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ABSTRACT

This paper reviews evidence of the success of behavior intervention approaches which teach students with challenging behaviors alternative functional communication behaviors. Research supporting the view that challenging behavior is a form of nonverbal communication is reviewed, noting the importance of identifying what such individuals are "saying" with their behavior problems. Functional communication training is described as providing the consequences originally maintaining the target behavior with a new more appropriate behavior. Specific interventions which used functional communication to reduce such behavior problems as aggression, self-injurious behavior, and stereotyped or self-stimulatory behaviors are reviewed. Factors affecting the initial effectiveness of functional communication training include matching responses to functions of the challenging behavior and ensuring that the appropriate behavior is more response efficient than the inappropriate behavior. Factors affecting generalizability and maintenance include response acceptability, recognizability of the communicative response, and communicative context. Recommendations for implementation stress home-school collaboration, teamwork, and development of secondary prevention strategies. Other recommendations address development of a comprehensive model of behavior, development of assessment procedures, improved use of augmentative communication strategies, and primary prevention of serious behavior problems. (Contains 73 references or suggested resources.) (DB)

Using Functional Communication Training as an Intervention for the Challenging Behavior of Students with Severe Disabilities

by
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Behaviors such as aggression, self-injury, and tantrums have been looked upon as nonverbal forms of communication. Directly following from this view of challenging behavior, intervention efforts have been designed around teaching students more appropriate ways to communicate their wants and needs. This paper reviews the growing evidence of the success of this approach to reducing challenging behavior.[1] In addition, specific recommendations are outlined for implementation and future directions. Of particular note is the crucial role of home-school collaboration and the potential of early intervention efforts to prevent severe challenging behavior.

Challenging behavior is often cited as a serious obstacle to the education of students with severe disabilities. Behaviors such as aggression, self-injury, and tantrums can disrupt ongoing efforts to include children and youth with severe disabilities in their home school districts and communities. Efforts to teach such important skills as communication can be significantly hampered by the presence of seriously disruptive behavior (e.g., Carr, Newsom, & Binkoff, 1976).

These challenging behaviors are exhibited by a large proportion of students having severe disabilities. Prevalence estimates for challenging behaviors range from 10% to 40% for persons with severe disabilities (Schroeder, Schroeder, Smith, & Dalldorf, 1978; Shodell & Reiter, 1968). Clearly, this is a large problem for those trying to help these individuals become more independent. Because of the prevalence of these behaviors and their detrimental effects on habilitation efforts, considerable research has been conducted to improve our understanding of challenging behavior and to facilitate efforts to reduce these behaviors.

This paper will focus on recent work that has viewed challenging behavior as a form of nonverbal communication. Following a brief review of the evidence for a communicative hypothesis for challenging behavior, research on communication-based interventions will be presented. The state of practice and implementation will then be outlined,

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along with recommendations for implementation and future directions.

The Correlation Between Communication Difficulties and the Presence of Challenging Behavior

The idea that challenging behavior may serve as a form of communication has a long history (Durand, 1990). Crying by children, in particular, has frequently been viewed as an attempt to communicate. Anyone who has observed a crying child and a frantic parent trying to discover what the child wants is struck by the power of these interactions. The earliest recorded observations support this notion. Writers including Plato and the French philosopher Rousseau observed that crying may have communicative properties (Plato, circa 348 BC/1960, p. 174; Rousseau, 1762/1979, p. 77). Family systems theorists have long relied on the idea that nonverbal behavior has communicative properties (e.g., Haley, 1963; Minuchin, 1974). Furthermore, over the last several decades, developmental psychologists have systematically studied the communicative nature of nonverbal behavior in young children (Bates, Camaioni, & Volterra, 1975; Bruner, 1973; Wolff, 1969).

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Research on the variables maintaining challenging behavior suggests that challenging behavior exhibited by persons with severe disabilities can, like communication, serve multiple social functions (Carr, 1977; Donnellan, Mirenda, Mesaros, & Fassbender, 1984; Durand & Carr, 1987; Evans & Meyer, 1985; Gaylord-Ross, 1980). The idea that the challenging behavior of persons with severe disabilities can serve a communicative function has intuitive appeal. These persons characteristically have difficulty communicating their wants and needs. Parents and other caregivers often describe persons with severe and multiple disabilities as being "frustrated," because they appear to want to communicate but cannot. Correlational research in this area also appears to support this idea. For example, Talkington, Hall, and Altman (1971) observed that aggression was more prevalent among persons with severe communication difficulties. Similarly, persons most likely to be engaging in self-injurious behavior have been found to be lacking in verbal facility (Shodell & Reiter, 1968).

This conceptualization is of contemporary importance, because workers in this field are proposing that behaviors such as aggression and self-injury may be similar to nonverbal forms of communication (e.g., Carr & Durand, 1985; Day, Johnson, & Schussler, 1986; Donnellan et al., 1984; Durand, 1982, 1986, 1990; Meyer & Evans, 1986; Neel et al., 1983; Schuler & Goetz, 1981). It has proven useful to compare challenging behavior to other forms of nonverbal behavior. Looking at challenging behavior in this way has been

helpful in intervention efforts. This work has found that if we can identify what these people are "saying" with their behavior problems, then we can teach them other, more constructive ways to communicate the same things as an alternative to their challenging behaviors.

Communication-Based Intervention

As was previously mentioned, viewing challenging behavior as a form of nonverbal communication has implications for intervention (Durand & Berotti, 1991). One ramification of this conceptualization is its effect on the way we view previous treatment attempts. Let us suppose, for example, that a young girl is hitting herself to escape tasks because they are boring. Punishing her self-injury by spraying water in her face or reprimanding her fails to provide her with more interesting activities and does not teach her a more appropriate way to express displeasure. We could predict that even if the water spray or reprimands were sufficiently unpleasant to get her to stop her self-injury, the young woman would attempt other ways to escape these tasks. Relying on negative consequences to "gain control until teaching can take place" bypasses the fundamental issue -- why is she hitting herself, and how can we address these concerns?

The communication hypothesis briefly outlined in this paper should provide guidelines for teaching alternatives and for improving the environments in which our students live. Specifically, if we could teach our students another, more acceptable way to communicate for the things they are getting with their challenging behavior, then they should display fewer behavior problems. Also, by listening to what they are saying with their challenging behavior, we can re-structure our interactions with these students in more appropriate ways.

Review of Functional Communication Training Literature

One intervention strategy that specifically uses communication to reduce challenging behavior has been called *functional communication training* (Durand, 1990). This strategy includes assessing the variables maintaining the behavior to be reduced and providing the same consequences for a different behavior. It is assumed that if individuals can gain access to desired consequences more effectively with the new response, they will use this new response and will reduce their use of the undesirable response. Applying this logic to challenging behavior, one is able to teach individuals more acceptable behaviors that serve the same function as their problem behavior. So, for example, we could teach people to ask for attention by saying, "Am I doing good work?" This would allow them to gain teacher attention in this appropriate way rather than in an inappropriate way such as through slapping their face. What follows is a review of the work in this area to reduce challenging behavior.

Severe Challenging Behavior

A number of studies have been conducted which demonstrate the value of this procedure in reducing severe behavior problems (e.g., Carr & Durand, 1985; Durand & Carr, 1991; Durand & Carr, in press; Durand & Kishi, 1987; Horner & Budd, 1985; Smith, 1985; Smith & Coleman, 1986). In one example, Durand and Kishi (1987) assessed the function of the severe behavior problems of five adults with multiple disabilities (dual sensory impairments and severe/profound retardation) by using a rating scale (the Motivation Assessment Scale, described in Durand & Crimmins, 1988). Through this scale, the researchers found that the challenging behaviors of these adults were maintained by escape from unpleasant situations, social attention from other adults, and gaining access to favorite tangibles. These individuals were then taught to nonverbally communicate requests that were equivalent to the assessed functions of their behavior problems. In other words, they were taught requests for assistance, requests for attention, and requests for tangibles. This intervention resulted in significant reduction in their severe self-injury and aggression.

In a similar study, Smith (1985) intervened with one 18-year-old man with autism who presumably engaged in aggression and self-injurious behavior to obtain tangibles. In particular, an analysis revealed that aggression and self-injury often occurred in the presence of food and was accompanied by requests for food. Teaching him to request favorite foods resulted in dramatic reduction in the number of his aggressive episodes. It is important to note that he was given food immediately upon request. Interestingly, as this man's weight began to rise and subsequently stabilized at a normal weight for his size, he requested food less. Therefore, even though he could have food whenever he asked for it, he did not overeat.

Bird, Dores, Moniz, and Robinson (1989) recently documented the successful use of functional communication training with two adult men who had extensive histories of severe aggression and self-injury. The Motivation Assessment Scale was used in this study to assess the function of these challenging behaviors. Following functional communication training, improvements were observed in appropriate behavior, work productivity, and the use of spontaneous communication. These results were maintained over six months following intervention. Hunt, Alwell, and Goetz (1988) and Hunt, Alwell, Goetz, and Sailor (1990) observed similar improvements in their high school-aged students following conversation skill training.

Wacker, Steege, and colleagues (Steege et al., 1990; Wacker et al., 1990) have conducted a series of studies that further support the use of functional communication training as an intervention for severe challenging behavior. In one study (Wacker et al., 1990), they identified two children who exhibited hand biting and aggression in the form of slapping and biting peers and staff. They taught one student a communicative response that matched the function of his challenging

behavior and added a response-contingent, time-out contingency. He could sign for a break from work, but would have to sit alone for a brief time at his table if he was disruptive. A second student was also taught a form of communication that matched the function of her challenging behavior. This was combined with response-contingent, graduated guidance. She was taught the signs for a "break" from work, "please," and "eat." Hand-over-hand guidance was used if she did not comply with requests. The results of this approach were that the students exhibited little to no challenging behaviors after intervention.

In the second study (Steege et al., 1990), two children with severe disabilities were taught to press a microswitch that activated a prerecorded message of "stop." Because their self-injurious behavior (hand and arm biting) was assessed to be maintained by escape from tasks, they were taught a means of requesting a brief end to their tasks. Again, this intervention resulted in significant reductions in their self-injurious behaviors.

Taken together, these studies have begun to demonstrate the success of using functional communication training as an intervention for even the more severe forms of challenging behavior. Although it is recognized that no one single intervention approach can be successful for all individuals, the cumulative evidence supports a more optimistic view of using these positive support strategies for more serious forms of challenging behavior.

Non-Injurious Behavior

Behaviors that are highly consistent and repetitive and that have no apparent adaptive function have been variously labeled stereotyped or self-stimulatory (Baumeister & Forehand, 1973; Berkson, 1967). These behaviors take a variety of forms, including repetitive body rocking, hand flapping, mouthing, and body posturing. Explanations for the maintenance of stereotyped behavior have often centered on their ability to provide the person with reinforcing sensory input (e.g., Lovaas, Newsom, & Hickman, 1987). However, *some* individuals appear to engage in stereotyped motor behavior for social reasons. Over time, some people who engage in stereotyped behavior such as rocking or hand flapping appear to learn to use these behaviors to do things such as escape from work demands. For these individuals, then, teaching communicative alternatives would include behaviors that evoke specific social reactions by others (as opposed to producing specific sensory feedback).

Following the logic that some stereotyped behaviors may occur for social reasons, Durand and Carr (1987) assessed the rocking and hand flapping of four individuals. They found that rocking and hand flapping were maintained by escape from unpleasant situations. Using this information, Durand and Carr taught participants to say the phrase "Help me" during difficult tasks. If the work was too difficult, they could ask for help, and the teachers would provide them with assistance. This treatment resulted in significant reductions in stereotyped motor

behavior for all four individuals. This finding has recently been replicated in a study by Wacker et al. (1990).

In summary, relatively few studies have so far examined the efficacy of functional communication training as a treatment for stereotyped motor responses, but given its non-aversive and constructive nature, the approach warrants further investigation.

Factors Affecting Initial Effectiveness

An important consideration for the initial success of functional communication training seems to be matching the communicative behavior to the function of the challenging behavior. In other words, the new trained response should evoke the same consequences as the targeted challenging behavior. *It is not enough just to communicate* -- others should respond to you if you need or want something. The form of communication being taught should match the function of the challenging behavior, and it should be more effective than the challenging behavior in getting the student what he or she wants. These two factors (response match and response efficiency) will be discussed as they relate to the initial reduction of challenging behavior.

Response Match

Our first study of functional communication training directly addressed the issue of response match (Carr & Durand, 1985). Following a functional analysis of the challenging behaviors of four students, we taught them responses that matched the assessed function of their behaviors, as well as responses that did not match the function of their challenging behavior. If, for example, a student's challenging behavior occurred to escape difficult tasks, then a corresponding communicative behavior would be to ask for help. Asking for help would result in assistance, which would make the difficult task easier. A communicative behavior that would not match this behavior would be to teach a request for attention. If the student asked for attention but did not get help on the task, then it would not match the intent of the challenging behavior.

In each case, the students' challenging behavior was reduced only when they used the communicative response that matched the function of their behavior. The students' behavior problems were not reduced when they were taught responses that did not match the function of their challenging behavior.

To further assess this issue, a second study was conducted. This study focused on the unusual speech of a young boy with autism (Durand & Crimmins, 1987). We conducted two separate analyses of the function of this boy's unusual speech and found that it tended to increase when he was faced with difficult tasks. Our interpretation was that his unusual speech served to allow him to escape from situations that he found unpleasant -- in this case, difficult tasks.

The intervention phase of this study involved teaching him to say "Help me" when presented with difficult tasks. In one condition, the phrase "Help me" was followed by assistance from an experi-

menter. Under this condition, unusual speech decreased as expected. It was assumed that the assistance provided to the student in effect made the task easier. In a second condition, the phrase was instead followed by praise from the experimenter but not with assistance. The experimenter would say "That's good talking!" when the boy said "Help me," but did not help him with his work. Under these conditions, unusual speech *increased* when compared to the previous condition and baseline. Therefore, although the student was taught the same communicative phrase in each condition, his unusual speech decreased only when the phrase served the same function. In both studies, reductions in challenging behavior only occurred when alternative behaviors were taught that matched the function of the problem behaviors. Alternative explanations such as stimulus control or physical incompatibility could be ruled out.

Response Efficiency

As was mentioned above, the form of communication being taught must not only match the function of the student's challenging behavior, it must also be more effective in getting the student the reinforcers he or she obtained with the problem behavior. It should be easier for the student to get what he or she wants by asking for it in an appropriate way rather than by hitting. In an elegant series of studies, Horner and his colleagues have begun to examine this aspect of functional communication training (Horner & Day, 1991; Horner, Sprague, O'Brien, & Heathfield, 1990). This group has found that three components of efficiency seem to be involved in the success of functional communication training.

The first component of response efficiency, *physical effort*, refers to the actual energy being expended for both the challenging behavior and the communication. If it is physically easier to get what you want with the new communicative response, then that behavior will replace the challenging behavior. The second component, *schedule of reinforcement*, refers to how effective each response is in obtaining the reinforcers. If the communicative response is successful each time it occurs, but the challenging behavior is reinforced only occasionally, then the communication will replace it. Finally, the *delay* in receiving the reinforcers will also affect whether or not functional communication training will be effective. If individuals delay too long in responding to the communication, it will not successfully compete with the challenging behavior.

The research on response match and response efficiency points out that it is not enough just to teach communication. In order for functional communication training to reduce challenging behavior, the new behaviors being taught must match the function of the challenging behavior *and* must be more effective in obtaining those things previously obtained through the problem behaviors.

Factors Affecting Generalization and Maintenance

Research has begun to examine if and how functional communication training generalizes to new people and settings,

and if and how it maintains over time (Durand & Carr, 1991, 1992). Several factors appear to affect generalization and maintenance. These factors include the *acceptability* of the communicative response, the *recognizability* of the communicative response, and the *context* in which the student is communicating.

Acceptability

One aspect of response success is its acceptability to significant others. If the new communicative response is seen as unacceptable in community settings, then the desired response will not be achieved. A number of anecdotes have attested to this aspect of generalization and maintenance. For example, one group relayed their dismay that, although functional communication training had been successful with one man they were working with, it had not been successful out in the community. When questioned, it was revealed that they taught a 31-year-old man to ask for a hug each time he wanted attention. Although this was acceptable in their program, it was pointed out that an adult man asking strangers for a hug would probably not be viewed positively in most communities. It made sense that his disruptive behavior did not decrease in the community (i.e., the communication he had been taught, the hug, would not generalize to settings and individuals outside of the program).

To date, there has been little empirical evidence for this aspect of functional communication training, although one study addressed this factor indirectly. Durand and Kishi (1987) used functional communication training to reduce the severe challenging behavior exhibited by five individuals with severe/profound mental retardation and dual sensory impairments (deaf/blind). One participants would scream and remove her clothes, apparently to obtain staff attention. Our first attempt at intervention involved teaching her to raise her hand as a means of signaling the staff to attend to her. Despite the fact that she learned to raise her hand, over time some staff did not respond to her requests consistently. When they were very busy doing chores around the home, they found that they could not respond to her each time she raised her hand.

We decided to change the meaning of the raised hand. Thus, instead of meaning "Come spend some time with me," we now taught the staff that her raised hand was to mean "Can I help you?" Each time she raised her hand it meant they were to take her along on the chores with which they were so busy. The staff accepted this form of attention as appropriate (she received their attention as well as learned new skills) and would respond to these new requests. These experiences suggested that, unless the response we teach is acceptable to those around the individual in question, it will not be elicit a consistent response by all people (no generalization) and may not be effective over time (no maintenance).

Recognizability

Several studies have addressed the issue of the recognizability of the communicative response. In a study of

maintenance, we found that, after initial success with functional communication training, one young boy resumed engaging in his serious self-injury (Durand & Carr, 1991). Examining the situation further, we found that his new teacher could not understand what he was saying when he was trying to get her assistance. Because she did not provide assistance when he asked for it, he began to hit himself again, which tended to result in fewer demands being placed on him. In this study we found that, by improving the boy's articulation skills, the teacher responded appropriately, and the boy's challenging behavior was again reduced (Durand & Carr, 1991).

Recognizability of communicative attempts is of particular importance for students with the most severe disabilities. If a student cannot communicate with others in a way they can recognize, they will not respond appropriately, and the student will go back to what *does* work -- his or her challenging behavior. In our research with students having severe communicative disabilities, we have begun to use vocal-output assistive devices as the means of communication (Durand, in press; Durand & Berotti, 1991). We have found that not only can students with the most severe disabilities use these devices to communicate (Durand, in press), but untrained individuals in the community can also understand the requests being made by these students and can respond appropriately (Durand & Berotti, 1991).

For example, we recently worked with a woman with dual sensory impairments who would have a tantrum when she was bored. Intervention proceeded by teaching Donna to request tasks. Her vocal output device (a Wolf communication board) was programmed to say "I'd like something to do." Sessions began by having Donna spend a few moments alone at a desk. Donna was then physically prompted to activate the communication device. Teachers responded to her requests by guiding her to a table that displayed several activities from which Donna could choose. Soon after Donna completed the task, she was again required to spend some time independently. She quickly learned to use the communication device without prompts and in the past several months has very rarely been observed engaging in any disruptive behaviors.

The vocal output device has also been used to help Donna become more independent when she is out in the community. Donna is currently using the device to order drinks at Burger King and to request items she would like to buy at the grocery store. As mentioned earlier, this is an important advantage when using a vocal output device. Persons working at Burger King and the grocery store do not have to be specially trained to understand Donna's requests. By pressing a pad on the device, Donna can "say" the phrase "Sprite, please" without help. In contrast, if she used sign language to make her requests, it is likely that someone would be needed to help translate.

In addition, devices such as Donna's have at times been programmed to speak in both English and Spanish; this is useful when a student's parents speak only Spanish at home and the teacher speaks only English at school. These

devices have permitted us to teach students to make relatively simple responses (pressing a pad on the machine) that can result in sophisticated output (full sentences). Again, because the output can be recognized by anyone, the success of communication training has been extended into the community.

Context

For communication to be successful, it has to occur within a context that will be responsive and supportive. If reasonable requests are being made by our students but the setting does not respond, then functional communication training will not be successful. Here, however, the problem lies not with the student or the particular response being taught but, rather, with the school, job site, or even the home. As we saw in the section on acceptability, at times there is a fine line between when the response is legitimately not acceptable (e.g., an adult asking strangers for a hug) and when the environment needs to change (e.g., not allowing a student to take a brief break from work on occasion). Durand and Kishi (1987) found that the initial success of functional communication training with one man was not maintained when staff refused to honor his occasional requests. Further research is needed to examine this aspect of training and to develop guidelines for adequate support.

Recommendations for Implementation

Specific techniques for teaching communication skills have been discussed previously and will be the focus of many of the other papers in this volume. Despite the wealth of important research on proper prompting, fading, and other teaching techniques, the actual teaching of communication skills may be among the easiest steps in reducing challenging behavior. When dealing with severe challenging behavior, the targets of intervention necessarily involve more than teaching one communicative response and responding to the behavior itself. Often, whole systems need to be re-designed to support these efforts (Durand, 1990; Horner, Dunlap, et al., 1990; Meyer & Evans, 1989). The more challenging aspect of this process is providing the proper supports for instruction and the necessary curricular and environmental modifications that may be essential for reaching the goals. For this type of intervention to be successful, several important components, such as a relationship between home and school/work and adequate training, must be in place.

Critical to the success of interventions for challenging behavior is *home-school collaboration*. Without a cooperative relationship between the school and home, any improvements observed following an intervention are likely to be short-lived and restricted to certain people, places, and/or times. Home-school collaboration, as used here, means more than just consultation by a teacher with a parent (Meyer, 1989).

Rather, it involves the ongoing relationship between the family and the school as they work together as a team.

In our own work in this area, we have targeted students with severe challenging behavior throughout New York State. Our training efforts have begun by developing a team of individuals who work and live with the student. These teams have included parents, other family members, teachers, school psychologists, speech therapists, and administrators. The initial training has been focused on the *team*. In addition to providing training to the team on how to assess the function of challenging behavior and design effective interventions, we have specifically focused on promoting the team process. Teams are encouraged to accept and adopt input from each member. No one approach is seen as correct; rather, the process of collaboration is seen as the most important first outcome. The "expert role" is downplayed, and trainees are encouraged to see the trainers as resources rather than the "givers of truth."

Another factor that is all too apparent is the lack of trained individuals to provide family and staff with guidance and training in the types of interventions described here. Successful intervention for severe challenges involves comprehensive assessment and the design of systems that can cover teaching new skills, changes in curricula, and developing support networks. Few people are sufficiently familiar with persons with severe disabilities *and* the types of assessments and interventions needed to adequately address severe challenging behavior. Initiatives are needed to train professionals in these complex skills.

In addition to preparing for and designing appropriate support systems, we need to re-assess how we focus our attention and resources on challenging behavior. Typically, a great deal of attention is placed on the students engaging in these behaviors only after serious harm has occurred, or after "everything has been tried and has failed." One new approach to this problem would be to adopt a *secondary prevention* strategy. Secondary prevention involves efforts to shorten the duration of existing cases through early referral, assessment, and intervention (Caplan, 1964). Perhaps a better way to proceed would be to set up systems that identify problems as they evolve but before they become serious. Secondary prevention would involve giving currently minor challenging behaviors the same intensive scrutiny now afforded to more serious problems (Dunlap, Johnson, & Robbins, 1990). The goal would be to determine how and why these behaviors were being displayed. Once this was determined, appropriate systems could be designed to prevent more serious behavior problems later on.

Recommendations for Future Directions

The study and treatment of challenging behavior has received a great deal of attention over the last 30 years. Yet, despite the interest and work in this area, there is still a great deal we do not know about these behaviors and their treatment. Because our accomplishments

continue to emerge, there are many avenues of research which should prove fruitful. Below are several paths that may advance our ability to assist people having severe disabilities. (For a more detailed list of recommendations, readers are referred to Helmstetter and Durand, 1991.)

A Comprehensive Model of Behavior

Our understanding of the factors that influence the development and maintenance of challenging behavior continues to evolve. In order to fully assist intervention efforts, we need a more comprehensive model of these behaviors. We have become more sophisticated in our understanding of the more discrete influences on behavior (e.g., the role of positive and negative reinforcement) (Carr, 1977; Day, Johnson, & Schussler, 1986; Donnellan, Mirenda, Mesaros, & Fassbender, 1984; Durand & Carr, 1987; Evans & Meyer, 1985; Gaylord-Ross, 1980). Yet, we are only just beginning to understand how more complex events such as diet, relationships, medical conditions, mood, and sleep can affect challenging behavior (Gardner, Cole, Davidson, & Karan, 1986; Gardner, Karan, & Cole, 1984). It is expected that, as our understanding of these more complex events becomes integrated into a model of challenging behavior, intervention efforts will improve proportionately.

For example, many people describe how a person's mood can affect his or her behavior. "He was in a bad mood when he came in and was disruptive all day." "That first incident in the morning seemed to put her in a bad mood throughout the day." However, despite recent advances in our understanding of the nature of challenging behavior, a great deal is still unknown about this relationship between challenging behavior and mood. The influence of mood on challenging behavior has yet to be studied experimentally in persons with severe disabilities. Some of the questions to be addressed include: Can a "good mood" be induced, and will that lower rates of behavior problems? Can we prevent "bad moods," and will that, in turn, prevent challenging behavior? There is a great deal we still do not understand about challenging behavior, and more research is needed to further untangle these influences.

Assessment

Along with expanding our knowledge base pertaining to the influences on challenging behavior, we must, in parallel, continue to develop our assessment procedures. Such assessments should be capable of reliably identifying the influences on challenging behavior. One issue that will need to be addressed involves *ethical concerns* related to the use of some assessments. Specifically, there are several problems when using a functional analysis for assessing challenging behavior. Functional analysis involves (a) the manipulation of those events that are thought to influence the behavior of interest, and (b) the observation of any change in that behavior (Baer, Wolf, & Risley, 1968, pp. 93-94). For example, if we thought that teacher attention influenced a student's classroom behavior, a

functional analysis would involve the systematic increase and decrease in teacher attention, and an observation of the student's behavior under these different classroom conditions. There is an obvious problem with an assessment that will result in increases in the problem behavior under certain circumstances (e.g., with decreased attention or when attention is a consequence). Especially with more severe cases of challenging behavior, it is difficult to justify any procedure that will potentially cause harm to the person or others.

An additional consideration specific to the use of consequences in a functional analysis is *the possibility of increasing the future probability of the behavior.* In other words, if attention follows screaming, and screaming increases, then attention is a reinforcer. If we are reinforcing screaming during the functional analysis (e.g., by repeated use of attention as a consequence), will this adversely affect the behavior outside of the functional analysis? Are we making the problem worse by doing this kind of assessment? This is a question that has not yet been answered and is one that should be addressed when considering the use of consequences in a functional analysis (Durand, 1993).

Augmentative Communication Strategies

One of the major obstacles to teaching communication as a way of replacing challenging behavior is the mode of output. Many students with severe disabilities have historically had difficulty acquiring formal communication skills. One alternative to both spoken and signed speech is the use of augmentative communication systems (Baumgart, Johnson, & Helmstetter, 1990; Reichle, York, & Sigafoos, 1991). These systems are formal or informal strategies that assist communication efforts instead of or in addition to spoken speech. These strategies have included using communication boards that require students to point to pictures (Mirenda, 1985; Rotholz, Berkowitz, & Burberry, 1989), vocal output devices (Dattilo & Camarata, 1991; Mirenda & Beukelman, 1987), and a variety of other adaptations (Mathy-Laikko et al., 1989). Vocal output systems have several advantages over other augmentative systems. Most importantly, others may be more likely to respond to vocal output devices over communication boards. Calculator and Dollaghan (1982), for example, have noted that less than two-thirds of the initiations made by students with communication boards (i.e., picture books) are responded to by adults. If individuals do not respond to the communication of these students, the applicability of such an intervention approach for community settings is limited. Fortunately, a variety of vocal output devices is currently commercially available and may be used to promote effective communication among persons with profound or multiple disabilities.

In order to provide students who have severely limited communication skills with the ability to request reinforcers, we have recently incorporated the use of vocal-output communication devices for use with functional communication training (Durand & Berotti, 1991). These devices should allow students to provide

minimal input (e.g., touching a pad) that results in *easily recognizable output* (e.g., a voice generated from the device requesting reinforcers in full sentences). For example, for a student with escape-maintained problem behavior, it is possible to teach her to activate a device that will produce the sentence "Would you help me with this, please?" Using state-of-the-art technology to provide students with a means of communicating wants/needs should result in reduced rates of challenging behavior.

Primary Prevention

Until recently, there have been relatively few demonstrations of the potential of early intervention for persons with severe disabilities. Fortunately, several groups have begun to apply intervention procedures with young children in an effort to prevent more serious, later problems (e.g., Dunlap, Johnson, & Robbins, 1990; Lovaas, 1987). One of the logical outgrowths of a communication hypothesis of challenging behavior may be specific guidelines for efforts to prevent these serious behaviors.

If some forms of challenging behavior develop primarily from a combination of a person's inability to effectively communicate his or her wants and needs in a more acceptable manner, and/or from an unresponsive environment, then it may be possible to intervene with children and their environments *before* these behaviors are exhibited. In other words, in addition to attempting to reduce already existing behaviors and identifying emerging problems (secondary prevention), it may be possible through specific early communication training and environmental design to prevent some instances of serious challenging behavior altogether (primary prevention). Again, viewing some challenging behavior as a form of nonverbal communication provides specific predictions about what types of early intervention efforts may be most effective in preventing problem behavior.

Conclusion

We have reviewed recent work that has focused on replacing challenging behavior with communication, using a technique known as functional communication training. A growing body of research supports this approach to treatment as an effective way to reduce even the most severe forms of behavior problems. In addition, this intervention strategy complements efforts to include persons with the most severe disabilities into regular education settings and other community environments. Recommendations were made to promote this type of treatment for challenging behavior by focusing on home-school collaboration, leadership training, research on the influences on challenging behavior, research on assessment methods, and work on prevention strategies. It is encouraging that positive strategies are being developed to affect meaningful outcomes for persons with severe disabilities and challenging behavior.

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