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Generalization and maintenance of functional communication training for individuals with developmental disabilities: A systematic and quality review

Leslie Neely*, Elaina Garcia, Brooke Bankston, Andrew Green

The University of Texas at San Antonio, United States

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ABSTRACT

Background: Functional communication training (FCT) is considered an evidence-based practice for treating problem behavior in individuals with developmental disabilities (e.g. autism, intellectual disabilities, down syndrome, etc.). However, there is little known on how to sustain behavioral change following FCT interventions. This systematic and quality review synthesizes the current literature base evaluating the maintenance and generalization of behavioral effects following FCT.

Method: A systematic review identified 37 studies that met the pre-set inclusion criteria. Those studies were summarized in terms of: (a) generalization dimension, (b) generalization assessment design, (c) maintenance assessment design, (d) maintenance and generalization teaching strategy, and (e) latency to maintenance probes. All studies employed single-case research designs and were evaluated using the What Works Clearinghouse pilot single-case research standards (Kratochwill et al., 2013) as adapted by Maggin, Briesch, and Chafouleas (2013). Maintenance and generalization data were evaluated using a researcher-developed rubric based on the WWC standards.

Results and discussion: Results indicate that 30 studies met standards or met standards with reservations while only six studies also met all of the maintenance and generalization standards. Of the six studies, five did not implement any additional strategies beyond the contacting natural contingencies that is inherent in the FCT intervention. Implications for future research and practice are discussed.

What this paper adds?

This review extends the work of Heath, Ganz, Parker, Burke, and Ninci (2015) and Falcomata and Wacker (2013) by synthesizing studies that collected data on generalization and maintenance following functional communication training (FCT) for individuals with developmental disabilities. In addition, this review evaluated studies using the What Works Clearinghouse single-case research standards to identify the quality of the literature base (Kratochwill et al., 2013). This study identified that 30 studies met standards or met standards with reservations. However, this review identified only six studies that met all of the maintenance and generalization standards. Of the six studies, five did not implement any additional strategies beyond the contacting natural contingencies that is inherent in the FCT intervention. Therefore, the evaluation of sustained behavioral change is limited. A more systematic approach to the investigation and evaluation of the generalization and maintenance of FCT effects is needed.

* Corresponding author.
E-mail address: leslie.neely@utsa.edu (L. Neely).

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1. Introduction

A behavioral orientation is often adopted for teaching individuals with developmental disabilities with at least four distinct phases of learning identified: acquisition, fluency, maintenance and generalization (Wolery, 2000). Acquisition is the early phase of learning hallmarked by performance of the skill with accuracy. Fluency indicates accuracy and speed at completing the skill. Maintenance is defined as continued performance of the skill following cessation of the intervention, and generalization indicates the ability to perform the skill in non-instructional contexts (e.g., across settings, persons, or materials).

Generally, evidence-based practices for individuals with developmental disabilities are established with research supporting the acquisition or fluency of skills (e.g., Wong et al., 2015). While acquisition and fluency can certainly enhance the quality of life for individuals with developmental disabilities, true behavioral change is only demonstrated when progress is sustained (Stokes & Baer, 1977). Unfortunately, the research is consistently reporting that little is reported about the maintenance and generalization of evidence-based practices (Neely et al., 2016). This can be particularly important for individuals with developmental disabilities who may have difficulty naturally generalizing or maintaining behavioral change once initial treatments are withdrawn (MacDuff, Krantz, & McClannahan, 1993).

Functional communication training (FCT) is an evidence-based practice used to treat problem behavior for individuals with developmental disabilities (PB; Durand & Moskowitz, 2015). FCT involves replacement of a PB with a socially appropriate communicative response (Carr & Durand, 1985). FCT begins with a functional analysis (FA; Iwata, Dorsey, Slifer, Bauman, & Richman, 1994) or functional behavior assessment (FBA) of the PB to determine why a behavior is occurring (Carr & Durand, 1985). Once function is determined, a more appropriate functionally matched response (e.g., sign, signal, or gesture, a picture card, or a verbal request; Durand, 1999) is taught as a replacement behavior. The socially acceptable replacement behavior should result in the same outcome for the individual, but in a more efficient and effective manner (e.g., Mancil, 2006). If the effort required to engage in this new appropriate response is *higher* than the PB, then this new way of communicating is not appropriate for the individual (Durand & Moskowitz, 2015).

Numerous studies have demonstrated the effectiveness of FCT (e.g., Durand & Moskowitz, 2015). Research has demonstrated the efficacy of FCT across subgroups (e.g., Hagopian, Fisher, Sullivan, Acquisto, & LeBlanc, 1998), across age groups (e.g., Durand & Carr, 1991), and across settings (e.g., Northup et al., 1994; Wacker et al., 2005). Furthermore, FCT has been utilized with individuals with various disabilities, including autism spectrum disorder (Mancil, 2006), intellectual disability (e.g., Hagopian, Toole, Long, Bowman, & Lieving, 2004), down syndrome (e.g., Hetzroni & Roth, 2003), Fragile X syndrome (e.g., Wacker, Harding, & Berg, 2008), hydrocephaly (e.g., Hagopian et al., 2004), cerebral palsy (e.g., Kuhn, Chirighin, & Zelenka, 2010), Angelman syndrome (e.g., Radstaake et al., 2013), and other developmental disabilities (e.g., Peck Peterson et al., 2005; Volkert, Lerman, Call, & Trosclair-Lasserre, 2009). Recent studies have also demonstrated the effectiveness of FCT when conducted by professional staff and parents via telehealth (e.g., Machalicek et al., 2016). Unfortunately, much of the research published on FCT targets the learning and acquisition of the appropriate communicative response without focus on maintenance or generalization of the learned skills (Durand & Moskowitz, 2015; Tiger, Hanley, & Bruzek, 2008).

There are a number of maintenance and generalization teaching strategies that could be employed to support sustained behavior change. Stokes and Baer (1977) presented nine general strategies for promoting maintenance and generalization of learned skills: (a) train and hope, (b) sequential modification, (c) introduce to natural maintaining contingencies, (d) train sufficient exemplars, (e) train loosely, (f) use of indiscriminable contingencies, (g) program common stimuli, (h) mediate generalization, and (i) train "to generalize." The train and hope category involves the observation of maintenance and generalization without the formal pursuit of programming for the sustainability (Stokes & Baer, 1977). All of the other teaching strategies require either programming for generalization or maintenance at the onset of the intervention (e.g., programming common stimuli) or probing for generalization or maintenance following the intervention and specifically teaching when behavioral effects were not maintained or generalized (e.g., sequential modification).

A previous review by Falcomata and Wacker (2013) synthesized the literature in regard to generalization of skills learned via FCT. Falcomata and Wacker identified ten studies that utilized five different techniques to program for generalization of FCT. As highlighted by Falcomata and Wacker, contacting natural consequences is inherent in the FCT intervention. However, they concluded that additional strategies are often necessary to facilitate generalization of learned skills. The purpose of this review is to extend the previous literature review by systematically reviewing and analyzing current literature that included either maintenance or generalization of FCT. The present review targeted both maintenance and generalization because both are needed for sustainability.

Furthermore, this review aims to evaluate the quality of the literature that included generalization or maintenance of FCT. Evaluating the quality of the literature will help to highlight rigorous research that can inform the practice of FCT and is an important step towards establishing evidence-based practices for maintenance and generalization of FCT. As individuals with developmental disabilities may not naturally generalize or maintain treatment effects, it is crucial that educators, parents, caregivers, and clinicians have access to the best evidence on how to program for the sustainability of FCT programs. In addition, it is critical that practitioners, educators, and caregivers have access to the highest quality literature when making intervention decisions. A study that meets the highest quality indicators communicates confidence in its results to the consumer. Therefore, this study aims to not only inform future research, but also practitioners looking to utilize FCT and program for sustainability of intervention results.

2. Method

To complete this review and analysis, the following steps were conducted: (a) a literature search of electronic databases, (b) an