Functional Communication Training: A Review and Practical Guide

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ABSTRACT

Functional communication training (FCT) is one of the most common and effective interventions for severe behavior problems. Since the initial description of FCT by Carr and Durand (1985), various aspects of the FCT treatment process have been evaluated, and from this research, best practices have emerged. This manuscript provides a review of these practices as they arise during the development of effective FCT interventions.

Descriptors: Behavior disorders, differential reinforcement of alternative behavior, functional communication training, function-based treatment

Functional communication training (FCT) is a differential reinforcement (DR) procedure in which an individual is taught an alternative response that results in the same class of reinforcement identified as maintaining problem behavior. Problem behavior is typically placed on extinction (i.e., reinforcement no longer follows problem behavior). Functional communication training differs from other function-based DR procedures in that the alternative response is a recognizable form of communication (e.g., a vocalization, manual sign).

Carr and Durand (1985) introduced FCT as treatment for the problem behavior of 4 children with developmental disabilities. A vocal response that resulted in teacher attention ("Am I doing good work?") was taught to the children for whom attention was thought to be maintaining their problem behavior. A different vocal response ("I don't understand") that resulted in teacher assistance was taught to the children for whom escape from difficult tasks was thought to be maintaining their problem behavior. These procedures resulted in acquisition of these vocal responses and substantial reductions in the problem behavior of all 4 children. In the 20 plus years since the publication of Carr and Durand (1985), FCT has emerged as the most published function-based treatment for problem behavior.[1]

FCT interventions progress through three stages. A functional analysis is conducted to identify the environmental events that serve as reinforcers for problem behavior and the conditions that evoke problem behavior (i.e., the relevant "establishing operations" that increase the value of the reinforcer; Michael, 1982). A socially-acceptable communicative response is strengthened by reassigning the reinforcer found to maintain problem behavior to that communicative response.[2] Finally, the FCT treatment is extended across settings and caregivers.

Although this process can be briefly summarized, there are procedural variations at each stage that are likely to affect the outcomes associated with FCT. The purpose of this paper is to identify the variations described in published research for each stage of treatment, to critically evaluate the effectiveness of different FCT variations, and to generate guidelines for best practice on the basis of this research. Ideally, this manuscript will serve as a practical guide to individuals who implement FCT for individuals with behavior disorders.

Studies on FCT were identified through a search of Psychinfo and ERIC using the keywords "functional communication training" or "functional equivalence training" from 1985 through 2006. The reference section of each article was examined to identify additional FCT articles. Finally, each article was reviewed to determine if it met inclusionary criteria for the present review. Studies were included if they were published in an English-language scholarly journal, described use of a pretreatment functional assessment in any form (i.e., indirect, descriptive, or functional analysis), and included FCT as an intervention for problem behavior. A total of 91 articles, published in 19 journals, and consisting of 204 individual participants[3] were included. A list of all 91 FCT articles can be found on www.abainternational.org/BAinPractice.asp.

For Whom Have FCT Interventions Been Developed?

The 204 participants in this review ranged from young children to adults, nearly all of whom were diagnosed with a developmental disability or mental retardation (195 of the 204 cases). Eighty-one individuals were diagnosed with autism. Those individuals not diagnosed with a developmental disability or mental retardation were diagnosed with traumatic brain injury (3 cases), attention deficit disorder or attention-deficit hyperactivity disorder (3 cases), and speech or language delays (3 cases). Although FCT has the greatest level of empirical support for use with individuals with developmental disabilities, there is limited evidence that FCT may be relevant for other persons who display problem behavior.

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[1] A search of PsychInfo in which the key terms functional communication training (FCT), differential reinforcement of other behavior (DRO), and noncontingent reinforcement (NCR) were linked to functional assessment, functional analysis, and behavioral assessment yielded 66 FCT papers, 31 NCR papers, and 11 DRO papers. These results, although preliminary, support the assertion that FCT is the most popular function-based treatment for problem behavior.

[2] The communicative response may be conceptualized as a mand in that it is evoked in the presence of a relevant establishing operation and maintained by a characteristic consequence

[3] Four additional FCT studies that consisted of relatively large groups of participants were excluded to avoid the possibility of overlap with other published papers. The reader is referred to Hagopian, Fisher, Sullivan, Acquisto, and LeBlanc (1998) for FCT summary data relevant to an inpatient sample, to Kurtz et al. (2003) for an outpatient sample of young children, and to Wacker et al. (2005) and Wacker et al. (1998) for samples of young children with developmental disabilities served in their homes.

Which Forms and Functions of Problem Behavior Have Been Addressed with FCT?

Participants most often engaged in aggression, self-injury, or motor and vocal disruptions; however, FCT evaluations have also included bizarre vocalizations (Mace & Lalli, 1991), stereotypy (Wacker et al., 1990), inappropriate sexual behavior (Fyffe, Kahng, Fittro, & Russell, 2004), self-restraint (Vollmer & Vorndran, 1998) and inappropriate communicative behaviors (Frea & Hughes, 1997). Problem behaviors were maintained by attention (32% of cases); materials (29% of cases); access to other events, such as restraint or wheel chair movement (3% of cases); escape from demands (43% of cases); and escape from other aversive events, such as loud noises and social interaction (4% of cases).[4] Thus, FCT is an appropriate treatment for a variety of problem behaviors maintained by social (positive or negative) sources of reinforcement.

Guidelines for Developing FCT Interventions

How Do You Identify the Reinforcer for the Communicative Response?

The first step in implementing FCT is to conduct a functional assessment of the client's problem behavior. Functional assessments identify the environmental event(s) maintaining problem behavior, thus allowing for the maintaining event to be withheld following problem behavior and reassigned to follow a recognizable communicative behavior. The majority of studies (71 of 91 published articles) used the functional analysis model in which potential controlling variables for problem behavior were manipulated (see Hanley et al., 2003, for a review). Without the accurate identification of maintaining reinforcers, the event(s) assigned to follow a communicative response may be functionally unrelated to problem behavior. Such interventions may be less likely to decrease problem behavior and/or strengthen a socially acceptable alternative. Therefore, we recommend

conducting a functional analysis of severe problem behavior prior to implementing FCT (see Iwata & Dozier in this issue of *BAP* for guidelines on conducting functional analyses).

How Do You Select a Communicative Response Topography?

A variety of response topographies have been targeted in FCT, including vocal responses, picture exchanges, sign language, gestures, and activation of voice or text output devices. Findings suggest several factors should be considered when selecting a communicative response topography. This includes the effort required to engage in the response, the likelihood that others will recognize and respond appropriately to the response, and the consumer's current behavioral repertoire.

Consider response effort. Horner and Day (1991) first showed that when a communicative response required more effort than problem behavior (e.g., manually signing a full sentence), the response failed to occur at levels higher than that of problem behavior. By contrast, when the communicative response required less effort (e.g., signing a single word), it occurred to the exclusion of problem behavior. Thus, the communicative response should be less effortful than problem behavior, at least in the initial stages of treatment. While this recommendation seems straightforward, the complexity or effort of acquiring a communicative response is often not fully appreciated.

Preliminary language research suggests that individuals with developmental disabilities are more adept at acquiring topography-based responding relative to selection-based responding (Sundberg & Sundberg, 1990; Wraikat, Sundberg, & Michael, 1991). In topography-based systems, such as sign language, the form of the response differentiates one verbal response from another (i.e., the sign for "play" is different from the sign for "break"). In selection-based systems, such as picture exchanges, the form of each response is identical (e.g., handing someone a picture card) and are differentiated by the stimulus selected. Selection-based systems may present challenges to individuals with disabilities because these systems require individuals to scan an array of stimuli and

to discriminate between multiple pictorial or textual stimuli. On the other hand, more precise motor control is required for effective manual signing relative to picture exchanges. Thus, selection-based responses may be easier to shape or prompt, facilitating quicker acquisition of the communicative response. Nevertheless, the extent to which the relative effort of selection-based and topography-based communicating systems impact the effectiveness of FCT interventions has not yet been determined.

There is also evidence that the use of simple and low-effort responses should be restricted to the initial stage of treatment. While teaching young children with language and developmental delays, Hernandez, Hanley, Ingvarsson, and Tiger (2007) showed that reinforcement of relatively high-effort responses (requests embedded within a frame such as, "May I have the ___[car]___, please") were more likely to induce generalization (e.g., "May I have the book, please") than low-effort responses (characterized by single specific words such as "Car").

Consider the social recognition of the response. Response topographies that a novel conversation partner will likely reinforce should be selected (Durand & Carr, 1992). Logically, adults unfamiliar with an individual's behavioral programming will be unlikely to respond appropriately to arbitrary gestures such as a hand claps and only slightly more likely to respond appropriately to manual sign language. Novel adults are most likely to respond to communication that unambiguously identifies the reinforcer.

One investigation provided strong support for selecting recognizable response topographies. Durand (1999) taught 5 individuals with disabilities to recruit reinforcement through voice-output devices as alternatives to destructive behavior. Following this training, the devices were introduced in community settings (e.g., an individual with problem behavior maintained by access to food was trained to use a voice output device to request food, and then took the device to a mall food court). This study showed that these responses occurred under untrained conditions for all 5 participants and that untrained adults responded appropriately to the communicative responses.

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[4] Individuals presenting with multiply controlled problem behavior resulted in the sum of these percentages to be greater than 100%.

Consider the likely speed of response acquisition. Response forms that can be quickly acquired as replacements for problem behavior should be selected. Vocal responses are the ideal alternative for socially maintained problem behavior due to the possibility of recruiting reinforcement from novel persons or from people at a distance. However, motor responses may be preferable for individuals who engage in little or no vocal behavior, as extensive training would be necessary to develop recognizable vocal responses. Motor responses probably should be considered as initial FCT responses even when vocal verbal repertoires are intact because vocal responses are more difficult prompt. Efforts can be dedicated to increasing the developmentally appropriate nature of the response once the communicative behavior has replaced problem behavior.

Alternative vocal or motor responses may already exist in the repertoires of consumers but not occur under the conditions evoking problem behavior. Clinicians may strengthen these responses through FCT. For example, an individual may sometimes manually sign "all done" or engage in self-injury in difficult situations. Therefore, the manual sign "all done" may be strengthened as a communicative response by terminating tasks only following the "all done" sign. The training of a pre-existing response is likely to result in more rapid acquisition than introducing a novel response alternative (Winborn, Wacker, Richman, Asmus, & Geier, 2002). However, reinforcement of a pre-existing response may result in an increase in problem behavior in some cases (see Derby, Fisher, Piazza, Wilke, & Johnson, 1998).

In summary, communicative responses that are recognizable and can be acquired quickly (i.e., low effort) should be selected during the initiation of FCT. More complex response forms should be considered after initial responses are acquired and problem behavior is satisfactorily reduced.

Who Should Implement FCT, and Where Should They Implement It?

When the reinforcer and communicative response have been identified, the teaching setting and the individual who will teach the communicative response should be selected. Both decisions are essentially issues of stimulus control and generalization. The ultimate success of FCT is determined by the extent to which communication occurs in the presence of all relevant caregivers in all relevant settings. That does not necessarily mean that all relevant caregivers should simultaneously implement FCT in all relevant settings. There are important starting conditions to ensure acquisition of the communicative response. Eventually, the teaching conditions are modified to promote generalization and maintenance of treatment effects.

Consider the initial teaching conditions. Functional communication training has been conducted by experts in highly controlled settings (e.g., clinicians in hospitals or clinics; Hagopian et al., 1998; Kurtz et al., 2003) and by parents or teachers in community settings (e.g., Northup et al., 1994; Wacker et al., 2005). The amount of time required to train a caregiver to implement FCT is worth considering when deciding who should implement FCT initially. Functional communication training requires the precise manipulation of establishing operations, timing of prompts, and delivery of consequences for communicative and problem behavior while ensuring the safety of the implementer and consumer. Caregivers may require extensive training to implement FCT, during which time problem behavior may continue to occur. Trained practitioners often implement the early stages of FCT (which are commonly the most challenging) and then introduce caregivers into the training environments following successful outcomes (when communication is occurring to the exclusion of problem behavior).

By contrast, some researchers have adopted the approach of initiating FCT exclusively in natural environments (e.g., training job coaches at a job site; Kemp & Carr, 1995). This approach has the advantage of developing communicative responding under target conditions (i.e., issues of generalization are minimized), but suffers two potential limitations. First, problem behavior or other behaviors that are incompatible with the communicative response may continue to be reinforced in the natural environment. These competing sources of reinforcement are more easily removed or minimized in controlled settings. Second, risk to the client, other individuals, and personal or public property can be minimized by eliminating other individuals from the training environment (e.g., other students), using special protective equipment (e.g., padded rooms and tables), and removing fragile or dangerous items (e.g., lamps, televisions, and tables). Initiating treatment in a protected settings is strongly recommended for individuals whose problem behavior poses undue danger to themselves or others.

That is not to say that conducting training only in a controlled setting will be sufficient. Conducting FCT in a single training environment will not consistently result in clinically acceptable levels of generalization to other settings or individuals (Wacker et al., 2005). When a controlled training environment is used, additional strategies typically will be necessary to promote generalization of behavior changes to other environments.

Consider strategies for promoting generalization. We highly recommend three of the generalization techniques described by Stokes and Baer (1977), along with caregiver training, to promote the generality of responding. One technique is to eventually incorporate multiple trainers or training settings (i.e., the multiple exemplar approach). Durand and Carr (1991) had three trained implementers conduct the initial FCT training, and then observed generalization of the communicative response to the classroom for 3 participants. In this regard, generalization to the teacher was enhanced by training the response in the presence of multiple trainers.

A second technique that has not been clearly articulated in the FCT literature is to include *like stimuli* into the training environment or, said another way, to make the training environment similar to the natural environment. For instance, common items found in classrooms can be introduced in training settings (e.g., particular curricular materials) to facilitate the transition back to classrooms. A third technique is often referred to as sequential modification, or sequentially conducting training in each relevant context. When minimal generalization of the communicative response occurs in other settings, training should be sequentially introduced in each setting to produce generalized reductions in problem behavior.

Although more challenging in terms of time and effort, this technique is clearly necessary when other attempts to promote generalization have failed.

There is little doubt that caregivers can be successfully trained to implement FCT. Several studies have evaluated the effects of FCT implemented by school teachers and staff members with minimal involvement from trained clinicians (e.g. Durand & Kishi, 1987; Northup et al., 1994). However, there is a lack of consensus on how best to train these individuals. Common staff-training procedures (e.g., the use of modeling, scripts, role play, videotapes, and feedback) have been anecdotally reported throughout the literature but have not been the focus of a formal evaluation.

In sum, we recommend that FCT be initiated by a well-trained practitioner in a setting that minimizes competing sources of reinforcement and maximizes the safety of the therapist, consumer, and personal property. Strategies to promote generalization to important settings and caregivers should be incorporated, and generalization should be assessed to ensure its occurrence. Direct training in these important environments may be necessary in some cases. Caregivers should be trained to implement FCT; however, the ideal way to arrange this training has yet to be described.

How Should You Teach the Communicative Response?

There are two considerations for teaching the communicative response. First, will teaching trials be arranged through contrived situations or will therapists wait for naturally arising opportunities? Second, how will the communicative response be prompted, and how will this prompting be faded? The following section will address each consideration individually.

Consider using contrived versus natural establishing operations. The distinction between contrived and natural establishing operations depends upon whether a trainer waits for the maintaining reinforcer to become valuable or specifically sets up conditions that will increase the value of the reinforcer. For instance, a trainer could embed FCT trials during morning self-care routines for individuals whose problem behavior is maintained by escape from these

routines or could repeatedly prompt an individual to engage in self-care tasks during contrived training sessions. Conducting training during naturally occurring routines will promote generalization to these conditions. However, this "natural establishing operation only" approach in isolation is likely to result in relatively slower acquisition of the target response due to fewer learning opportunities and may be dangerous for severe problem behavior. Contriving teachable opportunities can accelerate learning by arranging for multiple opportunities to prompt and reinforce the communicative response, both of which can be repeatedly arranged to occur under presumably safer conditions. However, this "contrived establishing operation only" approach in isolation may require additional training to promote generalization to more typical conditions (Moes & Frea, 2002).

Consider prompting and prompt fading tactics to promote communicative responding. Several prompting and prompt fading techniques have been described in the FCT literature. In a general sense, these prompting techniques can be described as least-to-most and most-to-least prompting sequences. One version of the least-to-most prompting technique was described by Shirley, Iwata, Kahng, Mazaleski, and Lerman (1997), who began each teaching trial by setting up the relevant establishing operation (e.g., removing access to a preferred item) and providing an opportunity for the communicative response to occur (e.g., waiting for 5 s). This 5-s delay was then followed by a verbal or physical prompt (i.e., physically guiding the participant's hands to complete the target sign), after which reinforcement was delivered in the form of brief access to the preferred item. The physical prompt then was further delayed to eliminate the participant's dependence upon prompting (i.e., the response eventually occurred when the target item was removed). The aim of this procedure is to transfer control from the teacher's prompting to the evocative event (e.g., a toy or attention being removed) via progressively increasing delays in time between the presentation of the evocative event and the prompt.

A version of the most-to-least prompting technique was described by Fisher et al. (1993) in what was termed an

errorless backward-chaining procedure. A therapist physically prompted the consumer to engage in the target communicative response immediately upon removal of the reinforcer (i.e., when the relevant establishing operation was in place). Upon successive trials, the physical prompt was gradually faded by removing the intensity of the prompt until the individual responded independently. Carr and Durand (1985) described a similar approach to prompt vocal responses by initially providing the vocal prompt, "Say, 'Please'," and gradually reducing the volume of the prompt (i.e., progressively whispering the prompt). The aim of most-to-least prompting strategies is also to transfer control from the teacher's prompting to the evocative event, but this occurs through the gradual elimination of the prompt as opposed to the time-delay inherent in the least-to-most procedure used by Shirley et al. (1997).

Although there have not been any comparative analyses of these prompting techniques in the context of FCT, there are some distinct advantages to each that may be considered. The least-to-most procedure permits problem behavior to occur during the initial stages of training, creating brief experiences with extinction which may be helpful in decreasing future problem behavior occurrences. However, undesirable response chains involving the problem behavior and the communicative response may develop if bouts of problem behavior consistently precede a prompted and reinforced communicative response. There is much less opportunity for undesirable response chaining to occur with the most-to-least procedure (e.g., Fisher et al., 1993) which ensures the emission of the communicative response as soon as the evocative event is experienced. However, extinction of problem behavior may be rarely experienced so problems may emerge even after successful communication training.

How Should You Select the Consequences for Problem Behavior?

When implementing FCT, three generic classes of consequences can be arranged for problem behavior: reinforcement, extinction, and punishment.

Consider continued reinforcement of problem behavior. Problem behavior may

need to be reinforced during FCT when there is little control over the reinforcer (e.g., peer attention in a classroom), or when withholding the reinforcer may be dangerous (e.g., a large adult who engages in severe aggression or self-injury). The effectiveness of this treatment approach relies upon the communicative response competing with problem behavior. A limited number of reported cases have shown FCT to be effective in the absence of extinction, and suggest that longer duration of reinforcement (Peck et al., 1996; Peterson et al., 2005), more immediate or higher quality of reinforcement (Horner & Day, 1991), and a higher rate of reinforcement (Kelley, Lerman, & Van Camp et al., 2002; Worsdell et al., 2000) should be assigned to the communicative response if problem behavior will continue to be reinforced.

Consider extinction for problem behavior. FCT without extinction will frequently fail to result in sufficient reductions in problem behavior (Fisher et al., 1993; Hagopian et al., 1998; Shirley et al., 1997; Wacker et al., 1990; Worsdell et al., 2000). Perhaps the most definitive study on the relative importance of arranging extinction for problem behavior was reported by Hagopian et al. (1998) in a summary of 27 applications of FCT implemented on an inpatient unit specializing in the treatment of severe behavior disorders. FCT without extinction was applied as a treatment in 11 of these applications and was not effective in reducing problem behavior below 90% of baseline levels in a single case. FCT with extinction was implemented during 25 applications and resulted in at least 90% or greater reductions in problem behavior in 11 cases. Based on these results and those of additional studies, we recommend implementing extinction for problem behavior as the starting point for FCT when possible.

Consider punishment of problem behavior. Although FCT with extinction has proven effective for a variety of behavior disorders, several rigorous component evaluations have shown that this treatment may not be effective for all individuals (e.g., Fisher et al., 1993; Hagopian et al., 1998; Hanley, Piazza, Fisher, & Maglieri, 2005; Wacker et al., 1990). These same studies showed that adding a punishing consequence for problem behavior

enhanced the efficacy of FCT with extinction. Although the therapeutic use of punishment raises ethical issues, research indicates that punishment contingencies are often effective and sometimes necessary for sustained reductions of severe problem behavior. For example, in Hagopian et al., after FCT with extinction was ineffective in reducing problem behavior in 14 of 25 reported applications, the addition of a punishment contingency (e.g., room time-out, brief manual restraint) resulted in a 90% reduction in all 14 cases. Thus, it should be expected that punishment may be needed for successful treatment in some cases. The aversive aspects of situations involving punishment can be minimized by continuing to deliver reinforcement for the communicative response, clearly identifying the behaviors that result in the punisher, and delivering the punisher on a reliable schedule (Hanley et al., 2005; Lerman & Vorndran, 2002).

Based on the available evidence, we recommend arranging extinction for problem behavior during initiation of FCT. For cases in which extinction cannot be implemented or is ineffective, parameters of reinforcement should be adjusted to favor the communicative response and punishment should be arranged for problem behavior. Selection of punishers should be based on a direct assessment that indicates their likely effectiveness.

How should Reinforcement be Thinned for Communicative Responding?

A continuous reinforcement (CRF) schedule has been used during the initial teaching of the communicative response (i.e., each response resulted in reinforcement) in all FCT studies; therefore, we strongly recommend that the communicative response be reinforced on a CRF schedule initially. However, caregivers often have multiple responsibilities (e.g., cooking, caring for other children) that preclude them from reinforcing each instance of communicative behavior. That is, reinforcement for the communicative response is likely to be delivered intermittently, after considerable delays, or both under natural conditions. When the schedule for communicative responding is abruptly shifted from a CRF schedule

in training to an intermittent or delayed schedule under natural conditions, the response is likely to undergo extinction, setting the stage for the reemergence of problem behavior (e.g., Fisher et al., 1993; Hanley, Iwata, & Thompson, 2001). Therefore, procedures have been developed to systematically thin CRF schedules to more manageable schedules that maintain treatment gains. The following sections describe these reinforcement-thinning.

Consider introducing a time delay between the communicative response and reinforcement. One reinforcement thinning technique involves introducing a time delay between the communicative response and delivery of the reinforcer. Following FCT for 1 participant, Fisher, Thompson, Hagopian, Bowman, and Krug (2000) introduced a 1-s delay to reinforcement for the communicative response and gradually extended this delay up to 30 s. This approach is the most frequently reported reinforcement-thinning procedure (see, for instance, Hagopian et al., 1998); however, its effectiveness is compromised with lengthier delays between the response and its reinforcer. The contingency between the communicative response and reinforcement is weakened as the time between the communicative response and the reinforcement delivery increases, making the resumption of problem behavior likely (Fisher et al., 2000; Hanley et al., 2001). This contingency weakening effect of delay may be minimized, but not eliminated, by including a salient cue during the delay that reinforcement is forthcoming (see Vollmer, Borrero, Lalli, & Daniel, 1999, for an example).

Lalli, Casey, and Kates (1995) described an alternative delay procedure that maintained the temporal contiguity between the communication response and the reinforcer. Lalli et al. first taught their participant to vocally request a break from a 16-step task by delivering the break following each request. Subsequently, the participant was required to complete more and more steps of the task before a request would be honored. In this regard, the reinforcer was delayed for responses that occurred before the task requirements were fulfilled, but the break immediately followed any requests that occurred as soon as the work requirement was completed.

Consider establishing stimulus control of the communicative response. After showing that delayed reinforcement resulted in extinction of the communicative response and resumption of problem behavior, Hanley et al. (2001) described a procedure that involved teaching the individual to identify when reinforcement would not be available for the communication response. The experimenters alternated between periods of reinforcement and extinction for communicative responses, and each period was correlated with a distinct discriminative stimulus (a red card viewable during reinforcement periods, and a white card viewable during extinction periods). This stimulus control procedure was highly effective when reinforcement for the communicative response was only available for 20% of the time. This procedure has the advantage of maintaining a strong contingency between the newly acquired communicative response and the reinforcer while still allowing caregivers a "break" during extinction periods.

Be aware of the reemergence of problem behavior. Problem behavior should be expected to occur during the reinforcement thinning process, regardless of the strategy used. Continued exposure to extinction may be sufficient to reduce problem behavior; however, additional treatment components may be necessary. One option is to provide preferred items during delay intervals or extinction periods to compete with the occurrence of problem behavior. For instance, Fisher, Kuhn, and Thompson (1998) taught a participant to request preferred materials during periods in which the functional reinforcer (attention) was unavailable. Another option, to be considered if preferred stimuli do not effectively compete with the reinforcer for problem behavior, is to include punishment of problem behavior during the extinction periods.

In conclusion, teaching consumers to appropriately escape from an aversive task and to request materials or attention are appropriate early steps in the treatment process; however terminating treatment at this phase will result in extremely unsatisfied caregivers. Although parents may be happy that their children are no longer engaging in problem behavior, they will not be satisfied if their children

effectively avoid important activities (e.g., personal hygiene or academic activities). Teaching consumers to tolerate periods without reinforcement and to complete initially aversive activities should follow initial FCT by thinning the reinforcement schedule. It is likely that the practical exigencies that make FCT challenging to implement with integrity would be best addressed by incorporating multiple thinning tactics into FCT programs. Arranging appropriate stimulus controls (i.e., signaled delays to reinforcement and signaled periods of extinction) and making alternative reinforcers available during delay or extinction periods are most likely to maintain the strength of the communicative response over time (Fisher, Thompson, Hagopian, Bowman, & Krug, 2000). In the case of escape-maintained problem behavior, we recommend the approach described by Lalli et al. (1995) due to the potential contingency weakening effects of the delay procedure.

Summary

The past 20 plus years of research have provided an empirical basis for making decisions during the implementation of FCT as a treatment for severe problem behavior. The important histories of those served and the contexts in which behavior analysts serve them will dictate some aspects of the FCT treatment process, but we have offered evidence-based guidelines for making decisions at each stage of the FCT process. These are summarized in Table 1. It is our hope that these guidelines will allow for more effective function-based interventions to be applied by behavior analysts charged with improving the conditions for persons who engage in severe problem behavior and their caregivers. In addition, these guidelines may be useful for proactive implementation of functional communication training with persons at risk for developing severe problem behavior (see Hanley, Heal, Tiger, & Ingvarsson, 2007, and Keen, Sigafoos, & Woodyatt, 2001, for examples).

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