



## Increased parent reinforcement of spontaneous requests in children with autism spectrum disorder: Effects on problem behavior

Rachel E. Robertson<sup>\*</sup>, Joseph H. Wehby, Susannah M. King<sup>1</sup>

Department of Special Education, Vanderbilt University, Box 228, Nashville, TN 37203, USA

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### ABSTRACT

Previous studies of response classes in individuals with developmental disabilities (DD) and problem behavior have shown that mild problem behavior, precursor behavior, and mands or requests can occur as functionally equivalent to severe problem behavior in some individuals. Furthermore, participants in some studies chose to use functionally equivalent alternatives over severe problem behavior to produce the maintaining reinforcer. The present study added to this literature by having parents reinforce spontaneous requests functionally equivalent to problem behavior in their children with autism at home. First, parent-implemented functional analyses identified conditions associated with increased problem behavior and requests in two children with autism. Then, parents provided the maintaining reinforcer contingent on problem behavior alone or both problem behavior and requests in a withdrawal design. The treatment analysis indicated that the same reinforcer maintained child requests and problem behavior. In addition, when parents reinforced both requests and problem behavior, child participants demonstrated a preference for requests, thereby decreasing problem behavior. Implications of this relation for function-based treatment of problem behavior in children with autism are discussed.

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Multiple responses maintained by the same reinforcer make up a response class (Sprague, 2005). Previous studies of response classes have shown that children and adults with problem behavior and developmental disabilities (DD) often have multiple means of producing the reinforcer that maintains their problem behavior, including milder forms of problem behavior (Harding et al., 2001; Lieving, Hagopian, Long, & O'Connor, 2004; Magee & Ellis, 2000; Richman, Wacker, Asmus, Casey, & Andelman, 1999), precursor behavior (Langdon, Carr, & Owen-DeSchryver, 2008; Najdowski, Wallace, Ellsworth, MacAleese, & Cleveland, 2008), and requests or mands (Athens & Vollmer, 2010; Bowman, Fisher, Thompson, & Piazza, 1997; DeLeon, Fisher, Herman, & Crosland, 2000; Grow, Kelley, Roane, & Shillingsburg, 2008). These studies have indicated that some children and adults with DD and problem behavior in fact have a variety of response class members, some problematic and some not, to select from and use to access reinforcement.

Which response class member is selected for use at a given time is known to be affected by a number of factors, including the immediacy, quality, magnitude, and schedule of reinforcement associated with each response, as well as its history of punishment and the amount of effort needed to engage in each behavior (Fisher & Mazur, 1997). Notably, with the exception of response effort, all of these factors are controlled in large part by the responses of the individual's interacting partner.

<sup>\*</sup> Corresponding author. Present address: Department of Counseling, Psychology, and Special Education, Duquesne University, 600 Forbes Avenue, Pittsburgh, PA 15282, USA. Tel.: +1 412 396 4478; fax: +1 412 396 1340.

E-mail addresses: robertsonr@duq.edu (R.E. Robertson), joseph.wehby@vanderbilt.edu (J.H. Wehby), Mollykdoux@gmail.com (S.M. King).

<sup>1</sup> Present address: Metairie Park Country Day School, 300 Park Road, Metairie, LA 70005, USA.

Therefore, the ways in which the interacting partner responds to the multiple response class members of a person with DD greatly affect the efficiency of each response, thereby affecting which response is used to access reinforcement and whether or not it is problematic (Drasgow, Halle, & Phillips, 2001). Because a primary factor affecting response selection is the amount of effort involved in each response, it follows that equalizing dimensions of reinforcement across multiple members of a response class might result in some persons with DD choosing to emit the least effortful response needed to produce the reinforcer (Harding et al., 2001; Lalli, Mace, Wohn, & Livezey, 1995; Langdon et al., 2008; Magee & Ellis, 2000; Skinner, 1938). It is further possible that in some individuals, choosing less effortful response class members would translate into choosing milder, less problematic responses to access reinforcement.

A number of studies have found evidence for this hypothesis (Harding et al., 2001; Langdon et al., 2008; Lieving et al., 2004; Magee & Ellis, 2000). These studies examined response classes of problem behavior and participant preference for various response class members by continuously reinforcing (i.e. on a fixed-ratio [FR] 1 schedule) severe problem behavior while alternating extinction and continuous reinforcement of functionally equivalent mild problem behavior (Harding et al.; Lieving et al.; Magee & Ellis) or precursor behavior (Langdon et al.). These methods showed that not only were these topographies sensitive to the same reinforcer, but when all were reinforced on a continuous schedule the participant would generally allocate to the response that appeared to require the least effort, thus decreasing severe problem behavior.

For example, Harding et al. (2001) found that when functionally equivalent mild problem behavior (tantrums and task refusal) and severe problem behavior (aggression and destruction) were continuously reinforced by parents, two children with DD primarily allocated to mild problem behavior to produce the reinforcer. Harding et al. argued that participants preferred to engage in mild responses over severe responses to access the reinforcer, possibly because they required less effort. Magee and Ellis (2000) and Lieving et al. (2004) also studied participant allocation to functionally equivalent mild and severe topographies of problem behavior when both types of responses were reinforced. Both investigations reported that when all problem behaviors produced reinforcement, only the mildest topographies of problem behavior were observed. When the mildest problem behaviors were placed on extinction, there was an increase in the more severe problem behaviors. In both studies there was a bias toward increases in the reinforced responses that appeared to require the least effort. Magee and Ellis stated that the systematic increase in frequency of more severe problem behavior as milder problem behavior was placed on extinction demonstrated that the dependent variables were members of the same response class and may have constituted a response class hierarchy. Finally, Langdon et al. (2008) employed a design similar to Harding et al. to examine participant allocation to problem behavior and precursor behavior. Precursor behavior was defined as innocuous behaviors that reliably precede more severe problem behavior. Similar to the findings of Harding et al. (2001), Langdon et al. found that when both problem behavior and precursor behavior were reinforced, participants allocated away from problem behavior to the apparently less effortful response option, which was precursor behavior.

The majority of research examining allocation between problem behavior and functionally equivalent requests when both responses produce the maintaining reinforcer has involved functional communication training (FCT) without extinction (Fisher et al., 1993; Hagopian, Fisher, Sullivan, Acquistio, & LeBlanc, 1998; Kelley, Lerman, & Van Camp, 2002; Shirley, Iwata, Kahng, Mazaleski, & Lerman, 1997; Worsdell, Iwata, Hanley, Thompson, & Kahng, 2000). In investigating whether participants would allocate to problem behavior or trained requests when both options were equally reinforced, each of these studies found mixed results in that some participants allocated to requests to produce the maintaining reinforcer and some participants allocated to problem behavior. One explanation for these mixed results may lie in differences between existing and novel response class members. Studies of allocation between severe problem behavior and mild problem behavior (i.e. Magee & Ellis, 2000) or precursor behavior (i.e. Langdon et al., 2008) examined distribution among responses already in participants' repertoires, whereas studies of FCT without extinction have generally examined allocation between an existing response (problem behavior) and a novel response (the trained mand). Winborn-Kemmerer and colleagues (Winborn-Kemmerer, Ringdahl, Wacker, & Kitsukawa, 2009; Winborn-Kemmerer et al., 2010) have shown that individuals with DD may demonstrate preferences for certain request forms over others, including existing request forms over novel request forms (Winborn, Wacker, Richman, Asmus, & Geier, 2002). It may be that an established response requires less effort (Horner & Day, 1991) or has a longer reinforcement history than a novel response, thereby making the existing response more probable.

A limited number of studies have examined participant allocation between problem behavior and existing requests when both responses produced equivalent access to the maintaining reinforcer (Athens & Vollmer, 2010; DeLeon et al., 2000). Both of these studies found when dimensions of reinforcement for problem behavior and existing requests were equivalent, participants, primarily children with autism spectrum disorders (ASD), generally allocated to problem behavior to access reinforcement. These results appear to contradict other studies of existing response class member allocation showing a response bias away from problem behavior to other existing responses when equally reinforced (Harding et al., 2001; Langdon et al., 2008; Lieving et al., 2004; Magee & Ellis, 2000). One possible reason for these results is that the requests targeted in these studies, while identified as previously existing in participant repertoires, were described as occurring at low rates (Athens & Vollmer) and sometimes requiring verbal prompting during study conditions (DeLeon et al.) and therefore may have been requests less preferred by the child (Winborn et al., 2002) or requests less efficient than problem behavior (Horner & Day, 1991).

The purpose of this study was to extend previous examinations of allocation among problem behavior and functionally equivalent existing response class members to include existing, spontaneous requests made by children with ASD and problem behavior toward their parents at home. As described, two previous studies have examined response allocation

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