Collateral effects of mand training for children with autism

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ABSTRACT

Proponents of the verbal behavior approach to instruction for individuals with autism have identified mand training as a starting point for early intervention. Mand training is a process whereby the learner is taught to request highly preferred items under conditions when those items are most valuable. A hypothesized benefit of this approach is that mand training has a collateral effect on nontargeted behavior, though empirical support for this hypothesis is currently tenuous. The present investigation examined the collateral effects of vocal mand training compared to vocal request training for 3 previously nonvocal children with autism. Levels of orienting toward a speaker, compliance with instruction, and overall problem behavior were measured across experimental conditions and analyzed using an alternating treatment design. Results indicate that problem behavior for all participants occurred at lower levels during mand training than request training and that the level of nontargeted social behavior (i.e., orienting and compliance) was higher during mand training for 2 participants and was similar across both conditions for the final participant. The results support the hypothesis that mand training can have a collateral impact on nontargeted behavior, though explicit instruction of social behaviors may also need to be embedded within mand training procedures.

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Skinner first defined the mand as "... a verbal operant in which the response is reinforced by a characteristic consequence and is therefore under the control of relevant conditions of deprivation or aversive stimulation" (1957, pp. 35–36). Simply speaking, mands allow a speaker to have some control over the way other people in the environment provide reinforcement. Proponents of the verbal behavior approach for teaching language to children with autism have suggested that the mand be the initial training target for early intervention (Drash, High, & Tudor, 1999; Sundberg & Michael, 2001; Sundberg & Partington, 1998). This suggestion is based, in part, on the hypothesis that mand training has a collateral effect on other important behavior such as improved social behavior and reductions in problem behavior (Jennett, Harris, & Delmolino, 2008; Sundberg & Michael).

The mand is functionally controlled by establishing or abolishing operations (EOs and AOs), which are terms to describe states of deprivation or satiation, respectively. Specifically, an EO temporarily increases the value of an item or event as a reinforcer and therefore temporarily increases behavior that has been followed by that item in the past (Laraway, Snycerski, Michael, & Poling, 2003). An AO has the reverse effect in that the value of an item and behavior previously followed by the item or event, temporarily decrease (Laraway et al.). EOs are very important during early mand training as individuals with deficient mand repertoires are usually taught to mand for preferred items or events as an initial communicative target (Sundberg, 2007). The purposeful manipulation of EOs differentiates mand training from other types of language training procedures that attempt to teach a child to "ask" for items or events without specifically arranging or capturing EOs (e.g., Smith, 2001).

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The counterfactual to mand training with explicit EO manipulation is a type of request training wherein reinforcers, EOs, or both are assumed, though not explicitly manipulated (Brady, Saunders, & Spradlin, 1994). For example, an instructor might attempt to teach a child to request attention from an adult by providing the child with a highly stimulating object (e.g., ball that lights up when bounced) and withholding attention from the child while he plays with the ball. Although a typically developing child may mand for the adult's attention by saying "wow, look at this," children with autism may not be motivated to recruit adult attention in the same way. The erroneous assumption that attention is reinforcing and that an EO has been contrived presents problems for mand training as the mand cannot be emitted unless the EO is sufficiently strong. Thus, the most effective mand training procedures often include methods for identifying and ranking reinforcers in order to manipulate access to those reinforcers and thereby contrive EOs (e.g., functional analysis of problem behavior and replacement with appropriate mand as in Carr & Durand, 1985).

There are several *potential* benefits to emphasizing and accurately conducting mand training during early intervention. First, mand training increases the child's ability to control his environment, which is said to decrease overall frustration and problem behavior (Sundberg & Michael, 2001). Second, mand training pairs a dense schedule of reinforcement with early language training experiences and the interventionist delivering the training. It has been hypothesized that this pairing process increases the value of interacting with the interventionist, which may have a collateral effect on nontargeted social behavior such as eye contact (Jennett et al., 2008). Additionally, future language training is presumably made easier through increased compliance as a result of reinforcement delivered during previous mand training sessions (Sundberg, 2007).

Despite the clear potential of mand training to affect multiple behaviors, the majority of experimental analyses investigating changes in other behaviors during mand training come from research examining functional communication training (FCT; Carr & Durand, 1985). The goal in FCT is to identify the function, or purpose, problem behavior serves and to select a functionally equivalent and nonproblematic mand to replace the problem behavior. The logic of FCT is that the problem behavior serves as a type of mand and a new response topography that serves the same function and is more efficient in obtaining reinforcement is more likely than the problem behavior to be emitted. Numerous research studies provide experimental support for this theory and FCT has become one of the most often used procedures to reduce problem behavior in clinical settings (Tiger, Hanley, & Bruzek, 2008). However, the majority of research on FCT targets problem behavior as the primary dependent measure and changes in problem behavior cannot therefore be considered a collateral effect of mand training. Thus, there are very few controlled experimental analyses demonstrating support for the collateral effects of mand training (i.e., impact on nontargeted behavior).

Charlop-Christy, Carpenter, Le, LeBlanc, and Kellet (2002) provide one of the few empirical demonstrations of collateral effects occurring as a result of mand training for young children with autism. The researchers taught three children to mand using the Picture Exchange Communication System (PECS; Frost & Bondy, 2002). In addition to acquiring target mands, participants demonstrated a decrease in problem behaviors and an increase in social behaviors such as eye contact, joint attention, and play, though these responses were not explicitly targeted. This analysis provides some empirical support for collateral effects occurring as a result of mand training. However, it is impossible to separate effects of the PECS-specific components, such as physically orienting the speaker toward an adult listener, from procedures that are more typically used when teaching vocal mands to learners with autism (e.g., Hartman & Klatt, 2005).

Jennett et al. (2008) examined rates of eye contact and problem behaviors when comparing discrete trial training with mand training for teaching children with autism to vocally request preferred stimuli. The discrete trial procedure followed a request training approach whereby EOs were not explicitly captured or contrived and the instructor selected the target response and consequence. The mand training condition contrived EOs by allowing the participant an opportunity to access one of a pair of items necessary to complete a highly preferred activity (e.g., access to coloring book but not crayons). The instructor then trained mands corresponding to the missing item. Though target behaviors were acquired faster during mand training, only two of the six participants demonstrated lower levels of problematic behavior in that condition, with no difference observed for the remaining participants. Contrary to the researcher's pre-experimental hypothesis, eye contact occurred at a higher rate during discrete trial training than mand training for all participants.

The findings of Jennett et al. (2008) and Charlop-Christy et al. (2002) provide tenuous empirical support for potential collateral benefits of mand training and also indicate additional research is needed in this area. The study conducted by Charlop-Christy et al. demonstrates powerful effects of mand training but does not rule out the possibility that outcomes occurred as a result of the PECS-specific components or that other types of language training procedures, such as request training without EO manipulation, could have similar effects on nontargeted behavior. In fact, the investigation conducted by Jennett et al. suggests request training may be more likely than mand training to produce collateral effects on nontargeted behaviors. However, the latter study did not employ an experimental design to examine collateral effects and it is therefore difficult to draw firm conclusions from those outcomes.

The uncertainty regarding the collateral effects of mand training may constrict the planning and delivery of an effectively sequenced program of early language instruction for children with autism. Whereas some procedures may embed explicit training of social behavior such as eye contact into the program (Smith, 2001), the same skill may be omitted from mand training (Jennett et al., 2008; Sweeney-Kerwin, Carbone, O'Brien, Zecchin, & Janecky, 2007): possibly due to the assumption cited by Jennett et al. that eye contact will occur as a result of pairing the instructor with a dense schedule of reinforcement. This uncertainty could be confusing for consumers who need to determine whether behaviors such as looking at the instructor need to be explicitly taught when mand training is adopted.