ASSESSING CONVERGENT VALIDITY OF THE QABF AND THE TBH FA INTAKE FORM WITH RESULTS OF A FUNCTIONAL ANALYSIS

By

Melissa Cisneros

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Dr. Christopher Walmsley, Committee Chair

Breanna Mosca, Committee Member

Dr. Chris Aberson, Program Graduate Coordinator

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Abstract

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The current study looked to compare and analyze the convergent validity of the Questions About Behavioral Function (QABF) with Trumpet Behavioral Health's current form, the Functional Assessment Intake Form. Both forms were compared with results gathered from a functional analysis conducted on individuals with identified challenging behaviors (e.g. body dropping and self- injurious behaviors). A multi-element design was used to conduct a functional analysis, and identified functions from the indirect assessments were compared to the results found in the functional analysis. Results indicated that there was no correspondence between the indirect assessments used with the results from the functional analysis. Future research should focus on the validity of indirect assessments used and compare them with functional analyses to increase their validity when used in applied settings.

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Introduction

The field of applied behavior analysis (ABA) has made improvements in the quality of work and services provided to individuals behavior analysts serve. The Behavior Analyst Certification Board (BACB) has defined behavior analysis as the science of behavior, initially influenced by the philosophical views of behaviorism which is used to analyze and improve behavior of individuals (BACB, 2019). Techniques derived from behavior analysis are commonly used to treat individuals with Autism Spectrum Disorder (ASD) or other intellectual disabilities, among others.

Common diagnostic criteria for an individual with a diagnosis of ASD are deficits in communication and socialization skills. Individuals with a diagnosis of ASD are primarily affected in their communication and behavior (NIH, 2018). With an impact in such domains, there can be an increase in problem behaviors that share the same function (e.g., an individual may engage in aggression to escape demands that may be too difficult or not preferred and instead of communicating to take a break appropriately, they engage in the problem behavior). In order to identify the function of the problem behavior, behavior analysts conduct functional assessments (indirect assessments and direct observation) and, if needed, a functional analysis. The interventions/programs that are developed to address the problem behaviors the client is expressing need to be effective (Baer et al., 1968). In order to do so, professionals need to have identified the function of the problem behavior in order to implement the best treatment. This is usually done by conducting a functional assessment and if warranted, a functional analysis first discussed

by Iwata et al. (1982/1994). Iwata and colleagues published one of the first studies that looked to examine functional relationships relating to problem behavior in order to properly identify what the function of the problem behavior actually was instead of implementing nonfunction-based procedures that might not have worked for the participants. Procedures consisted of four conditions (unstructured play, social disapproval, academic demand, and alone) in which participants were exposed to a total of eight sessions that included two sessions per condition. Order of sessions were randomly determined and lasted for 15 minutes each. The results of the functional analysis indicated clear functions of the problem behavior being measured but did not assess a function-based intervention based on the FA results. Lower levels of the problem behavior were seen in the play condition since it served as the control condition with no demands being placed and participants having access to preferred items. Although this study addressed a possible method to identify function of problem behavior, it only looked at individuals engaging in SIB and did not include assessment of other problem behavior (aggression, tantrums, etc.). Even though there are some critiques as to the applicability of the functional analysis (Hanley, 2012), it still has benefits for its continued usage.

Along with functional analysis, other indirect assessments have been used to help identify function. The Questions About Behavioral Function (QABF), first introduced by Matson et al. (1995) was created as an assessment tool to assess antecedent behavior and research has shown it to be valid as an assessment tool (Matson et al., 1999).

There has been limited research done that assessed any potential correlations between conducting a functional analysis and comparing them with other assessments. Koritsas and Iacono (2013) sought to compare the Motivation Assessment Scale (MAS) and the Questions About Behavioral Function (QABF). Although the results from the study indicated that there was good internal consistency between the two assessments, the two measures had low agreement on the function of the challenging behavior of its participants. It should be noted that the two indirect assessments were compared with each other and a functional analysis was not conducted to see if there were any correlations between either form of assessment with the functional analysis. Paclawskyj et al. (2001) compared the Questions About Behavioral Function (QABF) with the Motivation Assessment Scale (MAS) to see if one, or both had convergent validity with the analogue functional analysis first developed by Iwata et al. (1982/1994). Results have indicated that the QABF and the MAS had similar results to each other but not much convergent validity with the analogue functional analysis, although the QABF had higher correlations with the analogue functional analysis compared to the MAS.

Although there is emerging evidence that the QABF can be a reliable assessment tool that can identify function of problem behavior, there is limited, if any, research regarding the reliability of the Trumpet Behavioral Health Functional Analysis (TBH FA) Intake Form. The current study analyzed the QABF with a local agency's FA Intake Form to assess the convergent validity of the two forms and compare the results with functional analysis.

Methodology

Participants

Two participants (Mike and Jane) were recruited via a local agency that provides early intervention ABA services with a focus on skill acquisition and problem behavior. Participants ranged in age between four and ten years with problem behaviors of concern included dropping behaviors (Mike) and self-injurious behavior (Jane). Informed consent forms that described the purpose of the study were explained to participant's parents/caregivers by their assigned case managers to be able to participate in the study and assent by the participant was also collected if it was deemed developmentally appropriate (i.e. if the participants had the capacity to comprehend the instructions). Those participants in which assent was appropriate were informed that participation was voluntary and if they choose, they can withdraw at any point from the study without it impacting services. Agency employees who assisted in conducting the indirect assessments as well as participated in running one (or more) conditions in the functional analysis were also provided with consent forms and signed before any participation was done related to the study.

Setting

Functional analyses were conducted at the agency's local office in two therapy rooms that included a table, bookshelf, and two chairs. One indirect assessment (with Mike's parent) was conducted at the local agency's conference room that included a large

table, chairs, and a mounted television. Jane's indirect assessments were conducted at the parent/caregiver's home.

Human Subjects Protection

Informed consent was gathered from parents/guardians of participants before the indirect assessments were completed. Parents/caregivers were made aware that participation in the study was voluntary and if they chose, they would be able to withdraw from the study at any time without it impacting current services and without penalty for doing so. Based on Mike's problem behavior, modifications were made to one of the rooms in which the functional analysis was conducted. Mike was known to mouth objects in his environment so modifications were made to remove any small objects within the room to prevent accessibility to such items. The procedures put in place to protect the participants from harm were part of the best practice guidelines based on the Iwata et al. (1982/1994) study. Such procedures are common practice as it provides extra protection from harm to the clients when they are engaging in the problem behavior that may otherwise cause harm if outside the controlled environment. As data were gathered, confidentiality of client's information was protected by storing such information in file cabinets and locked inside the supervisor's office. For purposes of data analysis, documents were also stored in a laboratory with locked file cabinets in a locked room only available with access to a key card at Humboldt State University.

Materials

The QABF and the TBH Functional Assessment Intake Form were used with the caregivers/parents of the participants before conducting the functional analysis. TBH functional analysis data sheets were modified to represent the data collection method described below. Procedural protocols for the FA's were modified to only include the conditions implemented in the FA (i.e. ignore, attention, play, tangible and escape).

Research Design

The functional analysis was conducted using a multi-element design consistent with Iwata (1982/1994). The use of a multi-element design was used as it provides a method for comparing the effects of two or more conditions (Cooper, Heron, and Heward, 2007), which for the purpose of this study was comparing the conditions used in the functional analysis. The order of conditions was as follows: ignore, attention, tangible, play and demand for both participants.

The length of conditions were 5-minute sessions consistent with Wallace and Iwata (1999). Each condition was conducted a minimum of 3 times (i.e. all four conditions 3 times) or until differentiation occurred between the control condition and the test conditions. There was a 1-2-minute transition between each condition.

The indirect assessments were counterbalanced by conducting them in a random sequence (i.e. one client got the QABF form first and then the TBH FA Intake Form and another participant got the FA Intake Form first before administering the TBH FA Intake

Form). A questionnaire for parents was created to assess their preference for the type of assessment form they would prefer to use relating to future assessments. This served as the social validity component for implementing the QABF in the indirect assessments or continue using the TBH Intake Form.

Independent Variable

Comparisons between the QABF and the local agency's functional assessment form (TBH Assessment Form) were compared to the results gathered from the functional analysis to test which form, if any, indicated the same behavioral function when compared with the functional analysis.

To control for ordering effects, participants were randomly assigned to conditions in which either the QABF or the TBH Assessment form were conducted first followed by the second form. After the assessment forms were completed, all participants received the functional analysis for target problem behaviors. See table 1 for a flowchart visualizing order of assessments.

Table 1. Order in which assessments were conducted.

QABF ↓ TBH Functional Assessment Intake Form ↓ Functional Analysis	TBH Functional Assessment Intake Form ↓ QABF ↓ Functional Analysis

Training

Associate clinicians (AC's) assisting in the completion of the indirect assessments received training using behavioral skills training (BST) on how to complete each assessment. Training was provided in a group format for each assessment (there was one training session for each assessment). AC's were provided with instructions on how to complete the assessments (e.g. explaining the assessment to the parent/caregiver, asking the questions exactly how they were written, providing a specific example, etc.). The author then modeled how to conduct the assessments (role played with senior clinician). AC's rehearsed with each other and procedural integrity checks were completed during the rehearsal part of BST. Feedback was provided and training session was ended. AC number one met competency during the first training session across both assessments

with 100% correct responding (see Figure 1). AC number 2 needed an additional training session in order to meet competency for the QABF assessment (see Figure 2). BST was also used to train assistants and AC's to run the FA conditions. An emphasis was placed for the conditions they had been assigned to prior to running the actual conditions.

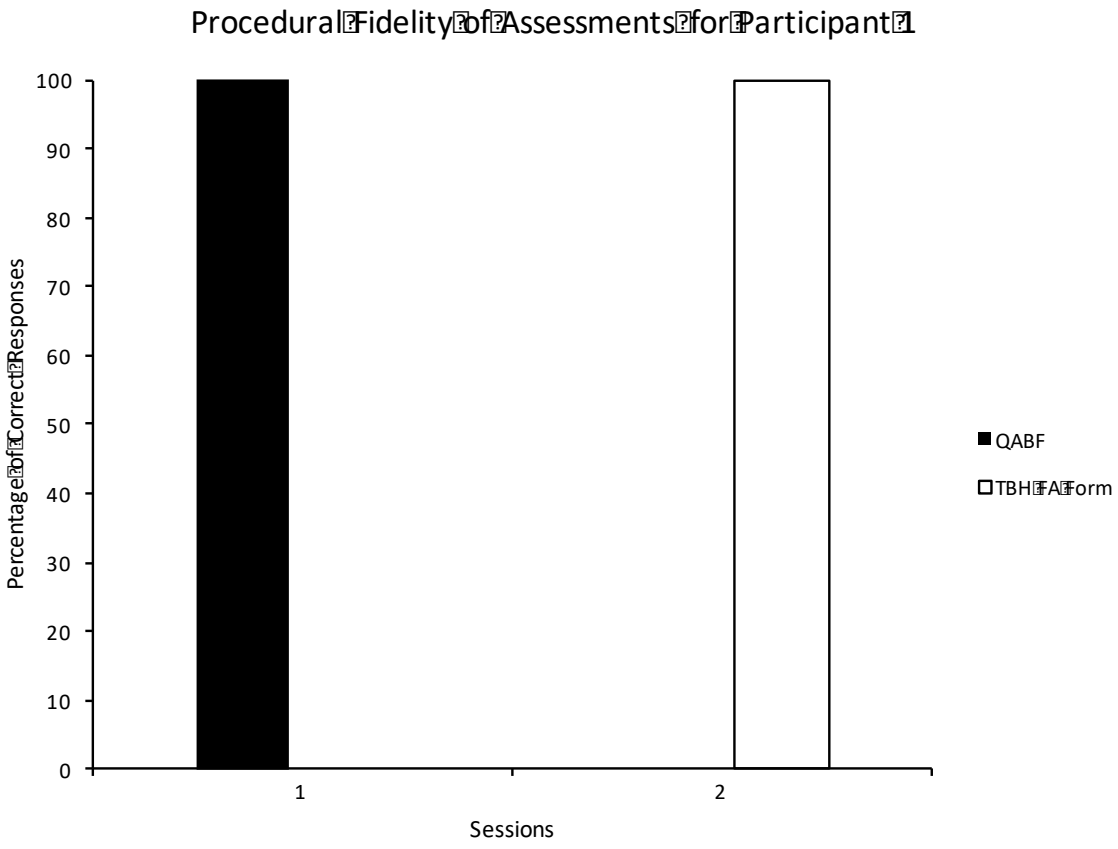

Figure 1. Procedural fidelity acquired during training for participant one assisting in conducting the QABF and the TBH FA Form

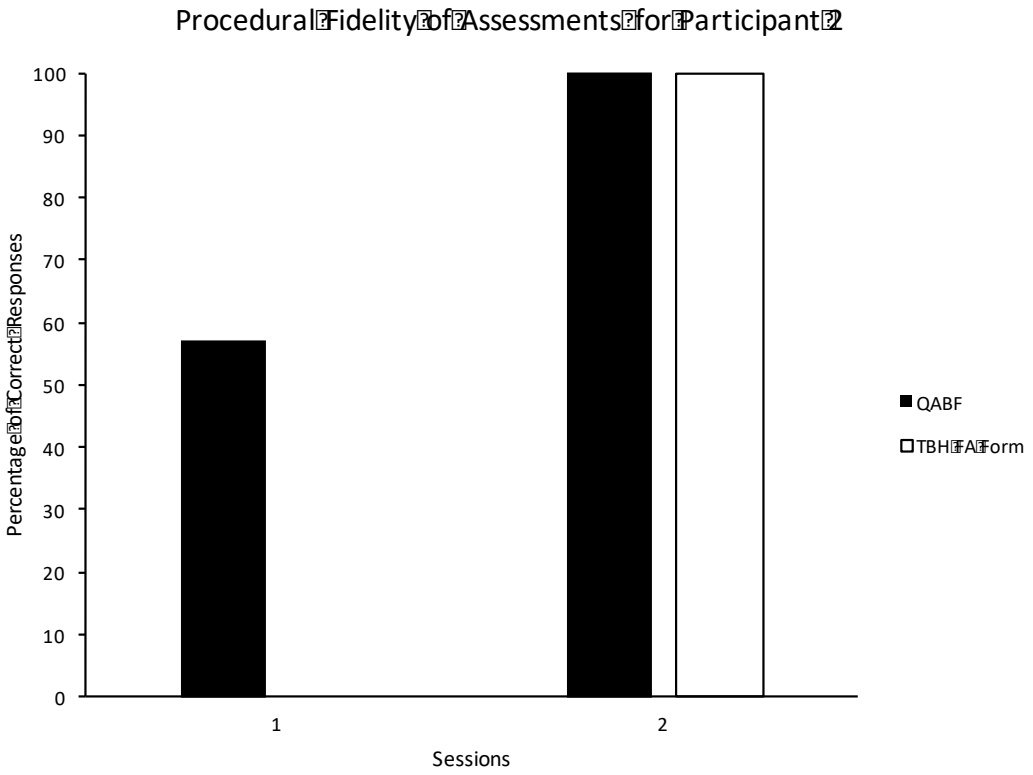

Figure 2. Procedural fidelity acquired during training for participant two assisting in conducting the QABF and the TBH FA Form.

Indirect Assessments

Indirect assessments were completed in the agency's conference room for Mike and at the parent/caregiver's home for Jane. Procedural integrity checks were completed for Mike's indirect assessments in which the author sat in for the interview and recorded answers provided by parent/caregiver while the AC collected primary data/information. Aside from recording answers, the same procedural integrity checklist used during the training sessions was completed by author (with 100% accuracy) in following the indirect

assessment procedure (e.g. explaining the purpose of the indirect assessment, asking the questions word for word and providing a client specific example, etc.). There was also 100% IOA when comparing answers from both assessments between the author and the AC.

Dependent Variable

The primary dependent variable consisted of the percentage of agreement and correlation between the outcomes of the QABF and the Functional Analysis and the percentage correct of the agreement and correlation between the outcomes of the TBH Functional Assessment Intake Form and the Functional Analysis. Secondary dependent variables included parent/caregiver's responses to the QABF and TBH Functional Assessment Intake Form questionnaires, and recording occurrences of behavior in real time during the functional analysis.

Inter-Observer Agreement (IOA)

Author collected primary data while assistants collected IOA data. IOA was calculated on an interval-by-interval basis by dividing the number of agreements by number of disagreements and multiplying by 100. IOA was also collected for the indirect assessment which consisted of an independent rater (author) simultaneously scoring measurement systems for the indirect assessments for Mike. IOA data for Mike's indirect assessments was 100%. In regards to Mike's functional analysis, IOA was as follows: ignore condition ranged between 85% - 100%, attention ranged between 85- 100%, play

was 100% across the four sessions, demand ranged between 85-100%, and tangible was 100% across the two sessions. For Jane, IOA for the functional analysis was as follows: ignore ranged between 70% - 100%, attention was 100% across all six sessions, tangible ranged between 60-100%, play condition ranged between 80-100%. Lastly, in the demand condition, IOA ranged from 95 -100%.

Procedure

The process began by first providing training to the AC's who would be assisting in conducting the indirect assessments with the parents/caregivers of the participants. Once the AC's were trained to competency, they set up appointments with the parents/caregivers to conduct the indirect assessments. Prior to conducting the indirect assessments, a coin was flipped, with heads being the TBH FA Intake Form and tails being the QABF and based on the results the participants were administered the alternating forms. Once the first form was completed, the second form (either QABF or TBH FA Intake Form) was completed by the AC associate clinician with the same parent/caregiver. Once the indirect assessments were completed, a date and time was scheduled to conduct the functional analysis with the participants. Five conditions were included and were as follows:

Ignore. The participant along with the assistant running the condition were in the room with no other stimuli present to make sure they were not obtaining reinforcement via other means. The assistant sat or stood in front of the door to block access to escape. The assistant ignored the participant for the entire condition. This condition served to

identify if the problem behavior was maintained by self-stimulation and/or was automatically maintained and not socially maintained.

Attention. The assistant and the participant were present in the therapy room and the participant was instructed to play with moderately preferred toys or engage in an activity (e.g. coloring for Jane). Attention was provided for 15 seconds contingent on the participant engaging in the problem behavior. Attention was provided in the form of statements concerning the problem behavior ("Don't hurt yourself" or "don't do that").

Tangible. In this condition, assistant and participant were present in the therapy room. The assistant provided access to highly preferred items (musical instrument for Mike and tablet for Jane) for two minutes prior to the start of the condition. During the first two minutes, the assistant ignored all appropriate and inappropriate requests for attention. Once the session began, the assistant immediately removed the preferred item from the participants and engaged with the items. Contingent on the occurrence of the target problem behavior, the assistant provided the participant access to the high-preferred items for approximately 15 seconds before removing the item again.

Play. During this condition, participants had free access to highly preferred toys with no demands placed. Social praise (e.g. "I really like your doll and how you are changing her outfits" or "Wow that guitar was pretty loud and made a cool sound!") was provided every 15 seconds to participants contingent on the nonoccurrence of problem behavior. Problem behavior was ignored. This condition served as the control condition to make sure that no other variables were influencing the problem behavior (e.g., supervisor being present, etc.).

Escape. In this condition, task demands were placed on the participants based on their hypothesized reason for escape (i.e. to avoid activity, or instruction). Escape from set activities were contingent on the participants engaging in the problem behavior. If participants engaged in the problem behavior, demands/instructions were removed and assistant would turn away and/or provide the participant with space for 15 seconds before representing the instructions/demands again.

Results

Results of the indirect assessments are summarized in Table 2. For Mike, the QABF was administered first with the parent, followed by the TBH FA form. Based on parent responses using the QABF, an identified function for body dropping was attention. Parent responses for the TBH FA form also identified attention to be maintaining participant one's body dropping.

Table 2. Identified functions from the indirect assessments and functional analysis for Mike and Jane.

Participant	QABF	TBH FA Form	Functional Analysis
Mike	Attention	Attention	Escape
Jane	Non-social (positive reinforcement)	Non-social (positive and negative reinforcement)	Tangible and Automatic

When completing the indirect assessments with Jane's parent, the TBH FA form was administered first, followed by the QABF. Based on the responses using the TBH FA form, the function that was identified was non-social (positive and negative reinforcement), while the results from the QABF identified the function for arm/hand biting was non-social (positive reinforcement).

Functional Analysis

Figure 3 summarizes the results for Mike. Data for both participants was summarized as rate of occurrences of problem behavior across sessions as it allowed researchers to visually inspect the data as it was being collected and allowed for modifications to be made for the following conditions. A total of two sessions were conducted on the first day with four conditions (alone, attention, play and demand) completed twice. The second session consisted of five conditions (alone, attention, tangible, play and demand) being completed twice.

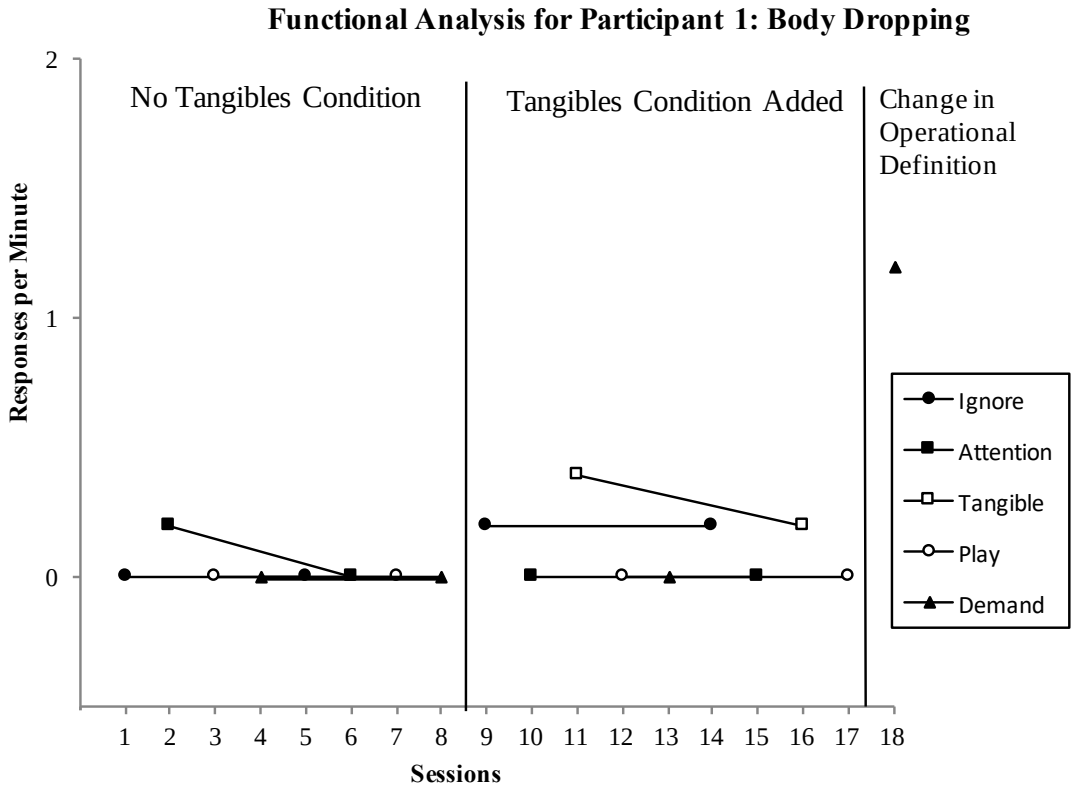

Figure 3. Rate of body dropping for Mike across sessions and conditions.

Instances of body dropping in the ignore condition ranged from 0 - 0.2 instances per minute across five-minute conditions. In the attention condition, body dropping ranged between 0 - 0.2 instances. Body dropping did not occur during the play condition. In the demand condition, body dropping ranged from 0–1.2 instances per 5-minute session. The tangible condition was added to the second FA session and instances of body dropping ranged from 0.2–0.4 instances per 5-minute conditions. Based on the rates of body dropping occurring being higher in the demand condition, an escape function was identified for Mike. Although this conclusion is based on the last data point on the graph, it is safe to assume that given the definition change, if the conditions were repeated 2-3 more times, we would have achieved differentiation between the conditions, with body dropping occurring at higher rates in the demand condition.

Figure 4 summarizes the functional analysis results for Jane. Instances of hand/arm biting in the ignore condition ranged from 0 – 1.6 instances per minute across five-minute conditions. In the attention condition, hand/arm biting was not observed. Hand/arm biting occurred at higher rates in the tangible condition, with instances ranging between 2.4 -4.5 instances per 5-minute sessions. During the play condition, instances of hand/arm biting ranged between 0-1.2 instances. Lastly, in the demand condition, instances of arm/hand biting ranged from 0- 0.4 instances per 5-minute session. Based on the higher rates of hand/arm biting occurring in the tangible condition, access to tangibles was identified to be the primary function for the behavior. Rates of hand/arm biting also

occurred at higher rates during the alone condition, which could possibly be serving as a second function for the behavior in question.

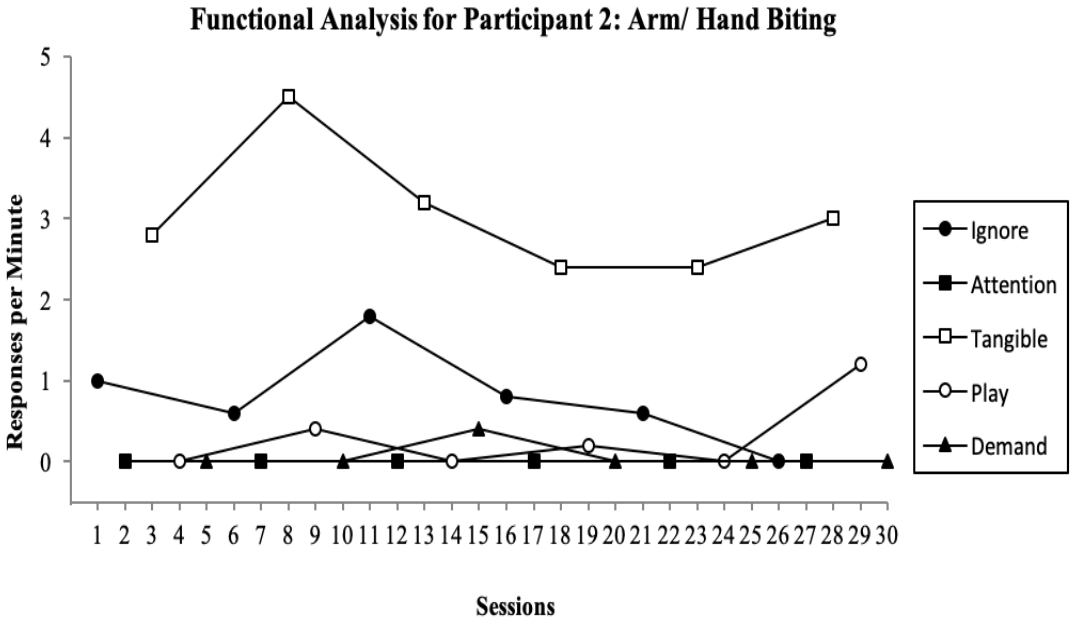

Figure 4. Rate of arm/hand biting for Jane across sessions and conditions.

Parent Questionnaire

Jane's mother completed the questionnaire at home. The purpose of the questionnaire was to get parent/caregiver's feedback relating to the process leading up to the functional analysis (reference questionnaire in the appendix). Parents were asked questions about the QABF as well as the TBH FA Forms using a Likert scale format with 1 being highly disagree to 5 being highly agree. Questions included (e.g., the questions were easy to understand, questions asked were short and to the point, I found the interview too long, questions were applicable to the problem my son/daughter is

experiencing, would not mind answering questions from the assessment again, etc.). On average, parent rated QABF and TBH FA questions at 3.6 out of a possible 5. Parent disagreed that the TBH form took long (rated it a 2) while the parent rated the same question for the QABF as a 3 (neutral). The other difference was relating to the last question regarding answering the questions for the assessments again. Parent rated this question for the QABF as a 3 (neutral) while the same question relating to the TBH FA form was rated as a 4 (agree). This suggests that overall there were no significant differences in preferences regarding indirect assessments.

Discussion

The results presented in this study suggest that there was no agreement on behavioral function between the indirect assessments and results gathered from the functional analysis. Although there was correspondence between the two indirect assessments for both participants, this did not prove to be the case when the contingencies were provided in a controlled setting during functional analysis. This has important implications that will inform selection of treatments in applied settings. If the indirect assessments do not identify the true functions of problem behavior, identified treatments might prove to be ineffective and could potentially increase the risk of the problem behavior worsening or increase in severity. Although the problem behaviors assessed in the current study were not considered to be "severe" problem behaviors in comparison to others, the implications of the indirect assessments not identifying the true functions is something that should be considered before such assessments are used with individuals who express severe problem behavior than the one's in the current study.

The inconsistencies between indirect assessments and the functional analysis could have been as a result of interviewer bias (e.g. previous knowledge or beliefs about what the function could be) that could have informed the type of examples being provided to the parents. Also, it is possible that the responses provided by the parents/caregivers could have biased the results. For example, Mike's parent indicated that she would always provide attention when he would engage in the body dropping behavior. This could have incorrectly led to the conclusion that Mike was engaging in

body dropping as a way to get parent attention, which was ultimately not supported when the functional analysis was completed.

Although there was clear differentiation across functional analysis conditions for one participant, a few limitations should be addressed. First, two different indirect assessments were compared, a standardized assessment (QABF) compared to an unstandardized assessment (TBH FA Form). Different conclusions could be found in the way questions are asked when using an unstandardized assessment such as the TBH FA form, which used open-ended questions to gather information about the problem behavior in question. Although this study did find correspondence between the two assessments, both assessments did not identify the true function of the problem behaviors being analyzed. Future research should attempt to address the limitations of indirect assessments when it comes to identifying true functions of behavior.

Second, the indirect assessments were completed back to back which could have resulted in carryover effects in responding. By completing both assessments on the same day, the answers provided for one assessment could have influenced how respondents answered questions in the second assessment. Given that the questions from the TBH FA form were open-ended, this could have influenced the answers or the reasoning for one function over the other.

Previous experiences with a particular assessment could have also informed responding. In applied settings, indirect assessments are used to gather information about possible functions of behavior. The types of assessments used vary by agency or company, which makes it difficult to standardize assessments that are reliable in

identifying functions without having to conduct an experimental functional analysis. Future research should focus on identifying indirect assessments that correlate with experimental functional analysis before they are implemented in applied settings. Additional training should be provided to professionals conducting the indirect assessments (Hanley, 2012). Both closed and open-ended assessments have strengths as well as weaknesses regarding the information gathered (Fryling and Baires, 2016). Professionals administering both types of assessments should be trained to competency before being completed with clients.

Lastly, for Mike, there was a change in the operational definition, which resulted in higher rates of body dropping occurring in the last demand condition (Session 18). At the beginning of the assessments, body dropping was defined as any time the client drops his body to the floor from a standing or seated position outside of instructed occurrences (i.e. when told to sit down). Given that instructions to "sit down" and "stand up" were provided in the demand condition and body dropping was not being observed during the conditions, the definition was modified to be "any instance in which the client drops his body to the ground and his back touches the floor within 5 seconds from a standing position that is outside of instructed occurrences" (i.e. when told to sit down). The addition of the time delay allowed observers, especially during the demand condition, to be able to distinguish between compliance with the instruction "sit down" and the occurrences of the problem behavior. When this change was made, there were higher rates of the behavior, which suggests that the problem behavior was not being measured as sensitively due to how the behavior was originally defined. Overall, zero to two

instances of body dropping behavior occurred with Mike with six instances occurring during session 18, once the definition was changed. Future research should set criteria in place when it comes to agreements with the operational definitions before assessments are conducted, whether it be indirect or experimental functional analysis since this could lead to false positives or false negatives.

This study attempted to see if there was convergent validity between indirect assessments, more specifically between the QABF and a local agency's assessment form (TBH FA Form) when compared to an experimental functional analysis. Results from the indirect assessments did not converge with the results from the functional analysis, suggesting that additional research should be done regarding the reliability and validity of indirect assessments. This has huge implications in applied settings which rely on indirect assessments much more than experimental analysis, primarily due to the time and resources it takes to conduct an experimental analysis.

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Appendix

Purpose: The purpose of this questionnaire is to get parent/caregiver's feedback relating to the process leading up to the functional analysis.

Directions: Please read the statements carefully and circle the number that best applies to your experience with the assessment forms.

1 = highly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = highly agree

Question	Scale					Notes
The questions asked from the QABF were easy to understand.	1	2	3	4	5	
I found the questions asked in the QABF were short and to the point.	1	2	3	4	5	
I found the QABF interview too long.	1	2	3	4	5	
The questions in the QABF were applicable to the problem my son/daughter is experiencing.	1	2	3	4	5	
I would not mind answering QABF questions if I had to do the assessment again.	1	2	3	4	5	

The questions asked in the TBH Functional Assessment Intake Form were easy to understand.	1	2	3	4	5	
I found the questions asked in the TBH FA Intake Form were short and to the point.	1	2	3	4	5	
I found the TBH FA Intake Form interview too long.	1	2	3	4	5	
The questions in the TBH FA Intake Form were applicable to the problem my son/daughter is experiencing.	1	2	3	4	5	
I would not mind answering TBH FA Intake Form questions if I had to do the assessment again.	1	2	3	4	5	