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Functional Communication Training for Severe Problem Behaviour: A Review of the Literature

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Abstract

This literature review will summarize the use of functional communication training as an intervention to reduce severe problem behaviours in individuals with intellectual disabilities. Its goal is to determine if FCT is effective for individuals with varying behaviours, ages, and disabilities. A total of 10 articles were chosen for this paper, all of which used a single subject research design. Two additional articles were referenced for information required to evaluate FCT as a procedure. These articles were found on the Capilano University library data base system. A total of 80 participants were involved in the 10 articles reviewed, all of whom had deficits in communication and engaged in severe problem behaviours that posed a threat to themselves or others. Across the articles, results demonstrated impressive reductions in problem behaviours and an increase in the abilities of the participants to use functional communication responses (FCRs). Despite being an evidence-based practice, future research should focus on the use of FCT in varying environments throughout intervention.

Functional Communication Training for Severe Problem Behaviour: A Review of the Literature

It is not uncommon for individuals with intellectual or developmental disabilities to engage in some form of problem behaviour. Throughout the history of Applied Behaviour Analysis, the primary focus of those who work as professionals in our field has been on reducing and eliminating these behaviours (Carr & Durand, 1985). Carr and Durand (1985) however, suggested that in conjunction with eliminating the problem behaviour, behaviour analysts should instead be teaching their clients functional methods of communication to replace the behaviours they once engaged in, not just eliminating them. They suggested that problem behaviours serve a function, and once that function is determined, a socially appropriate means of maintaining that function can be developed (Carr & Durand, 1985); FCT does just that. FCT is a process that includes conducting a functional analysis (FA) to determine the function of a problem behaviour, then basing an intervention on those FA results in order to teach the individual a functionally equivalent and socially acceptable alternative behaviour (Horner et al., 2005, p. 176). Through this process, an individual with limited communicative abilities, who engages in some form of problem behaviour, can be taught a new method of communication for their needs to be met. This paper will review the use of FCT with participants of varying ages, disabilities, and in different settings to determine its status as an evidence-based practice and its effectiveness as an intervention.

Method

The articles in this literature review were found on the Capilano University library data base system and all advanced research was conducted through PsycInfo. For the advanced search, specific terms were used to yield appropriate results. These terms included “functional

communication training”, “severe”, and “problem behaviour”. To ensure that there was no substantial difference in results, the abbreviation “FCT” was used in replacement for functional communication training and “severe” was not included. These changes did not yield substantial differences in the search results. Based off title alone, many of the articles did not specify the severity of the problem behaviours of the participants. Upon reading through the articles, the problem behaviours of focus were primarily self-injurious, aggressive, and destructive, even though they had not been classified as such. The severity of the behaviours included in the studies was crucial to whether they were included in this literature review. The behaviours of interest were self-injury, aggression towards others, and destruction of the surrounding environment. A variable that was not factored into the decision was the age or gender of the participants in the articles, though the majority of participants across articles were children with only a few individuals being young adults or older.

Dependent Variables

Severe problem behaviours can encompass a variety of topographies and operational definitions. Due to the large array of problem behaviours that were reported in the 10 articles being reviewed, a brief description will be provided. The participants of the articles engaged in various problem behaviours that can be categorized as self-injurious, aggressive (included towards others), disruptive/destructive, and communicative. These dependent variables held priority due to the risks they posed to the participants themselves and those around them. Additionally, lack of communication was included as it was thought to be the cause of the problem behaviours. The most commonly encountered behaviours across all articles included screaming, kicking, and hitting. Some examples of SIB were eye gouging (Davis et al., 2018; Danov, Hartman, McComas, & Symons, 2010), and head banging (Petursson & Eldevik, 2019).

Four of the articles had a secondary DV of communicative ability which was roughly defined as the participant's ability to gain access to desired activities or items through the use of some form of AAC, sign, or words (Boesch, Taber-Doughty, Wendt, & Smalts, 2015; Davis et al., 2018; Gilroy, Ford, Boyd, O'Connor, & Kurtz, 2019; Lang, 2009). In one article by Petrusson and Eldevik (2019), a secondary DV of time spent in restraint was included due to the severity and frequency of the participant's behaviours.

Independent Variables

Every article reviewed in this paper used FCT as their main intervention though many of the studies used it in conjunction with other behavioural procedures. Four studies used FCT as its only intervention while the other six combined FCT with other procedures. The most commonly used procedures that were paired with FCT included escape extinction (Danov et al., 2010; Gilroy et al., 2019; Petrusson & Eldevik, 2019) and a differential reinforcement procedure (Davis et al., 2018; Rooker, Jessel, Kurtz, & Hagopian, 2013). Table 1 shows the different combinations of interventions for all 10 articles reviewed and a brief description of their results.

Table 1. Interventions used

Study	DV	IV	IOA	Results
1 Boesch, M. C., Taber-Doughty, T., Wendt, O., & Smalts, S. S. (2015).	SIB Manual sign	FCT + increasing FI	31% sessions; mean SIB: 99% mean sign: 97%	Combo of FCT+ increasing FI resulted in a drop to 0-4% occurrence of SIB and 100% occurrence in manual sign.
2 Carr, E. G., & Durand, V. M. (1985).	Aggression/destruction	FCT	70% sessions; Mean expt 1: 80% Mean expt 2: 80%	FCT increased functional communication responses up to 95.4%.
3 Danov, S. E., Hartman, E., McComas, J. J., & Symons, F. J. (2010).	SIB	FCT + Sr ⁺ + Ex	22-27% sessions; mean: 100%	Combo of FCT+ Sr ⁺ +Ex decreased SIB significantly.
4 Davis, T. N., Weston, R., Hodges, A., Uptegrove, L.,	Aggression FCRs Task completion	FCT + demand	83% sessions; Condition 1 mean: 99.1% Condition 2 mean: 99.6% Condition 3 mean: 99.7%	Combo of FCT + demand fading + DR reduced levels of aggression to 0-3%,

Williams, K., & Schieltz, K. M. (2018).		fading + DR		increased FCRs to a mean of 29%, and task completion to 100%.
5 Gilroy, S. P., Ford, H. L., Boyd, R. J., O'Connor, J. T., & Kurtz, P. F. (2019).	Aggression Disruption Communication	FCT+EE	31.25% FA sessions; 46.67% attention sessions; 47.62% demand sessions; 100% generalization sessions; Mean: 99.5% Mean: 100% Mean: 94.20%	Combo of FCT+ EE dropped problem behaviour to almost 0% and increased rates of functional communication responses.
6 Lang, R. (2009).	Problem behaviour Manding	FCT	30% sessions; Mean DV 1: 96% Mean DV 2: 97%	FCT was successfully used on 3 participants to reduce problem behaviours to 0 occurrences and increase levels of verbal manding.
7 Moore, T. R., Gilles, E., McComas, J. J., & Symons, F. J. (2010).	SIB	FCT	33% sessions; Mean: 91%	FCT successfully dropped SIB levels to almost 0% in an individual with a traumatic brain injury.
8 Petursson, P. I., & Eldevik, S. (2019).	Aggressive behaviours Time in restraint	FCT+EE	24% sessions; Mean: 94%	Combo of FCT+EE dropped levels of problem behaviour to near 0% and time in restraint reduced from 145 min a week to 52 minutes a week.
9 Rooker, G. W., Jessel, J., Kurtz, P. F., & Hagopian, L. P. (2013).	SIB Aggression Disruption	FCT+DRA FCT+DRO	29-71% sessions; Range DV1: 85-100% Range DV 2: 83-100% Range DV 3: 88-99.8%	Combo of FCT+DRA and FCT+DRO resulted in an over 90% reduction in SIB.
10 Walker, V. L., Lyon, K. J., Loman, S. L., & Sennott, S. (2018).	Destructive SIB	FCT	30% studies; Mean: 99%	Using FCT with AAC can produce large reductions in problem behaviour.

Participants

Throughout the 10 articles reviewed in this study there were a total of 80 participants, not included in this count are the parents and teachers who had been trained to implement the interventions. Rooker et al. (2013), had 50 individuals involved in their study while Walker, Lyon, Loman, and Sennott (2018), had 17 participants. Horner et al. state in their 2005 article that “In most cases a research participant is an individual, but it is possible for each participant to

be a group whose performance generates a single score per measurement period” (p. 166). This is the case with Walker et al (2018), as their 17 participants were other studies. The rest of the studies did not exceed 4 participants. All participants had limitations in their ability to communicate and engaged in some form of severe problem behaviour (SIB, aggression, disruption/destruction). Their ages ranged from 18 months (Moore, Gilles, McComas, & Symons, 2010) to 30 years old (Petursson & Eldevik, 2019).

Reliability

Interobserver agreement is the level of which a minimum of two or more observers independently record data on the same responses. IOA should have a minimum of 80% agreement for it to be considered reliable. Overall IOAs included Danov et al. (2010) with a mean of 100% IOA, Moore et al. (2010) had a mean of 91%, both of which were for SIB while Walker et al. (2018) had a mean of 99% recorded for SIB and destructive behaviours. The rest of the articles took IOA on the various dependent variables chosen for the study. The lowest mean percentage from these seven articles is 80% (Carr & Durand, 1985) with the highest mean IOA being 100% (Danov et al., 2010; Gilroy et al., 2019; Rooker et al., 2013). The IOA results indicate that the observers from each article underwent effective training and all had a good understanding of the operational definitions of the dependent variables. It also indicates that the operational definitions were clear and any changes in data were not due to who was observing, but to the intervention taking effect. The levels of IOA combined with effective training and understanding, lead us to believe that there is a high level of reliability for this literature.

Results

All studies began by conducting a functional analysis to determine the function of the problem behaviours. The results of these FAs demonstrate that there were three main functions across the participants, these included attention (Carr & Durand, 1985; Gilroy et al., 2019; Moore et al., 2010; Rooker et al., 2013), tangible (Boesch et al, 2015; Danov et al., 2010; Lang, 2009; Rooker et al., 2013) and escape (Davis et al., 2018; Gilroy et al., 2019; Petrusson & Eldevik, 2018; Rooker et al., 2013; Walker et al., 2018). In most cases, results showed that once the FCT intervention was implemented, the level of severe problem behaviours reduced dramatically. For the sake of conciseness, the results from four articles will be provided. An example of this can be seen in the results published in the article by Davis et al. (2018) where in baseline, aggressive behaviour was occurring for a mean of 69% of an interval ranging up to 80%, but when FCT was implemented these levels instantly dropped to 0.8%. In another study problem behaviour went from 4 occurrences per minute in baseline, down to levels of almost 0 by the final two phases of FCT. This participant's functional alternative responses also increased from 0 per minute in baseline to 0.7 per minute (Perursson & Eldevik, 2019). The study conducted by Boesch et al. (2015) demonstrates another example of positive results. The participants levels of SIB had occurred in 49% of recorded intervals but reduced to almost 0% after 6 sessions in phase 1 of FCT and 4 sessions in phase 2. Similarly, the participant made 0 appropriate requests in baseline but after 3 sessions of FCT was using functional responses on 100% of trials. The final example of results comes from the study by Rooker et al., (2013) in which FCT was evaluated on 50 participants. Implementation of FCT alone resulted in an over 90% reduction in problem behaviours. In maintenance, 74% of these cases managed to maintain the reduction in problem behaviour. The use of FCT + NCR/DRA in the same study resulted in a

90% drop which was successfully maintained for 3 out of the 4 participants who received this intervention.

While not reviewing the results of every article included in this paper, these few studies give an idea of the effectiveness that FCT can have on individuals with severe problem behaviours and communication deficits. The results of the other studies emulate the results discussed here.

Evidence Based Practice Status

This section of the paper will evaluate the evidence-based practice status of FCT. The article *The Use of Single-Subject Research to Identify Evidence-Based Practice in Special Education* by Horner et al. (2005) discusses how an evidence-based practice must follow a 5-20-3 rule. This rule states that the practice must have 5 single subject studies conducted that meet the fidelity requirements, demonstrate a functional relationship and have been published in peer reviewed journals, these 5 studies must include a minimum of 20 participants, and finally must be replicated by at least 3 other researchers across different environments (Horner et al., 2005, p. 176). This article provided “objective criteria for determining when single-subject research results are sufficient for documenting evidence-based practices” (Horner et al., 2005, p. 166). This includes that all articles used SSRD, had one or more DV, the IVs were operationally defined so others could replicate it, a functional relationship can be established between the IV and the DV, and the intervention has been implemented with fidelity (Horner et al., 2005).

The 5-20-3 rule requires that a procedure have a minimum of 20 participants across 5 studies. This paper reviewed 10 studies and 80 participants across at least 3 different environments. Though only 10 studies were reviewed in this paper, these few articles have surpassed the EBP requirements and provide a snapshot of what countless other studies are

demonstrating in their own research. All 10 articles used a SSRD as a means of conducting their research. They all had one or more dependent variables, all of which were chosen because of the immediate risk they posed to the participant and those around them. All but one article (Walker et al., 2018) provided operational definitions for the dependent and independent variables. In this article, the independent variables were defined but not the dependent variables, no reason was provided for the lack of operational definitions. All articles demonstrated a reduction in the severe problem behaviours that the participants engaged in and an increase in their ability to use functional communication responses. Similarly, they all demonstrated a functional relationship. Finally, the IOA for all the studies reviewed minimally met or surpassed the requirements for IOA. The reliability section of this paper goes into further detail for these results.

Within 10 articles FCT can be confidently considered an effective intervention and this paper is only providing a review on a small portion of the literature that exists. By comparing the EBP requirements provided to us in the article by Horner et al., with the results and implementation methods of the articles reviewed in this paper, it is safe to conclude that functional communication training is an evidence-based practice.

Social Validity

Wolf (1978) identified three components of social validity that are crucial to the overall effectiveness of an intervention. These include the dependent variables, the procedures, and the outcomes. Since one of the study requirements for individuals was the severity of the behaviours they engaged in, the dependent variables of all the participants had immediate priority because of the risk it put themselves and others in. Addressing these behaviours first increases the participant's quality of life and independence which should always be part of our goal as behaviour analysts. Additionally, it would be considered unethical to work on less important

targets when the client is engaging in behaviours that cause harm to themselves and those around them.

Only a few articles had family members, teachers, or service providers comment on their thoughts for the procedures used. In Petursson and Eldevik's article (2019), the service providers of the participant reported that once FCT had been implemented they began enjoying their work more and even found that their client was a happier and more aggregable person. In Boesch et al. (2015) the teachers had directly requested the behavioural services so we can presume that they were satisfied with the outcomes. The participant's mother in Moore et al. (2010) reported that she felt empowered once she was able to implement FCT on her own. While we do not have testimonies from all participants, the reviews of those who did report provide confidence on the quality of FCT as an intervention.

Finally, all the outcomes of the articles show a dramatic reduction in problem behaviours and an increase in communication with one article even seeing a trend towards increased verbal usage when AAC was an available option (Lang, 2009). This information demonstrates that FCT is a socially valid intervention because it produces clinically significant results in an ethical manner and has been reported to fit the needs and goals of those involved.

Conclusions / Futures Directions / Implications for BCaBAs

The results demonstrate that FCT is a very effective intervention for reducing severe problem behaviours and increasing functional communicative responses, especially when used in conjunction with other behavioural procedures; but every procedure has a few limitations. Walker et al. (2018), suggested three factors that could influence the effectiveness of FCT and those were the severity of the problem behaviour, the type of tools used to create the FCT intervention, and finally, the setting that FCT occurred in. One article reported that their study

held three limitations. Due to the participant's high frequency of behaviour, the researchers felt it was not ethical to reverse the intervention should he hurt himself again. This means they could not definitively say there was a functional relationship. Additionally, they had not trained in other settings and had not attempted to replicate their study. There was no reasoning given for these last two limitations. From these limitations is the opportunity for further research. The majority of settings included the home and school; future research could implement FCT in various settings like the community. Another research consideration would be to attempt to demonstrate generalization of FCT by moving from one setting to another within a study.

A consideration for all BCaBAs is the idea that problem behaviour often serves a function for the individual, and usually stems from the lack of ability to effectively communicate with others (Carr & Durand, 1985, p. 112). This concept of behaviours having a function is what brought about the use of FAs in our field, it holds importance and should be considered with every client. Since communication deficits are not uncommon to come across, BCaBAs should also consider the benefits of function-based interventions. The use of function-based interventions provides effective results and conserves resources and time; two things our ethics code requires. By using function-based interventions, we are providing more effective and ethical services.

Though some limitations were documented, this does not mean FCT is not effective, it means that there is further research that can be done. Put together, these 10 articles provide a convincing case for the effectiveness, social validity, and the EBP status of functional communication training as an intervention for individuals with a wide range of disabilities, behaviours, and ages.

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