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# Progress in Behavior Modification

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Edited by

Michel Hersen  
Richard M. Eisler  
Peter M. Miller

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# **PROGRESS IN BEHAVIOR MODIFICATION**

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# INDEPENDENT PERFORMANCE AMONG INDIVIDUALS WITH MENTAL RETARDATION: PROMOTING GENERALIZATION THROUGH SELF-INSTRUCTION

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## I. INTRODUCTION

The recent thrust toward integrating individuals with mental retardation into the community requires the independent performance of socially valued behaviors under conditions not associated with training situations. However, programming for generalization of newly acquired skills rarely is incorporated into instructional goals for people with mental retardation (Haring, 1988). Berg, Wacker, and Flynn (1990) identified self-instruction as an effective instructional strategy for promoting independent performance among persons with mental retardation. When self-instruction is used, individuals are taught to verbalize a sequence of statements when performing a task. The statements serve to direct task performance or appropriate responses to a situation. For example, Agran, Fodor-David, and Moore

(1986) taught four hospital employees with mental retardation to self-instruct while completing job tasks in sequence. Self-instructional training resulted in increased job-task sequencing for all employees that was maintained for up to three months.

Applications of self-instruction typically are based upon a training sequence developed by Meichenbaum and Goodman (1971) comprising combinations of components that include a rationale for instruction, modeling, rehearsal, corrective feedback, and reinforcement presented during several brief training periods (e.g., one or two 2-hour sessions or four or five 30-minute sessions). The original (1971) training sequence consisted of five steps, including (a) trainer performs task, instructing aloud while subject observes; (b) subject performs task while trainer instructs aloud; (c) subject performs task while self-instructing aloud; (d) subject performs task while whispering; and (e) subject performs task while self-instructing covertly.

Contemporary applications of self-instruction typically omit the final two steps of Meichenbaum and Goodman's training sequence because of research requirements for measuring self-instructions verbalized by subjects during performance. Self-instructional statements that individuals are taught to verbalize while performing a task typically are the same as those taught in the 1971 training sequence and include (a) stating the problem, (b) stating the response, (c) self-evaluating, and (d) self-reinforcing. This chapter (a) reviews studies investigating the use of self-instruction among individuals with mental retardation in community settings with generalization of skills as the primary focus, (b) presents a model for teaching self-instruction that promotes independent skill performance (generalization), and (c) discusses future areas of research.

## **II. REVIEW PROCEDURES**

Studies were included in the review based upon four criteria: (a) that the study was conducted in a community setting, (b) that the main component of the independent variable was self-instruction (Meichenbaum & Goodman, 1971), (c) that the subjects were individuals with mental retardation, and (d) that the study was published in a refereed journal. The studies were evaluated in terms of methodological factors relating to (a) generalization across people, situations, and tasks; (b) generalization over time; and (c) acquisition, generalization, and maintenance of self-instruction.

## **III. FACTORS RELATING TO GENERALIZATION ACROSS PEOPLE, SITUATIONS, AND TASKS**

Table 1 displays factors identified across studies relating to generalization across people, situations, and tasks. Characteristics evaluated include (a) level of disability; (b) type of generalization assessed; (c) type of response assessed (e.g.,

on-task behavior); (d) instructional strategies, identified by Stokes and Baer (1977), to program generalization (i.e., train and hope, sequential modification, introduce to natural maintaining contingencies, train sufficient exemplars, train loosely, use indiscriminable contingencies, program common stimuli, mediate generalization, train "to generalize"); and (e) additional assistance provided, if required. Findings indicated that none of the eight studies evaluated assessed generalization across people. Seven studies assessed generalization across situations (Agran et al., 1986; Agran, Salzberg, & Stowitschek, 1987; Hughes & Petersen, 1989; Hughes & Rusch, 1989; Rusch, McKee, Chadsey-Rusch, & Renzaglia, 1988; Rusch, Morgan, Martin, Riva, & Agran, 1985; Salend, Ellis, & Reynolds, 1989) and four studies assessed generalization across tasks (Agran et al., 1987; Hughes & Rusch, 1989; Rusch et al., 1988; Whitman, Spence, & Maxwell, 1987). A description of studies that assessed generalization across situations and tasks follows.

### A. Generalization Across Situations

All studies measured generalization of tasks from the training to the work situation, except Whitman et al. (1987), which assessed task performance in the training situation only. Generalization was produced in the remaining seven studies; however, additional intervention was required in three studies (Agran et al., 1986; Rusch et al., 1988; Salend et al., 1989), and performance varied in a fourth study (Agran et al., 1987). For example, Agran et al. (1986) introduced additional training sessions with two subjects whose job-task sequencing failed to generalize from the training to the work situation and introduced verbal prompting with three subjects when their job-task sequencing decreased during work performance. Rusch et al. (1988) introduced corrective feedback during performance when appropriate requesting failed to generalize from the training to the work situation.

Differential outcomes across studies appeared to relate only to instructional strategies used to program generalization. Level of disability and type of response assessed did not covary with outcomes. Specifically, generalization occurred in one study with individuals with severe mental retardation (Hughes & Rusch, 1989), but did not occur until additional intervention was introduced in three other studies (Agran et al., 1987; Rusch et al., 1988; Salend et al., 1989). Generalization occurred with individuals with mild to moderate mental retardation in two studies (Hughes & Petersen, 1989; Rusch et al., 1985), although additional intervention was required to produce generalization in another study (Agran et al., 1986). Type of response assessed varied across studies (i.e., sequencing job tasks, initiating contacts, maintaining on-task behavior, solving work-related problems, requesting materials, packaging items, and sorting and sequencing letters) and did not appear to relate to generalization.

*Instructional strategies used to program generalization.* Three instructional strategies used to program generalization across situations were found to be effective unequivocally across studies. These strategies include (a) train sufficient exemplars (i.e., teaching multiple examples of stimulus conditions or responses), (b) program common stimuli (i.e., introducing similar stimuli in the training and

TABLE 1  
Factors Relating to Generalization Across People, Situations, and Tasks

<i>Study</i>	<i>Level of Disability</i>	<i>Generalization Produced?</i>	<i>Response Assessed</i>	<i>Instructional Strategies Used to Program Generalization</i>	<i>Additional Assistance Required?</i>
Agran et al. (1986)	3 mild MR 1 moderate MR	Yes	Job-task sequencing, task completion, and decreased task repetition generalized from training to work situation	1. Train and hope	Yes, additional training required with two subjects
		Not known	Generalization across people or tasks not assessed	None	
Agran et al. (1987)	behavior disordered 1 moderate MR 2 severe MR	Yes	Contacts initiated by subjects generalized from training to work situation	1. Train and hope	No, however, generalized responding was variable for two subjects (one with severe MR)
		No	Training contacts initiated when out of materials did not generalize to contacts initiated when needs assistance	1. Train and hope	
		Not known	Generalization across people not assessed	None	
Hughes & Petersen (1989)	1 mild MR 3 moderate MR	Yes	On-task behavior across varied tasks generalized from training to work situation	1. Train sufficient exemplars 2. Program common stimuli 3. Mediate generalization	No
		Not known	Generalization across people or tasks not assessed	None	

Hughes & Rusch (1989)	2 severe MR	Yes	Correct responses across trained problem situations generalized from training to work situation	1. Train sufficient exemplars 2. Program common stimuli 3. Mediate generalization	No
		Yes	Correct responses generalized from trained to untrained problem situations	1. Train sufficient exemplars	No
		Not known	Generalization across people not assessed	None	
		Yes	Appropriate requests generalized from training to work situation	1. Train and hope	Yes, instructional feedback provided in performance
Rusch et al. (1988)	1 severe MR	No	Training appropriate requests when materials missing did not generalize to appropriate requests when not enough materials	1. Train and hope	
		Not known	Generalization across people not assessed	None	
		Yes	Percentage of time spent working generalized from training to work situation	1. Train sufficient exemplars 2. Program common stimuli	No
		Not known	Generalization across people or tasks not assessed	None	
Rusch et al. (1985)	1 mild MR 1 moderate MR	Yes			
		Not known			

(continued)

TABLE 1 (Continued)

<i>Study</i>	<i>Level of Disability</i>	<i>Generalization Produced?</i>	<i>Response Assessed</i>	<i>Instructional Strategies Used to Program Generalization</i>	<i>Additional Assistance Required?</i>
Salend et al. (1989)	4 severe MR	Yes	Number of packages completed generalized from training to work situation	1. Train and hope	Yes subjects prompted to self-instruct at beginning and end of each performance session and whenever they failed to self-instruct
		Not known	Generalization across people or tasks not assessed	None	
Whitman et al. (1987)	14 mild-moderate MR (between-group design)	Yes	Sorting and sequencing letters generalized to similar task (i.e., stimulus differed only in letters used and sequence for sorting letters)	1. Train and hope	No
		Not known	Generalization across people or situations not assessed	None	

generalization setting), and (c) mediate generalization (i.e., teaching a response, such as a self-generated verbal prompt, as a strategy to produce generalization across stimulus conditions; Stokes & Baer, 1977). Applications of these instructional strategies produced generalization without the need for additional intervention across studies (Hughes & Petersen, 1989; Hughes & Rusch, 1989; Rusch et al., 1985). Two instructional strategies consistently identified with generalized responding were (a) training sufficient exemplars and (b) program common stimuli, while the absence of these two strategies consistently resulted in a lack of generalization.

For example, Hughes and Petersen (1989) employed all three strategies for programming generalization by (a) teaching on-task behavior across varied tasks (train sufficient exemplars), (b) using a permanent picture cue to prompt self-instructing and telling subjects to respond in training as if in response to work demands (program common stimuli), and (c) reminding subjects in training to self-instruct when in the work situation (mediate generalization). Results indicated that on-task behavior for all four subjects generalized from training to the work situation.

Hughes and Rusch (1989) also used all three strategies by teaching problem-solving across five problem situations (train sufficient exemplars), telling subjects to respond in training as if in response to work demands (program common stimuli), and reminding subjects when in training to self-instruct when in the work situation (mediate generalization). Both subjects in the Hughes and Rusch (1989) study generalized their problem-solving skills across situations. Rusch et al. (1985) used two strategies to train two employees in their study that sought to teach subjects to generalize their time spent working from the training to the work situation. Time spent working was taught across three food service tasks (train sufficient exemplars) and subjects were told to respond in training as if in response to work demands (program common stimuli). Following training, both employees increased their time spent working during lunch and dinner to exceed performance standards set by coworkers.

The remaining studies that required additional intervention to produce generalization or that produced variability in performance used only a train and hope strategy (i.e., probing without programming for generalization following acquisition of a response; Stokes & Baer, 1977). For example, additional training sessions were required with two of four subjects and self-instructional statements taught had to be modified for one subject in the Agran et al. (1986) study before job-task sequencing generalized across situations. Agran et al. (1987) found that generalization across situations for initiating contact with supervisors was variable for two of four subjects. Instructional feedback was required during work performance before appropriate requests generalized across situations in Rusch et al. (1988), and trainer prompting to self-instruct in the work situation was employed in Salend et al. (1989). An important characteristic of these studies is that correct responding was taught with only one rather than with multiple examples of the response class; common stimuli were not introduced across situations; and subjects were not taught to mediate generalization across situations.



## B. Generalization Across Tasks

Four studies assessed generalization across tasks. Of these, two studies were successful in producing generalization (Hughes & Rusch, 1989; Whitman et al., 1987) and two were not (Agran et al., 1987; Rusch et al., 1988). Favorable outcomes appeared to relate to instructional strategies used to program generalization and level of disability rather than type of response assessed. Specifically, the teaching of self-instruction in combination with one example of a desired response appeared to produce generalization across tasks among subjects with mild to moderate mental retardation. However, the teaching of multiple examples of a response was required to produce generalization among subjects with severe mental retardation.

*Instructional strategies used to program generalization.* Both studies that produced unfavorable outcomes used only train and hope strategies to program generalization. Agran et al. (1987) found that teaching subjects to initiate contacts with supervisors when they were out of materials did not generalize to initiating contacts when in need of assistance. Similarly, the teaching of appropriate requesting when materials were missing did not generalize to appropriate requesting when not enough materials were available in the Rusch et al. (1988) study. Both studies taught only single instances of the desired response to subjects with severe mental retardation.

Whitman et al. (1987) also used only a train and hope strategy (i.e., single-instance teaching), yet, in their study, subjects with mild to moderate mental retardation were successful in generalizing across tasks. Employees of a sheltered workshop were taught to sort and sequence a set of alphabet letters. Following one assessment probe on the training task, the same task was modeled using a different set and sequence of letters. The employees then were asked to complete the second task once as a generalization probe. Limited generalization across tasks was demonstrated in this study, however, because training and generalization tasks were very similar with respect to stimulus dimensions and response requirements. Additionally, repeated measures of generalization were not taken, and only group means, rather than individual data, were reported. As a group, subjects in this study had fewer correct responses to the generalization than the training probe (i.e., approximately 15 versus 18 correct responses). Finally, trainer modeling of the generalization task cannot be separated from the effects of teaching self-instruction with only one example.

A more convincing demonstration of generalization was provided by Hughes and Rusch (1989), who employed a train sufficient exemplars strategy (i.e., teaching multiple exemplars) with individuals with severe mental retardation. In their study, two employees of a janitorial supply company learned to solve a variety of task-related problems typical of those that occurred throughout the workday. Correct responses to five problem situations were trained (i.e., multiple exemplars), and five problem situations served as generalization probes. Generalization was demonstrated when employees applied the problem-solving strategy across functionally dissimilar responses (e.g., moving obstacles in the way, finding missing