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The Effects of Teaching Children to Tact their Emotions on Problem Behavior

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by

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"The Effects of Teaching Children to Tact their Emotions on Problem Behavior."

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Abstract

Title: The Effects of Teaching Children to Tact their Emotions on Problem Behavior

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Children with autism spectrum disorder (ASD) often struggle to understand and describe private events, such as emotions. When an individual cannot communicate appropriately, it can lead to various problem behaviors. Previous literature suggested that we teach children to tact their emotions (e.g., "I am sad," "I am angry") in an attempt to decrease their problem behavior. The primary purpose of the current study is to teach children with autism to tact their emotions. The secondary purpose is to evaluate the effects of empathy statements on problem behavior. Four children participated, three with problem behavior maintained by access to tangibles and one whose problem behavior was maintained by escape from demands. Functional analyses were conducted with each participant to confirm suspected functions. We then taught each child to tact an emotion generally associated with their affect during episodes of problem behavior. All four participants successfully learned the emotions tacts and generalized them to their parents. Two participants appeared to exhibit decreased levels of problem behavior subsequent to the tact training. Implications for practitioners are discussed.

Keywords: emotions, problem behavior, autism spectrum disorder, private events, tacting.

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Chapter 1 : Introduction

Autism spectrum disorder (ASD) can affect an individual's ability to have appropriate social interactions and communication and may increase the occurrence of repetitive behaviors (Copeland, 2018). According to the *Autism Speaks* website, about 1 in every 44 children was diagnosed with autism spectrum disorder (ASD) in 2021 (*What is autism?*). According to the data taken in 2018, boys were four times more likely to be identified with autism than girls (Autism Statistics and Facts). The autism spectrum disorder (ASD) has a wide array of conditions, and each case is different from the next. According to the DSM-5, an individual with ASD typically has deficits in social skills, engages in repetitive patterns of behaviors, interests, or activities, or has restricted interests or activities (Widiger, 2011). Often children with autism have difficulty understanding and expressing their and other peoples' feelings (Baron-Cohen et al., 1985). Problem behavior can have several different functions, including but not limited to attention, access to tangibles, and escape. Furthermore, certain environmental events can evoke both respondent and operant behavior.

Early Intensive Behavioral Intervention (EIBI) has been known to be the most effective approach for reducing the rate of undesirable behavior and helping 47% of children meet developmental expectations for their age group (Peters-Scheffer et al., 2011). For example, Anagnostou et al. (2014) found that four of the five participants in their study had remarkable outcomes from EIBI. In addition to decreasing undesirable behaviors, EIBI has been effective in teaching various other skills such as cognitive and academic skills, social skills, appropriate play, and independence in daily routines. One study which compared multiple studies found that EIBI decreased not only (inappropriate) behaviors but also improved IQ scores (Reichow et al., 2018).

There have been several treatments that behavior therapists have implemented to try to decrease problem behaviors such as self-injurious behaviors, tantrums, aggression, and

other behaviors that could harm the person or anyone around. These interventions include but are not limited to differential reinforcement, extinction, time-out, response cost, overcorrection, contingent electric shock, and ecological interventions (Carr & Durand, 1985).

Most functional analyses (FA) are composed of four conditions: play (control), tangible, attention, and escape. During the play condition, problem behavior is expected to be low, if present, because the therapist provides continuous reinforcement and attention without placing any demands. The tangible condition is designed to test for social positive reinforcement, so the therapist will give the individual time to engage with a preferred item then he/she will remove the item. If problem behavior occurs, the item will be given back to the individual for 20 - 30 s before removing it again. The attention condition also is designed to test for social positive reinforcement, so the therapist diverts their attention elsewhere. If problem behavior occurs, the therapist will provide brief attention and divert their attention elsewhere. The escape condition is designed to see if problem behavior is maintained by social negative reinforcement and the therapist delivers demands or other non-preferred activities. If problem behavior occurs, the activity/demands are removed for 20 – 30s. The alone condition is designed to see if problem behavior is maintained by automatic reinforcement, so there will be little to no environmental stimulation during this condition, and all problem behavior should be ignored during this condition. (Cooper et al., 2020)

In 1985, Carr and Durand, along with many other researchers, agreed that decreasing behavioral problems is an essential step in self-improvement; however, there should be socially acceptable behavior in place of these problematic behaviors. Therefore, Carr and Durand (1985) designed two experiments to evaluate providing the choice of replacement behaviors to participants. In the first experiment, the researchers assessed levels of disruptive behavior in different conditions. Specifically, they assessed if problem behavior was related to low attention or challenging demands. They evaluated three conditions: Easy

100, which meant attention was provided 100% of the time*; Easy 33,* which meant mands and praise were only presented 33% of the time*;* and *Difficult 100.*

Easy 100 consisted of the children working on various "easy" tasks such as match-to-sample and receptive identification. Attention was provided for 100% of the trials that the children were working. This condition functioned as a control condition, in which the child would unlikely engage in disruptive behavior. The *Easy 33* condition consisted of children in a regular classroom doing independent work, mostly simple matching programs, and receiving less adult attention than the *Easy 100* condition. In this phase, the verbal reprimands were no longer being used. However, mands and praise were still presented 33% of the time. The purpose of this condition was to test if the child engaged in disruptive behavior in low-attention situations. The *Difficult 100* condition was conducted much like the others in that it was in a regular classroom setting, working on similar tasks (e.g., receptive identification of picture cards). They conducted an assessment before beginning the study to ensure the cards selected were difficult. This condition aimed to assess if disruptive behavior was related to complex tasks. Results showed differentiated responses in the Easy 33 or Difficult 100 conditions, which varied across participants. These data indicate that disruptive behavior occurred for different reasons for different participants.

In the second experiment, researchers attempted to decrease problem behaviors by alternating two phases, relevant and irrelevant replacement behaviors. They taught each participant verbal phrases that were relevant (i.e., related to the function of the behavior) or irrelevant (not related to the function of behavior) based on results from the first experiment. Children who engaged in problem behavior during complex tasks were taught to ask for assistance from adults (relevant phase) or praise from adults (irrelevant phase). Children who engaged in problem behavior during low attention were taught to request praise (relevant phase) or assistance (irrelevant phase). The procedures were conducted similar to the way they were in the first experiment, with a couple of exceptions. First, the adult in the room asked if the child had any questions each time a question was answered incorrectly in the Difficult 100 condition and every 30 seconds in the Easy 33 condition. In

the response phase, the child was taught to respond to the question, "Do you have any questions?" Then, they could ask for adult attention or help by saying, "I do not understand." Once the child responded incorrectly, 8 out of the ten trials started stage two, which consisted of prompting the children right away to respond to the question with the appropriate response based on the condition he/she was in. Results showed decreased problem behavior only when the relevant mand was taught across participants. These data from the two experiments were consistent with an approach known as "the communication hypothesis of child behavior problems," which stated that behavioral issues could function as a mand for socially mediated reinforcers or attention for non-verbal children.

This early research spurred several decades and hundreds of studies on functional communication training (FCT) to reduce problem behavior. For example, in 2016, Gerow et al. reviewed and evaluated peer-reviewed literature to determine the effectiveness of FCT in decreasing problem behaviors. Over 200 studies were reviewed, resulting in over 400 experiments. The researchers concluded that there is sufficient evidence to support using FCT to decrease problem behavior. Furthermore, because the intervention is typically effective without additional reinforcement or punishment procedures, clinicians should consider using FCT with extinction before trying anything else (Carr & Durand, 1985).

Chapter 2 : Literature Review

Common Advice for Parents

Parenting plays a significant part in their child's learning and development, more specifically their language development. Similar to the behavior analytic literature, communication experts advise and encourage parents to teach communication skills to benefit the child. It is believed that tantrums typically arise when children are experiencing emotions that they are unable to express in acceptable ways, which is one reason why it is important to teach children to talk about their emotions. In behavior analysis, emotions are a type of "private event," which is defined by Skinner as behaviors that are only visible to the individual experiencing them, such as thoughts, feelings, pain, etc. (Skinner, 1957, p. 130-131).

That said, there is a lot of debate about what to do when children are engaging in problem behavior. Typically in our field we are taught to ignore the problem behavior because it is possible that providing attention will increase the likelihood of that behavior happening again. However, Schilling (2022) states that problem behavior should be handled differently depending on the reason for the problem behavior. Parenting expert, Janet Lansbury suggest that acknowledging emotions, even during problem behavior, is a communication tool that helps children understand, release the feelings, and let it go (Mariella, 2021).

Tacting Private Events

Tacting is a form of verbal behavior in which individuals will label something they hear, taste, smell, see, or feel. Individuals need to learn how to tact private events to explain what they feel others cannot see. For example, a person knows when they are tired, but unless he/she starts yawning or telling people they are tired, there is no way for others to know that they are. This is the same for children with autism. Often we pass "tantrums" off as problem behavior and children just being non-compliant. However, they do not consider that the child could be feeling something internal that others cannot see, such as

exhaustion. That said, Goldman et al., 2011 found a higher chance of a child misbehaving if he/she had poor sleep the night before.

According to Skinner, there are many ways an individual can learn to tact private events using verbal behavior (Skinner, 1957, p. 131). The first method mentioned is "public accompaniment," which occurs when an individual is present to witness the public event and can teach an appropriate response for the private event. For example, if a child is petting a dog with soft fur, the teacher could tact, "the dog looks like he/she feels soft." The second method of tacting private events is using "collateral events" to identify a private event. Skinner uses the example of a dentist and toothache in his book. This would be the same as a doctor checking a child's ear and seeing that he/she has an ear infection. The doctor might say, "Your ear must hurt," and the child learns to report the earache. The third method used to tact private events is through properties where two stimuli share metaphorical or metonymical extensions. For example, a child who has experienced and learned to label "tickling" from another person may report private events such as "my throat tickles." The last method is when previously public responses become private over time, known as response reduction. For example, a child who recently swam in the ocean may report the sensations of swimming or be able to "imagine" swimming.

Studies on Teaching Emotion Tacts

As mentioned earlier, language skills and developmental delays are prevalent in children with autism, and because language is such a crucial part of everyone's life, many researchers have focused on strengthening this skill. In 2011, McHugh et al. conducted a research study using a multiple baseline design focused mainly on teaching children diagnosed with autism to tact and generalized situation-based emotions by using multiple exemplars (e.g., video stories). They taught the children to tact four situation-based emotions (angry, afraid, happy, and sad) by showing the child the video, pausing it, and then presenting a question regarding feelings (e.g., "How will Sarah feel if she falls?" then prompting the child immediately by saying "say-sad "). Echoic prompts were used to ensure the child was emitting the correct answer and were systematically faded throughout the study. Researchers recorded whatever the child said or did in the 3 seconds following

the question. Correct answers were reinforced, and incorrect answers or failure to respond within 3 seconds were followed up with a verbal reprimand (e.g., "No") before implementing error correction. According to the results from this study, children with autism can be taught to tact emotions and then generalize to private, untrained events.

To add to the previous study, Conallen and Reed (2017) aimed to teach children with autism to tact others' emotions. The purpose of this study was to determine whether the teaching procedures behavior analysts use to teach language comprehension could encourage tacting of private events. Furthermore, they wanted to evaluate if the same approach could help with emotion-based language structure. They designed two separate studies for this research. For the first study, each participant had the chance to start a conversation by tacting private events using words already in their repertoire (e.g., fun, boring, etc.). They did this by using a picture card exchange system to initiate the conversation, then interacting using any predetermined words from the learner's repertoire. Initially, the participants needed to be physically prompted to exchange the 'talk card,' which functioned as a mand, and this was followed by a modeled response that faded out after five consecutive trials. The researcher then modeled the participant's private event (e.g., fun, boring, etc.) to echo. The results from the first study suggest that using a 'talk card' to prompt children with autism to initiate and engage in conversations was effective and was generalized across settings. (Conallen & Reed, 2017)

The purpose of the second study was to teach participants to respond to the "talk card." The teachers prompted the participant through the process of creating a sentence using complete echoic responses and eventually fading the prompts over successful trials. The second study proves that children with autism can learn to generate a sentence with a proper grammar structure. For this study, data reveals that the participants retained their new skill of generating sentences across new stimuli (Conallen & Reed, 2017). This was only one of many studies that looked at different intervention plans to teach individuals with ASD to tact emotions of themselves and others.

In 2018, Berggren et al. evaluated the effectiveness of randomized controlled trials (RCT) in teaching emotion recognition (ER) to individuals with autism spectrum disorder. In order to categorize the studies for the literature review, they used a checklist to determine the intervention, who provided the intervention, participants, context, and possible outcomes for the randomized controlled trials. Once they completed the checklists, they investigated how the training could generalize to the participants' daily lives. Articles that were reviewed had to be using randomized controlled trials that were published in English and met the following criteria: participants had to be 18 years old or younger with a diagnosis of autism spectrum disorder or pervasive developmental disorder not otherwise specified (PDD-NOS), designed to teach emotion recognition, precursor skills of emotion recognition, based on common theories of emotion recognition, or focused on testing the different theories of emotion recognition with individuals in autism (Berggren et al., 2018). They found 13 studies within 14 publications that met the criteria to review. Two authors electronically searched using relevant words and medical subject headings, read through each abstract with relevance, and discussed disagreements. After finding studies related to the topic, data were collected from each study and loaded into a sheet that both authors had access to. Results suggest that emotion recognition training in conjunction with social skills training resulted in improvements in participants' daily life. However, more research is needed to evaluate the generalizability of skills taught using emotion recognition training (Berggren et al., 2018).

Schmick et al. (2018) extended previous studies by teaching teenagers how to identify private events exhibited by others using a curriculum-based program. They did this by first teaching the participant to tact what was happening in a video (e.g., crying at a wedding) and then teaching relations between the video and the feelings involved (e.g., "If someone is crying at a wedding, how might they feel?"). Following training, they tested to see if the participant could label the correct emotion to the video. In addition, they tested a new relation by having the research state, "I felt (emotion), and I was (behavior related to emotion), where was I?" Two out of the three participants demonstrated derived relational responding, and one required additional training to achieve these outcomes. However,

limitations suggest that there is no way of knowing if this skill could be taught to children with a less advanced verbal repertoire. The researchers also did not assess real-life situations during the study, so they are unsure if the skills generalized to real-life situations.

Belisle et al. (2020) evaluated the success of using discrete-trial teaching (DTT) to teach children with autism to tact private events of others with public accompaniment. That is, individuals may be unable to react to others' feelings, such as having a headache, unless the person engages in some kind of behavior that is visible to others. Being able to identify the emotions of others is an important skill to have when interacting with peers. Belisle et al. did this by having the therapist deliver a public accompaniment (e.g., the therapist holding his/her head, applying a bandage, yawning, etc.) and asking the child, "How may I be feeling?" Correct responses were followed by praise. However, if they did not respond or responded incorrectly, they were prompted using a mixed-prompting procedure. A level one prompt consisted of giving the child the full answer after five seconds of not responding. A level two prompt gave the child only the first sound of the correct response. Finally, a first-level prompt was applied if they did not get the answer correct after the second-level prompt. Once the participant responded with the correct answer, they received praise. Results from this study suggest that there is success in using procedures to teach children to tact the private events of others. Stability, defined as three consecutive trials with scores within 25 percent of each other, was achieved during the baseline phase, and the mastery criterion was met in six to eight trial blocks. The results of this study, in addition to previous literature, demonstrate that interventions can be implemented to teach children with autism to tact emotions and private events. The studies mentioned used video stories, picture exchange cards, randomized controlled trials, and discrete trial teaching, all of which successfully taught children to tact either their own emotions or the emotions of others.

Relationship Between Attention and Problem Behavior

Behavior analysts consider most problem behavior to be operant or under the control of environmental variables. As such, typical behavior management strategies often include recommendations to minimize the delivery of potential reinforcers following an occurrence of problem behavior. Parents and caregivers may be advised to withhold preferred items and limit any attention when problem behavior occurs. However, recommendations to ignore all problem behavior may be problematic for several reasons. First, attention is only one possible functional reinforcer, meaning problem behavior may be maintained by other social reinforcers such as escape from demands, access to tangibles, or non-social reinforcers (Kodak et al., 2007). Removing attention for escape-maintained behavior may inadvertently reinforce the behavior (i.e., provide a break from demands). Additionally, this recommendation assumes that all kinds of attention have equal reinforcing value, but different forms of attention may serve different functions for each individual. For example, Kodak et al. (2007) evaluated the effects of providing different forms of attention contingent on problem behavior. First, they conducted a traditional functional analysis (FA) (Iwata et al., 1982/1994) which included attention, demand, play, and alone conditions for one of the participants. The functional analysis results indicated that attention was a maintaining variable for problem behavior.

Next, they conducted an attention evaluation to assess the effects of reprimands, unrelated comments, physical attention, tickles, and eye contact on problem behavior. During the reprimand conditions, therapists provided 20 seconds of verbal reprimands contingent upon problem behavior that was related to the problem behaviors (e.g., "Do not pinch me there"). They delivered the reprimands in a monotone voice without providing physical contact. During the unrelated comments condition, similar to the reprimands condition, therapists provided comments unrelated to whatever the child was doing contingent upon problem behavior. During the physical attention condition, therapists began a hands-down procedure in which the researchers held the participants' hands down by their side (but did not provide vocal attention) contingent on the problem behavior. During the tickles condition, the therapist played with the child by providing tickles and comments ("I am

tickling you") contingent upon the problem behavior. In the praise condition, the therapist commented on appropriate behavior contingent upon problem behavior ("I love when you play with your toys"). Finally, in the eye contact condition, the therapist made eye contact with the participant contingent on the problem behavior. Results of the study showed differentiated responses across the different types of attention. In addition, responding across the conditions was idiosyncratic across participants.

Results from this study can also be used in the future to identify functional forms of attention. Not including a control condition during the attention evaluation was one limitation of this study. Another limitation was that they did not evaluate the impact of differential access to the dissimilar types of attention. This illustrates that not all types of attention will reinforce problem behavior. It is possible that clinicians can use the occurrence of problem behavior as an opportunity to teach communication without increasing the problem behavior.

Teaching children to label private events, including emotions, is an important skill for an individual's overall development. The best way to teach these skills is by using public accompaniment of observable events. Problem behavior typically occurs when a child cannot communicate appropriately, indicating certain emotional states such as being upset or angry. Experts often discourage caregivers from providing attention to any form of problematic behavior. However, the effects of providing attention in the form of a sympathy statement (e.g., "I am sorry you are sad") have not previously been studied. This study aims to evaluate the effects of attention on problem behavior among children with autism. The second purpose is to teach children to tact their emotions to replace problem behavior.

Chapter 3: Method

Participants

The participants included four children diagnosed with autism spectrum disorder (ASD). Three of the four participants were attending ABA therapy at the time of the study, and they demonstrated language skills commensurate with level 2 on the Verbal Behavior Milestone Assessment and Placement Program (VB-MAPP; Sundberg, 2008), which is thought to correlate with the language skills of a typically developing 18 to 30-month-old child. The fourth participants were not receiving ABA therapy at the time of the study. In addition, all four participants were able to tact two-word phrases and engaged in mild problem behavior when access to desired items or activities was denied or discontinued. We excluded children with severe problem behavior, which could have caused injury to the children or researchers.

Participant 1, Riley, was a 6-year-old Caucasian boy diagnosed with ASD by his pediatrician in 2018. At the time of the study, he was not receiving ABA services, but he had received services in the past. Riley's mother reported that when highly preferred items were removed, he engaged in aggressive behaviors. His problem behaviors included hitting, kicking, hair pulling, negative vocalizations (e.g., crying, screaming "no"), self-injurious behavior, flopping, and property destruction. Before the study, Riley did not engage in spontaneous emotion tacts.

Participant 2, Bentley, was a 4-year-old Caucasian boy diagnosed with ASD by a licensed psychologist in February 2021. He had been receiving an average of 30 hours of ABA therapy each week for the last year. He scored 115 out of 170 points on his most recent VB-MAPP assessment. He met criterion for all of Level 1 milestones, met criterion for majority of Level 2 milestones, and met criterion for some of Level 3 milestones. Bentley's overall strengths were in the domains of mands, independent play, visual perception – match to sample, tact, echoics, and imitation. He demonstrated deficits in the areas of lister responding- feature, function, class (LRFFC), social, intraverbals, and group skills.

Bentley's case manager reported that when tangibles were removed, or access to tangibles was denied, he often engaged in aggressive behaviors. His problem behaviors included hitting, kicking, pulling hair, negative vocalizations (e.g., crying, screaming "no"), self-injury, flopping, and property destruction. Bentley never spontaneously tacted emotion. However, he did know emotion words from videos he watched on the iPad and would occasionally sing them (e.g., blue is sad, red is angry, green is happy)

Participant 3, Avery, was a 3-year-old Caucasian girl diagnosed with ASD by a licensed psychologist when she was 23 months old. She had been receiving an average of 3 hours of ABA therapy each week for one year. Avery's mother reported that she often became upset and cried whenever a preferred item was removed. Her problem behaviors included elopement, negative vocalizations, and property destruction. She also reported that despite being "very verbal,: she frequently "shut down and not talk to others when she got to this point." Avery did not have any assessments completed at the time of the study. She manded for missing and preferred items using full sentences consistently, tacted noun-verb combinations and followed instructions 100% of the time during the study. Avery had been taught her emotion words prior to participating in the study. However, she never spontaneously tacted her emotions.

Participant 4, Gunner, was a 4-year-old Caucasian boy who had been receiving an average of 15 hours of ABA therapy a week for 12 months. More specifically, he participated in small group instruction, with a 3:1 student-to-teacher ratio. He was diagnosed in March of 2021 with ASD by a licensed psychologist. Gunner's mother and ABA therapist reported that he became "frustrated" and cried when given a difficult task he did not know how to complete instead of asking for help which he had been taught to do. His problem behaviors included aggression, spitting, non-compliance, and negative vocalizations. Gunner also did not have any assessments completed at the time of the study. He consistently manded for missing and preferred items using full sentences, tacted noun-verb combinations, and followed instructions 75% of the time during the study. Gunner knew the majority of the

emotions from activities he completed in group. However, he never spontaneously tacted his emotions.

Setting and Materials

The materials included writing utensils, data sheets, a timer, a digital video camera, tally counters, highly preferred items to be removed during sessions, low-to-moderately preferred items for the child to engage with between sessions, and edibles, which were used as reinforcers when the child emitted the correct emotion tact. For some trials, we also used a blank, square piece of paper as a neutral item.

Riley's sessions were conducted in his home. The room contained a small television, a stand, a couch, and the required materials for the study. The television remained off for all sessions to limit any distractions.

Bentley and Gunner's sessions were conducted in a treatment room at a university-affiliated clinic during baseline and the first phase of treatment. The treatment room only included items that were needed for the research sessions. When Bentley failed to generalize the emotion tact, his sessions were moved to his classroom at the clinic. Bentley's classroom contained seven other children and was equipped with a wide variety of play and instructional materials (e.g., paint supplies, puzzles, playdough, etc.).

Avery's sessions were conducted in a classroom at her school. No children were present at the time of the study due to it being summer break. The classroom was equipped with one small table and four chairs, matching games, art supplies, a doll house, and dolls, along with all required materials for the session.

Measures

The primary dependent variable was the frequency of emotion tacts emitted in the presence and absence of an establishing operation. An establishing operation (EO) is a motivating operation that increases the value of a reinforcer and the frequency of behavior that has resulted in that reinforcer in the past (Cooper, Heron & Heward, 207, p. 695). Said another

way, an establishing operation *establishes* some consequence as a reinforcer for a particular behavior at a particular moment in time. For example, when a child is playing with his friends, the appearance of a parent may not be at strength as a reinforcer. However, if the child fell and got a bloody nose, the bloody nose would momentarily increase the reinforcing value of the presence of a parent because the parent would be able to clean him up and offer comfort.

For the purpose of this study, the establishing operations were antecedents that typically evoked problem behavior and elicited emotional responding. If the establishing operation was not present, that means that we did not contrive a situation that typically evoked those reactions. Thus, the measure was the number of emotion tacts emitted during a distressing situation versus a neutral situation.

Responses were scored as an occurrence if the participant said the targeted emotion tact after an item (neutral or preferred) was removed. Responses were scored as prompted if the behavior technician provided a vocal model prior to the participant emitting the emotion tact. A nonoccurrence was scored if the participant did not emit the emotion tact upon removing an item.

We took data on two secondary dependent variables: affect and problem behavior. To measure affect, we asked the caregivers or case managers to list three to five specific behaviors the child typically engaged in when they were displaying problem or emotional behavior (Parsons et al., 2012). Next, we determined and operationally defined sadness, anger, and neutral by reviewing the listed behaviors and observing the client. After removing each item, we observed the clients for 10 s and recorded their affect. Anger, sadness, and frustration were all considered negative affect. An angry affect was scored if the participant displayed furrowed brow, engaged in negative vocalizations such as screaming, crying, saying ‘no,’ clenched their fist, or began throwing items. A sad affect was scored if the participant displayed a downturned mouth, for example, a frown, tears may or may not be present in/around eyes, and whining may or may not be present. A frustrated affect was scored if the participant appeared to be sad or angry due to the

inability to complete or achieve something. A neutral affect was scored if the participant did not appear to care when either item was removed, so this looked like us removing an item from the child, and they just walked away, started talking, or found a different task or item to engage in.

The other secondary dependent variable was problem behaviors, which were identified and operationally defined by each participant's case manager before beginning the study. Data for each problem behavior were collected using frequency measures. Negative vocalizations were defined as any vocalization louder than typical conversational volume accompanied by negative affect (e.g., crying, screaming, saying no) that did not include laughing or singing. Property destruction was defined as any occurrence of throwing or sweeping items from the table, ripping paper or other materials, or forcefully hitting objects or surfaces from a distance of six inches or greater. Self-injurious behavior was defined as any physical act directed towards oneself that has the potential to cause harm. Elopement was defined as any actual or attempted instance in which the participant moved more than 3 ft from a designated area without permission. Aggression was defined as any actual or attempted occurrence of contact with another individual’s body which resulted in a visible mark or sound, including hitting, biting, and pulling hair. Spitting was defined as any occurrence of projecting saliva or objects from the mouth, excluding drooling that occurred while eating.

Experimental Design

For the functional analysis (FA), we used a multi-element design (Kazdin, 1982) to determine eligibility for participation in the study. Participants whose problem behavior was maintained by access to tangibles or escape from demands were included. We specifically tested the effects of the delivery of tangible items on problem behavior. If no problem behavior was observed, we evaluated effects of escape from demands. We used a nonconcurrent multiple baseline across participants design (Watson & Workman, 1981) to evaluate the effects of tact training and problem behavior.

Pre-Experimental Procedures

Tangible Preference assessment. We conducted a multiple stimulus without replacement (MSWO) preference assessment (DeLeon & Iwata, 2000) to determine highly preferred items to be used during sessions. The participants' caregivers identified preferred items that we could include in the assessment. For each trial, we arranged five to eight highly preferred items in front of the participant and instructed them to pick one. The participant was given 15 s to engage with the item. When the 15 s elapsed, the item was removed and placed out of sight. The remaining items were placed on the table and the participant was asked to pick one. Again, the participant was allowed to play with this item for 15 s. We continued doing this until the items were gone. This yielded a hierarchy of preferences so we could use the most highly preferred items during the subsequent experimental sessions.

Edible Preference Assessment. Before each session, we conducted an MSWO in the same manner described above, except edibles were placed in front of the participant instead of tangible items, and the participant was allowed to consume the edible after each selection.

Functional Analysis. An experimental functional analysis (FA) was conducted to determine what maintained each participant's problem behavior. This study included four conditions: play (control), tangible, typical caregiver attention, and empathetic attention. Each session was 5 min long, and the participants had a 3 to 5 min break between sessions. In the play condition, we sat on the floor or at the table and gave continuous attention to the participant who was playing with moderately preferred items. Because we were giving attention, no demands, and access to preferred items, this condition served as the control to which we compared the other conditions. For the tangible condition, we let the participant play with a highly preferred item for about 2 mins before the start of the session. When the 2 mins were up, we removed the item. If the child requested the item back, we responded by saying, "Not right now." For every instance of problem behavior, we gave the item back to the child for 20 s and then removed the item again.

For both attention conditions, we engaged with the participant for 2 mins prior to starting the session. When the session began, we said, "You can play while I finish some work." During this time, the participants had access to moderately preferred items around the room but did not receive any attention unless they engaged in problem behavior. For every instance of problem behavior in the typical caregiver attention condition, we provided attention in the form of a reprimand that a parent would typically use when they engaged in problem behavior (e.g., "No, we do not hit others," “Stop doing that.”). For every instance of problem behavior in the empathetic attention condition, we provided attention in the form of an empathy statement (e.g., "I am sorry you are sad"). After either form of attention was delivered, the therapist removed attention and returned to our "work." If the participant did not engage in problem behavior during any condition, we delivered praise at the end of the session.

To evaluate the effects of the tact training with a child who was reported to engage in problem behavior to escape demands, we included a demand condition for one participant, Gunner. We did not conduct a demand condition for the other participants because escape was not a suspected function for them. In this condition, we presented five math problems that the participant knew how to do and five difficult math problems that he could not complete without help. The math problems were chosen by Gunner’s therapy team based on the types of tasks included during his regular therapeutic sessions. If the participant engaged in problem behavior, we removed the worksheet for 30 s. Once the 30 s elapsed, we represented the worksheet with the math problems. If the participant complied with the demand, we delivered praise.

Procedure

Sessions

We conducted five to 15 sessions per week. Each session consisted of five trials in which the EO was in effect. In other words, we presented the participant with a situation previously shown to evoke emotional behavior. We also randomly interspersed five trials in which no EO was in effect. The purpose of the no-EO trials was to evaluate whether the participant said the emotion tact in a similar situation that should not evoke emotional

responding. For example, if we removed a highly preferred item (EO present), we predicted it would elicit an emotion at some strength even if no collateral behaviors occurred. On the other hand, if we removed something the participant did not care about (EO absent), we predicted that no emotion would be elicited. Thus, the no-EO trials served as a control, in which no emotion tact would be expected to occur. Additionally, the participant's emotion tact should be under the stimulus control of their subjective experience of feeling the emotion.

Baseline

Tangible Procedure. Riley, Bentley, and Avery's problem behaviors were determined to be maintained by access to tangible items. I would like to note that we did not conduct a demand condition with these three participants, so it is possible that their problem behavior could also be maintained by escape from demands. For these participants, the trials were conducted by presenting a high-preference item (EO present) or a neutral item (EO absent) to play with for 1 to 2 min. Next, we removed the item scheduled for that trial and recorded the participant's response. If the participant engaged in problem behavior upon removing any item, we immediately gave the item back.

Escape Procedure. Gunner's problem behavior was maintained by escape from demands, so his trials were conducted by presenting math worksheets similar to the ones we used during the FA. The ABA therapist provided worksheets that they use in session to ensure they were his level. During the EO-present trials, we presented difficult math problems. During the EO-absent trials, we presented simple math problems he could complete without help (e.g., 1+1 or 5+0). If Gunner engaged in problem behavior on either trial type, we removed the worksheet for 30 s.

Tact Training

Sessions were conducted in the same manner as baseline, with EO-present and EO-absent trials randomly interspersed. The particular tact (e.g., "angry," "sad") taught to each participant was determined on an individualized basis by observing the participant's affect during the FA. In addition, we conferred with the clinical team and caregivers to ensure

they agreed that the tact selected best fit their child's demeanor when placed in the evocative situation. The tact "sad" was selected as the target if the participant primarily engaged in the following behaviors during the EO-present trials: downturned mouth with or without tears, whining, or plaintive vocalizations. The tact "angry" was selected if the participant engaged in the following behaviors: furrowed brow with or without negative vocalizations (e.g., screaming, crying, saying 'no'), clenched fists, or throwing items. The tact "frustrated" was selected if the participant displayed negative affect coupled with an inability to accomplish a task.

Upon delivering an EO-present trial, we modeled the target tact (e.g., "I am upset") at a 0-s delay. When the participant repeated the prompt, we gave an empathy statement such as, "I am sorry, I know you are upset. You can have your toy back later." We then delivered an edible and praise. If the child did not emit the emotion tact after three prompts, we did not say anything and moved on to the next trial. After two sessions of the 0-s prompt delay, we faded the prompt using a constant time delay procedure to 5 s. We provided differential reinforcement (i.e., only reinforced unprompted responses) after fading our prompts to 5 s.

For the EO-absent trials, we did not provide any prompts. We ignored the response if a participant ever said the emotion tact during these trials. Sessions continued until the participant responded to the EO-present trials by saying the emotion tact for 80% of the trials and did not say the emotion tact on 100% of the EO-absent trials across three consecutive sessions.

Accepting "No" Training. Bentley did not demonstrate generalization of the emotion tact to other situations in which problem behavior was maintained by access to tangibles. Specifically, when told "no" to a request made in naturalistic conditions, Bentley engaged in problem behavior and did not say the emotion tact that was taught. To address this, we conducted sessions in which we contrived a situation for Bentley to mand for a preferred item or access to a preferred location. In baseline, we presented five opportunities for him to mand, and we responded to his mands by saying, "Not right now," or "We can't go there

right now." During the next phase, we conducted two priming trials presented in the same manner described for the EO-present trials above. After two consecutive trials in which he independently said, "I'm angry" after the removal of a preferred item, we presented a mand opportunity trial. We used the same prompting, prompt fading, and reinforcement strategies as described above.

Generalization Probe

Prior to baseline and after the participant met the mastery criteria with the experimenters, we conducted probe sessions with one of the participants' parents to determine whether the participant would emit the tact in the presence of a new person. Sessions were conducted in the same manner as described for baseline.

Maintenance

One week after the research sessions were completed, we conducted a probe session to determine whether the participants continued to engage in the emotion tact. The sessions were conducted in the same manner as described for baseline.

Fidelity and Acceptability of the Dependent and Independent

Interobserver Agreement (IOA)

A second observer independently collected data on the dependent variables for a minimum of 33% of the sessions for each participant. Data were either scored live or from video recordings of the sessions. The first and second observer's data were compared on each trial. If both observers scored an occurrence of the emotion tact, it was coded as an agreement. If one observer scored an occurrence of the tact and the other did not, it was coded as a disagreement. Trial-by-trial IOA was calculated by dividing the number of agreements into the total number of trials (agreements plus disagreements) and multiplying by 100 (Kazdin, 2011).

The mean agreement scores for Riley's FA sessions were 99% (range=92-100%). His mean IOA scores for intervention were 100% for emotion tacts, 89% (range= 88-91%) for problem behavior, and 90% (range = 80-100%) for affect. Bentley's mean IOA scores for the FA were 99% (range=97-100%). His mean IOA scores for intervention were 100% for

emotion tacts , 99% (range = 93-100%) for problems behavior, and 95% (range = 80-100%) for affect. Avery's means scores for the FA were 100%. Her mean IOA scores for intervention were 100% for emotion tacts, 100% for problem behavior, and 97% (range = 90-100%) for affect. Gunner's mean IOA scores for the FA were 97% (range=97-100%). His IOA scores for intervention were 100% for emotion tacts, 100% for problems behavior, and 100% for affect.

Treatment Integrity

A second observer collected data on the fidelity with which the procedures were implemented in at least 33% of sessions. The observer scored a detailed checklist containing each step of the experimental procedures. (See Appendix A.) The percentage of steps implemented correctly was calculated and averaged across all sessions. The treatment integrity score for Riley was 100%. The treatment integrity score for Bentley was 97% ranging from 91% to 100%. The treatment integrity score for Avery was 99.6% ranging from 99% to 100%. The treatment integrity for Gunner was 100%. Treatment integrity across all participants was 98% ranging from 91% to 100%.

Social Validity

The participant's caregivers and case managers were given a questionnaire at the end of the study to assess the acceptability of procedures. Each question contained a 5-point Likert scale in which the responders were asked to circle a number to indicate their impressions of the study (See Appendix B). We also conducted a social validity assessment with the participants by asking them to circle pictures of emoticons depicting a range from smiling to frowning (See Appendix C.)

Chapter 4 : Results

Riley

The results from Riley's functional analysis are displayed in Figure 1 below. He did not engage in problem behavior during the play, caregiver attention, or empathetic attention conditions. However, he did engage in problem behavior (negative vocalizations and aggressions) during the tangible condition.

Figure 5 (top panel) shows the percentage of correct emotion tacts in the presence of the preferred and neutral items during both baseline and treatment. Riley emitted zero emotion tacts during baseline and displayed a negative affect, often sad or frustrated, 100% of the EO-present trials and a neutral affect 100% of the EO-absent trials. After implementing tact training, he reached the mastery criteria within four sessions and was displaying a neutral affect in 45% of the EO-present trials and a negative affect, often angry or frustrated, in 55% of the EO-present trials. During baseline, he engaged in a mean rate of 1.9 (range = 1.4 - 2.3) combined problem behaviors per session. After tact training, his mean rate of problem behavior was 1.6 per session (range = 0.2- 5.7). During the pre-test probe, Riley engaged in 0 problem behavior and scored a 0% on both EO-present and EO-absent trials. During the post-test probes, Riley engaged in 0 problem behavior and scored a 100% on EO-present trials and 0% on the EO-absent trials. During the post-test probes, he displayed a neutral affect 100% of the trials.

Bentley

Bentley's functional analysis data are displayed in Figure 2 below. He did not engage in problem behavior during the play, caregiver attention, or empathetic attention conditions. However, he did engage in problem behavior (i.e., negative vocalizations and aggression) during the tangible condition.

Figure 5 (middle panel) shows the percentage of correct emotion tacts (x-axis) in the presence of the preferred and neutral items during baseline, training, and generalization probes. Bentley emitted 0 emotion tacts during baseline and displayed a negative affect,

often sad or angry 100% of the EO-present trials and a neutral affect 0% of the EO-absent trials. After implementing the tact training, he reached the mastery criteria in 16 sessions and was now displaying a negative affect, often sad or angry, 28% of the EO-present trials. He displayed a neutral or happy affect 72% of the EO-present trials and a neutral affect 90% of the EO-absent trials and a negative (sad or angry) 10% of the EO-absent trials. Bentley did not achieve the mastery criterion in the first generalization probe, so we conducted another baseline for a slightly different antecedent (i.e., Accepting "No"). His baseline data for tacting were 0%, after implementing the Accepting "No" training, he reached the mastery criteria in 11 sessions. During baseline, he engaged in a mean rate of 0.95 per session for combined problem behavior (range = 0.81 - 1.05) of problem behavior, including hitting, kicking, biting, negative vocalizations, disruptions, and spitting. During the pre-test probe, Bentley engaged in a mean rate of 0.1 combined problem behaviors and scored a 0% on both EO-present and EO-absent trials. During the post-test probe, Riley engaged in 0 problem behaviors and scored a 100% on EO-present trials and 0% on the EO-absent trials. During generalization and maintenance probes, he engaged in 0 problem behavior, and scored a 100% on EO-present trials and 0% on the EO-absent trials.

Avery

Results from the functional analysis for Avery are displayed in figure 3 below. She did not engage in problem behavior during the play, caregiver attention, or empathetic attention conditions. However, she did display precursors to problem behavior during the tangible condition. Therefore, we did not need to conduct escape conditions with Avery during this assessment.

Figure 5 (bottom panel) shows the percentage of correct emotion tacts in the presence of the preferred and neutral items during both baseline and treatment. Avery emitted zero emotion tacts during baseline and displayed a sad affect 74% of the EO-present trials and a neutral affect in 100% of the EO-absent trials. After implementing tact training, she reached the mastery criteria within four sessions and displayed a neutral affect in 100% of the EO-present and EO absent trials. During baseline, she engaged in a mean rate of 1.9 (range = 1.4 - 2.3) combined problem behaviors per session. After tact training, her mean

rate of problem behavior was 0 per session. During the pre-test probe, Avery engaged in 0.65 problem behavior and scored a 0% on both EO-present and EO-absent trials. During the post-test probes, Avery engaged in 0 problem behavior and scored a 100% on EO-present trials and 0% on the EO-absent trials. She displayed a neutral affect in 100% of the trials during the post-test probes.

Gunner

Results from the functional analysis for Gunner are displayed in figure 4 below. He did not engage in problem behavior during the play, tangible, caregiver attention, or empathetic attention conditions. However, he did engage in problem behavior (negative vocalizations) during the escape condition.

Figure 7 shows the percentage of correct emotion tacts in the presence of the preferred and neutral items during both baseline and treatment. Gunner emitted zero emotion tacts during baseline and displayed a negative affect, often sad or frustrated, 100% of the EO-present trials and a neutral affect 100% of the EO-absent trials. After implementing tact training, he reached the mastery criteria within four sessions and displayed a neutral affect of 100% of the EO-present and EO-absent trials. During baseline, he engaged in a mean rate of 7.2 (range = 6.4 - 8.4) combined problem behaviors per session. After tact training, his mean rate of problem behavior was 0. During the pre-test probe, Gunner engaged in a mean rate of 1.9 combined problem behavior and scored a 0% on both EO-present and EO-absent trials. During the post-test probes, Gunner engaged in 0 problem behavior and scored a 100% on EO-present trials and 0% on the EO-absent trials. During the post-test probes, he displayed a neutral affect 100% of the trials.

Social Validity

According to the social validity survey results, 100% of the respondents believe that teaching children to tact their emotions would be beneficial, and they would recommend a study such as this one to other parents. Twenty-five percent of the respondents reported that they noticed a change in their child's behavior during the study, and 50% of the respondents reported a change in their child's behavior after the study was completed.

100% of the respondents reported that teaching children with other disabilities would be beneficial. Lastly, 100% of the respondents reported that the procedures we used were acceptable to them.

Chapter 5: Discussion

All four participants learned to tact an emotion when we presented situations that have evoked problem behavior in the past. This is consistent with previous research that states children with ASD are capable of learning to tact emotions and other private events. McHugh et al. (2011) taught children that were diagnosed with ASD to tact and generalize situation-based emotions using video stories. Schmick et al. (2018) taught teenagers to identify private events in others using a curriculum-based program For example, they taught relations between videos (someone crying) and the feelings involved (e.g.,"If someone is crying, how might they feel?") and then testing to see if the individual could label the correct tact for each video. This would help the child differentiate between the different emotions (e.g., happy, sad, angry) before trying to focus in on one specific emotion.

In addition to learning to tact their emotions, three of the four participants demonstrated an immediate decrease in problem behavior once the intervention was implemented. This is consistent with previous research that suggests teaching a replacement behavior is effective for decreasing problem behavior (Carr & Durand, 1985). It is possible that the edibles we used as reinforcers competed with the tangible items and functioned as an arbitrary reinforcer. Fewell et al. (2015) suggested that practitioners should be mindful of the reinforcers they use during treatment because they can influence intervention. It is possible that problem behavior decreased because the participants learned that saying the emotion word resulted in an edible and not necessarily because they were experiencing the emotion we were teaching.

Bentley's problem behavior was variable throughout the study. However, we saw an overall decrease throughout the duration of the study. Observations of his affect suggest that tacting his emotions did not consistently serve as a replacement behavior for Bentley. There were times when he was visibly angry but not tact the emotion, even when he was

prompted to do so. It is possible that the intense emotional experience may have served as an abolishing operation for the reinforcers that were delivered for the tact.

Towards the beginning of the study, there were times that Bentley would tact, "I am angry" during the EO-absent trials. He tacted “I am angry” in an average of 30% of the EO-absent trials in the first five sessions after we introduced training but decreased to 0% in the last five sessions of the study. If an emotion tact occurred out of context at any point, we ignored it, which is similar to teaching any tact in DTI. If a child looked at a peer in a preschool setting and incorrectly tacted, “Cooper” when the peer’s name was Emmett, he may not get any reinforcement because Emmett did not realize the statement was directed at him. Similarly, a parent may not attend to a child who’s saying, “I’m sad” if there are no other contextual or behavioral indicators of sadness.

On several occasions, Bentley and Avery manded for the preferred item that had been removed. We occasionally reinforced appropriate mands to avoid a decrease in appropriate manding during his ABA sessions. However, Bentley engaged in higher intensities of problem behavior when access was denied than when we removed a preferred item. This is likely due to a history of dense reinforcement for manding appropriately. On the trials in which he engaged in high rates of problem behavior, he would not repeat the tact, nor would he comply with any other tasks. This suggests that strong emotion may influence other behavior.

Once the emotion tact was taught, Bentley engaged in more problem behavior when access was denied than he did when tangibles were removed. We suspected he was not actually angry when we removed the tangibles due to his affect which was negative only 25% of the time once. When we started teaching the denied access condition for Bentley, we interspersed the original intervention trials (removed a preferred item) and trials where we denied access to mands. The previous intervention trials served as priming sessions for the denied access sessions. During this condition, he learned the contingency within ten trials which was much faster than he did during the initial teaching sessions, which took him 26

sessions overall. It is likely that the efficient learning demonstrated in the second teaching phase was due to the history in the prior teaching phase. These results are encouraging, suggesting that additional emotion tacts will perhaps be learned more quickly in the future.

In the first teaching session, Gunner tacted that he was frustrated without even looking at the math problem. This could suggest that he initially did not understand that “frustrated” was a tact for encountering a hard problem, as opposed to a disguised mand for help. This is problematic because it is difficult to say whether or not he actually learned to tact when he was feeling frustrated or if he just learned to say he was frustrated to get out of the task. However, his behavior did eventually come under the control of the type of problem he was presented with. If we observed that he was not looking at the question, we prompted him to look at the problem first.

For Gunner, we interspersed math problems that he knew how to do and more complex ones that we knew he struggled with, based on case manager report. We expected him to tact that he was frustrated only when presented with a complicated problem. However, it was unclear if he genuinely did not understand the question on the occasions he emitted the emotion tact after looking at an 'easier' problem. In the future, researchers might consider probing each question before beginning the research sessions to confirm what the participant knows and what he does not know.

Limitations and Future Directions for Research

There were several limitations within this study. One is that it is possible we taught the participants to tact the wrong emotion. For example, we may have taught Bentley to tact that he was angry when he was not experiencing anger. According to his affect and problem behavior during the FA, he was experiencing anger. However, when we started teaching him to tact that he was angry, his affect was not always angry. Throughout the study, he said "I am angry" with a neutral expression or sometimes even while laughing. In the future, I would suggest that practitioners only prompt the emotion tact when the child is overtly showing the collateral behavior associated with the emotion.

A second limitation is that only children diagnosed with ASD with a history of ABA therapy participated in this study. Thus, it makes it unclear whether or not results would generalize to individuals with different diagnoses, typically developing children, or children who had never attended ABA therapy. Furthermore, all of the children who participated in the study had a strong vocal verbal repertoire, which means we cannot assume this would be effective for children who are not vocal (e.g., using a picture exchange program or sign language). However, Conallen and Reed (2017) successfully taught children to exchange pictures as a mand for conversations about different private events (e.g., fun, boring). However, there is no reason to believe that children who use different communication modalities would learn emotions tacts any differently than children who use spoken language. In the future, researchers should consider conducting the study with a larger, more variable pool of participants.

The last limitation is that once the participants leave research sessions, we have no control over what they are learning or watching. Throughout the study, Bentley's parents reported that he had begun watching videos on his iPad about different emotions. During his regular therapy sessions, his therapist noticed he sang a song that paired up colors with emotions (e.g., blue means sad, red means angry, etc.). However, he never tacted his or others' emotions, so this outside exposure did not appear to affect the data. This demonstrates that just because a learner can emit one type of verbal operant does not mean they emit the same response topography in a related operant. In the future, researchers could talk to the participants' team members and caretakers about trying the monitor what they are watching and limit exposure to material that could serve as a confounding variable.

One strength of the current investigation is the relatively short amount of time to completion. Three of the participants learned the emotion tact within the first four sessions. In contrast, Bentley took longer than expected. We anticipated the study to last less than a month. However, the treatment phase alone took one month due to adding a phase to address the denied access function. Overall, Bentley's problem behavior was more variable

across the study. It is possible that problem behavior was contacting reinforcement outside of the research sessions which could have affected the data. Research has shown that both contingent and noncontingent access to functional reinforcers in other contexts can lead to a persistence of problem behavior (see Pritchard et al., 2014 for a review). Specifically, if Bentley is accessing his tangible item contingent upon problem behavior outside of the research session, this could cause an increase in problem behavior during research sessions.

Implications

In the current study, we collected data on participant affect to evaluate the accuracy of the participant tacts. We were able to obtain high levels of IOA for the affect variable. Collecting data on affect may have additional clinical utility. For example, practitioners could consider taking data on the participants' affect to determine if the procedures they use are aversive to the children. If the procedures are eliciting an overall negative affect, client progress may be hindered. Additionally, clients may be more likely to engage in problem behavior to avoid or escape the instructional context if they do not appear to enjoy (or at least not be engaged with) instruction.

In the field of ABA, it is common to recommend limiting attention following the occurrence of problem behavior, as the attention may inadvertently reinforce the behavior. We demonstrated for all participants in the current investigation that attention in the form of empathy statements did not reinforce problem behavior. Moreover, once the intervention was implemented with empathy statements following a distressing situation, problem behavior decreased across all participants. This suggests that showing empathy to children does not always strengthen problem behavior. Future research should investigate the effects of providing empathy statements when problem behavior is maintained by other reinforcers, such as attention. For children whose problem behavior is maintained by attention, clinicians should evaluate the different kinds of attention that the problem behavior is sensitive to. If empathy statements do not serve to reinforce problem behavior, we strongly recommend that practitioners include this practice in their treatment plans.

One way to teach tacting of private events is to use public accompaniments as a basis for knowing whether the private event may be occurring. In this case, caregivers may use contexts which evoke emotional responding (e.g., denied access, preferred item removal) as opportunities to teach emotion tacts. These tacts may also function as replacement for problem behavior. So, by teaching children to tact their emotions, we could potentially decrease problem behavior because we are giving them a functional response that we can reinforce.

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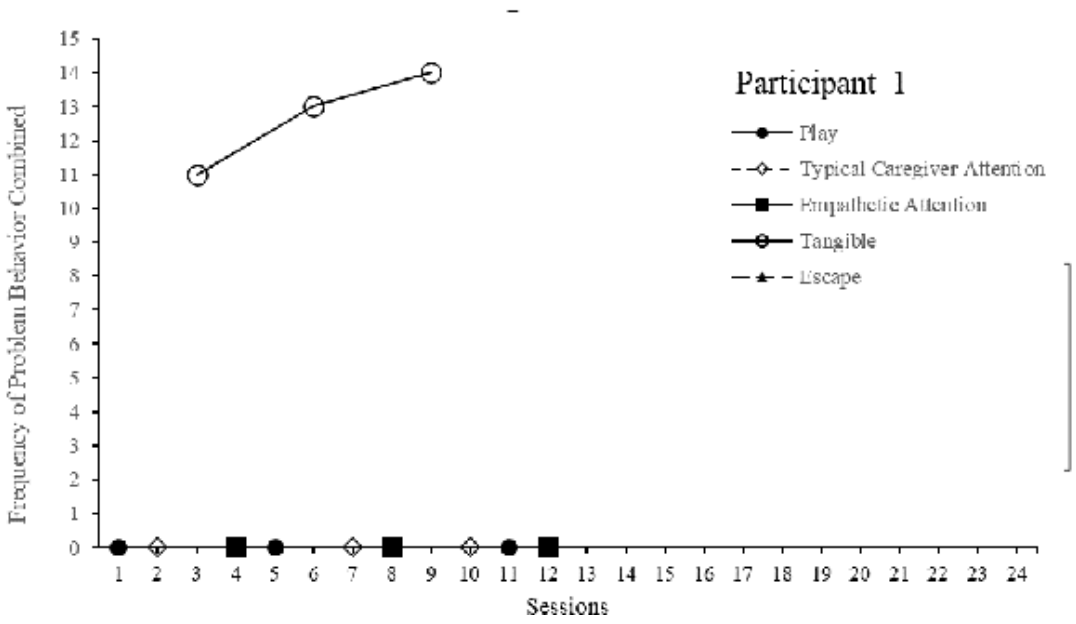
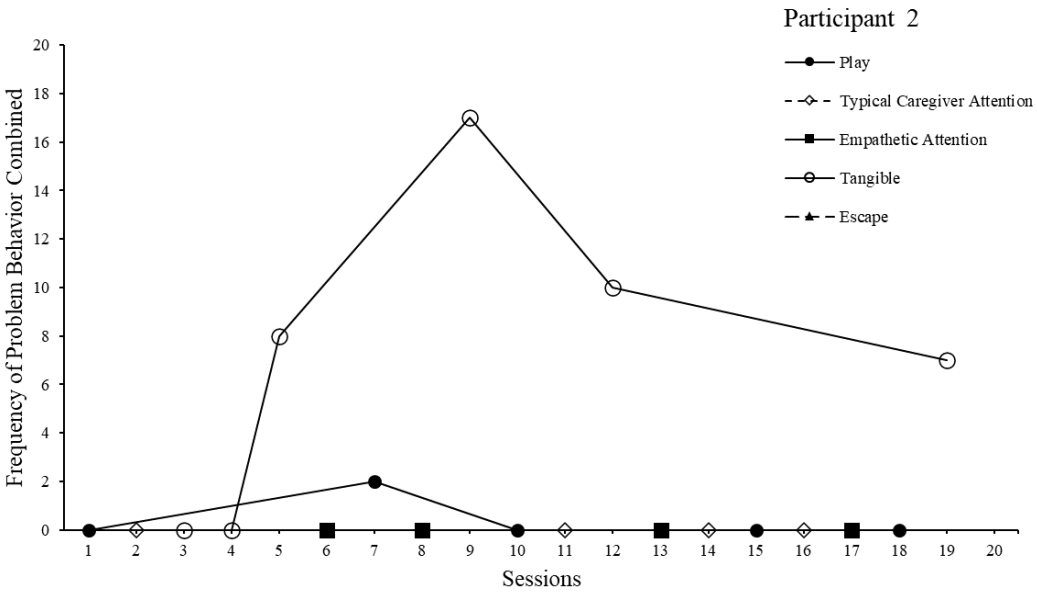
Figure 1: Graph depicting data from the functional analysis for Riley



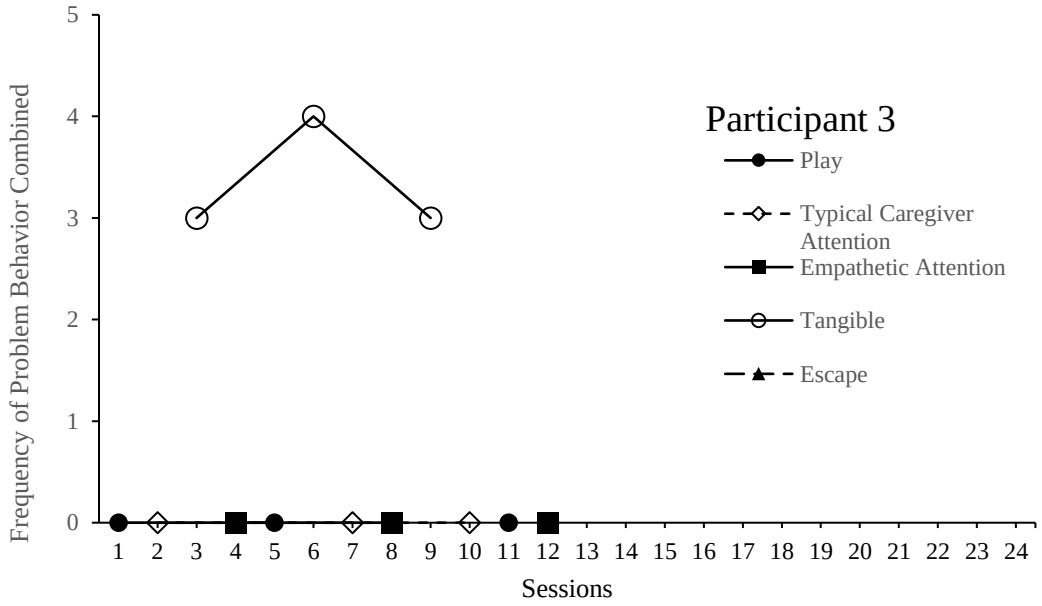
Note. Frequency of problem behavior combined during play, caregiver attention, empathetic attention, and the tangible conditions of the functional analysis.

Figure 2: Graph depicting data from the functional analysis for Bentley



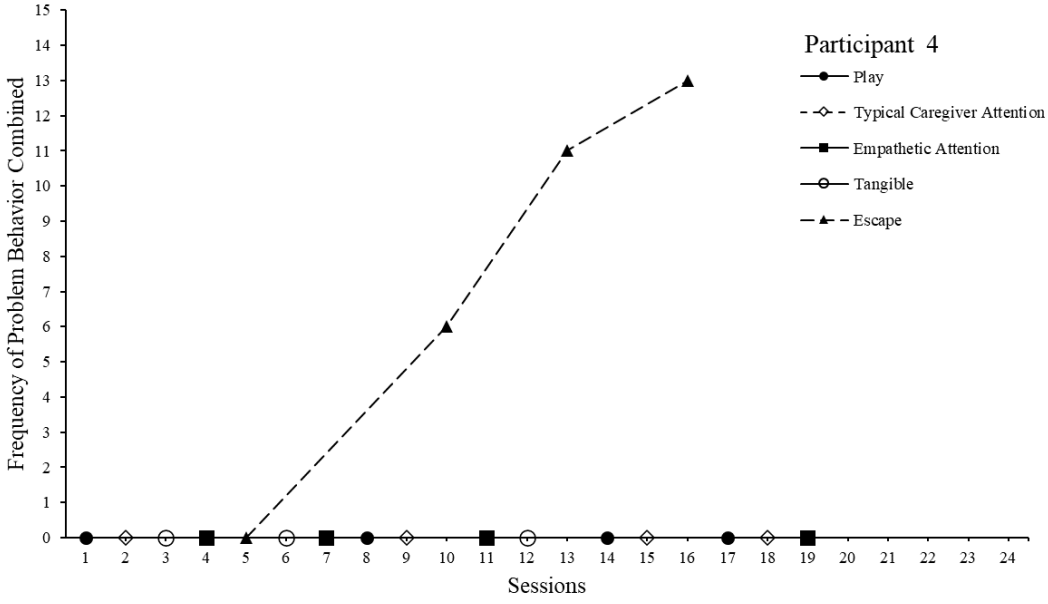
Note. Frequency of problem behavior combined during play, caregiver attention, empathetic attention, and tangible conditions of the functional analysis.

Figure 3: Graph depicting data from the functional analysis for Avery



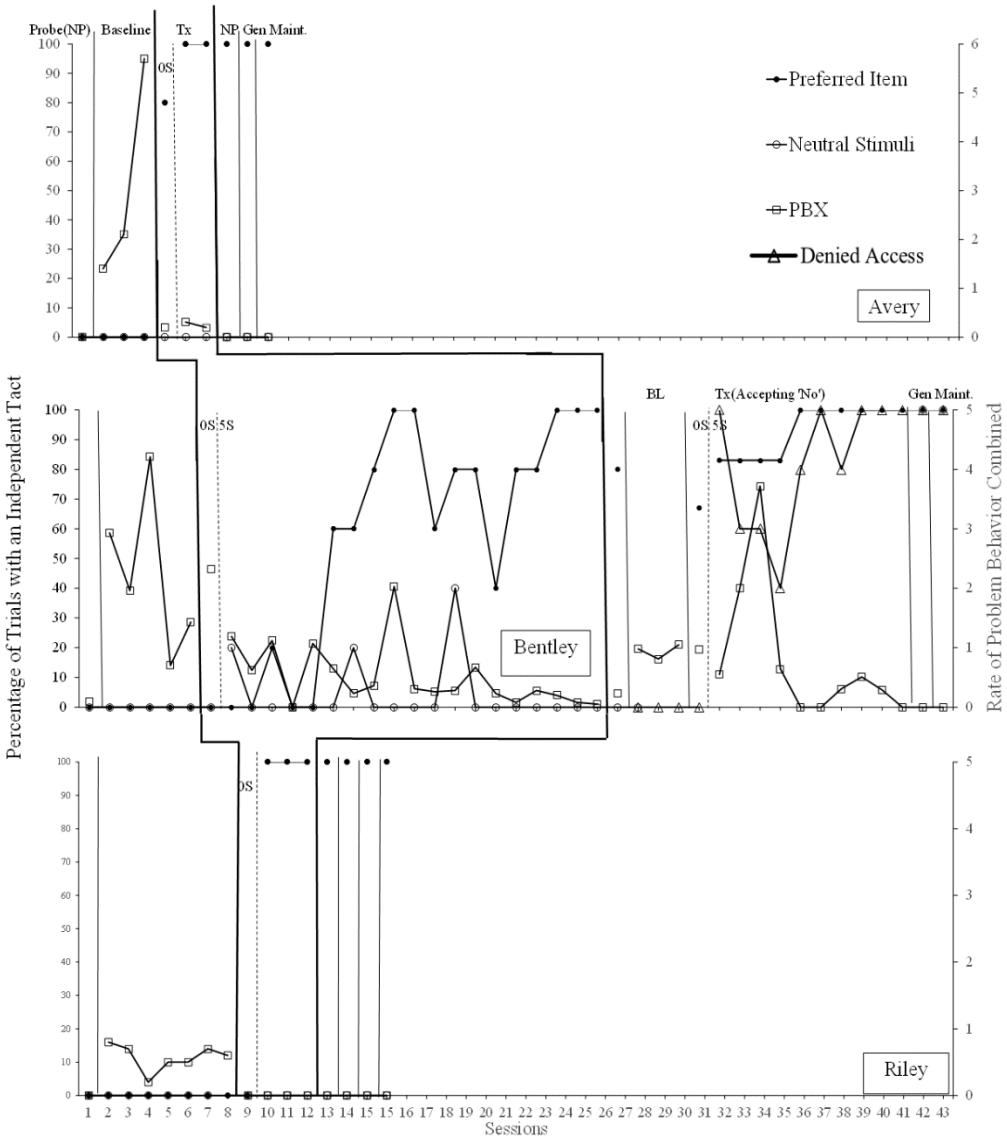
Note: Frequency of problem behavior combined during play, caregiver attention, empathetic attention, and tangible conditions of the functional analysis.

Figure 4: Graph depicting data from the functional analysis for Gunner



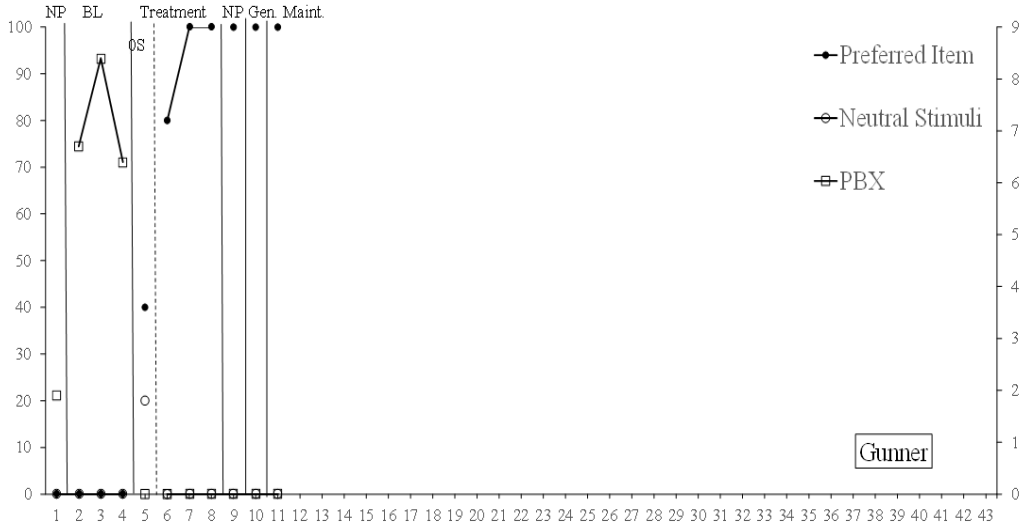
Note. Frequency of problem behavior combined during play, caregiver attention, empathetic attention, tangible conditions, and demand conditions of the functional analysis.

Figure 5: Results from emotion tact training for children that had problem behavior maintained by access to tangibles



Note. Percentage of tacts emitted are on the primary Y-axis, the frequency of problem behavior combined is along the secondary Y-axis, and the session number is along the X-axis.

Figure 6: Results from emotion tact training for children that had problem behavior maintained by access to tangibles



Note. Percentage of tacts emitted are on the primary Y-axis, the frequency of problem behavior combined is along the secondary Y-axis, and the session number is along the X-axis

Appendix

Treatment Integrity Checklist

Name of observer:	**Session number:**					**Live/ video**		**Score:_____**		
Before Session:	**Trial #1**	**Trial #2**	**Trial #3**	**Trial #4**	**Trial #5**	**Trial #6**	**Trial #7**	**Trial #8**	**Trial #9**	**Trial #10**
Therapist collected materials prior to starting the session (data sheet, preferred item(s), reinforcer(s), camera, etc.)										
During Session:										
Therapist removed the item after the appopriate time? (at least 30 seconds, no more than 2 minutes)										
Therapist followed correct procedure for prompting (0 sec for first session, 5 for following sessions (until independent))										
If child labels his/her emotion independently or after prompted (within 3 prompts), does the therapist reinforce?										
If child labels his/her emotion independently or after prompted (within 3 prompts), does the therapist provide a sympathy statement (i.e., "I'm sorry you are upset right now)?										
If the child does not respond after 3 prompts, does the therapist move on without reinforcement or attention?										
Therapist recorded data after each trial										
Therapists appropriately handled (block, ignore, etc.) problem behavior (if present)										
Therapist waited until pbx ends to present next item										

Informed Consent

Please read this consent document carefully before you decide to participate in this study. The researcher will answer any questions before you sign this form.

Study Title: The Effects of Teaching Children to Tact their Emotions on Problem Behavior

Purpose of the Study: The purpose of this study is to evaluate whether showing children with autism empathy during problem behavior will cause them to engage in more problem behavior in the future. The second purpose is to teach children with autism to label their emotions when they are upset.

Procedures:

Sessions: We will run anywhere from 5- 15 sessions each week, depending on your child's availability. We anticipate that each session will take about 10-20 minutes. We will give them breaks in between each session. The length of the study will depend on how many sessions your child can attend each week.

Preference Assessment: Before beginning research, we will show your child 5-7 items and tell them to pick one. We will let your child play with the item they chose for up to 2 minutes before removing the item and repeating these steps again with all remaining items. We will do this until all items have been picked and will use the data to figure out what items to use as reinforcers when teaching. We will also complete the same process with 5-7 snacks to determine what to use as an alternative reinforcer.

Procedures

1. Pre-test/ Post-test probes: We will do tests in the child's natural environment to see if your child will label their emotions in their natural environment when preferred items are removed. We will do this before and after intervention.
2. Baseline: We will give an item to your child for 30-120 seconds and then remove the item and record any responses (i.e., verbal, problem behavior, affect). We will do a total of 10 trials per session (5 preferred item trials and 5 neutral item trials). This is to see what your child does before the intervention is implemented.
3. Teaching: We will teach your child to label their emotions in the same manner as baseline except we will prompt your child (e.g., "Say, 'I'm angry!" or "Say, I'm sad!") when the preferred items are removed. If your child repeats the verbal response, we will praise them and give their preferred snack, regardless of whether they engage in problem behavior. We will then make a statement such as, "It is upsetting when you can't play with what you want." We will gradually

fade the prompt until your child labels their emotions on their own when they are really upset or angry and not when they are not.

4. Social Validity: When the study is complete, we will give you a survey to determine your level of comfort with the procedures used in this study. If your child has sufficient skills to fill out a picture-based survey, we will also him or her a survey to complete.

Potential Risks of Participating: In order to teach your child to label their emotions, we will have to intentionally upset them by removing a preferred item. This will likely cause them mild distress. The risks of participating are minimal given that there will be a trained therapist present with your child at all times during the research. Although the therapist will do their best to block and prevent any behavior your child engages in (e.g., aggression to self and others, destruction) from occurring, it is possible that injury can still occur. If any problem behaviors occur that are unusual in topography, intensity, or duration, we will end the session and notify the parents and case manager to determine the next steps. Because of COVID-19, there may be other risks of in-person sessions. To reduce these risks, we will follow the current precautions outlined by the university's Covid Response Team.

Potential Benefits of Participating: Your child could potentially benefit from participating in the study by learning to label their emotions in distressing situations that typically result in problem behavior. Some parenting experts have claimed that being able to label emotions can help reduce tantrums, although that remains to be seen.

Compensation:

No compensation will be given for participation in this study.

Confidentiality:

We will refer to the participants only using a pseudonym for any data and documents. Data and references will not include any personally identifying information. Raw data and documents will be scanned and stored on university-owned secure cloud storage that is password-protected and HIPAA compliant. All raw data sheets will be shredded within 1 week. All videos will be removed from the video camera within 1 week and uploaded to the cloud storage.

Voluntary participation:

Participation in this study is completely voluntary. There is no penalty for not participating. The decision to participate or not will not have any impact on you in any aspect of your life.

Right to withdraw from the study:

You have the right to take your child out of the study at any time without consequence. Your child's ABA services will not be impacted by whether or not they participate, or by withdrawing.

Whom to contact if you have questions about the study:

Principal Investigator: Haley Harber

Graduate Student

School of Behavior Analysis

(304) 972- 2936

hharber2020@my.fit.edu

Co-Investigator: Dr. Katie Nicholson

Assistant Professor

School of Behavior Analysis

` (321) 674- 8106

cnicholson@fit.edu

Whom to contact about your rights as a research participant in the study:

Dr. Jignya Patel, IRB Chairperson

150 West University Blvd.

Melbourne, FL 32901

Email: Fit_irb@fit.edu

Phone: (321) 674-8104

Agreement:

I have read the procedure described above. I voluntarily agree to participate in the procedure, and I have received a copy of this description.

<If research participants do not receive a copy of their informed consent form, they should then receive an informational sheet including at least the title of your study, along with your name and contact information, along with the contact information for the IRB.>

Participant: _____ _____

Date

_____ _____

Signature of parent/guardian Date

Principal Investigator: _____ _____

Date

Co-Investigator:_____ _____

(If PI is not present) Date

CONSENT TO VIDEO AND AUDIO RECORD FOR A MINOR

Project Title: The Effects of Teaching Children to Tact their Emotions on Problem Behavior

Primary Investigator: Haley Harber, Graduate Student

Co-investigator: Katie Nicholson, PhD, BCBA-D; Amanda Groos, M.A., BCBA

Purpose and use of recording:

The primary purposes of recordings are data collection, interobserver agreement, and treatment integrity.

Other purposes may include the following:

Training purposes for staff and other professionals

Presentation at professional conferences

Specific identifiers that will be recorded:

Participants' first names may or may not be used in recordings. (Last names will never be stated.)

Recordings will include full facial features and the bodies of participants.

People who will have access to the recording(s):

The primary investigator, co-investigator, and research assistants will be the only people that have access to the video recordings unless consent is given otherwise. Even if consent is given to use recordings for training or professional presentations, no other people will have direct access to the recordings. Recordings will be used for viewing purposes only.

Storage procedures, the storage location, and the duration of storage:

All recordings will be stored on a secure cloud-based storage program (i.e., box.com). Recordings will be deleted from the device (camera or audio recorder) within 24 hours of recording and placed in electronic storage. Video cameras containing recordings will be stored in a secured location such as an office, closet, or locked storage container.

Procedures for controlling access to and use of the recordings:

Videos will only be used in the manner in which consent is given. Should the consenting individual give permission for us to use videos for training purposes or professional presentations, external use of videos will be limited to viewing only. Copies of videos will not be made or provided to anyone.

When and how recordings will be destroyed:

All videotapes will be destroyed after a period of five (5) years by permanently deleting them from the storage location (i.e., hard drive or cloud-based storage).

I, _____, consent to the use of video and audio recordings of me and/or my child for the following purposes (please check all that apply):

_____ Data collection purposes

_____ Training purposes

_____ Professional presentations

_____ I do not give my consent to be recorded for any purpose

_____ _____

Signature of parent/guardian Date

_____ _____

Print name of participant Date

_____ _____

Signature of Witness Date

Social Validity Survey for Caregiver

Circle one: Parent/ Caregiver or Case manager **Name:**_____ **Date:**_____	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I believe teaching other children to tact emotions would be beneficial	1	2	3	4	5
2. The procedures used in this study were acceptable to me	1	2	3	4	5
3. I noticed changes in my child's behaviors **DURING** the study	1	2	3	4	5
4. I noticed changes in my child's behaviors **AFTER** the study	1	2	3	4	5
5. I have noticed the child using this new skill in different environments	1	2	3	4	5
6. I think this study could be useful for children with other disabilities	1	2	3	4	5
7. I would recommend this study to other families	1	2	3	4	5
8. Do you have any feedback for the future?					

Social Validity Survey for Participant

Questions	Yes	Sometimes	No	I Don't Know
1. What is research?				
2. Did you like this research?				
3. Did you learn anything new from this research?				
4. Do you think this research was helpful for you?				
5. What was your favorite part of the research?				
6. What was your least favorite part of the research?