Behavior technicians should be able to help implement assessment techniques (RBT Task List (2nd ed.), 2018), but results from the present study indicate that asking behavior technicians to classify ABC data may not be appropriate for behavior analysts to do. Thus, behavior analysts who ask behavior technicians to collect structured ABC data should do so as a technique to gather supplemental information about the client's problem behavior and not to make treatment decisions. Additionally, behavior analysts might find it in their interest to train and ask behavior technicians to collect narrative ABC data, so that they can analyze and classify the data themselves rather than rely on behavior technician classifications, as they would in structured ABC data formats. However, doing so comes with risks, too, as previous research indicates that it is also difficult to teach collection of accurate narrative and structured ABC data (Lerman et al., 2009, Pence & St. Peter, 2018).

Previous research reported that many behavior analysts often rely on descriptive assessment in their FBAs and rarely use functional analysis (Oliver et al., 2015). This is concerning given that we were not able to teach classification of environmental events, and skill repertoire of an expert, to novices in narrative ABC data classification. Much of this difficulty

may be attributed to the subjectivity of ABC data itself. However, this study demonstrated that behavior technicians may not reliably identify antecedents and consequences within narrative ABC data classification of environmental events even after giving training to do so. Sumatra et al., (2023) concluded that participants in their study were more likely to identify the correct function of behavior when they accurately collected structured ABC data. This finding stresses the importance of accurate ABC data collection, which should include emphasis on correct classification. Lerman et al. (2009) stated that indirect and descriptive assessments are often conducted prior to a functional analysis or as an alternative assessment to a functional analysis when it is too dangerous or when there is a lack of resources available. The present research concludes that descriptive assessments are highly ambiguous and must be interpreted and analyzed with caution. Thus, narrative ABC data should be used to gather information about the environment to inform a full FBA rather than rely on its results in place of more experimental assessments such as the functional analysis due to the high level of inference involved in the analysis of these data.

Limitations and Future Research

This study had several limitations that were not mentioned previously. One limitation was that strands of narrative ABC data were created by me, meaning that the examples were pulled from my learning history. As a result, there may be situations, populations, and behaviors that are not reflected in the strands of narrative ABC data that could impact the generalizability of the training. An additional limitation was that it was unclear whether or not having experts individually classify narrative ABC data strands and then meet in pairs to come to an agreement allowed me to identify "correctness" of narrative ABC data classifications. Although I used a rigorous review process prior to the study to identify correct answers, it was unclear as to

whether or not those identified classifications were the only "correct" answers. In addition, the expert ABC data classifiers, during consensus sessions, often had difficulty coming to an agreement on one or more correct classifications with another expert. This resulted in having to change wording of some antecedents, behaviors, and consequences in order to come to a consensus. Interestingly, on initial review, experts also had relatively low agreement or IOA with each other (i.e., 32.5%) across the 12 individual data sheets. It is unclear how behavior analysts come to a conclusion on narrative ABC data classification, which adds to the complexity of teaching the skill to novices. Future research should evaluate whether or not there even are correct answers within narrative ABC data classification. Another limitation with data sheet creation was that expert classifications often varied across groups of experts. For example, some experts classified similar antecedents as "demand" versus "attention" and "demand" and it was unclear why they would select it in one scenario versus in another. This is a limitation of gathering humans experts as some variability in responding is expected. One way to mitigate this concern would be to gather a larger group of experts together to classify each data sheet as a group. This way each data sheet would be classified by the same group of experts and hopefully decrease the variability in responses for similar antecedent and consequent classifications. Additionally, all experts were recruited from the same university. Although experts had varying training backgrounds and advisors and were grouped to review with another expert with a different training background as much as possible, this is still a limitation within the study.

Another limitation was that the intervention did not increase accuracy of any of the participants to mastery criterion. Future research should attempt identify whether or not other training procedures would have a positive effect on accuracy of classification. For example, training strategies that involve different instructional design may be more effective at teaching

classification of environmental events (Tennyson & Park, 1980) since it is a complex skill that involves a high level of expertise and inference. More specifically, if environmental events are analyzed through a concept analysis (Layng, 2018; Markle & Tiemann, 1970), the functions of behavior could be taught to novices according to their common attributes, involving both critical and variable attributes of each individual classification. A concept analysis of environmental events could be useful in training novices to classify narrative ABC data since it is a complex skill. These trainings should also be extended to asynchronous formats, when possible.

Finally, a main limitation of this study was the use of a nonconcurrent multiple baseline (MB) design. Nonconcurrent MB designs demonstrate the least control over behavior compared to all other multiple baseline design variations (Cooper et al., 2020). However, barriers with participant recruitment were experienced throughout the study and required the use of this design. The addition of the simultaneous-treatment design was incorporated to strengthen the experimental design by allowing for more conclusions to be drawn about antecedent and consequence classification separately and comparatively.

It is presently unknown to what effect this training would have on individuals already acquiring BCBA hours or are novice BCBAs who have more training and experience in behavior analysis. Research should specifically be extended to this population. Future research should also evaluate the degree to which those in training to become BCBAs are taught to implement narrative ABC analyses with integrity and accuracy. Narrative ABC data classification is a higher-level skill that behavior analysts engage in as part of their FBA process. It appears that these skills are very nuanced and are not easily trained or shaped up. Future studies should also extend generalization procedures to evaluate whether or not training, such as the present, would increase the likelihood that behavior technicians can more accurately collect narrative ABC data

within client sessions as this would be the ultimate social validity. Data collection and data classification may be transferable skills in that expertise in one skill may increase accuracy in another, but further research would be needed to assess this relationship. Overall, behavior analysts should use caution when assigning the task of analyzing narrative ABC data to novices, especially if they plan to use the results to guide future treatment decisions.

REFERENCES

Aciu, J-L. A., Vladescu, J. C., Marano-Frezza, K. E., Reeve, K. F., & Gravina, N. (2021). Teaching hands-only CPR using behavioral skills training. *Behavioral Interventions*, 1– 16. https://doi.org/10.1002/bin.1820

Behavior Analyst Certification Board. (2020). *Ethics code for behavior analysts.* https://bacb.com/wp-content/ethics-code-for-behavior-analysts/

Behavior Analyst Certification Board. (2018). *RBT Task List (2nd edition).* https://www.bacb.com/wp-content/uploads/2020/05/RBT-2nd-Edition-Task-List_230130-a.pdf

Camp, E. M., Iwata, B. A., Hammond, J. L., & Bloom, S. E. (2009). Antecedent versus consequent events as predictors of problem behavior. *Journal of applied behavior analysis*, *42*(2), 469–483. https://doi.org/10.1901/jaba.2009.42-469

Catania, C., Almeida, D., Liu-Constant, B., & DiGennaro-Reed, F. D. (2009). Video modeling to train staff to implement discrete trial instruction. *Journal of Applied Behavior Analysis*, *42*(2), 387–392. https://doi.org/10.1901/jaba.2009.42-387

Contreras, Tate, S. A., Morris, S. L., & Kahng, S. (2022). A systematic review of the correspondence between descriptive assessment and functional analysis. *Journal of Applied Behavior Analysis*, *56*(1), 146–165. https://doi.org/10.1002/jaba.958

Cooper, J. O., Heron, T. E., & Heward, W. L. (2020). *Applied Behavior Analysis* (3rd Ed.). Pearson Education.

Deliperi, P., Vladescu, J. C., Reeve, K. F., Reeve, S. A., & DeBar, R. M. (2015). Training staff to implement a paired-stimulus preference assessment using video modeling with voiceover instruction. *Behavioral Interventions*, *30*(4), 314–332. https://doi.org/10.1002/bin.1421

Dey I. (1993) *Qualitative data analysis. A user-friendly guide for social scientists.* Routledge, London.

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*(1), 107-115. https://doi.org/10.1111/j.1365-2648.2007.04569.x

Erath, T.G. and DiGennaro Reed, F.D. (2020), A brief review of technology-based antecedent training procedures. *Journal of Applied Behavior Analysis*, 53: 1162-1169. https://doi.org/10.1002/jaba.633

Erath, T., DiGennaro Reed, F. D., & Blackman, A. L. (2021). Training human service staff to implement behavioral skills training using a video-based intervention. *Journal of Applied Behavior Analysis*, *54*(3), 1251–1264. https://doi.org/10.1002/jaba.827

Giannakakos, A., Vladescu, J. C., Kisamore, A. N., & Reeve, S. A. (2015). Using video modeling with voiceover instruction plus feedback to train staff to implement direct teaching procedures. *Behavior Analysis in Practice*, *9*(2), 126–134. https://doi.org/10.1007/s40617-015-0097-5

Hanley, G. P., Iwata, B. A., & McCord, B. E. (2003). Functional analysis of problem behavior: a review. *Journal of applied behavior analysis*, *36*(2), 147–185. https://doi.org/10.1901/jaba.2003.36-147

Hollins, & Peterson, S. (2022). Blending Active Student Responding with Online Instruction to Evaluate Response Accuracy and Student Engagement. *Journal of Behavioral Education.* https://doi.org/10.1007/s10864-022-09499-w

Horner, R. D., & Baer, D. M. (1978). Multiple-probe technique: a variation on the multiple baseline. *Journal of applied behavior analysis*, *11*(1), 189–196. https://doi.org/10.1901/jaba.1978.11-189

Hsieh, H., and Shannon, S. E. (2005). Three Approaches to Qualitative Content Analysis. *Qualitative Health Research. 15*(9). 1277-1288. 10.1177/1049732305276687

Jimenez-Gomez, C., McGarry, K., Crochet, E., & Chong, I. M. (2019). Training behavioral technicians to implement naturalistic behavioral interventions using behavioral skills training. *Behavioral Interventions*, 34(3), 396–404. https://doi.org/10.1002/bin.1666

Kazdin, A. E., & Hartmann, D. P. (1978). The simultaneous-treatment design. *Behavior Therapy*, *9*(5), 912-922.

Kyngäs H. & Vanhanen L. (1999) *Content analysis* (Finnish). *Hoitotiede* 11, 3–12.

Layng, T.V.J. (2019). Tutorial: Understanding Concepts: Implications for Behavior Analysts and Educators. *Perspectives on Behavior Science.* 42, 345–363. https://doi.org/10.1007/s40614-018-00188-6

Lerman, D.C., Hovanetz, A., Strobel, M. Tetreault, A. (2009). Accuracy of teacher-collected descriptive analysis data: A comparison of narrative and structured recording formats. *Journal of Behavioral Education,* 18, 157–172. https://doi.org/10.1007/s10864-009-9084-7

Lipschultz, J., Vladescu, J. C., Reeve, K. F., Reeve, S. A., & Dipsey, C. R. (2015). Using video modeling with voiceover instruction to train staff to conduct stimulus preference

assessments. *Journal of Developmental and Physical Disabilities*, *27*(4), 505–532. https://doi.org/10.1007/s10882-015-9434-4

Luna, O., Petri, J. M., Palmier, J., & Rapp, J. T. (2018). Comparing accuracy of descriptive assessment methods following a group training and feedback. *Journal of Behavioral Education*, *27*(4), 488-508. http://dx.doi.org/10.1007/s10864-018-9297-8

Markle, S. M., & Tiemann, P.W. (1970). " Behavioral" analysis of" cognitive" content. *Educational Technology.*, *10*(1).

Martens, B. K., Digennaro, F. D., Reed, D. D., Szczech, F. M., & Rosenthal, B. D. (2008). Contingency space analysis: an alternative method for identifying contingent relations from observational data. *Journal of applied behavior analysis*, *41*(1), 69–81. https://doi.org/10.1901/jaba.2008.41-69

Mayer, K. L., & DiGennaro Reed, F. D. (2013). Effects of a training package to improve the accuracy of descriptive analysis data recording. *Journal of Organizational Behavior Management*, *33*(4), 226-243. https://doi.org/10.1080/01608061.2013.843431

Oliver, A. C., Pratt, L. A., & Normand, M. P. (2015). A survey of functional behavior assessment methods used by behavior analysts in practice. *Journal of applied behavior analysis*, *48*(4), 817–829. https://doi.org/10.1002/jaba.256

Parsons, M., Rollyson, J. H., & Reid, D. H. (2013). Teaching practitioners to conduct behavioral skills training: A pyramidal approach for training multiple human service staff. *Behavior Analysis in Practice*, *6*, 4–16. 10.1007/BF03391798

Pence, S. T., & St. Peter, C. (2018). Training educators to collect accurate descriptive-assessment data. *Education and Treatment of Children*, *41*(2), 197-221. 10.1353/etc.2018.0008

Pence, S. T., Roscoe, E. M., Bourret, J. C., & Ahearn, W. H. (2009). Relative contributions of three descriptive methods: implications for behavioral assessment. *Journal of applied behavior analysis*, *42*(2), 425–446. https://doi.org/10.1901/jaba.2009.42-425

Peterson S. M. & Neef, N. (2020). Functional Behavior Assessment. In Cooper, Heron, Heward (Ed.). *Applied behavior analysis* (3nd ed., pp. 627-653). Harlow: Pearson Education.

Rooker, DeLeon, I. G., Borrero, C. S. W., Frank-Crawford, M. A., & Roscoe, E. M. (2015). Reducing Ambiguity in the Functional Assessment of Problem Behavior. *Behavioral Interventions*, *30*(1), 1–35. https://doi.org/10.1002/bin.1400

Samudre, Allday, R. A., Jones, M., & Fisher, A. (2023). Behavioral skills training to teach pre-service elementary general educators to conduct descriptive assessments. *Preventing School Failure.*, 1–11. https://doi.org/10.1080/1045988X.2023.2197400

Sawyer, Andzik, N. R., Kranak, M. P., Willke, C. P., Curiel, E. S. L., Hensley, L. E., & Neef, N. A. (2017). Improving Pre-Service Teachers' Performance Skills Through Behavioral Skills Training. Behavior Analysis in Practice, 10(3), 296–300. https://doi.org/10.1007/s40617-017-0198-4

Shayne, R. and Miltenberger, R. G. (2013), Evaluation of Behavioral Skills Training for Teaching Functional Assessment and Treatment Selection Skills to Parents. *Behavioral Interventions,* 28: 4-21. https://doi.org/10.1002/bin.1350

Tennyson, & Park, O.-C. (1980). The Teaching of Concepts: A Review of Instructional Design Research Literature. *Review of Educational Research*, *50*(1), 55–70. https://doi.org/10.3102/00346543050001055

Thompson, R. & Iwata, B. A. (2007). A comparison of outcomes from descriptive and functional analyses of problem behavior. *Journal of Applied Behavior Analysis*, *40*(2), 333–338. https://doi.org/10.1901/jaba.2007.56-06

Appendix A
Participant Recruitment

Recruitment Flyer:

Email Recruitment Letter:

"Hello and Welcome!

You're being invited to participate in a behavioral research study involving descriptive assessment, specifically, narrative ABC data classification of environmental events (antecedents and consequences). The purpose of the study is to evaluate the effects of a video-based BST on the accuracy of narrative ABC data classification. In this study, you would be asked to classify narrative ABC data to the best of your ability and participate in intervention, a video-based module. This study will be conducted across 5 or more sessions until mastery criteria are achieved or there is no improvement across an 8 or more sessions in intervention. Sessions will last approximately 20 minutes or until you have classified the narrative ABC data sheet or 30 minutes has elapsed. Additionally, the study will last no longer than three months. You are eligible to participate in this research study if you know of ABC data collection and are a behavior technician, are familiar with ABC data, and are interested in severe problem and continuing your education in behavior analysis. Additionally, you are eligible to participate in this research study if you are not fluent at classifying narrative ABC data. The purpose of this study is to teach narrative ABC data classification of environmental events. If you are interested in learning more about participating in this study, please contact Grace Sylvester at 269-501-5217 or grace.e.sylvester@wmich.edu.

Best,

Grace Sylvester"

Appendix B

Eligibility Questionnaire

Name: _____ Date: _____

1. How long have you been a behavior technician? _____
2. Do you have interest in continuing/beginning your education in behavior analysis? Circle YES or NO
3. What is your experience with ABC data?
    A. I have never heard of ABC data.
    B. I have heard of ABC data but have not collected it.
    C. I have collected but never analyzed ABC data.
    D. I have collected and analyzed ABC data in the past.
    E. Other: _____
4. Are you interested in severe problem behavior/challenging behavior? Circle YES or NO

Additional comments about ABC data:

Appendix C

Written Instructions

Instructions: Read each line of narrative ABC data. Use the classification definitions (see below) to classify each antecedent and consequence event for **all *relevant*** classifications that may be occurring at the same time by writing the classification(s) in the blank space provided (antecedent classification and consequence classification columns).

Classification Definitions

Diverted Attention: no vocal or physical interaction with another person and/or interactions are directed toward another person.
Demand Presented: an instructional context and/or any vocal verbal, gestural, or physical instruction to engage in a behavior.
Denied Access: the removal, delay to access, or denial of an item, activity, or preferred stimulus.
Alone: the absence of interactions with another person.
Attention: the vocal, gestural, or physical presence/interaction with another person.
Escape from Demand: the removal of a demand or materials to complete a demand and/or the absence of prompting.
Access to Tangible: the presentation of an item and/or activity.

Appendix D

Sample Narrative ABC Data Sheet

Antecedent	Antecedent/MO Classification	Behavior	Consequence	Consequence/Function Classification
Client was in the room by themselves	Alone	Client poked their eyes	Client was in the room by themselves	alone
Dad said, "go get your shoes on and get ready to leave."	Demand, Attention	Client put their shoes in the toilet	Dad said, "Now we have to wait until these dry before we leave, nice going."	attention, demand, escape
Mom came to the bathroom door and asked the client to wash their hands.	Demand, Attention	Client reached into the toilet and threw water at mom	Mom closed the door and said, "When I come back in 5 minutes, you better have your clothes on and hands washed!"	attention, demand, escape
Client was grabbing water when a peer started playing tag with him stating, "tag you're it" while touching the client	attention, demand	Client ran after peer and pushed them down to the ground	The peer began to cry stating, "you are the meanest friend ever."	attention
Peer turned the other way with a book	diverted attention, denied access	Client ran after peer and grabbed the book	Client had access to the book	tangible
Staff were passing out dinner to all the residents starting at the end furthest from the client	diverted attention, denied access	Client started to bang their head against the table	Staff rushed over with a plate of food and asked the client to start eating	tangible, demand, attention
Client was watching TV when the staff asked the client to make his bed	Demand, Attention, tangible	Client broke the remote that was next to him	Staff stated "why would you do that, now we cannot watch TV. You stay here while I try to	attention, demand, denied access, escape

			fix this remote."	
Client was playing with toys with his peers	tangible, attention	Client yelled at another peer and stated, "I will hurt you if you don't give me that toy"	Peer gave them a helicopter toy	tangible, attention
Mom yelled at client and grabbed their arm in the zoo	attention	Client hit mom with open hand.	Mom said, "Do not hit me! We are going home right now."	demand, denied access, attention
Client was in the kitchen listening to the news on the radio when another consumer walked into the room yelling	denied access	Client punched the peer and told them to be quiet	Staff picked up the radio and handed it to the client and said, "take your radio and take a break in a different room please."	attention, tangible, denied access, demand
Client was in the family room playing with toys when mom asked him to clean up his toys before dinner	denied access, demand, attention	Client ran after mom and scratched her arm causing bleeding	Mom left to clean out her wound and dad yelled, "oh my! You cannot scratch people like this!" while helping mom clean the wound.	attention, demand, diverted attention, escape
Mom signed, "you are doing a great job drawing."	attention	Client tore up the artwork they were working on	Mom signed "That was not nice."	attention
Client was sitting on their bed at night	alone	Client pulled their skin off their hangnail	Client was still in his bed	alone
Music was playing on a DVD player	access to tangible, alone	Client ripped the DVD player apart when it skipped	Mom entered the room and said I am not buying you a new DVD player	attention, denied access
A staff member asked the client to start washing the dishes	Demand, Attention	Client hit the staff member on the head with a pan	Staff member ran into the office with a cut and asked a different staff	diverted attention, escape

			member to help the client	
Parapro was yelling at another kid on the playground to walk	diverted attention	Client began running as fast as they could away from the parapro	Parapro ran after the client and put them in timeout	attention, denied access, demand
Client was in the bathroom by themselves	alone	Client picked their nose until it bled	Client was in the bathroom by themselves	alone
Client was at a restaurant with his family for dinner as their parents were talking about their jobs	Diverted attention	Client stabbed their hand with a fork	Family all gasped and were talking about how the client should not act that way while out in public and the client's sister got up and left the room	attention, demand, diverted attention
Dad was watching TV	diverted attention	Client started to hit their head on the ground	Dad jumped up and ran to client saying, "knock it off, you're going to hurt yourself."	attention, denied access, demand
Client was hiding from all of his teachers in the coat closet	alone	Client hit their head on the closet door	Client was sitting in the closet	alone

Appendix E

Social Acceptability Survey

Video-based Module

Did you enjoy the video-based module?

1	2	3
No	No opinion	Yes

Do you feel you learned something from the video-based module?

1	2	3
No	No opinion	Yes

Would you recommend this video-based instruction to others?

1	2	3
No	No opinion	Yes

What did you like about the video-based module?

What did you *not* like about the video-based module?

What did you learn from the video-based module?

What did you wish you learned from the video-based module?

Is there anything that was unclear in the module- or anything that could be improved?

Phase 2- Self-correcting with Answer Key

Did you like the self-correction phase?

1	2	3
No	No opinion	Yes

Do you feel you learned something from the self-correction?

1	2	3
No	No opinion	Yes

Would you recommend this instruction to others?

1	2	3
No	No opinion	Yes

What did you like about self-correcting your own answers with an answer-key?

What did you *not* like about self-correcting your own answers with an answer-key?

What did you learn from self-correcting your own answers with an answer-key?

Phase 3- Q&A Feedback with Experimenter

Did you like the Q&A phase?

1	2	3
No	No opinion	Yes

Do you feel you learned something from the Q&A sessions?

1	2	3
No	No opinion	Yes

Would you recommend this instruction to others?

1	2	3
No	No opinion	Yes

What did you like about the Q&A sessions with feedback with the experimenter?

What did you *not* like about the Q&A sessions with feedback with the experimenter?

What did you learn during the Q&A sessions with feedback with the experimenter?

What did you wish you learned from the Q&A sessions?

Is there anything that was unclear in the Q&A sessions- or anything that could be improved?

Overall Feedback

How comfortable are you with classifying of narrative ABC data in practice?

1 2 3 4 5
Least comfortable----------Most Comfortable

How helpful has this experience been with collecting ABC data at the center you work in?

1 2 3 4 5
Least helpful----------Most Helpful

Is there any other feedback/comments/concerns you would like to say about this study?

APPENDIX E CON'T

Social Acceptability Measures- Written Responses

Video-based Module

What did you like about the video-based module?
1: It was easy to follow along and practice scoring by yourself. You can rewind or skip to a specific part of the video if you need more practice or wanted to hear/see/read something in the video again.
2: I did like the task analysis that was provided in the video based-module. The cue to read the entire line of behavior was helpful for me and the cue to label ALL antecedents and consequences that could be at play was helpful as well. I think when I started I would only put one antecedent and consequence, but the video-based module gave instructions to think about all possibilities.
3: What I liked about the video-based module is that it gave a deeper explanation to the definitions and how to apply them in ABC data. The examples and explanations were clear and the module allowed me to complete it at my own speed during the study without feeling rushed.

What did you *not* like about the video-based module?
1: While video-based modules allow easy dissemination, you cannot ask a video questions; for example, there is no way to clarify something or ask why something is scored "x" and not "y."
2: From what I can recall (because it's been awhile) I was not given any information about the my answers, only the score. It probably would have been helpful for me to see which questions I was consistently getting right and wrong.
3: There wasn't anything that I disliked about the video-based module. It was well put together and the information included made sense to me along with the workbook given.

What did you learn from the video-based module?
1: To look at the "line" as a whole and not as separate pieces; when I was in baseline, I remember looking at the antecedent, behavior, and consequence separately and scoring them one by one rather than reading the whole line and then going back to score/identify the antecedent(s) and consequence(s).
2: I learned many antecedents and consequences can be at play, not just one. I also was introduced to the concept of "alone." I think this makes sense in concept given automatic reinforcing behaviors, but I had not seen the "alone" be an option when classifying behaviors.
3: I think the most important thing I learned from the video-based module is how to apply the definitions to ABC data examples. It's one thing to read each word and the correct definition, but it's another to try to apply what you've learned with examples. This helped clear up initial misconceptions before discussing further with the experimenter.

What did you wish you learned from the video-based module?
1: Clarification on definitions or situations when an antecedent/consequence is considered "alone" versus "diverted attention" or another common mistake/error I had while participating in the study.
2: I think more details and more information. The task analysis provided was helpful in the process of actually classifying data, like reading the entire line and thinking through each element thoroughly. But the task analysis did not help me (in my opinion) classify the correct answers. It was a task analysis on how to complete the process, not things to look out for in order to get the correct answer.
3: While I think it's fine on its own, I think it would be helpful to include common

misconceptions about specific situations in ABC data classification. I feel like sometimes it depends on the professionals scoring the definitions in relation to an ABC data line, or the situation for both the antecedent and consequence as the wording might not be clear or there isn't enough information.

Is there anything that was unclear in the module- or anything that could be improved?
1: Perhaps providing more examples and non-examples of the definitions. You could look through the data and see what the most common mistakes were and focus on providing more examples and non-examples of those. For example, if discriminating between "alone" and "diverted attention" was a common error, the video could provide more examples of when to code an antecedent/consequence as "alone/diverted attention."
2. Nothing more than what I've already mentioned I think.
3: In terms of the module designed, there wasn't anything that was unclear or could be improved. It was a nice addition to what I already learned in Introduction to Behavior Analysis.

Phase 2- Self-correcting with Answer Key

What did you like about self-correcting your own answers with an answer-key?
1: It provided immediate feedback to me and I had time to think to myself why it was coded the way it was.
2: I liked being able to see my answers and compare them to the correct answers. It was helpful to ask questions about particular questions I was confused about and talk those through.
3: It was nice to compare my answers according to what the experts said.

What did you *not* like about self-correcting your own answers with an answer-key?
1: There were some instances that I was confused why it was coded "x" and not "y" and I could not ask any clarifying questions or try to support the answer I came up with.
2: I can't remember a whole lot about this portion of the study, but if I remember correctly I wasn't provided with explanations for incorrect answers, only the answers.
3: I didn't like how there was no explanation from the experts on how they felt about each classification and why they put what they did. I felt like I had to guess why I got it wrong, which took me a bit longer to figure out. I'm a learner that needs a long time to be exposed to the material before understanding it.

What did you learn from self-correcting your own answers with an answer-key?
1: I learned what mistakes I was commonly making (e.g., when a demand was presented it is also considered attention) and it helped me fix those mistakes in future sessions.
2: More of the same things.
3: By learning what the experts said, it was nice to see different perspectives based on the ABC data given. Ex: the difference between diverted attention and attention…can an antecedent or consequence be coded as both?

Phase 3- Q&A Feedback with Experimenter

What did you like about the Q&A sessions with feedback with the experimenter?
1: I got immediate feedback on my answers, and I could also ask clarifying questions or show my reasoning for why I thought an antecedent/consequence could be "x."
2: I liked this method a lot better than the others. I am someone who needs to talk out my process

and have a back-and-forth with someone in order to learn. I find it helpful for me to "say it my own words" and repeat it back to the person, so just I make sure I've understood a concept correctly and it was helpful to do through this method. I like that my work was scored on the day I completed it. I also liked being able to talk through my thought process and ask clarifying questions after and sometimes before completing the data. I liked the convenience of the web-ex compared to the in-person meetings just because I often have limited availability.
3: I liked these sessions based on being able to be more specific with the feedback by getting a second opinion. This helped me understand different sides of the classifications in situations as these are scenarios I haven't been exposed to before. For me personally as an RBT, it's easy for me to deal with these types of situations if I know the client, so going off of what little information I have in these ABC's helped me learn the classifications and how ABC data works more. This also helps me understand the perspective of a BCBA when they take on new clients to try and figure out what works well for their client and what doesn't, which is helpful for me based on my future goals.

What did you *not* like about the Q&A sessions with feedback with the experimenter?
1: N/A
2: It probably would have been helpful me to go over my incorrect answers on the day I completed the data, not just the overall score. This would be helpful as I could provide more insight into the answers I choose, and hopefully learn from those mistakes rather than recalling my thoughts from a few days prior.
3: There was nothing I didn't like about the feedback sessions with the experimenter. They were extremely helpful and while my data varied per session, I think with more time I will get better.

What did you learn during the Q&A sessions with feedback with the experimenter?
1: Rationale behind why antecedents/consequences were coded the way they were. Why an antecedent would or would not be coded "access to tangible" (e.g., client already has access to it, item/activity was not presented in antecedent).
2: I learned a lot of general information about ABC data collection and have been able to think more critically about classifying antecedents and consequences. I have learned that ABC data collection can often be up to the interpretation of the individual; one person may notice an antecedent at play whereas another person may not consider it a factor. I am also able to appreciate the complexity of behavior because of this section and how accidental reinforcement of behavior occurs all the time. A person may be accidentally reinforcing problem behavior if they aren't able to recognize an antecedent at play in a behavior. If a person misses an antecedent or consequence when classifying data, how much more so would this occur when dealing with challenging behavior? A person may not notice that diverted attention is an antecedent to an individual's behavior and may provide attention, accidentally reinforcing that behavior.
3: Being able to talk with the experimenter on each classification of ABC data was extremely helpful as I felt like the results depended on the professional scoring it or the situation in the ABC data scenario. This helped clear up misconceptions about the classifications I had or helped me learn something new I previously didn't know when coding ABC data.

What did you wish you learned from the Q&A sessions?
1: I cannot think of anything.
2: Nothing that I can think of
3: I don't have anything I wish I learned from the Q&A sessions. The experimenter answered all of my questions clearly.

Is there anything that was unclear in the Q&A sessions- or anything that could be improved?
1: Nothing I can think of.
2: Possibly going over answers the day of completion instead of a few days later?
3: I don't think there was anything that became unclear or needed improvement in the Q&A sessions. I think this session was the most helpful for me out of the whole study.

Overall Feedback

Is there any other feedback/comments/concerns you would like to say about this study?
1: There were a couple of antecedents/consequences I remember being unsure of due to the way it was written. For example, I remember being confused during a specific antecedent if the client was playing with peers or if the client was in the same room/area as the peers but not playing with them. Also, there were some inconsistencies with the way experts coded alone/diverted attention. Sometimes the client was mentioned to be sitting in a classroom working on classwork at their desk, later the teacher would be mentioned in the consequence and there was some confusion on if the client could be considered alone even though they are in a classroom with peers and a teacher (but no interaction was present in the antecedent).
2: Nothing really, I do find it interesting and honestly kind of frustrating that there doesn't seem to be clear answers that everyone can agree on. One person may notice and antecedent that another person may not. It feels very ambiguous. (This has nothing to do with the format of your study, just some thoughts). Oh also perhaps including a section where an individual classifies antecedents and consequences along with the experimenter, so if they have questions during classification they can talk that through with them.
3: I'd like to give a huge thank you to the experimenter for being so willing and helpful during the ABC classification process with me as the participant new to classifying ABC data. The experimenter was great at clarifying questions or misconceptions I had, which made me learn and enjoy the process a lot more.

Appendix F

Procedural Fidelity

Baseline

Do:
Provide a copy of written instruction in the session room.
Say:
"Please read/review these written instructions, I will not be able to answer any questions, but please notify me when you are finished.".
Do:
When participants have reviewed and/or read the instructions and have notified you, give them a laptop computer with a narrative ABC data sheet.
Say:
"Please classify each antecedent and consequent event based on the information provided in the written instructions to the best of your ability. You will not be able to ask any questions and will not be provided with any feedback. Please notify me when you are finished, or I will let you know when 30 minutes has elapsed, and the session will be terminated."
Do:
Leave the room.

Intervention

Phase 1:
Do:
Provide a computer with the video-based BST module loaded and displayed and a copy of the guided notes.
Say:
"Please watch the video module and follow along with these guided notes. The guided notes will be scored for completion and accuracy once you are finished watching the video. Please let me know when you are finished watching the module and ready for me to look at your guided notes."
Do:
Leave the room.
Do:
When the participant informs you that the guided notes are completed, score them for completion and accuracy. If the guided notes are not complete or accurate, mark which spaces need improvement and:
Say:
"Please view the training again as the answers you have provided are not accurate and/or complete. Please let me know when you are finished with the training and guided notes again."
Do:
Leave the room. Repeat as necessary.
Phase 2:
Do:
Provide a computer with both the previously classified ABC data sheet and the answer key.
Say:
"Please self-check and correct your answers with the answer key as you see fit. Let me know when you are ready for the next data sheet. I will not be able to answer any further questions."
Phase 3:
Do:
Provide the answer key and previously scored data sheet on the computer screen.
Say:
"You can ask me any questions about the data sheets during this session."
Do:
Answer all questions and provide feedback to participant based on their questions and the error analysis conducted.
General procedures for all sessions:
Do:

Provide a narrative ABC data sheet in the session room on the laptop computer.
Say:
“Please classify each antecedent and consequence event based on the information provided in the video-based BST module to the best of your ability. You will not be able to ask any questions and will not be provided with any feedback. Please notify me when you are finished, or I will let you know when 30 minutes has elapsed, and the session is terminated.”
Do:
Thank participant for the session or inform them that the session is terminated after 30 minutes and thank them for their participation.

APPENDIX G

HSIRB Approval Letter

WESTERN MICHIGAN UNIVERSITY

Human Subjects Institutional Review Board

Date: April 20, 2023

To: Stephanie Peterson, Principal Investigator
[Co-PI], Co-Principal Investigator

Re: Initial - IRB-2022-179
The Effects of Video-Based Behavioral Skills Training on the Accuracy of Narrative ABC Data Classification of Environmental Events

This letter will serve as confirmation that your research project titled "The Effects of Video-Based Behavioral Skills Training on the Accuracy of Narrative ABC Data Classification of Environmental Events" has been reviewed by the Western Michigan University Institutional Review Board (WMU IRB) and **approved** under the **Expedited** 7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

The conditions and duration of this approval are specified in the policies of Western Michigan University. You may now begin to implement the research as described in the application. **Please note:** This research may **only** be conducted exactly in the form it was approved. You must seek specific board approval for any changes to this project (e.g., ***add an investigator, increase number of subjects beyond the number stated in your application, etc.***). Failure to obtain approval for changes will result in a protocol deviation.

In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the IRB or the Associate Director Research Compliance for consultation.

Stamped Consent Document(s) location - Study Details/Submissions/Initial/Attachments

The Board wishes you success in the pursuit of your research goals.

Sincerely,

Amy Naugle, Ph.D., Chair