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Functional Communication Training and Autism Spectrum Disorders

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Functional Communication Training and Autism Spectrum Disorders:

A Literature Review

by

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Chapter I: Introduction

Autism Spectrum Disorder (ASD) is a developmental disorder that includes deficits in communication, social skills, and restrictive/repetitive behaviors (American Psychiatric Association, 2018). According to the Centers for Disease Control and Prevention (2018), the prevalence of ASD is 1 in 59 individuals, being four times more common for boys than girls. The Autism Science Foundation (2018) indicated that autism can be detected in children by 18 months and can receive a diagnosis by the age of two. Developmental screening is the first step to diagnosing. If a child appears to be at risk, a comprehensive diagnostic evaluation is completed. Early detection signs of autism include lack of eye contact, fixation of items, and repetitive behaviors such as rocking or flapping.

Stereotypic, repetitive, and aggressive behaviors are common in children with autism. These behaviors become problematic due to the child's social inappropriateness, and the challenges they present to teachers, families, and caretakers (Fitzpatrick, Srivorakiat, Wink, Pedapati, & Erickson, 2016). According to Doehring, Reichow, Palka, Phillips, and Hagopian (2014), the term "problem or challenging behavior" is generally used to refer to behaviors such as aggression, self-injury, property destruction, pica, elopement, and other behaviors that can potentially result in injury to self or others, or that can significantly impair functioning.

Doehring et al., (2014) noted that the prevalence of behavior problems is 50% among individuals with Autism Spectrum Disorders (ASD) and related developmental disorders. There are multiple types and severity levels of problem behaviors ranging from minor to potentially life-threatening. Children diagnosed with autism are nine times more likely than other

individuals to seek emergency care due to mental health concerns which may lead to hospitalization.

While some of these behaviors are re-directable, more severe behaviors can lead to aggression or self-injury (McDonald, Moore, & Anderson, 2012). Without intervention, problem behaviors are likely to persist and may negatively impact an individual's socialization, academic growth, and adaptive skills (Fragale, Rojeski, O'Reilly, & Gevarter, 2016). Problem behaviors can also limit an individual's ability to integrate into schools and their community (Doehring et al., 2014).

Communication difficulties are not the only cause of problem behaviors; however, they can be the main reason for some individuals. Understanding social communication, environmental cues, following directions, performing self-management or organizational tasks, and developing effective expressive communication are specific skills that individuals with autism may have difficulty with (Hodgdon, 2001).

According to Hodgdon (2001), individuals with autism who have deficits in communication and engage in problem behaviors can experience improvements through the use of various interventions. Functional communication training (FCT) is an effective intervention that helps individuals express their wants and needs rather than engaging in the problem or challenging behaviors.

Functional Communication Training

In 1985, according to Battaglia (2017), Carr and Durand depicted FCT as an intervention in which specialists address the fundamental reason for a behavior and replace the behavior with a communication skill, which addresses the function of the behavior. Functional Communication

Training (FCT) is a commonly used, often recommended intervention that involves teaching a functionally equivalent communicative response to replace challenging behaviors.

Battaglia (2017) noted that the initial phase of FCT includes conducting a Functional Behavioral Assessment (FBA) to gather information to determine what maintains an individual's behavior. The information from the FBA will determine if the behavior is due to the individual trying to gain access to preferred activities or items, social attention, escape from demands or unpleasant stimuli, or access to sensory stimulation. The second step of FCT is selecting alternative communication for the individual. See table one.

Table 1

Functions of Behavior and Possible Communicative Responses

Function of Behavior	Possible Situation	Example of Communication Response
Escape/Avoid	Student engages in behavior when work is too hard.	"I need help."
Attention	Student engages in behavior to gain peer attention.	"Can you play with me?"
Sensory	Student engages in behavior when the class is too loud.	"I need headphones."
Access to Tangible	Student engages in behavior when the toy is out of reach.	"I want my toy, food, activity."

Note. Adapted from "Using Functional Communication Training to Reduce Self-Injurious" (Quest, 2016).

Individuals who have difficulty with verbal communication or have no verbal communication may use an alternative mode of communication. This may include a picture

symbol that the student hands to their communication partner (e.g., picture of favorite food in order to request it), voice-output communication aides that can produce a phrase when you press the button (e.g., Big-Mac switch), or a speech-generating device that displays pictures or a keyboard on the computer screen that can produce an auditory response (e.g., Tobii, Dynavox, or iPad communication apps like Proloquo2Go, TouchChat HD, or TapSpeak Choice) (Quest, 2016).

The last step of FCT according to Battaglia (2017) is implementing the intervention selected during the first two steps. The individual with autism is taught instruction on desired communication under various conditions and then provided opportunities to practice. Quest (2016) noted that, once the invention is selected, the process begins by prompting the individual to use communication instead of engaging in challenging behavior. “The least to most intrusive prompts are a gestural, verbal, visual, model, partial physical, and full physical.” Once the individual communicates their wants and needs, they are reinforced with their desired consequence. After multiple opportunities to practice, prompting is faded to the least intrusive, and the skills can be generalized to new locations.

Research Question

Is functional communication training an effective intervention for reducing problem or challenging behaviors for individuals with Autism Spectrum Disorders and other developmental disabilities?

Focus of Review

The focus of the paper is to review research that examines functional communication training and its effectiveness for reducing problem or challenging behaviors for individuals with

Autism Spectrum Disorders and other developmental disabilities. The studies in Chapter II consist of articles that examine the effectiveness of functional communication training. The participants in the studies ranged from 2 to 18 years of age and met the diagnostic criteria for ASD.

The databases I used to research the literature are the following: Academic Search Premier, PsycINFO, and ERIC. I used a variety of keywords with various combinations to locate literature on this topic. The keywords include: *Autism Spectrum Disorders, Autism, reducing challenging behaviors, reducing problem behaviors, improving behaviors, functional communication training.* I used information from the following websites: *American Psychiatric Association, Autism Science Foundation, and U.S. Department of Health & Human Services and the Center for Disease Control and Prevention.*

Importance of Topic

As an ASD teacher, I work with many individuals who display problem or challenging behaviors. I have experienced hitting, kicking, biting, scratching, charging, chasing, and throwing objects at staff or other students. I have also worked with students who display self-injurious behaviors such as biting, head banging, and hitting. These behaviors can lead to crises where the individual or others are severely harmed.

According to Anderson, Bucholz, Hazelkorn, and Cooper (2016), the presence of problem behaviors can result in a lower quality of life for the child and limit access to community resources. Children with developmental disorders that also show problem behaviors are at increased risk for out-of-home, residential placement. For individuals who have ASD who display challenging behaviors, everyday routines are regularly disrupted, the well-being of

family members is compromised, and financial resources are strained as the family exhausts them on extra support, medical and care visits, and crisis-related costs. Families with a child who is diagnosed with ASD and exhibits challenging behavior often have difficulty accessing supports specific to the treatment of challenging behaviors.

Definitions

Autism Spectrum Disorders (ASD). Autism spectrum disorder (ASD) is a complex developmental condition that involves persistent challenges in social interaction, speech and nonverbal communication, and restricted/repetitive behaviors. The effects of ASD and the severity of symptoms are different in each person (American Psychiatric Association, 2018).

Functional Behavior Assessment (FBA). The term Functional Behavioral Assessment (FBA) comes from what is called a “Functional Assessment” or “Functional Analysis” (FA) in the field of applied behavior analysis. It is the process of determining the cause (or “function”) of behavior before developing an intervention for behaviors that may cause disruptions at school, home, or in the community (Children’s Hospital of Philadelphia, 2016).

Problem/challenging behavior. Problem or challenging behaviors are behaviors such as aggression, self-injury, property destruction, pica, elopement, and other behaviors that can result in injury to self or others (Doehring et al., 2014).

Chapter II: Review of Literature

The purpose of this paper was to determine if functional communication training is an effective intervention for reducing challenging or problem behaviors for individuals with autism. For this chapter, I reviewed 10 studies that implemented functional communication training with individuals diagnosed with autism and other developmental disabilities to determine the effectiveness of reducing challenging or problem behaviors.

Functional Communication Training Studies

Schmidt, Drasgow, Halle, Martin, and Bliss (2014) conducted a two-part study to determine if Discrete-Trial Functional Analysis (DTFA) and Functional Communication Training (FCT) are successful in enhancing communication and reducing problem behaviors displayed by the participants diagnosed with autism and other developmental disabilities in a natural classroom setting.

Three participants diagnosed with autism and other developmental disabilities participated in this study. Ivan, a 9-year-old boy, was nonverbal and displayed problem behaviors that included throwing objects, aggression, and pica. Thomas, a 10-year-old boy, could follow one-step commands but needed prompting for daily living activities. He displayed behaviors including aggression, self-injurious behavior (SIB), elopement, fecal smearing, pica, and property destruction. The last participant, Billy, a 15-year-old individual, could communicate 100 words in a nonfunctional way and displayed echolalia. His problem behaviors include statements involving cursing, racial slurs, or sexual comments, aggression, and inappropriate touching of others' genitals.

The studies were conducted at a residential treatment facility that served individuals with developmental disabilities that had a history of exhibiting problem behaviors. The school was the only setting the studies were conducted except for generalization trials. The school consisted of eight classrooms with four students and one behavior staff member (BSM) assigned to each room.

The first part of the study examined DTFA procedures for determining the function of problem behaviors. The DTFA was completed by placing trials in each participant's natural routines. In the second part of the study, FCT was implemented based on the results of the DTFA. The purpose of the FCT study was to teach each participant a new communication form that served the same function as his problem behavior (see Table 2).

Table 2

Function of Behavior and Functional Communication

Participant	Problem Behavior	Function	Functional Communication	Number of Days to Mastery
Ivan	Food stealing Aggression	Tangible- edible Escape	Signs "eat."	30
Thomas	Food stealing Aggression	Tangible- edible	Signs "eat."	22
Billy	Inappropriate touching Cursing/sexual statements	Attention	Verbally communicates or signs "talk to me."	49

Note. Adapted from "Discrete-Trial Functional Analysis and Functional Communication Training with Three Individuals with Autism and Severe Problem Behavior" (Schmidt et al., 2014).

The first step of implementing FCT was to determine each participant's baseline. Eight to 10 trials were spread throughout the participant's classroom routine. Trials were separated by at least 10 minutes, and participants were not exposed to more than three trials per hour. The first behavior response was recorded, and the trial was terminated, so the participant's behavior did not escalate to a severe level. Baseline data indicated that all participants engaged in problem behaviors 100% of trials with zero occurrences of communication.

During the intervention phase, the therapist was near the participant while a BSM continued with the scheduled activity. General procedures consisted of presenting the antecedent condition or the presumed motivating stimulus, issuing a prompt if necessary for the participant to perform the replacement behavior (i.e., model the sign for "eat" or say "talk to me"), and delivering a consequence based on the participant's response (Schmidt et al., 2014).

The intervention phase had a mastery criterion of at least 90% for three consecutive sessions. Once participants met that criterion, they entered the maintenance phase. The maintenance phase consisted of one to two trials three times per week. These trials were conducted by the BSM's. Two participants were able to sign "eat" in various settings with numerous adults who were not involved with intervention. When provided with the 10 opportunities, both participants signed "eat" with various care providers in locations that they had not been trained during the intervention phase.

The study results concluded that Ivan met mastery of signing "eat" in 30 days, Thomas met master of signing "eat" in 22 days, and Billy met mastery of verbally communicating or signing "talk to me" in 49 days. Outcomes from the study suggest that DTFA helped identify the function of the behavior for each participant. The research also indicates that FCT successfully

provided the participants with alternative communication which replaced problem behavior that served the same function.

Boesch, Taber-Doughty, Wendt, and Smalts (2015) investigated the effects of a behavioral training package that consisted of functional communication training (FCT), and a delayed schedule of reinforcement to determine if the behavior package is useful for decreasing Self Injurious Behavior (SIB) and another challenging behavior while increasing appropriate requesting.

The participant of this study was Mike a 14-year-old individual diagnosed with autism. Mike displayed limited communication skills and exhibited self-injurious behavior (SIB) (face slapping). He preferred to wrap his wrists with weights and, when the wrist weights were not accessible, he would engage in the SIB.

The baseline data were gathered in a room at Mike's high school. The training and intervention sessions occurred in his self-contained special education classroom that consisted of 15 other students and four staff. After baseline data were collected, an FBA was conducted to determine the function of Mike's behavior. The results concluded that the SIB occurred when he did not have access to the wrist weights. After identifying the function of the behavior, FCT was implemented. Mike was taught to sign "want" to gain access to the wrist weights to replace the SIB behavior.

Training sessions included Mike engaging in activities similar to those in the baseline trials. The trainer provided wrist weights for Mike, but he was unable to reach them. When Mike reached for the wrist weights, the trainer hand-over-hand prompted Mike to sign "want." Before gaining access to the wrist weights, the trainer verbally and physically prompted Mike to practice

signing. Mike would then have access to the wrist weights for two minutes. The mastery criterion was for Mike to sign “want” with 100% accuracy with no more than one verbal prompt for three consecutive occasions.

An A-B1-B2-B3-B4 design was used to demonstrate the impact of the intervention for reducing SIB. The process to progress from Phase B1 to B3 required that Mike exhibit no SIB for one session. The requirement to progress from Phase B3 to B4 needed low rates of SIB through observations of data. Completion of Phase B4 required no SIB for two consecutive sessions.

During Phase A, Mike displayed SIB an average of 49% of intervals per session. In Phase B1, the intervals with SIB increased to an average of 64% but, during Session 11, the SIB decreased to an average of 0% of intervals per session, which met the criteria for advancing to Phase B2. In Phase B2, after four intervention sessions, the SIB decreased to an average of 33% of intervals per session, which resulted in advancement to the next phase. In Phase B3, the SIB was an average of 4% of intervals per session. During the last intervention, wrist weights were removed, and a wristband was introduced. The criterion for Phase B4 was changed to a level of no occurrences of SIB for two subsequent sessions, and the other intervention procedures remained the same. In the first session of Phase B4, the SIB’s increased to an average of 21%, but the remainder of the sessions decreased to 0% intervals per session.

The intervention used in this study placed SIB on extinction, provided Mike with communication “want” and access to wrist wrapping on a fixed-interval schedule. Mike engaged in high-frequency SIB and did not appear to have the ability to request the wrist weights before the intervention. Once the intervention was introduced, it took six weeks for the SIB’s to reach

0%. While there was a decrease in the SIB's, the authors of the study noted that it is unclear whether a single component of the training package was responsible for the reduction of SIB.

A study conducted by Rispoli, Camargo, Machalicek, Lang, and Sigafoos (2014) examined the function of problem behavior associated with changes in routine. The study included three young children with autism, and the purpose was to evaluate the effectiveness of FCT and schedule thinning as a treatment of problem behaviors.

There were three participants in this study. The first was Timmy, a 4-year-old boy who was diagnosed with pervasive developmental disorder not otherwise specified. He had the ability to communicate using short phrases. The next participant John was a 3-year-old boy who had a diagnosis of ASD. During the study, John had communication skills, but they were not functional, so he was learning to communicate using the picture exchange communication system. The third participant, Diego, was a 3-year-old boy who was diagnosed with pervasive developmental disorder not otherwise specified. Diego was administered the Autism Spectrum Rating Scales (ASRS) which placed him at a very elevated risk for having an ASD. Diego could verbally communicate, was bilingual and received services at the autism clinic in both Spanish and English.

A functional analysis was conducted to determine the function of behavior related to changes in routine for each participant. Sessions took place three days per week, with no more than four sessions per day. Each session lasted five minutes. Data were collected on 10-second intervals the individual engaged in the target problem behavior. Partial-interval recording was used to collect data on the frequency of the replacement response during each session for both the functional analysis and treatment phases.

After the functional analysis, participants were taught communication responses that were functionally equivalent to their problem behavior. For each participant, the communicative response was saying, “I don’t want that,” or handing the implementer an index card with an image of the universal “no” symbol. Immediately before the treatment session, the implementer said, “If you don’t want me to [interrupt target routine] then say, ‘I don’t want that,’ or hand me this card.” After this statement, the session began (Rispoli et al., 2014).

During the intervention phase, the implementer interrupted the target ritual for each participant and then prompted the replacement communication using most to least intrusive prompts. The implementer then praised the participants for using replacement communication. This intervention trials sustained until the participant’s target problem behavior met the criterion. The criterion was for each participant to reach 95% below baseline levels for five consecutive sessions.

During baseline sessions, Timmy engaged in problem behavior when rituals were interrupted while he was watching television, playing on the computer, and coloring. When interrupted while watching television, he engaged in problem behaviors an average of 74% of the intervals; when interrupted while playing on the computer, he engaged in problem behaviors an average of 57% of the intervals; and, when interrupted while coloring, he engaged in problem behaviors an average of 67% of the intervals. After implementing the interventions of FCT and extinction, when Timmy was interrupted while watching television, he engaged in problem behaviors an average of 0.9% of the intervals, and when interrupted while playing on the computer, he engaged in problem behaviors an average of 4% of the intervals. Problem behaviors no longer occurred when Timmy was interrupted while he was coloring.

During baseline sessions, John engaged in problem behaviors when his routines were interrupted while he was putting puzzles together, playing with letters, and playing with blocks. When the implementer interrupted him while he was putting puzzles together, he engaged in problem behaviors an average of 50% of intervals, while playing with letters he engaged in problem behaviors an average of 51% of intervals, and while playing with blocks he engaged in problem behaviors an average of 45% of intervals. After implementing FCT and extinction, his problem behavior dropped to an average of 0.06% of intervals when he was interrupted while putting puzzles together, and he engaged in problem behaviors an average of 4% of intervals while playing with letters. Problem behaviors did not occur when he was interrupted while playing with blocks.

During baseline sessions, Diego engaged in problem behavior when his routines were interrupted while reading books, playing with trains, and playing on the computer. When he was interrupted while reading books, he engaged in problem behavior an average of 37% of the intervals. When he was interrupted while playing with trains, he engaged in the problem behaviors an average of 22% of the intervals and, when he was interrupted while playing on the computer, he engaged in problem behaviors an average of 44% of the intervals. After FCT and extinction were implemented, Diego engaged in problem behavior when interrupted while reading books an average of 0.09% of intervals, when interrupted while playing with trains he engaged in problem behavior an average of 0.05% of intervals, and, when interrupted while playing the computer, he engaged in problem behaviors an average of 0.06% of intervals.

Outcomes of the functional analyses established that when the participant's access to rituals was interrupted all three participants engaged in problem behavior. Treatment with FCT,

and extinction increased appropriate communication, and there was a decrease in problem behavior when routines were interrupted. These results continued during the schedule-thinning phases, and generalization occurred for one participant.

A study conducted by Wacker et al. (2013) examined the effectiveness of FCT via telehealth reducing problem behaviors for individuals diagnosed with autism. This study included 17 participants between the ages of 29 months and 80 months who displayed problem behaviors. Two participants required two FCT's, so 19 treatments were conducted. During this study, participants' parents served as therapists during all FCT procedures. The parents received training from a behavior consultant.

A Functional Analysis (FA) was conducted to determine the function of the problem behavior for each participant. Upon completion of the FA, FCT was conducted. Parents and on-site support conducted FCT within multiple baseline designs which consisted of three to seven sessions. The participants' parents identified the target problem behaviors that included aggression, self-injury, property destruction, screaming, elopement, repetitive behavior, and dangerous behavior. Video conferencing software for data collection was used during all procedures.

Parents went to their regional Child Health Specialty Clinics (CHSC) weekly for one-hour visits. During this time, data were collected, and parents received training from the behavior consultant to assist them with FCT. During these visits, FCT sessions were conducted for all 17 children. Baseline data determined that all participants engaged in problem behaviors an average of 97.37 % of intervals.

The FA established that the escape function was the result of problem behaviors for 13 participants. The FCT for the escape function consisted of having a child complete a task and then request a break. Once the individual requested the break, they received the reinforcement of a preferred toy for one to two minutes. The session began by the parent allowing the child to engage with the preferred toy for 30 seconds. Next, the parent would indicate “it’s time to work, you can have your toy after.” The parent would then direct the child to a designated work area and model a task. If the child completed the task, they received praise. If the participant did not complete the task, the parent would hand-over-hand prompt them to complete the task.

According to the Tennessee Behavior Supports Project at Vanderbilt University (2019), hand-over-hand prompting is a full physical prompt which involves physically guiding an individual to the correct response. For the participant to receive the one- to two-minute break, they needed to complete the task independently. The initial sessions required the completion of two tasks during two trials. Upon mastery, the tasks were increased to 10 work tasks.

The results of the FA also indicated that five of the participants engaged in problem behavior due to a tangible function, and one participant engaged in problem behavior due to an attention function. These FCT trials were conducted in similar form to the other participants. For the tangible function, participants requested a toy, and they were required to wait one to two minutes until receiving the toy. During the attention function, the participant would request to play and then wait one to two minutes for his mother’s attention. It was asked that parents practiced all FCT trials 10-15 times per day.

The results concluded that problem behavior across all 19 FCT treatments was reduced by an average of 93.5 % and every participant demonstrated a reduction in problem behavior by

at least a 68.7 %. The average treatment was completed in 13 weeks and averaged 21 sessions needed. The results suggest that FA and FCT via telehealth are an effective treatment for reducing problem behaviors for children with autism.

Anderson, Barretto, McLaughlin, and McQuaid (2016) conducted a study to determine if functional communication training (FCT) is effective in reducing problem behaviors (tantrum and aggression) for one individual diagnosed with autism spectrum disorder. Johnny, a 5-year-old boy, was selected for this study due to engaging in behaviors that caused challenges in the home and public places. His behaviors also created dangerous situations for his siblings. The study was conducted at the Gonzaga University clinic as well as in the participant's home. The clinician met with Johnny once or twice per week. On occasion, family members were present during the meetings.

A functional analysis was conducted to determine the function of the participant's problem behaviors. The functional analysis consisted of five conditions, and the sessions were five minutes in duration. The first condition was free play. During this condition, the participant was permitted access to any toy or activity and provided attention from others in the room. The free play condition was run in both the clinic as well as in the home. During the baseline free play sessions, Johnny displayed tantrum behaviors an average of 1% of intervals and an average of 0.05% for aggressive behaviors.

The escape function was the second condition. During this condition, the participant was prompted to complete a task such as cleaning up toys. If he did not complete the task after two verbal prompts, hand-over-hand prompting was provided to complete the task. Dependent upon problem behavior, Johnny was allowed a break from the task. After 15-20 seconds, the hand-

over-hand prompting was provided again. During the escape sessions, tantrums were observed an average of 12% of intervals and aggression occurred an average of 4.7% of intervals.

The next condition was the “Johnny” condition. Johnny was allowed access to any toys or activities and had attention from others present. Contingent upon problem behavior, a toy or activity was presented to distract Johnny, if the name Johnny was not said for 20 seconds. This was due to Johnny engaging in problem behaviors when he was called by his name. During the “Johnny” sessions where Johnny was allowed access to items, he displayed tantrum behaviors an average of 0.7% intervals and aggression an average of 0.7% intervals.

The tangible function was the fourth condition. During this condition, Johnny was permitted access to any toys or activities in the environment. The toy was then removed with the implementer saying, “my turn.” Any time that Johnny tried to gain access to the toy this procedure was repeated. Contingent upon problem behavior, Johnny was provided with the toy or activity for 20 seconds. During the baseline tangible sessions, Johnny displayed tantrum behaviors an average of 20.5% of intervals and an average of 10.2% of intervals for aggressive behaviors.

The last condition was the attention condition. During this condition, Johnny was given access to any toy or activity; however other individuals in the room ignored him. Contingent upon problem behavior, attention was given to Johnny by the adults for 20 seconds. After 20 seconds, Johnny was instructed to “go play,” and the planned ignoring continued. During the attention sessions, Johnny displayed tantrum behaviors an average of 1% of intervals and aggression an average of 0.4% of intervals.

An ABABCDEF G reversal design was used in this study to evaluate the treatment developed from the functional analysis. The five conditions were used while gathering baseline data over seven sessions. Following the FA and determining the conditions, the FCT intervention was implemented. The FCT intervention was a card that said, “my turn.” During sessions, Johnny was given access to toy or activity. The implementer would remove the toy or activities saying “my turn” presenting the card to Johnny. When Johnny touched the card, he was provided with the toy or activity for 20-30 seconds. Once Johnny mastered touching the card upon removal of the toy or activity, the implementer delayed providing him with the toy or activity. The implementer would set a timer and require him to wait. The implementer began with five seconds and eventually progressed to five minutes.

After the treatment was implemented, Johnny displayed aggressive behaviors an average of 2.2% of intervals and tantrum behaviors occurred an average of 3.9% of intervals. Upon returning to baseline for one session, tantrum behaviors occurred an average of 18% of intervals and aggression at an average of 22% of intervals. During FCT with a 15-second time delay tantrum, aggressive behaviors occurred at an average of 0% of intervals. During FCT with a 30-second time delay, tantrum behaviors occurred at an average of 28.7% of intervals, and aggressive behaviors had occurred an average of 1% of intervals. During FCT with a 30-second time delay, tantrum and aggressive behaviors occurred an average of 0% of intervals. Last, during FCT with a 90-second time delay, Johnny displayed tantrum and aggressive behaviors at an average of 0% of intervals. During the FCT with a 5-minute time delay, while taking turns with his brother, there were zero occurrences of problem behavior or aggression.

The study was conducted to determine if FCT and time delay were successful in reducing problem behaviors for an individual with autism. The results of this study suggest that FCT helped decrease problem behaviors and increased the use of appropriate communication. The participant also gained tolerance to waiting for desired items after requesting them.

A study by Fragale et al. (2016) investigated whether FCT could reduce challenging behaviors for individuals with autism. Four participants with ASD participated in the study. Mark, the first participant, was a 9-year-old boy who was diagnosed with autism. Mark could request three to five preferred items using one-word verbal expressions and could follow one-step directions that were part of his routine in the classroom. Occasionally he communicated by leading adults by the hand to the item he wanted. Mark's challenging behaviors included engaging in aggression and SIB (head slapping and biting).

The next participant, Luke, was a 5-year-old boy who was diagnosed with autism. Luke spoke fluently, requested preferred items, followed multiple step directions, and scripted storylines from television shows and movies. Luke engaged in behaviors including elopement, flopping, and whining.

Nathan, the third participant, was a 4-year-old boy who was diagnosed with autism. Nathan spoke in two- to three-word phrases and could follow one-step directions. Nathan engaged in challenging behaviors that included vocal protesting, physical protesting, aggression, and elopement.

Last, Corey was a 4-year-old boy who was diagnosed with autism and apraxia. Corey was able to speak in short phrases, but, due to his apraxia, he was difficult to understand. Therefore, Corey used a communication device to communicate his needs. Corey was able to follow one-

step directions in his classroom. Corey's challenging behaviors included engaging in eloping behaviors.

A functional analysis was conducted for each participant to determine what condition was sustaining the challenging behaviors. Each participant was exposed to five sessions that included four conditions in an alternating format using a multi-element design. The four conditions included attention, demand, tangible, and play. Sessions were 10 minutes in duration for Luke and Mark. Nathan's sessions were a duration of 5 minutes, and Corey's were two-minute sessions.

Baseline data indicated that Mark engaged in an average of 93% of challenging behaviors during the intervals. Luke engaged in challenging behaviors an average of 90.5% of the intervals. Nathan engaged in challenging behaviors for an average of 98% of the intervals and Corey engaged in challenging behaviors an average of 97% of the intervals. Data were collected with frequency recording by observers.

This study used a multi-element design and participants were exposed to two conditions: FCT or no FCT. Following each condition, the participants entered into a 15-minute instructional session. When the session began, participants were provided with access to their preferred item for 30 seconds to one minute. The item was then moved out of the participants reach but remained within sight. The participant was given 30 seconds to request for the item independently. If the participant did not make the request, a prompt was provided. Once the participant requested the item (prompted or unprompted), the therapist would provide the participant with the preferred item for three to four minutes. The duration of FCT trials continued

by age or learning style, or until the participant lost interest in the preferred item. If the participants engaged in challenging behaviors during the sessions, the behaviors were ignored.

Following the FCT condition during academics, all participants exhibited fewer challenging behaviors. The participants exhibited higher challenging behaviors following the no FCT condition. Mark engaged in an average of 0.4 challenging behaviors per minute during academics following FCT. During academics, he engaged in an average of 0.6 challenging behaviors per minute when there had been no FCT. When FCT was provided before academics for Luke, he engaged in an average of 0.1 challenging behaviors per minute. When there was no FCT before academics, Luke engaged in an average of 2.3 challenging behaviors per minute. For Nathan during FCT, exhibited an average of 15.9% of challenging behaviors per session. Without FCT, Nathan engaged in an average of 24.4% of challenging behaviors per session. Corey engaged in an average of 9.5% of challenging behaviors per session when provided with FCT. Without the presence of FCT, Corey exhibited an average of 36.1% of challenging behaviors per session.

This study examined whether or not FCT would decrease challenging behaviors for four participants diagnosed with autism. The method included conducting a functional analysis combined with FCT. The results suggest that FCT reduced challenging behaviors for the participants in this study.

A study conducted by Langdon, Carr, and Owen-DeSchryver (2008) examined if a precursor behavior and problem behavior would serve the same function. Next, they examined communication-based intervention, applied dependent on the precursor behavior, and its effect of reducing the occurrence of problem behavior for individuals with autism.

This study included three participants. The first participant, Timmy, was a 6-year-old boy diagnosed with autism that had an IQ of 32. He used the Picture Exchange Communication System (PECS) to communicate his wants and needs. Sally, the second participant, was a 7-year-old girl that had an IQ of 64. The authors noted that she had ASD characteristics. Sally used one-word utterances to communicate. Jake was an 18-year-old individual diagnosed with autism and had an IQ of 30. Jake used picture symbols and sign language to communicate. Occasionally, Jake could utter single words. The participants all had a history of displaying severe problem behavior.

Timmy displayed precursor behaviors that consisted of hand posturing. He displayed problem behaviors that included self-injury, defined as biting his hand, hitting his chin with his wrist, hitting his head, banging his head, throwing his body back into a chair, or hitting his hands on furniture or other hard objects. Sally displayed precursor behaviors that consisted of high-pitched vocalizations, squealing, grunting, or whining. She displayed problem behaviors including aggression, consisting of biting, scratching, or hitting others, and self-injury, defined as biting her wrist. Jake displayed precursor behaviors that consisted of abrupt, jerky body movements involving his head, arms, legs, or shoulders. He displayed problem behaviors including SIB defined as hand biting.

The study consisted of four components. First, participants were selected. Second, a descriptive analysis was conducted to examine the relationship between the precursor behavior and problem behavior for the participants. During the third component, an investigation was conducted to explore the relationship between precursor behavior and problem behavior. Last,

functional communication relevant to the precursor behavior was selected to reduce the existence of the problem behavior.

During the first component of the study, participants were identified to determine the motivation for displaying problem behaviors. Classroom staff completed an interview that provided information about the problem behaviors as well as when they are likely to occur. Next, a Functional Analysis Interview Form was used to interview staff to determine the function of each participant's problem behaviors. Based on the results, escape was determined to be the function of the problem behaviors for each participant.

The purpose of the second component was to document the relationship between precursor behavior and problem behavior for each participant. The second component was completed through direct observations. The observations occurred in the school setting. Four 20-minute observations were videotaped in environments where the problem behavior would likely happen based on the information from the functional analysis interview.

The third component examined whether or not there was a relationship between precursor behavior and problem behavior. The participants were exposed to potential trigger stimuli.

Finally, during the fourth component, an appropriate communication intervention was chosen for each participant. Timmy and Sally used a PECS break symbol. Sally would occasionally verbally request a break. During intervention sessions, the PECS symbol was positioned in front of each participant on the table. For Jake, a picture of a "stop" sign was used as his communicative response. While on the treadmill the "stop" sign was placed in front of Jake.

This study utilized an ABAB reversal design. In Phase A, the precursor behavior and problem behavior were reinforced with a 30-second break. Only the problem behavior was reinforced in Phase B. In Phase B when the precursor behavior occurred, the participant was prompted to communicate. During Phase A, problem behavior was the only component reinforced. During this phase, reinforcement was provided for both communication and problem behavior.

During the intervention phase, there were one to six sessions conducted per day. The sessions generally occurred three to five days per week. The total number of sessions conducted was 14 sessions for Timmy, 15 sessions for Sally, and 12 sessions for Jake. Sally and Jake were in classrooms similar to their natural classroom environment during demand sessions. Jake participated in gross motor activities that involved exercise at a community residence during demand sessions.

For each participant, during sessions, least to most intrusive verbal, gestural, or physical prompts were used. During sessions, each participant would receive a verbal cue; if the participant responded incorrectly, the experimenter would respond with a prompt. After a task was presented, the session would end after 30 seconds. After a 30-second break, the experimenter would place another demand on the participant.

During the FCT phase, Timmy was taught to use a break symbol to communicate that he wanted a break. In Phase A, Timmy displayed problem behavior an average of 20.0 times per session and did not display communication. In Phase B, Timmy exhibited problem behavior an average of 3.0 instances per session, and he displayed communication an average of 10.0 instances per sessions.

Sally, during the FCT phase, was taught to use a break symbol. Sally could verbally communicate and often when she needed a break, she would say “break.” Throughout Phase A, Sally displayed problem behavior an average of 12.0 times per session and displayed communication an average of 2.0 times per session. During Phase B, Sally exhibited problem behavior an average of 2.0 times per session and displayed communication an average of 15.0 times per session.

During the FCT phase, Jake was taught to touch a “stop” sign to request a break. In Phase A, Jake displayed problem behavior an average of 7.5 times per session, and he did not display communication. During Phase B, problem behaviors did not occur, and Jake communicated an average of 4.0 times per session.

This study examined whether or not there is a relationship between precursor behaviors and problem behaviors, and whether or not FCT would be useful in reducing problem behaviors for three individuals. The results indicate that for each participant, problem behaviors were reduced after the implementation of the FCT, concluding that the intervention was effective.

Olive, Lang, and Davis (2008) examined the effects of Functional Communication Training (FCT) and a Voice Output Communication Aid (VOCA) on language development and challenging behavior. The participant of this study was a 4-year-old girl diagnosed with autism spectrum disorder. Kerri’s communication consisted of engaging in echolalia, fixating on topics of her interest, and reversing pronouns. Kerri’s challenging behaviors included elopement, screaming, hitting, biting, and mouthing materials.

A functional analysis was conducted to determine the function of Kerri’s challenging behaviors. The results indicated that she engaged in the behaviors when her mother was doing

household chores and her attention was not on Kerri. Once the function of behavior was determined, the experimenters selected an aid to help Kerri communicate. The experimenters chose a VOCA which consisted of four buttons with pictures of activities linked with Kerri's pre-recorded message requesting attention.

During baseline sessions, Kerri was prompted to engage in an activity alone while her mother completed chores. During these sessions, the VOCA was present; however, Kerri did not receive any reinforcement or prompting to use it. If Kerri engaged in challenging behavior during the baseline sessions, her mother asked her to stop.

A multiple probe design was used in this study across four different activities. Before the intervention phase, Kerri's mother received training on FCT and was provided opportunities to practice before sessions. Intervention sessions were five minutes, and frequency data were collected when challenging behaviors and targeted behaviors of using the VOCA were occurring.

During the intervention sessions, Kerri's mother informed her that she was leaving, and left the activity that Kerri was completing. Kerri's mother would then return immediately and prompt Kerri to push the button on the VOCA that corresponded with the activity. Once Kerri hit the button, her mother would return to the activity and repeat the VOCA message. Most to least intrusive prompts were used during the intervention phase.

During baseline sessions, Kerri displayed challenging behaviors an average of 8.7 times per minute while working on an art activity, 4.3 times per minute while reading, and 2.8 times per minute while putting puzzles together. During the FCT phase, Kerri exhibited zero challenging behaviors. Kerri's ability to make requests also increased during the FCT phase. During baseline, Kerri did not make any requests while reading. During FCT, she requested an

average of 3.6 times per session. During baseline, while completing an art activity, Kerri did not make requests. During the intervention phase, she requested an average of 2.9 times per session. While putting puzzles together during baseline, Kerri made an average of 2.9 requests per session, and during the intervention phase, she requested an average of 2.5 times per session.

This study examined whether or not FCT through the use of a VOCA would be a successful intervention for reducing challenging behaviors for an individual with autism. The results of this study suggest that FCT using a VOCA was an effective intervention for the participant. After FCT was implemented, the participant's challenging behaviors decreased and her ability to make requests increased.

Falcomata, Muething, Gainey, Hoffman, and Fragale (2013) examined functional communication training (FCT) paired with a chained schedule of reinforcement to reduce challenging behaviors displayed by individuals with autism. There were two participants in this study. The first participant, Alonzo, was a 7-year-old boy who was diagnosed with autism. He was able to use approximately 100-word utterances, although during the study it was noted that he rarely used appropriate communication to make requests. Alonzo's challenging behaviors consisted of aggression and disruptive behaviors such as inappropriate vocalizations and throwing objects at people.

The second participant, Joe, was a 12-year-old boy who was diagnosed with autism. Joe was able to use approximately 50-word utterances, but during the study, he did not display appropriate communication to make requests. His challenging behaviors consisted of aggression and self-injurious behaviors.

A functional analysis was conducted to determine the function of the challenging behavior for each participant. Escape, attention, tangible items, and free play were the conditions that were considered. During the free play condition, Alonzo did not engage in any challenging behaviors. During the escape condition, he engaged in an average of 3.7 challenging behaviors per minute and during the tangible condition he engaged in an average of 1.4 challenging behaviors per minute. During the attention condition, he engaged in an average of 0.3 challenging behaviors per minute.

Joe also did not engage in any challenging behaviors during the free-play condition.

During the escape condition, he engaged in an average of 0.5 challenging behaviors per minute.

Joe engaged in an average of 0.2 challenging behaviors per minute during the attention condition, and he engaged in an average of 0.6 challenging behaviors per minute during the tangible condition.

During baseline, before beginning the session, the therapist provided the participant with access to highly preferred activities paired with attention for one minute. When the session started, the therapist removed the highly preferred activities and told the participant, "It is time to work." The therapist then removed their attention and provided a gestural prompt. If a challenging behavior occurred during the session, the therapist removed the work for 30 seconds and allowed access to a preferred item for 30 seconds before beginning another trial. Any requests by the participant made during this time were ignored.

A reversal (ABAB) design was used in this study to evaluate FCT and delay training. Once baseline data were collected, the intervention was selected. For each participant, the intervention consisted of a wrist band that provided access to all preferred reinforcers. The FCT

sessions began with the participant having access to a preferred activity for one minute. Next, the therapist presented the antecedent such as a work task and restricted attention. The therapist wore the wristband during the trials. The therapist then prompted each participant to request for the wristband and then provided the preferred reinforcer to the participant.

Following FCT, delay training was incorporated. These trials were similar to the FCT trials; however, a timer was set for five minutes, the therapist wore the wristband during that duration of time, and it was expected that the participant engaged in the non-preferred activities presented. If the participants were off task for five seconds, the therapist would gesturally prompt the participant. If the participant continued off-task behavior for another five seconds, the timer was stopped. When the participant successfully requested the wristband and waited five minutes, the participant was given immediate access to the wristband and preferred activities for 30 seconds.

The final phase of this study included the FCT and a chained schedule. During this phase, the trials were similar to the FCT phase, but also, when the five-minute timer went off, and the participant requested the wristband, the wristband was placed on the participant's wrist. The participant was not provided with immediate reinforcement but was required to continue the non-preferred task. When wearing the wristband and requesting for preferred items, the therapist provided the preferred items to the participant. During this phase, challenging behaviors were ignored.

Alonzo engaged in elevated levels of challenging behavior during the combined antecedent baseline sessions. He engaged in an average of 1.2 challenging behaviors per minute and did not make requests for the wristband. Alonzo engaged in low levels of challenging

behaviors during the FCT plus chained schedule condition displaying an average of 0.6 challenging behaviors per minute and displaying elevated levels of requests for the wristband an average of 0.3 requests per minute.

Joe engaged in elevated levels of challenging behavior during the combined antecedent baseline sessions displaying an average of 1.7 challenging behaviors per minute, and he exhibited zero levels of requests for the wristband. During the FCT with the combined chained schedule, Joe displayed zero levels of challenging behavior and made requests for the wristband an average of 0.2 times per minute.

This study examined if FCT and a chained schedule would be a successful method for reducing challenging behaviors for two individuals. The results of the study demonstrate that FCT combined with a chained schedule is useful for reducing challenging behaviors for individuals with autism.

Strand and Eldevik (2018) conducted a study with a combined treatment of functional communication and delay-tolerance training. The study was conducted to determine if the combined treatment would reduce problem behaviors for an individual with autism. The participant of this study was John, a 4-year-old boy diagnosed with autism. John could request, label items, imitate two- to three-word sentences and follow two-step directions. John also displayed vocalizations which were not understood by others. This resulted in John engaging in problem behaviors. John displayed problem behaviors including loud vocalizations, screaming or crying, disruption, and throwing objects.

Before the functional analysis, the parents completed an open-ended functional assessment interview. After gathering the information from the interview, a functional analysis

was completed to determine the function of the problem behaviors. The results of the FA indicated that the problem behavior occurred due to being restricted or being denied access to attention or tangible items. Escape was identified as another function.

After the functional analysis, an intervention was selected for functional communication training. It was determined that the problem behavior would be replaced with John saying, "I want x please." FCT sessions consisted of five-minute trials in which the instructor removed preferred stimuli every 30 seconds. If John displayed a problem behavior after the removal of the stimuli, a vocal prompt was provided by the instructor, and the stimuli were returned. Once John met mastery criterion of displaying simple, functional communication responses (FCR) at least 80% of the removals over three consecutive sessions with two different instructors he would move to the next phase of complex FCR.

The complex FCR phase consisted of John gaining an adult's attention before making a request. The complex FCR involved John walking up to an adult, saying, "Excuse me" and then waiting for the adult to acknowledge him. Once the adult acknowledged him, he was able to provide the FCR. When John was able to emit the simple and complex FCR over three sessions and two instructors, the next phase was introduced.

Denial and delay tolerance training was the next phase to introduce. During this phase, the preferred stimuli were removed, and John emitted the FCR's. The adults would tell John, "No" and in the treatment phase John was taught to respond with, "Okay."

During baseline, John did not display simple FCR, complex FCR, or tolerance responses and he exhibited problem behaviors an average of 2.5 instances per minute. During the first treatment phase, problem behavior was replaced by simple FCR. Across the simple FCR phase,

problem behavior reduced to an average of 0.7 times per minute and simple FCR was increased from not occurring to occurring an average of 1.5 times per minute. In the second treatment condition, problem behavior decreased to an average of 0.7 times per minute. Complex FCR replaced simple FCR during this phase, and complex FCR increased from an average of zero to 1.1 times per minute. Complex FCR increased from a mean of 0 instances per minute to an average of 1.1 instances per minute.

Last, in the denial and delay tolerance response training phase, problem behavior decreased to near zero, and tolerance responses increased to an average of 0.7 times per minute. John continued to use simple FCR an average of 0.7 times per minute and complex FCR an average of 1.3 times per minute.

This study examined the effects of FCT paired with denial-tolerance training for one individual. Based on the results of this study, it is concluded that the FCT with denial-tolerance training was an effective intervention for reducing problem behaviors and increasing requests for the participant.

Conclusion

In Chapter II, I reviewed 10 studies that implemented Functional Communication Training with individuals diagnosed with autism and other developmental disabilities. Each of the studies conducted a functional analysis to determine the cause of problem behavior for each participant. After the functional analysis, functional communication training was implemented. Each of the 10 studies concluded that functional communication training was effective in reducing problem behaviors for individuals with autism spectrum disorders and other developmental disabilities.

Table 3

Chapter II Summary

Authors	Design	Participants	Procedure	Findings
Fragale, Rojeski, O'Reilly, & Gevarter (2016)	A multi-element single-case design.	Four participants diagnosed with autism ages four, five, and nine.	A functional analysis paired with functional communication training.	The functional analysis identified the function of the problem behavior for each participant, and the functional communication training taught each participant to verbally request desired items. Each participant increased their academic engagement while reducing their engagement in problem behaviors.
Schmidt, Drasgow, Halle, Martin & Bliss (2014)	Multiple baseline design.	Three individuals diagnosed with autism ages 9, 10 and 15.	Discrete-Trial Functional Analysis and functional communication training utilizing sign language or verbally requesting.	The discrete -trial functional analysis identified the cause of problem behaviors for each participant. The functional communication training of sign language for two participants and sign language or verbally requesting for the third participant replaced problem behavior that served the same function.
Olive, Lang & Davis (2008)	A multiple probe design.	One four-year-old diagnosed with autism.	Functional analysis and Functional communication training using a VOCA.	The functional analysis identified the cause of problem behavior, and the VOCA helped the participant communicate which resulted in a reduction of problem behaviors.

Authors	Design	Participants	Procedure	Findings
Strand & Eldevik (2018)	Logic of a changing criterion design.	One four-year-old diagnosed with autism.	Functional analysis, functional communication training, and denial and delay tolerance training.	The functional analysis helped identify the cause of problem behavior for the participant and the functional communication training of verbally requesting items replaced the problem behavior. During the denial and delay tolerance training, the participant was taught to gain adult attention prior to making a request, or he had to tolerate “no” and did not gain access to the item. All phases resulted in a reduction of problem behaviors.
Falcomata, Muething, Gaaney, Hoffman & Fragale (2013)	A reversal (ABAB) design was used to evaluate FCT and delay training.	Two participants, ages seven and twelve, diagnosed with autism.	Functional analysis, functional communication training, delay training, and a chained schedule.	The functional analysis identified the cause of each participants challenging behavior, and the functional communication training helped the participants verbally request for desired items. During the delay training phase, the participants requested an item and were required to wait five minutes prior to receiving the item. During the chained schedule phase, the participants were required to request their item, wait five minutes and then continue a task prior to receiving reinforcement. All phase resulted in a reduction of challenging behaviors.

Authors	Design	Participants	Procedure	Findings
Anderson, Barretto, McLaughlin, & McQuaid (2016)	ABABCDEF G reversal design.	One five-year-old diagnosed with autism.	Functional analysis and functional communication training using a card.	The functional analysis identified the cause of problem behaviors for the participant and the functional communication intervention of a task card was implemented. After FCT of touching a task card to gain access to desired items, the results indicated there was a reduction in the percentage of problem behaviors, as well as an increase in the use of appropriate communication for the participant.
Rispoli, Camargo, Machalicek, Lang, & Sigafos (2014)	Multiple-probe design.	Three individuals diagnosed with autism ages three and four.	Functional analysis, communication training, and schedule thinning.	The functional analysis identified the cause of problem behaviors for each participant. The combined treatment including functional communication training, extinction, and schedule thinning resulted in a reduction in problem behavior and an increase in the use of appropriate communication.

Authors	Design	Participants	Procedure	Findings
Boesch, Taber-Doughty, Wendt, & Smalts (2015)	A-B1-B2-B3-B4 design.	One 14-year-old diagnosed with autism.	Functional analysis and functional communication training utilizing sign language.	A functional analysis was conducted and identified the function of the participants challenging behavior. Functional communication was used in the form of sign language to replace the challenging behavior. After the intervention was implemented, it took six weeks for the challenging behaviors to reach 0%.
Wacker, Lee, Padilla Dalmau, Kopelman, Lindgren, Kuhle, & Wacker (2013)	Nonconcurrent multiple baseline (across children) design.	Seventeen young children with autism ages 29-80 months.	Functional analysis and communication training via telehealth.	A functional analysis was conducted for each participant, and the cause of problem behaviors was identified. Next, functional communication training was implemented for each participant. The results indicated that every participant demonstrated a reduction in problem behavior by at least 68.7%.
Langdon, Carr, & Owen-DeSchryver (2008)	ABAB reversal design.	Three participants diagnosed with autism ages three, seven, and 18.	Functional analysis and functional communication training.	The functional analysis identified the cause of problem behavior. Once the functional communication training was implemented for the three participants, there was a reduction in problem behaviors.

Chapter III: Conclusions and Recommendations

The implementation of functional communication training is widely used to increase communication and reduce problem or challenging behaviors for individuals with autism. The purpose of this paper was to determine if functional communication training reduces problem or challenging behaviors for individuals with autism. Chapter I included background information on autism spectrum disorders, problem behaviors, and provided an overview of functional communication training. Chapter II summarized the findings of 10 research articles explaining the effectiveness of functional communication training for reducing problem behaviors. In this chapter, I will discuss the studies examined, the conclusions made, and I will provide recommendations for future research.

Conclusions

Each of the 10 studies I examined suggested that functional communication training reduced each participant's problem behaviors. Additionally, each participant increased their communication skills. There were a variety of research designs used, a variety of settings, and a variety of functional communication interventions were utilized.

Two of the 10 studies utilized sign language as a functional communication strategy.

Both of these studies conducted a functional analysis before implementing functional communication training. The study conducted by Schmidt et al. (2014) had three participants. Each used sign language, but one participant also made requests verbally. The study conducted by Boesch et al. (2015) had one participant who only used sign language. The sign language was beneficial for the four participants. It increased their ability to request their desired items and helped reduce their engagement in problem behaviors.

An alternate communication form was utilized in four of the 10 studies due to five out of the seven participants having limited verbal skills. The alternative communication forms included PECS, a Voice Output Communication Aids (VOCA) or a card that had visuals on it as a way for the participants to communicate. The study conducted by Rispoli et al. (2014) had two participants who requested verbally and one participant who used a card with a “no” symbol. The study examined by Anderson et al. (2016) utilized a card that said “my turn” for one participant. Langdon et al. (2008) conducted a study that included three participants. Two of the participants used PECS, while the third participant used a card with a “no” symbol. Last, the study by Olive et al. (2008) had one participant who used a VOCA to communicate. The alternative communication forms were successful functional communication training methods for the five participants and helped reduce problem behaviors.

Three of the 10 studies took place within the individual’s home, and FCT was implemented by either a trained parent or a therapist. For these studies, there were designated places within the home located for FCT sessions. All data collected for these sessions were collected and monitored by trained professionals. Wacker et al. (2013) conducted a study with 17 participants. Each participants’ parents served as the therapist for FCT sessions. The participant would visit the Child Health Specialty Clinic once or twice per week. Anderson et al. (2016) conducted a study with one participant. The sessions for this study occurred in the home and at the clinic. Last, the study conducted by Olive et al. (2008) had one participant, and all sessions occurred in the participant’s home. The participant's mom received FCT training before the sessions. For each of these three studies, the participants were able to increase their ability to request their wants and their engagement in challenging behaviors were reduced.

One of the limitations found during research was the small number of participants in the studies found. Four of the 10 studies only had one participant. For each of these studies, the participants utilized a different FCT strategy. One participant in the Boesch et al. (2015) study used sign language. The next participant, in the study conducted by Anderson et al. (2016) used a card with that said, “My turn,” and the participant in the Olive et al. (2008) study used a VOCA. The final participant in the study conducted by Strand and Eldevik (2018) requested verbally.

While there were limited participants, it was beneficial to see that each had success with FCT using different strategies. Following FCT there was a reduction in problem behaviors as well as an increase for communication for all four participants.

Recommendations for Future Research

Throughout my research on the effects of functional communication training for individuals with autism, most of the studies I found provided data that showed the immediate benefits for the FCT interventions. Most of the research was conducted in controlled environments with few distractors, and the studies were limited to a few participants or just one participant.

The 10 studies focused primarily on participants who had limited verbal skills. The participants were all able to communicate, but all had deficits which impeded on their ability to get their wants and needs met. Since autism spectrum disorders are very broad, it would be beneficial to see how FCT benefits individuals who have better verbal skills.

Future research should focus on more replications of studies. While some were similar, the participants of the studies displayed problem behaviors that served different functions.

there should be more research on individuals that exhibit problem behaviors for similar functions.

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There were also a variety of functional communication interventions utilized. It would be beneficial for replications using the same FCT interventions. Replication studies could provide better information about which FCT interventions could be the most helpful for individuals. It would also be beneficial to determine long term effects. Many of the studies utilized FCT to teach communication to gain particular things, not increasing communication broadly. During the process, prompting is used and then faded, but there is no follow up concerning whether or not the skills are sustained or if there is generalization across settings. It is essential for individuals to gain skills that help reduce problem behaviors, but it is also important to know whether the individual can use this skill long term and in various settings.

Implications for Practice

The field of special education serves students who have unique needs. I work with students with autism who engage in severe problem behaviors. Engaging in severe problem behaviors is concerning for many reasons. It can limit a student's access to academics, peer interactions, and there is an increased chance for injury to self or others. When working with students who engage in problem behaviors frequently, it is essential to find effective strategies quickly.

When selecting strategies, I look for ones that fit the unique needs of the learners. Since finding an effective strategy can be time-consuming, it is also essential to find interventions that work for multiple functions of problem behaviors. Strategies utilized in the classroom should also be evidence-based strategies to ensure success for the students. I discovered that FCT can

be modified to meet each individual's needs and is successful for individuals who display behaviors for various functions. 44

As a special education teacher, I am always looking for strategies that are effective for increasing my student's communication so they can express their wants and needs rather than engage in problem behaviors. Throughout my research, I learned how FCT is implemented across various settings, using multiple techniques, and interventions. I also found that it works with students with a wide range of abilities, so many individuals could use and have success with this strategy. After reviewing the research, I will be implementing FCT in my classroom to promote success for all of my students.

Summary

Individuals with autism spectrum disorders may have deficits in communication. Those deficits make it difficult for them to gain access to their wants and needs and could result in problem behaviors. It is essential for educators to have a variety of interventions that can meet the unique needs of our students with autism. Functional communication training provides individuals with communication to replace the problem behavior that the individual displays. This strategy is successful for multiple behavior functions and various levels of individual's verbal abilities. Overall, functional communication training is an effective strategy for reducing problem behaviors for individuals with autism.

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