



Functional Communication Training

44

Reem Muharib and Emily Gregori

Typically developing children as well as children with developmental disabilities may engage in challenging behaviors. Challenging behaviors range from noncompliance to more severe forms such as aggression (e.g., hitting, kicking, biting others), self-injury (e.g., self-biting, hair pulling, head banging), and property destruction (e.g., breaking furniture). Challenging behavior may interfere with the child's learning, impede the child's ability to develop healthy friendships with peers, and in severe cases, also cause harm to the child and others (Powell et al., 2007). Because of the negative effects of challenging behaviors, practitioners must be able to use evidence-based practices to reduce these behaviors and teach appropriate prosocial skills. One of these evidence-based practices is Functional Communication Training (FCT; Carr & Durand, 1985). FCT has accumulated sufficient research support to be deemed an evidence-based practice for children including children with autism, intellectual disability, other health impairments, behavior disorders, and multiple disabilities (Gerow et al., 2018; Muharib & Wood, 2018).

FCT involves three steps. The first step is to identify the function of the challenging behavior. In other words, a practitioner attempts to find out why the child is engaging in challenging behavior; what the child is getting or getting out of by engaging in challenging behavior. The second step is to select a new replacement behavior (i.e., an appropriate way to ask for the reinforcer). The third step is to teach the child a replacement behavior that will result in accessing the same reinforcer as the challenging behavior. For example, if the child engages in hitting to gain access to a toy (the function), then the practitioner may teach the child to say "*can I have my toy, please?*" and then provide the child with the requested toy.

Functional Behavior Assessments

Conducting functional behavior assessments is the first step in FCT. The process of functional behavior assessments typically involves several components: (a) indirect assessments, (b) direct assessments, and (c) formulating a hypothesis regarding the function (purpose) of challenging behavior.

R. Muharib (✉)
Texas State University, San Marcos, TX, USA
e-mail: R_m806@txstate.edu

E. Gregori
University of Illinois at Chicago, Chicago, IL, USA
e-mail: egregori@uic.edu

When conducting functional behavior assessments, a practitioner gathers information about the child's challenging behavior and related contextual variables. For example, a practitioner may gather information about what happens right before and right after the challenging behavior occurs. A practitioner may find out that every time mealtime begins, the child starts throwing a tantrum, and then the parent removes the child from the dining area. In this example, the practitioner learns that this challenging behavior is maintained by avoiding mealtime. In other words, the child engages in tantrums because she has learned that every time she throws a tantrum, her parent removes her from the dining area (i.e., an activity the child dislikes). The practitioner, in this example, also learns about the time (mealtime) and place (dining room) where the challenging behavior is likely to occur. By collecting such information (data), a practitioner can develop an FCT program where the child is taught an appropriate replacement behavior (e.g., saying "break, please") and implement the program during the time and place where the challenging behavior is likely to occur.

Indirect Assessments

Information regarding the function of challenging behavior and relevant contextual variables may be obtained using indirect and direct assessments. Indirect assessments involve interviewing people that are familiar with the child such as parents, teachers, and paraprofessionals. The purpose of these interviews is to gather information about (a) when and where challenging behaviors occur and do not occur, (b) when and where appropriate behaviors occur and do not occur, and (c) what happens before and after challenging behaviors occur. This method is considered indirect because the practitioner assessing the behavior is not directly observing the child. Instead, the practitioner is asking others who interact with the child and have observed the child engage in these behaviors.

Rating Scales Rating scales are surveys designed to obtain information on a specific challenging behavior, or group of challenging behaviors. The purpose of a rating is to obtain information regarding the settings and contexts in which the challenging behavior is likely to occur and variables that may trigger and reinforce the behavior. Typically, rating scales list scenarios (e.g., "Does the behavior occur when you walk away from the child") and ask the respondent to rate the extent to which that statement is accurate using a numerical scale (e.g., "1 = always true, 2 = true, 3 = sometimes true, etc."). Sections with the highest ratings may indicate the function of the individual's behavior. Common rating scales used during the functional behavior assessment process include the *Motivation Assessment Scale* (Durand & Crimmins, 1992) and the *Questions About Behavioral Function* (Paclawskyj et al., 2000). Rating scales are useful when you want to glean initial information regarding a challenging behavior. Typically, rating scales can be implemented quickly (10–20 min) and require minimal training to administer, which make them feasible to use in classroom, home, and community-based settings. Rating scales, however, only provide the practitioner with an overview of the behavior, and more detailed information is often overlooked when using these tools.

Interviews Interviews are structured conversations between the practitioner and individuals who know the target child (e.g., parents, teachers, related service providers). Behavioral interviews typically consist of questions designed to elicit information about the behavior of concern, and variables that influence the occurrence of the behavior. For example, interview questions may include "In what situations is the target behavior most likely to occur?" "What typically happens right before the behavior occurs?" or "Have there been any recent changes to the child's regular routine?" There are many published interview tools available to behavior analysts and educational practitioners. The

Functional Assessment Interview (FAI; O’Neill et al., 1997) is a comprehensive interview tool that is commonly used during the functional behavior assessment process. The FAI gleans information related to the target challenging behavior, history of treatments for the target behavior, communicative abilities, environmental factors that may influence the target behavior, and variables that may reinforce the target behavior. Like other interview tools, the FAI is more time intensive than rating scales, but gives the practitioner deep and rich information concerning the child and the target challenging behavior.

The process of conducting indirect assessments begins by identifying the key individuals who you will administer the assessments to. When conducting indirect assessments, it is important to obtain information from individuals who know the child well, spend consistent time with the child, and interact with the child in settings where the challenging behavior occurs. For example, if a practitioner is conducting a functional behavior assessment for a fourth-grade student in special education, he or she may consider implementing indirect assessments with the child’s parents, special education teacher, paraprofessional, and related service providers (e.g., speech therapist, occupational therapist). The practitioner should conduct the interviews or administer the rating scales at times that are feasible and convenient for the respondent. For example, if the practitioner plans to interview a parent, they should schedule the interview in a way that reduces logistical barriers (e.g., in the evening, conducting the interview over distance technology). The practitioner should also ensure that the respondent is comfortable with and informed regarding the assessment procedures. Before beginning the assessment, the practitioner should explain the purpose of the assessment and ask the respondent if they have any questions.

After the practitioner has administered the assessments, the practitioner will analyze the results. The practitioner should summarize the results of the assessments and use the results to identify the settings in which they will conduct the direct observations. The practitioner may also use the information obtained during the indirect assessments to refine the definition of the target challenging behavior. Although the result of the indirect assessments may indicate potential functions of challenging behavior, they are often less reliable than direct assessment procedures, and therefore, should only be one of many tools used during the functional behavior assessment process.




Direct Assessments

Often times, indirect assessments are not sufficient to determine the function of challenging behaviors and the relevant contextual variables that influence the behavior. While indirect assessments are an important first step in identifying the function of challenging behavior, other methods, such as direct assessment, can provide more accurate and reliable information regarding the behavior of concern. Direct assessments provide a practitioner with opportunities to observe the child during natural routines without disturbing the flow of events (e.g., classroom routines). Unlike indirect assessments wherein a practitioner relies on reports from others, a practitioner can observe and record challenging behaviors as they occur to determine the environmental variables that trigger and maintain the challenging behaviors. Direct assessments involve the practitioner directly observing the child using (1) a scatterplot to determine the settings and times of day the challenging behavior is most likely to occur and (2) antecedent-behavior-consequence (A-B-C) recording method to identify environmental variables associated with the challenging behavior to determine the function of challenging behaviors.

Scatterplots A scatterplot is a matrix relating challenging behavior to the time of day and is used to gather information about when challenging behaviors occur. Scatterplots are used to record the extent

Child: Sara

Observation Period: 1-10 through 1-17

-  = 0 hits or object throws at others
-  = 1-3 hits or object throws at others
-  = more than 3 hits or object throws at others

Time/day	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 arrival					
8:30 circle time					/
9:00 snack time		/			
9:30 center time				/	
10:30 playground	/		/		
11:30 lunch time					
12:00 departure					

Fig. 44.1 A Scatterplot during a 5-Day Observation

to which the challenging behavior occurs more often at certain times of the day or certain contexts than others. To use a scatterplot, a practitioner creates a matrix and divides the day into several blocks of time (see Fig. 44.1). After a practitioner collects data for several days using scatterplots, a practitioner can analyze the data to detect any patterns. A practitioner may find out that a challenging behavior occurs more often during a certain time of the day such as a certain time of the day wherein the child is expected to complete a set of non-preferred tasks. It is important to note that a practitioner should collect data using this method over several days to be able to see a pattern of the challenging behavior.

As an example of a scatterplot (Fig. 44.1), a practitioner observed Sara in her preschool from arrival time at 8:00 until departure time at 12:00 Monday through Friday. Using a scatterplot, we can see that Sara hits and throws objects at others during circle time and center time more often than any other time of the school day. Finding this information about when Sara is more likely to engage in

challenging behavior will help the practitioner choose the time of the day in which these behaviors occur to conduct A-B-C recording. In this next step, a practitioner uses A-B-C recording to gather information about the function of challenging behavior.

A-B-C Recording After identifying the times and locations that the challenging behaviors occur most frequently using a scatterplot, a practitioner will observe the child during those times using antecedent-behavior-consequence (A-B-C) recording method. The purpose of the A-B-C recording is to identify the relationship between environmental variables and the target challenging behavior. Ultimately, the results of the A-B-C observations will be used to determine the function of the challenging behavior (i.e., what does the child get or get away from by engaging in challenging behavior?). A-B-C recording has several advantages: (a) like scatterplots, a practitioner can observe the challenging behaviors as they occur without disturbing the child’s natural routine, and (b) a practitioner can gain a better understanding of the environmental variables that trigger and reinforce the challenging behavior. Before conducting an A-B-C recording, a practitioner must be familiar with the three-term contingency (A-B-C) that governs behavior. Challenging behavior (or any other behavior) does not occur in isolation. Before a behavior occurs, an antecedent (something in the environment) triggers the challenging behavior. Examples of antecedents include placing a non-preferred worksheet in front of the child, a peer taking a toy from your target child, or a peer telling your child “you can’t play with us.” When the antecedent takes place, a behavior occurs. What occurs immediately after the behavior is called a consequence. A consequence in the form of reinforcement (i.e., giving the child what she wants or removing what the child does not want) increases the chances that the child will keep engaging in challenging behavior in the future. Examples of reinforcement include removing a non-preferred worksheet after the child hits the teacher or giving the child a toy after the child yells at her peer. Figure 44.2 illustrates the three-term contingency involving a child who hits and spits at her teacher.

A-B-C recording involves directly observing the child in settings where the challenging behavior is most likely to occur. As seen in Table 44.1, the practitioner will record every challenging behavior

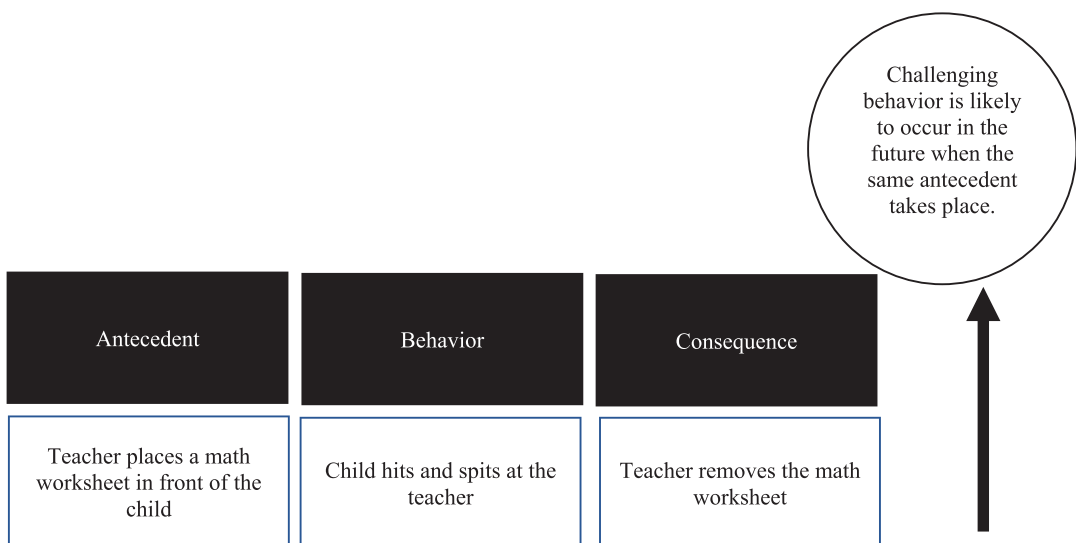


Fig. 44.2 The three-term contingency

Table 44.1 A-B-C recording

Time	Antecedent	Behavior	Consequence
9 am (center time)	Peer playing with a tea pot	Sara hits the peer	Peer cries and gives Sara the tea pot
9:02 (center time)	Peer approaches Sara and says "my turn"	Sara pushes peer with one hand	Sara keeps the tea pot
9:05 (center time)	Peer playing with a potato head	Sara grabs the potato head from the peer	Peer walks away and Sara keeps playing with the potato head
9:08 (center time)	Peer tries to grab a toy from Sara	Sara slaps the peer on the face	Sara keeps playing with the toy
10 am (snack time)	Peer shows others a toy he brought from home	Sara grabs the toy from peer	Peer cries and teacher takes the toy from both of them
10:01 (snack time)	Teacher takes the toy	Sara cries and throws her snack on the floor	Teacher throws the snack in the trash

occurrence (e.g., hitting), what happens right before the behavior (antecedent; e.g., a peer is in a possession of a toy in the housekeeping center), and what happens right after the behavior (consequence; e.g., the peer cries and gives Sara the toy). By gathering such information, a practitioner can see a pattern of behavior and what occurs before and after the behavior. Consequently, a practitioner can formulate a hypothesis about why the child is engaging in challenging behavior. Based on the information gathered in the A-B-C report, we can see and hypothesize that Sara engages in challenging behaviors to obtain toys from her peers.

Selecting a Replacement Behavior

After a practitioner has formulated a hypothesis regarding the function of the challenging behavior, the practitioner, along with people that often interact with the child (e.g., parents, teachers), select a new replacement behavior to teach the child that will replace the challenging behavior. Specifically, this new replacement behavior is taught to the child as an alternative way to ask for the functional reinforcer (e.g., toy, attention, break) instead of engaging in challenging behavior. For example, if a child engages in hitting when they are thirsty, a practitioner could teach the child to say, "*Drink, please*" instead of hitting. Selecting a new replacement behavior should be done as part of a collaborative team that includes individuals who interact with the child such as caregivers, the classroom teacher, and a speech and language pathologist. There are a few considerations to keep in mind before selecting a new replacement behavior: (a) it must be easy to learn, (b) easily recognizable by others, and (c) must result in getting access to reinforcement consistently and immediately (Dunlap & Duda, 2004).

Easy to Learn The first rule to increase the effectiveness of FCT is that the child should have the skills to emit the replacement behavior or the ability to learn the replacement behavior with their existing skills. For example, if a child has complex communication needs and is unable to communicate vocally (a skill they do not have), a practitioner should not select a vocal response. Instead, the practitioner may teach the child to exchange a card that includes a picture of the preferred item or activity. However, if a child is able to form simple sentences (a skill they do have), the practitioner may choose to teach the child to make a simple vocal request such as "toy." Regardless of the level of support the child requires to learn a new skill, the practitioner should select a skill that is most appropriate for the child's needs and preferences.

The second consideration a practitioner needs to make is to ensure that the replacement behavior requires less effort to emit than the challenging behavior; in other words, the practitioner should select a replacement behavior that is easy for the child to emit. For example, a child engages in head banging to get away from one-on-one work and has no appropriate replacement behaviors in her repertoire. A practitioner may teach a child to point to a “break” picture. The practitioner, for example, does not teach the child to pick up the “break” picture and hand it to him/her because this may require more effort from the child than simply banging her head. If a practitioner selects a new replacement behavior that requires more effort than engaging in challenging behavior, then the child is more likely to engage in the challenging behavior than the new replacement communicative behavior.

For children who do not produce vocal speech or only produce unintelligible speech, a practitioner may opt to teach the replacement behavior using Augmentative and Alternative Communication (AAC) systems. AAC systems are used to supplement or replace vocal speech and are commonly used for children with developmental disabilities. AAC systems include aided system where an external tool is used such as pictures, speech-generating devices (e.g., microswitches), or tablets loaded with communication applications (apps), as well as unaided systems wherein no external tool is required and this includes the use of manual signs.

It is important for a practitioner to consult with parents, as well as other people who frequently interact with the child (e.g., teachers, paraprofessionals), regarding what AAC system to select for the child. It is also key to assess the child’s ability to use an AAC system before selecting one. Specifically, the team should assess the child’s vision and hearing abilities and fine motor skills (Alzrayer & Banda, 2017). For example, for a speech-generating device or tablet to be selected, the child must have the ability to see the icons, hear the speech output that the device produces, and have the motor strength to tap an icon. Some modifications can be made when using such devices. For example, if the child has low hearing ability, then a practitioner may place the tablet in a case with a sound amplifier feature. If the child has low vision abilities, then a practitioner may enlarge the icons on the tablet screen, and if the child has hand tremors, a practitioner may decrease the screen sensitivity (e.g., two taps required to operate an icon instead of one tap). If the child does not have the minimum abilities to use such devices (e.g., blind), then a practitioner will rule out this option. Similar considerations also apply to selecting printed pictures as an AAC system. For pictures to be selected, a child must be able to see the pictures and touch them (or hand them to the other person). On the other hand, if a practitioner and other stakeholders (e.g., parents) consider manual sign to teach the child (e.g., “break”), then the child must have the necessary fine motor skills to manually do the sign.

After assessing the child’s necessary skills, an AAC system is selected. Regardless of which AAC system is selected for the child, it is important to teach the child one response only to increase the effectiveness of FCT. For example, Johnny is a nonvocal child with autism. His challenging behavior is maintained by access to attention from adults. After assessing his abilities, a tablet that is loaded with a communication app is selected as an AAC system. A practitioner programs the app and allows only one icon “*play please*” on the screen. By allowing only one icon on the screen, the child does not need to learn to discriminate between multiple icons, thus, decreasing his response effort in engaging in the new appropriate replacement behavior. In other words, if Johnny had to select the correct icon out of multiple icons to request attention, it might be just easier for him to simply engage in challenging behavior. The same consideration must be kept in mind when selecting a communicative response in the form of a manual sign, picture, or even a vocal response. For example, a practitioner wants to teach Peter to vocally request a break from work instead of engaging in challenging behavior. The practitioner teaches Peter to say “*break*” instead of “*may I have a break, please?*” Although saying “*may I have a break, please?*” may be more socially appropriate than just saying “*break,*” teaching Peter to only say “*break*” may increase the likelihood that he will use this vocal response to ask for a break because it does not require a lot of effort compared to “*may I have a break, please?*”

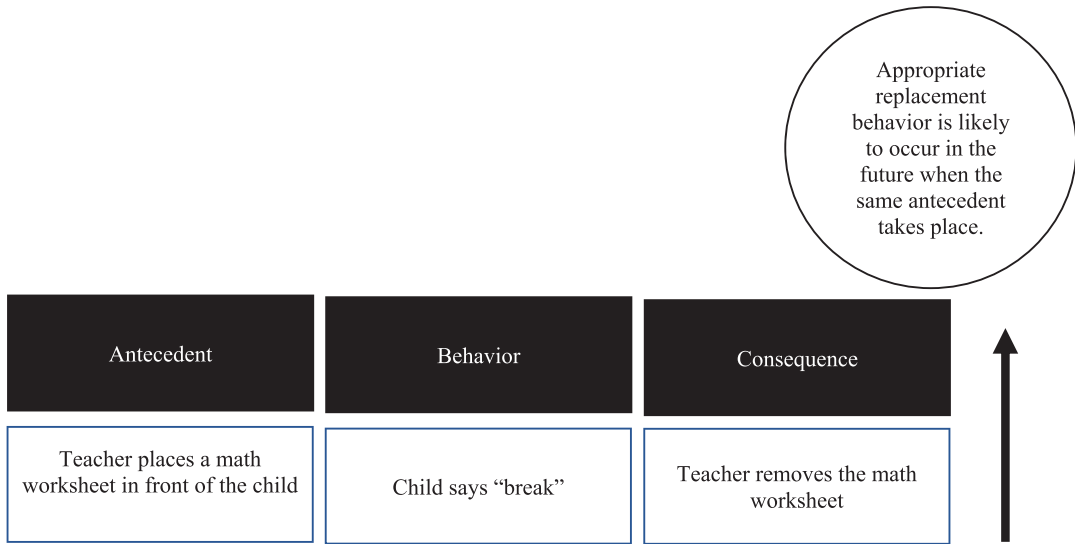


Fig. 44.3 The three-term contingency in reinforcing appropriate replacement behavior

Easily Recognized by Others The second consideration for selecting a new replacement behavior for the child is that it must be easily recognized by others such as parents, siblings, peers, and other individuals who interact with the child. If the child uses a new replacement behavior correctly but others are not able to recognize it, then the child is likely to return to engage in challenging behavior. For example, Alex is a child with Down syndrome who is now able to sign “play” to request attention from his teacher in the classroom. Alex goes home and signs “play” to request attention from his sibling but his sibling does not recognize the sign. Because Alex does not get attention from his sibling when he signs “play,” Alex screams and his sibling immediately turns his attention to Alex. In this scenario, even though Alex was able to sign correctly, the sign was not recognizable by others who interact with him. For this reason, it is important to select a communicative behavior that can be easily recognized by others so that they respond to the child’s appropriate communication, which consequently decreases the child’s likelihood of returning to challenging behavior. This may require training people who interact with the child to recognize the new replacement behavior. For example, a teacher may explain to other children in the classroom what the “play” sign means and how they should respond when Alex uses this sign. A teacher may also model or verbally prompt other children when Alex signs “play” to get their attention.


Consistently and Immediately Reinforced The last consideration for selecting a new replacement behavior is that it must be reinforced consistently and immediately. For FCT to be effective, the new replacement behavior (e.g., saying “*break please*”) must immediately and consistently produce reinforcement. For example, every time a child uses the new replacement behavior to ask for a break from a demand, the teacher should immediately provide the child with a break. The reason behind the need for reinforcing each appropriate replacement response immediately is to teach the child the contingency between asking appropriately and getting access to the requested reinforcer, and also to weaken the contingency between the challenging behavior and the reinforcer. In other words, when a practitioner provides the reinforcer every time the child asks for it appropriately, then the child is likely to use this appropriate replacement response more often and refrain from engaging in challenging behavior. See Fig. 44.3 for an example.

Teaching the New Replacement Behavior

After selecting the new replacement behavior, a practitioner begins teaching the child the new replacement behavior. A practitioner may teach the new replacement behavior (a) in a one-on-one format or (b) during natural teaching opportunities. Teaching in a one-on-one setting involves repeatedly presenting antecedents that evoke challenging behavior, teaching the replacement behavior, and reinforcing the replacement behavior during a predetermined instructional session. For example, a practitioner selects a demand that has a history of provoking the challenging behavior of Alex whose challenging behavior is maintained by escape (getting away) from demands. The practitioner places the demand in front of Alex and immediately prompts Alex to engage in the new replacement behavior to ask for a break. The practitioner immediately provides Alex for a break whether he requests a break appropriately with or without a prompt. The practitioner may give Alex a 30- or 60-s long break and then present the demand again and repeat the steps. The practitioner would repeat this process until the instructional session has ended. The purpose of providing the child multiple consecutive opportunities to engage in the new replacement behavior is to build the contingency between the new replacement behavior and accessing the requested reinforcer. That is, the child learns that every time she uses her replacement behavior, she immediately gets what she asks for (e.g., a break). One main advantage of teaching a new replacement behavior in a one-on-one format is that the practitioner does not need to wait for a natural teaching opportunity to present itself. Instead, a practitioner can direct when the teaching occurs and how many teaching opportunities to present to the child. Another advantage to this teaching format is that the child can have multiple opportunities to engage in the new replacement behavior in one teaching session; thus, learning the new replacement behavior may occur more rapidly. However, this approach may not facilitate generalization. For example, a child who learns to ask for a break during the one-on-one teaching session may not be able to ask for a break during small group instruction. This may happen because the child was only presented with opportunities to engage in the new replacement behavior in one setting/situation, so the child may associate the new replacement behavior with that one setting/situation only.

A practitioner may also take advantage of natural opportunities to encourage the child to use the new replacement behavior. For example, Sara whose challenging behavior is maintained by access to toy was approaching her peers in the housekeeping center. Before Sara engages in challenging behaviors (e.g., hitting peers to get toys), the practitioner immediately prompts Sara to say *“toy, please.”* Once Sara uses this new replacement behavior, the practitioner prompts the peer to give Sara the toy. As another example of looking for natural opportunities to teach the new replacement behavior, Alex is having trouble opening a box of blocks. A practitioner sees this as an opportunity to prompt Alex to ask for *“help.”* The practitioner prompts Alex to ask for *“help”* when the challenging behavior is triggered (having difficulty opening the box) rather than waiting until Alex engages in challenging behavior. Once Alex uses the new replacement behavior, the practitioner opens the box. Using natural opportunities to teach the new replacement behavior has several advantages. First, the child’s natural routine is not disturbed. A practitioner only waits for a natural teaching moment to teach the child the new replacement behavior. Second, this teaching method may facilitate generalization. Because teaching happens during natural routines, a child may learn to generalize the new replacement behavior across different people or settings more easily compared to the one-on-one format. For example, Alex who had trouble opening a box of blocks now has trouble opening his lunchbox. The practitioner prompts Alex immediately to ask for *“help”* and opens the lunchbox for him once he says *“help.”* Now that Alex has had multiple situations where he was taught to say *“help,”* he is more likely to be able to say *“help”* in similar situations. For example, Alex had a hard time opening his milk box. Without teaching, Alex asked his teacher for *“help.”* This happened because Alex was exposed to multiple natural opportunities that represented a range of similar situations (i.e., box of blocks and lunchbox). A disadvantage of this approach, however, is that learning the new replacement behavior may take longer as the practitioner must wait for natural teaching opportunities.

Table 44.2 System of prompts

	Prompt type	Definition	Prompt type	Definition
Most supportive  Least supportive	Full verbal	Practitioner models full word (e.g., “Milk”)	Full physical	Hand-over-hand assistance
	Partial verbal	Practitioner models partial word (e.g., “Mil”)	Partial physical	Hand-on-elbow assistance
	Initial phoneme	Practitioner models initial phoneme of the target word “M”	Partial physical	Hand-on-shoulder assistance
	Model	Practitioner demonstrates desired response		
	Gesture	Action that indicates what the learner should do (e.g., pointing, nodding)		

Systems of Prompts

The efficacy of FCT relies, in part, on the child learning to emit the replacement communication response. As mentioned earlier, not all children have an appropriate communicative response in their repertoire. In these cases, the practitioner must teach the child the response. Prompting is a procedure that involves a practitioner using various levels of verbal and physical support to evoke a specific response. Prompts range from less supportive to most supportive (see Table 44.2). The level of prompt support provided to a child should be selected based on the child’s needs and preferences, and the mode of the communicative response (i.e., vocal, gesture, picture exchange). Various prompting methods exist for teaching communicative responses including least-to-most prompting, most-to-least prompting, graduated guidance, and time delay (Collins et al., 2018).

Least-to-Most Prompts Least-to-most (LTM) prompting is a prompt hierarchy that involves providing increasing levels of physical or verbal support until the child is able to engage in the target behavior. To begin LTM prompting, the practitioner should select three prompts and order them from least to most supportive (e.g., initial phoneme, partial verbal, full verbal). To implement LTM prompting, the practitioner should first provide the antecedent and provide the predetermined wait time (e.g., 5 s). If the child does not respond to the antecedent, the practitioner should provide the first, least supportive, prompt. If the child responds correctly, the practitioner should provide praise and reinforcement (e.g., “Nice job saying, ‘Cookie please.’ Here is your cookie”). If the child does not respond, the practitioner will provide the second, next supportive prompt. If the child responds correctly, the practitioner should provide praise and reinforcement. If the child does not respond, the practitioner should provide the third and most intrusive prompt. After the child responds to the most supportive prompt, the practitioner should provide praise and reinforcement. If at any point the child makes an error or does not respond, the practitioner should provide the next most supportive prompt.

To illustrate how LTM works, read the case scenario of Marcus and his social worker, Mrs Lu. Mrs Lu is using FCT to teach Marcus to request juice without engaging in challenging behavior. Marcus has complex communication needs and uses a picture exchange system to communicate. Mrs Lu conducts

FCT sessions right before snack time, when she knows Marcus will be thirsty for his juice. To begin the session, Mrs Lu asks Marcus to sit across from her at the snack table and places Marcus' juice cup in sight but out of reach. Mrs Lu then waits 5 s for Marcus to touch the picture of the juice on his communication book. When Marcus does not respond within 5 s, Mrs Lu points to the picture of the juice (i.e., model prompt) and gives Marcus another 5 s to respond. When Marcus does not point to the picture of the juice, Mrs Lu places her hand on Marcus' elbow (i.e., partial physical prompt). After 5 s elapses and Marcus still does not respond, Mrs Lu places her hand on top of Marcus' and guides him to point to the picture of juice (i.e., full physical prompt). When Marcus points to the picture of juice, Mrs Lu says, "*Great job pointing to juice*" and hands Marcus the juice cup.

Most-to-Least Prompts Most-to-least (MTL) prompting is a prompt hierarchy that involves providing the most supportive prompt first and decreasing the supportiveness of the prompt based on child responding. To implement MTL prompting, the practitioner should select three prompts and order them from most supportive to least supportive. MTL prompting begins with the practitioner providing the antecedent and immediately providing the most supportive prompt. When the child responds correctly, the practitioner will provide praise and the reinforcer. On the next opportunity, the practitioner will provide the antecedent and simultaneously provide the second most supportive prompt. If the child responds correctly, the practitioner will provide praise and access to the reinforcer. On the next opportunity, the practitioner will present the antecedent and the third most supportive prompt. If the child responds correctly, the practitioner will provide praise and access to the reinforcer. If at any point the child makes an error or does not respond, the practitioner should provide the next most supportive prompt.

Read the example of how Mr Johnson used MTL prompting during FCT to teach Hakeem to request crackers during lunch time. During lunch, Mr Johnson sat across the table from Hakeem and placed a cracker on his plate. After Hakeem consumed the cracker, Mr Johnson looked at him and said, "*Cracker.*" Hakeem then immediately said, "*Cracker.*" In response, Mr Johnson said, "*Great job asking*" and gave Hakeem another cracker. After Hakeem finishes his cracker, Mr Johnson says, "*Cr,*" and waited for Hakeem to respond. When Hakeem said, "*Cracker,*" Mr Johnson replied, "*Excellent job asking for more,*" and gave him another cracker. Once Hakeem finishes his second cracker, Mr Johnson looks at him and says, "*C.*" Once Hakeem says, "*Cracker*" Mr Johnson offers praise and another cracker.

Graduated Guidance Graduated guidance is a procedure used to prompt communication that requires a motor response (e.g., sign language, picture exchange). Graduated guidance involves the practitioner providing the most supportive prompt to evoke correct responding (e.g., full physical prompt) and gradually fading amount of support based on the child's responding. For example, a practitioner can use graduated guidance to teach a child with complex communication needs to press an icon on her speech-generating device. First, the practitioner would use hand-over-hand prompting by placing their hand over the child's and gently guiding them to press the correct icon. Once the child starts responding with the most supportive prompt, the practitioner would fade the support. For example, the practitioner could place their hand on the child's elbow and guide them to the correct icon. After the child starts responding, the practitioner would once again fade the supportiveness of the prompt. For example, the practitioner could place their hand on the child's shoulder to facilitate pressing the correct icon. Eventually, the practitioner should lessen the prompts until they are no longer providing physical support. Like other prompt hierarchies, if at any point the child makes an error, or does not respond, the practitioner should increase the supportiveness of the prompt.

Time Delay Time delay is a procedure used to increase the amount of time in between an antecedent and the delivery of a prompt. To begin, the practitioner should select the *controlling prompt*. The controlling prompt is the prompt that the practitioner expects the student to respond to (e.g., full verbal prompt). To start a time delay session, the practitioner should provide the antecedent and immediately provide the controlling prompt. The immediate delivery of the controlling prompt is known as a 0 s delay. Once the child reliably responds with a 0 s delay, the practitioner will insert the time delay. There are two methods for implementing time delay: *constant* and *progressive*. Constant time delay involves keeping the delay consistent across teaching trials (e.g., 5 s). Progressive time delay involves gradually increasing the duration of the delay across teaching trials. It is important that the delay increase gradually, in small increments (e.g., 2 s, 4 s, 8 s, 16 s) until the final time delay is reached. Both constant and progressive time delay have been shown to be effective (Duker et al., 2004), so practitioners should select the method they feel is most appropriate.

To illustrate, let's read about how Mrs Jeffries used time delay to teach her student Chan Woo to request his toy car during shared play. To start, Mrs Jeffries says, "My turn," takes the car and immediately says, "Car." When Chan Woo says, "Car," she gives him the car and says, "I liked the way you asked for car." After Chan Woo reliably says, "Car" with a 0 s delay, Mrs Jeffries increases the time delay. After saying, "My turn," and removing the car, she waits 2 s before providing the full verbal prompt (i.e., "Car"). Mrs Jeffries continues this process until Chan Woo begins requesting the car before the controlling prompt.

Additional Considerations to FCT

In addition to prompting the appropriate replacement behavior, it is also important to acknowledge and reinforce replacement behavior every time the child uses it. For FCT to be effective, the new replacement behavior should work more efficiently for the child than challenging behavior. This means that the child gets what she asks for when she uses the replacement behavior rather than exhibiting challenging behavior. If the challenging behavior works more efficiently for the child (e.g., Alex spits on a worksheet, the teacher lets him leave the work area), then the child is likely to continue to use challenging behavior and less likely to use the new replacement behavior. On the other hand, if the replacement behavior works better for the child (e.g., the teacher lets Alex leave the work area every time Alex says "break please"), then the child is more likely to use the replacement behavior and less likely to engage in challenging behavior.

Equally important, for FCT to be effective a practitioner places the challenging behavior on extinction (Hagopian et al., 2011). In other words, a practitioner does not provide a reinforcer when the child engages in challenging behavior. For example, Mikey's challenging behavior is maintained by access to toys. A practitioner removes a toy from Mikey to provide him with an opportunity to engage in the new replacement behavior. The practitioner verbally prompts Mikey (e.g., saying "touch the picture") to engage in the replacement behavior in the form of touching a picture depicting (*toy please*). Instead of touching the picture, Mikey screams and pulls the practitioner's hair. The practitioner does not provide the toy to Mikey, but instead, the practitioner moves up in the prompt hierarchy (e.g., physical prompt) to help Mikey engage in the appropriate replacement behavior without exhibiting challenging behavior.

For many children with disabilities, challenging behavior is their only form of communication. This means, that over the course of their life, the challenging behaviors have been reinforced numerous times and may be resistant to change. In other words, the child may engage in challenging behavior more often because the child is used to getting what she wants (or getting out of what she does not

want) by exhibiting challenging behavior. By being consistent in ignoring challenging behavior and only reinforcing the replacement behavior, the child learns that the new replacement behavior is more useful than challenging behavior to get what she wants.

In practical settings, such as in the classroom, it may not be possible to place challenging behavior entirely on extinction. For example, it is likely impossible, and always unsafe, for a teacher to ignore a child that is hitting his peers. In this situation, a practitioner may remove the child away from others to keep the child and others safe even though responding to the child's behavior that way may provide the child some attention (i.e., the reinforcer).

It is important to note that while extinction can be effective in reducing challenging behavior, it may lead to a temporary increase in the challenging behavior. This temporary increase in behavior is known as an *extinction burst*. Although the increase in challenging behavior is not expected to last, it is important that the practitioner and team develop a safety plan. The safety plan should include procedures for blocking challenging behavior and other relevant safety measures (e.g., protective equipment). It is also important that the safety plan align with the guidelines for crisis intervention in place at the school or other organization where FCT is being implemented. For example, if the school's crisis plan indicates that the school counselor should be called if dangerous challenging behavior (e.g., aggression, self-injury) occurs, then the child's safety plan should include those procedures as well.

While FCT is effective in reducing challenging behavior and increasing appropriate communication, it is important the children learn to use the appropriate communicative response in all contexts where challenging behavior may occur. Learning to use communicative skills in other settings or contexts beyond the initial teaching setting is known as *generalization*. Planning and teaching for generalization is critical because we want to ensure that children are able to use important skills like communication in the contexts that are important in their life. For example, we want children to be able to request bathroom at home, at school, and in the community.

Generalization Across Individuals It is important that the child learn to use the communicative response with individuals who they interact with in their daily life including teachers, parents, peers, and other relevant educators and related service providers. The practitioner should train all relevant individuals in the FCT procedures and create opportunities for the child to use the communicative response with them. For example, if Lucy is learning to say, "My turn," after a toy is taken away, the practitioner should teach the child to use this response during free play with peers. First, the practitioner should teach Lucy's peers that if she says, "My turn," that they should give her a turn with the toy. The practitioner should also closely observe during free play and provide any necessary support the peers need (e.g., prompts, reminders, reinforcement).

Generalization Across Settings It is also important the child learn to use the communicative response in all of the settings where the challenging behavior is likely to occur. Using FCT across settings will increase the likelihood that the child uses the communicative response any time they need it. For example, if a child screams anytime they want water, it would be important to teach the child to ask for water at home, at school, on the playground, and when the child is at a friend's house.

Reinforcement Schedule Thinning

In applied settings such as the classroom, home, or community settings (e.g., grocery store, library, park), it may not be possible to provide the child with the requested reinforcer every time the child asks for it appropriately. Excessive requesting for a break or a toy, for example, may impede the

child's learning and prevent engagement in other prosocial behaviors or activities (e.g., school work; Muharib et al., 2022). On the other hand, not providing the child with the reinforcer when the child asks for it appropriately may teach the child to revert back to engaging in challenging behavior (Hagopian et al., 2011; Muharib & Pennington, 2019). For example, Tony has learned to ask for his favorite toy by touching an icon on his speech-generating device. Every time he touches the icon to ask for the toy, his mother gives him the toy. One day while the mother was on the phone, Tony asks for the toy using his device but mother was too busy on the phone to respond to his appropriate request. Tony, then, screams and bangs his head against the wall. The mother hangs up immediately and gives Tony the toy.

Unfortunately, variations of this scenario are not uncommon in applied settings. Fortunately, research has identified effective methods to prevent challenging behavior from recurring while simultaneously teaching the child to wait for access to reinforcement. These methods are referred to as *reinforcement schedule thinning*. Reinforcement schedule thinning involves teaching the child to tolerate delays to reinforcement by gradually increasing the number of tasks required to complete before accessing a break (*Chained Schedules of Reinforcement*) or gradually increasing the time of no access to attention or tangible items (*Multiple Schedules of Reinforcement*).

Chained Schedules of Reinforcement In applied settings, it may be problematic and impractical to provide the child with a break every time the child asks for it appropriately. This may lead to frequent interruptions of educational routines and may also impede the child from receiving academic instruction. Chained schedules of reinforcement (also known as demand fading) addresses this issue by allowing a practitioner to program for one task or a series of tasks to be completed before allowing the child to receive a break (Hagopian et al., 2011). Chained schedules of reinforcement are most suitable for children who engage in challenging behavior maintained by escape from non-preferred tasks (e.g., instructional demands). In this procedure, a practitioner gradually increases the number (or difficulty) of tasks the child must complete before reinforcement (i.e., a break) is provided. This procedure increases the child's tolerance for non-preferred tasks and also to delayed reinforcement.

Steps to Implement Chained Schedules of Reinforcement Following successful implementation of FCT (e.g., low rates of challenging behavior, consistent use of the replacement behavior), a practitioner implements a chained schedule of reinforcement by requiring the child to complete one small task or one step of a long task. If the child asks for a break appropriately before completing the task, the practitioner delivers a wait signal (e.g., "*good job asking nicely, but first finish your work*") and does not attend to nondangerous challenging behavior. Once the child completes the task, the practitioner allows the child to take a break. Gradually, the practitioner increases the number of tasks or time required to be engaged in a task before giving the child access to a break.

Multiple Schedules of Reinforcement In applied settings, children need to learn when it is appropriate to ask for reinforcers (e.g., a toy) and when it is not appropriate to ask for reinforcers. For example, it may be appropriate to ask for a tablet to play video games during break periods in the classroom, but it may not be appropriate to ask for it during instructional periods. Similarly, it may be appropriate for a child to ask her mother to play with her when the mother is reading a newspaper, but it may not be appropriate to ask her mother to play with her when the mother is talking on the phone. When a child asks for a reinforcer (e.g., a toy, attention) during an inappropriate time, it is likely that child will not get access to the reinforcer which may lead to engagement in challenging behavior. For example, if a child asks her mother to play with her while the mother is busy talking on the phone, it

is unlikely that the mother will be able to respond to the child's request for attention. In this case, the child may revert to challenging behavior. Multiple schedules of reinforcement address this issue. Using this procedure, a practitioner teaches the child to differentiate between periods/situations when reinforcers are accessible and periods/situations where reinforcers are not accessible (Muharib & Pennington, 2019; Saini et al., 2016). This procedure is most appropriate for children whose challenging behavior is maintained by attention (e.g., from peers, teachers, parents) or tangible items (e.g., toy, tablet). By teaching the child to differentiate between appropriate and inappropriate periods/situations, a practitioner does two things: (a) increases the child's tolerance for not receiving a reinforcer during inappropriate periods, and (b) decreases the likelihood that the child returns to using challenging behavior to get her wants or needs met.

Steps to Implement Multiple Schedules of Reinforcement Following a successful implementation of FCT (e.g., low rates of challenging behavior, consistent use of the replacement behavior), a practitioner selects two distinct visual cues (e.g., two colored cards). These cues will be used to signal that reinforcement is or is not available. When the visual cue for reinforcement is in place (the appropriate periods/reinforcement periods), every time the child asks for a reinforcer, the child is immediately given the reinforcer. When the visual cue signaling that no reinforcement is in place (the inappropriate periods/no-reinforcement periods), the reinforcer is not given to the child even if the child asks for it appropriately.

For example, a practitioner selects a red card to use during the no-reinforcement period and a green card to use during the reinforcement period to help Johnny differentiate between when it is appropriate to ask for a tablet (his reinforcer) and when it is not. After selecting the visual cues, the practitioner should explain how the system works and use a rule to help Johnny understand the new procedure (“*when the green card is out, you can ask for your tablet and I will give it to you, when the red card is out, no tablet*”). After presenting the rule, the practitioner models the expected behavior and then provides Johnny with opportunities to engage in the appropriate replacement behavior during the reinforcement period. For example, the practitioner might say, “Johnny now that the green card is out, you can ask for tablet. Let me show you how you can ask. Now you try.” The practitioner should also be prepared to provide error correction if the child uses the replacement behavior during no-reinforcement times. For example, if Johnny does engage in the replacement behavior during the no-reinforcement period, the practitioner should acknowledge (“*good job asking nicely, but you need to wait for the green card*”) and then redirect the child to other appropriate activities or tasks.

Using this procedure, it is critically important to keep three rules in mind: (a) select visual cues that the child is familiar with and is able to differentiate between, (b) reinforce the replacement behavior only during the reinforcement period, and (c) keep the no-reinforcement period short in the beginning of using this procedure. To address the first rule, a practitioner pre-tests the child's ability to differentiate between the visual cues before using them. For example, a practitioner presents the red card in the presence of other colored cards and asks the child to select the red card. A practitioner also presents the red card and asks the child (“*what color is this?*”). If the child is able to answer correctly, then the practitioner can select this visual cue to use in the multiple schedule procedure.

To address the second rule, a practitioner should only give the child the requested reinforcer when the child engages in the replacement behavior during the reinforcement period and never give the child the requested reinforcer when the child engages in the replacement behavior during the no-reinforcement period. A practitioner should also refrain from giving the child the reinforcer when the child engages in challenging behavior during either period. Finally, to address the third rule, a practitioner should keep the no-reinforcement period short initially. For example, a practitioner may start

with only 1 min in which the target reinforcer is not accessible. Gradually, the practitioner can increase the duration in which the reinforcer is not accessible (e.g., 2 min, 3 min). Keeping the period short initially may help the child build tolerance for not receiving the reinforcer and it may also help prevent the child from returning to challenging behaviors.

To make multiple schedules of reinforcement more practical, a practitioner may pair visual cues with specific activities and then fade out the visual cues. For example, a practitioner may present a green card during break time to signal the availability of the reinforcer and present a red card during one-on-one time to signal that reinforcement is not available. For example, a mother may present a green card while she is reading a newspaper to signal the availability of the reinforcer and present a red card while she is on the phone to signal the unavailability of the reinforcer. Once the child consistently differentiates between the two conditions (i.e., requesting a reinforcer appropriately during the reinforcement period, and not requesting a reinforcer nor engaging in challenging behavior during the no-reinforcement period), then the colored cards may be removed.

For some children who have strong language receptive repertoire, visual cues may not be needed. Instead, a practitioner presents the child with at least two different scenarios wherein one represents the reinforcement period and the other represents the no-reinforcement period (Kuhn et al., 2010). For example, a practitioner may begin by stating a rule (e.g., “*when I’m not talking to someone, you can talk to me, when I’m talking to one of your friends, I can’t talk to you, you need to wait*”). Then, the practitioner may prompt the child to talk when the practitioner is not talking to others (e.g., “*OK, Johnny, I’m not talking to anyone, you can talk with me if you want to*”). The practitioner gives Johnny attention by talking and listening to him as he is talking. Then, as the second situation, the practitioner talks to another child in the classroom for a brief period (e.g., 20 s). If Johnny tries to ask for the practitioner’s attention, the practitioner acknowledges his replacement behavior only once (e.g., “*good job asking, but I’m talking to your friend, you need to wait*”) and then ignores any other occurrences of the replacement behavior during the waiting period to teach Johnny that he needs to wait while she is talking to others.

For some children whose challenging behavior may persist in the no-reinforcement periods, a practitioner can give the child an alternative reinforcer when the targeted reinforcer is not available (Fuhman et al., 2018). For instance, when a child’s reinforcer is her teacher’s attention, and the teacher cannot attend to the child, the teacher may give the child an alternative activity to engage in while waiting. The alternative activity must be (a) preferred by the child and (b) given before the child starts engaging in challenging behavior.

To identify the child’s preferred activities, a practitioner can conduct one or more preference assessments which may involve (a) asking the child’s parents, teachers, and others who frequently interact with the child about the toys/activities the child likes to do during free time, (b) observing the child during free play and noting the toys/activities the child engages with, or (c) giving the child a few choices and asking the child to select one (Cannella-Malone et al., 2013). For instance, using the information gathered from an observation, the teacher presents the child a few options (e.g., toy car, squishy ball, coloring book) and asks the child to choose one at the beginning of an instructional period. The first selection (e.g., squishy ball) is likely to be the most highly preferred activity for the child. Then, once a waiting period (i.e., no-reinforcement period) starts, the teacher immediately gives the child this selected alternative activity while waiting to get the teacher’s attention (e.g., “*OK, you can play with the squishy ball while I help your friends, I will right back*”).

Recommendations for Successful Implementation of Reinforcement Thinning Procedures

As previously stated, to make FCT feasible and practical in applied settings such as home and school, it is important to use a reinforcement thinning procedure following a successful implementation of FCT. There are a few recommendations to consider to enhance the effectiveness of reinforcement thinning procedures. First, it is important for all stakeholders (herein referred to as the team) to be on the same page. This can include parents, teachers, paraprofessionals, and any other individuals who interact with the child on a regular basis. Before implementing an intervention, a practitioner meets with the team, describes the intervention and the rationale behind using the intervention with the child, and provides a step-by-step description in jargon-free language about how to implement the intervention with the child. It is important to make the team feel their input being valued and to answer their questions clearly. This may increase the team's buy-in. Without their buy-in, the team is less likely to implement the intervention with fidelity. After a clear description of the intervention and answering the team's questions, a practitioner models to the team how to implement the intervention with the child and provides different scenarios of how to react to a child's replacement behavior or challenging behavior when they occur. Then, the practitioner provides multiple opportunities for the team to practice the intervention in a role-play format wherein the practitioner plays the child's role until each member of the team can implement the intervention with 100% accuracy. This is especially important because lack of consistent accurate implementation of the intervention across all the team members may lead the child to revert to challenging behavior. For example, a teacher has been implementing a chained schedule of reinforcement with Johnny where Johnny is required to complete one academic task before he can take a break. When Johnny engages in challenging behavior, the teacher ignores it and prompts Johnny to complete the task. However, when a paraprofessional implements the intervention with Johnny and Johnny engages in challenging behavior, the paraprofessional lets Johnny take a break. This inconsistent implementation teaches Johnny to engage in challenging behavior with certain people or in certain contexts (Muharib & Pennington, 2019). Therefore, it is critical to make sure every member of the team follows the intervention steps accurately. In Johnny's scenario, the teacher may provide positive and corrective feedback to the paraprofessional. When providing feedback to any team member, it is important to provide it in a positive calm tone and start off highlighting the steps the team member implemented correctly. Then, a practitioner provides the corrective feedback (e.g., "I liked the way you presented the task to Johnny. Next time Johnny spits on the worksheet, let's ignore it and prompt Johnny to complete the task"). It is also important to provide the feedback immediately and privately. A practitioner provides immediate feedback so that the team member remembers what they exactly did during the implementation. A practitioner refrains from providing feedback in front of other people because doing so may make the team member feel uncomfortable which consequently may build a wall between the team member receiving the feedback and the practitioner giving the feedback (Reid & Parsons, 2018).

Second, before implementing any of the reinforcement thinning procedures, it is important to determine how long you expect the child to tolerate periods of no reinforcement (i.e., terminal goal). This goal should resemble what is acceptable in the setting and should be age appropriate. This decision should be made as a team. In other words, a practitioner consults with other team members such as teachers and parents and asks them what would be acceptable in the classroom or home. For example, a teacher may say that other children in the classroom are allowed to take a break for 5 min every 30 min. Another example, a mother may say that she wishes her child would only play video games on the tablet during a certain time of the day (e.g., before dinner). Based on the information gathered from the team members, the ultimate goal can be selected. So, for Johnny, for example, his ultimate goal would be receiving a 5-min break after engaging in activities (e.g., circle time, center time, one-on-one time) for 30 min.

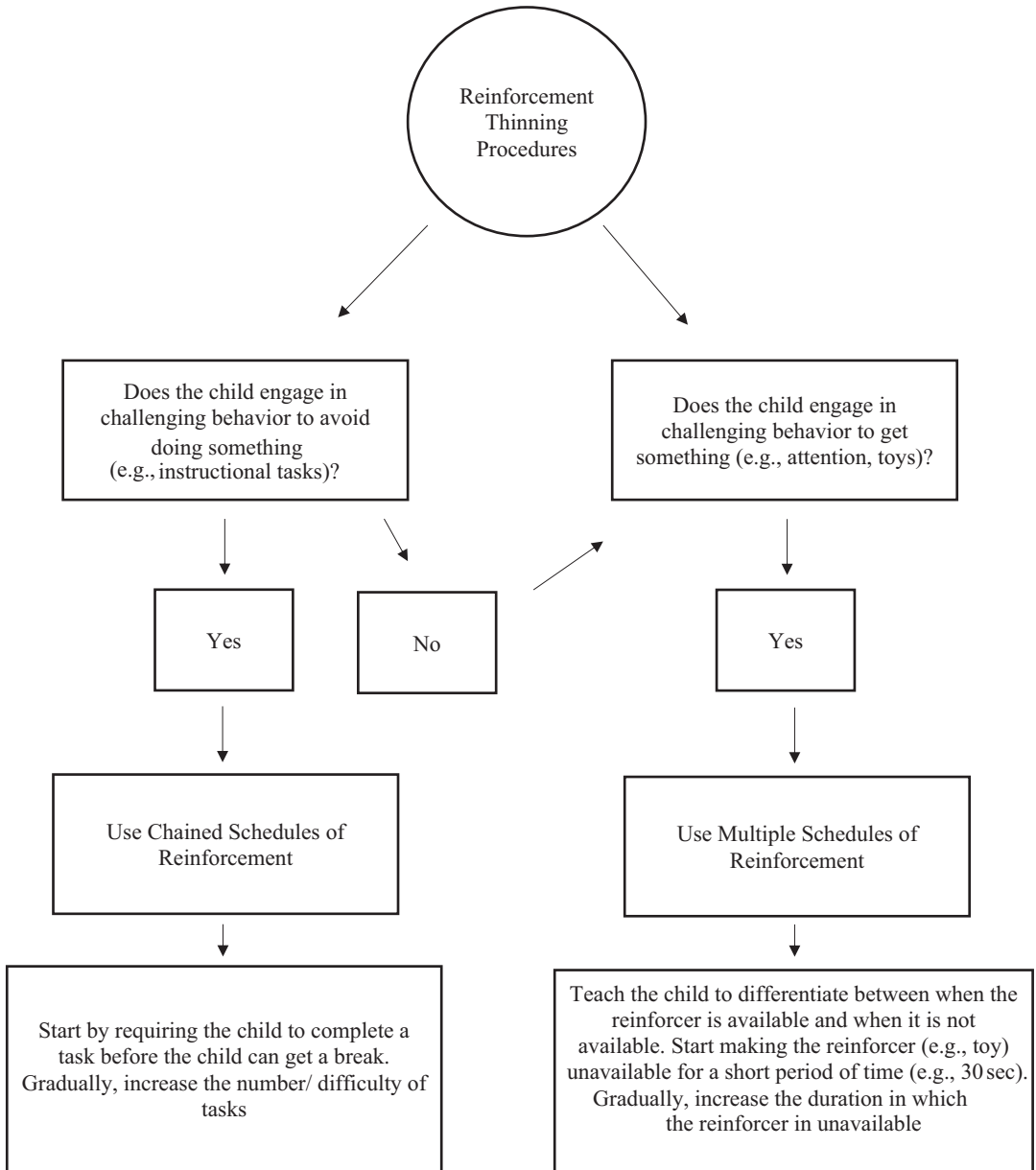


Fig. 44.4 Reinforcement thinning procedures

Third, as with any intervention, it is important to collect data to assess the effectiveness of FCT and reinforcement thinning procedures. Data collection serves as a guide tool. For instance, a data pattern that shows a lack of progress may suggest a need to revisit and modify the procedure. A data pattern that shows a lack of progress may also suggest that team members may not have been implementing the procedures accurately which may explain the lack of child’s progress. In this case, a practitioner does not modify the procedure. Instead, a practitioner re-trains the team members using modeling, role-play, and feedback.

Finally, a practitioner must gradually thin the schedule of reinforcement and base any changes in the criteria (e.g., changing from requiring the child to complete one task to requiring the child to complete two tasks) on data indicating the child's success on the current criteria. Changing criteria rapidly or arbitrarily (e.g., increasing the 1 min to 10 min of no reinforcement in a multiple schedule of reinforcement) may lead the child to return to engage in challenging behavior. Thus, criteria changes must be gradual and not easily detectable by the child (e.g., going from 1 to 1.5 min). If a practitioner makes a criterion change and the data pattern indicates a high level of challenging behavior, a practitioner can adjust the criteria or go back to the previous criteria. For example, a practitioner implementing a multiple schedule of reinforcement changes the waiting period (no-reinforcement period) from 1 to 3 min. The practitioner sees a data pattern that indicates an increased level of challenging behavior of Alex and, therefore, adjusts the waiting period from 3 to 2 min. After adjusting the criteria, Alex's challenging behavior decreases. The practitioner continues to have Alex wait for 2 min for a few more days to ensure the decreased level of challenging behavior continues, and then increases the waiting period for Alex from 2 to 3 min (Fig. 44.4).

Summary

- Functional communication training is an evidence-based practice that involves teaching a child an appropriate replacement behavior that matches the function of challenging behavior.
- To identify the function of challenging behavior, a practitioner conducts indirect and direct functional behavior assessments and then formulates a hypothesis about why the challenging behavior occurs.
- A practitioner uses a team approach to select a new replacement behavior for the child that is easy for the child to learn and use, and can be easily recognized by others in the child's environment.
- A practitioner teaches the child the new replacement behavior using a prompt procedure (e.g., least to most, most to least) and ensures teaching takes place in different contexts and across different individuals to ensure that the child is able to generalize the new replacement behavior across settings and individuals.
- A practitioner gradually thins the schedule of reinforcement using either a multiple schedule of reinforcement (for challenging behavior maintained by attention or tangible items) or a chained schedule of reinforcement (for challenging behavior maintained by escape from non-preferred activities).

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