

*THE INFLUENCE OF ACTIVITY CHOICE ON
PROBLEM BEHAVIORS MAINTAINED BY
ESCAPE VERSUS ATTENTION*

CATHRYN ROMANIUK, RAYMOND MILTENBERGER, CAROLE CONYERS,
NICOLE JENNER, MANDY JURGENS, AND CRYSTAL RINGENBERG

NORTH DAKOTA STATE UNIVERSITY

This study assessed whether the function of an individual's problem behavior was related to the effectiveness of an intervention involving choice among tasks. Analogue functional analyses were conducted with 7 students with various diagnoses to determine whether problem behaviors were maintained by escape or attention. Following identification of the function of each student's problem behavior, reversal designs were used to assess the effectiveness of an intervention that allowed the students to choose their own instructional tasks. Results showed that students who displayed escape-maintained problem behavior showed substantial reductions in such behavior when they were provided with opportunities to choose among tasks. On the other hand, students who displayed attention-maintained problem behavior did not show any effects as a result of the choice intervention. These findings are discussed in terms of the effective use of behavior management programs involving choice and the reduction of problem behavior.

DESCRIPTORS: choice, functional analysis, children, problem behavior

In recent years, researchers have begun to evaluate the effects of choice making on the problem behaviors of individuals with disabilities (see Romaniuk & Miltenberger, 2001). A number of researchers have demonstrated, in educational, occupational, and residential contexts, that individuals who display problem behavior often exhibit lower rates of such behavior when they are given opportunities to make choices among tasks or activities (e.g., Bambara, Koger, Katzer, & Davenport, 1995; Berotti, 1996; DeLeon, Neidert, Anders, & Rodriguez-Catter, 2001; Dunlap, dePerczel, et al., 1994; Dyer, Dunlap, & Winterling, 1990; Golonka et al., 2000; Kern, Mantegna, Vorndran, Bailin, & Hilt, 2001; Moes, 1998; Powell & Nelson, 1997; Seybert, Dunlap, & Ferro, 1996).

Although the opportunity to choose among tasks or activities has been a component of a number of successful treatment packages for individuals with disabilities (e.g., Carr & Carlson, 1993; DeLeon et al., 2001; Dunlap, Kern-Dunlap, Clarke, & Robbins, 1991), several researchers have evaluated the independent effects of choice of tasks on problem behavior. In these studies, students who exhibit problem behaviors in task situations are allowed to choose among a small number of available tasks. For example, Dyer et al. (1990) evaluated the effects of choice of activities on the disruptive behavior of 3 students with developmental disabilities and found lower levels of problem behaviors when students were allowed to choose compared to when the teacher chose the task. Likewise, Dunlap, dePerczel, et al. (1994) showed that the provision of choice of activities decreased the disruptive behavior of 2 boys with emotional disorders relative to when the teacher chose the task. Similarly, Vaughn and Horner (1997) and Seybert et al. (1996) showed the

This study was conducted as a masters thesis by the first author. We thank the teachers and students in the Fargo and Moorhead Public Schools who allowed us to conduct this research in their classrooms.

Address correspondence to Raymond G. Miltenberger, Department of Psychology, North Dakota State University, Fargo, North Dakota 58105 (e-mail: ray.miltenberger@ndsu.nodak.edu).

beneficial effects of choice of tasks with school-age children and high school students with mental retardation, respectively. Most recently, Kern *et al.* (2001) showed that problem behaviors of students with attention deficit hyperactivity disorder (ADHD) or mental retardation were reduced when they were given choices of activities relative to when choices were not provided.

With the beneficial effects of choice among tasks well established, researchers have begun to explore the mechanisms that underlie the effectiveness of choice interventions. Several researchers have speculated that, when individuals display problem behavior during particular tasks to escape from the task, the opportunity to engage in chosen tasks reduces motivation to escape from the task and problem behaviors are, therefore, less likely to occur (e.g., Clarke *et al.*, 1995; Dunlap, Foster-Johnson, Clarke, Kern, & Childs, 1995; Dyer *et al.*, 1990; Foster-Johnson, Ferro, & Dunlap, 1994; Seybert *et al.*, 1996; Vaughn & Horner, 1997).

If the hypothesized mechanism underlying reductions in problem behavior associated with chosen tasks is to decrease motivation to escape from the task, it follows that individuals displaying problem behaviors maintained by escape from task demands would be more likely to benefit from interventions involving choice of tasks than would individuals whose behaviors are maintained by other variables (e.g., attention or access to tangible items).

The present study was designed to assess the effects of an intervention involving choice among tasks on problem behaviors maintained by attention versus escape. It was hypothesized that problem behaviors maintained by escape from task demands would show greater reductions when individuals were provided with choice among tasks than would problem behaviors maintained by attention. During the choice intervention

phase, problem behaviors continued to produce the reinforcing consequences identified in the analogue functional analysis conditions. This was done to assess the effects of interventions involving choice of tasks on problem behaviors independent of the effects of an extinction procedure when the establishing operation for attention or escape was still in place.

METHOD

Participants

Seven participants were selected from public elementary-school classrooms serving children with behavior problems. Teachers were asked to nominate individuals who engaged in problem behavior numerous times each day. The participants met the following criteria: (a) Behavior problems were maintained by either escape or attention, as indicated by an analogue functional analysis; (b) they could make choices, as indicated by teacher report; and (c) parental permission to participate in the project was obtained.

Brooke was a 7-year-old girl who had cerebral palsy and moderate cognitive impairments. On the Mullen Skills of Early Learning Test, she received a composite score of 51. Brooke participated in both regular education and special education classes, and displayed disruptive behavior when asked to complete assignments across both settings.

Maggie was a 10-year-old girl who had a diagnosis of autistic disorder. She had an IQ score of 86 on the Woodcock-Johnson Tests of Cognitive Ability. At the time of the study, Maggie was taking 1 mg of amphetamine salts, which she had been taking for approximately 2 years prior to the study. She was enrolled in a regular education classroom and also participated in a math class with students with learning disabilities. Maggie's teachers were concerned about disruptive behaviors that occurred when she was engaged in instructional activities.

Gary was a 7-year-old boy who displayed high rates of disruptive behavior when working with his teachers on instructional activities. Gary had been diagnosed with moderate mental retardation and received an IQ score of 42 on the Weschler Preschool and Primary Scale of Intelligence-Revised. Gary spent the majority of his day participating in one-on-one special education services.

Riley was a 5-year-old boy who engaged in high rates of disruptive behavior across all settings, according to his teacher. Riley was enrolled in a regular kindergarten classroom; however, he evidenced significant delays in his academic skills. His teacher reported that it was difficult to assess his academic ability because his disruptive behavior often interfered with assessment.

Christy was a 9-year-old girl who had been diagnosed with Mosaic Down syndrome and who functioned approximately 2 years behind her chronological age level. Christy was taught primarily in small-group and one-on-one special education settings, although she also participated in some regular education class periods. She was reported to behave disruptively during both academic tasks and while interacting with peers.

Rick was a 7-year-old boy who had been diagnosed with ADHD. Rick began taking 20 mg of methylphenidate, twice daily, part way through the study. He was placed in a regular education setting, where his teacher reported that he engaged in disruptive behavior both during and outside of academic assignments.

Katie was an 8-year-old girl who had been diagnosed with a mood disorder, unspecified, and a seizure disorder. At the time of the study, Katie was taking several medications, including valproic acid (125 mg twice daily), risperidone (5 mg once daily), amitriptyline (10 mg twice daily), buspirone (5 mg twice daily), and amphetamine salt (5 mg twice daily). Formal testing indicated moderate impairments in cognitive func-

tioning. On the Weschler Individual Achievement Test, Katie received a standard score of 70. She was enrolled in a combination of regular and special education classes, and was reported to engage in disruptive behaviors across all settings.

Setting

All experimental sessions were conducted in a separate classroom at the participant's school. The classroom contained at least one table, several chairs, instructional tasks, and videotape equipment for recording the sessions. Sessions lasted 5 min, with no more than four sessions taking place on any given day.

Response Definitions

Problem behaviors, defined individually for each student, included the following: biting, hitting, whining, crying, pinching, getting out of seat, off-task comments, putting head on the table, touching or hugging the therapist, refusal statements, inappropriate use of materials, covering face with hands, inappropriate gestures, making inappropriate noises or faces, scribbling on work, yelling, saying "shut up," and throwing objects.

Data Collection

All functional analysis and experimental sessions were videotaped, and trained observers recorded data from the videotapes. The occurrence of problem behaviors was evaluated using a data sheet to record the second of onset and offset of the behavior, as determined by the VCR timer. Duration, reported as the percentage of session time that problem behavior occurred, was used as the dependent variable for all students except Riley. For Riley, problem behaviors tended to be brief, discrete events that were best captured by a frequency measure. A second observer independently scored 25% of the functional analysis and experimental sessions for each participant. The percentage of

interobserver reliability was determined by dividing the seconds of agreement on the occurrence and nonoccurrence of the target behaviors by the total number of seconds in the observation period. Agreement on the onset and offset of the target behaviors was recorded when the raters were within 1 s of each other. Mean agreement scores for Brooke, Maggie, Gary, Riley, Christy, Rick, and Katie were 98% (range, 93% to 100%), 99% (range, 97% to 100%), 98% (range, 90% to 100%), 91% (range, 79% to 100%), 97% (range, 89% to 100%), 96% (range, 85% to 100%), and 99% (range, 97% to 100%), respectively.

Procedure

Each student participated in a functional analysis to identify the reinforcer maintaining the problem behavior. Following the functional analysis, each student participated in choice and no-choice conditions to evaluate whether choice of activity differentially influenced the problem behavior depending on the function of the behavior.

Analogue functional analysis. During the functional analysis, the level of problem behavior across several conditions was compared to assess the influence of escape and attention on problem behavior. Functional analysis conditions were implemented in a multielement design. Each session lasted 5 min, with three to four sessions conducted approximately 2 to 3 days per week. When more than one session was conducted on a given day, the student was given at least a 3-min break between sessions.

During each session the student was seated at a table and was prompted to work on a task with the therapist. The tasks were based on the teacher's nomination of academic tasks that were typically presented to the student in his or her regular classroom setting, and that occasioned problem behavior. For each child, a pool of 8 to 10 tasks was identified by the teacher in advance.

During the escape condition, the therapist began working on a teacher-nominated task with the child, and upon the occurrence of a problem behavior, the student was given a 10-s break from the task. The therapist issued a statement (e.g., "you can take a break now"), and after the 10-s interval had passed, the therapist began working on the task with the child once again. If, at any point in the session, the student did not initiate the task as requested, a three-prompt sequence was used. The prompt sequence consisted of instructions, modeling, and physical prompting. Each step in the prompt sequence occurred after 5 s of no response to the previous prompt.

During the attention condition, the therapist began working with the child on one of the teacher-nominated tasks. Upon the occurrence of a problem behavior, the therapist provided 5 s of attention in the form of mild reprimands (e.g., "don't do that," "that's not appropriate," or "keep on working"). If, at any point in the session, the student did not initiate the requested response, the same prompt sequence described under the escape condition was used.

During the noncontingent preferred stimuli condition, the child was left alone in a nondemand situation. The student was given a preferred task to work on (e.g., coloring, looking at a book, playing with a toy), was told that the therapist needed to run an errand and would return within 5 min, and was left alone in the classroom for the duration of the session.

Choice evaluation. Once the functional analysis sessions were completed, the choice evaluation began. An ABAB reversal design was used to compare the level of problem behavior across two conditions (choice and no choice). The no-choice condition was identical to the functional analysis condition that produced the highest rate of problem behaviors for each student. Therefore, the functional analysis data served as the first

no-choice condition. During the no-choice condition, the therapist began the session by prompting the student to engage in one of the teacher-nominated tasks. The assignment of tasks was counterbalanced across sessions, and the therapist began the session by issuing a statement such as "this is the assignment you will be working on today," or "it's time to work on —." If, at any point in the session, the student did not initiate the requested response, the three-prompt sequence was used.

During the choice condition, the same teacher-nominated tasks as in the no-choice condition were available; however, the student was allowed to choose the task he or she wished to work on during that session. Materials from four to six tasks were placed on the table in front of the student, and the experimenter prompted the student to choose one of the tasks. The therapist began by issuing a statement such as "which assignment would you like to work on today?" The student was also told that he or she could switch tasks at any point within the session if a request was made to do so. Once the student began working on the chosen task, if the student did not initiate the requested response, the three-prompt sequence was used.

In both the choice and no-choice conditions, problem behaviors were addressed in the same manner as in the functional analysis. If a student engaged in a higher level of problem behavior during escape conditions, he or she continued to receive a 10-s break contingent on each occurrence of problem behavior. On the other hand, if the student engaged in a higher level of problem behavior during attention conditions, he or she continued to receive 5 s of attention in the form of reprimands contingent on each occurrence of problem behavior. The purpose of this was to obtain a measure of the influence of choice on problem behavior

that was independent of the effect of an extinction procedure on the problem behavior.

For Katie, it was determined via the functional analysis that her problem behaviors were maintained by both escape and attention. Thus, she received choice within both escape and attention conditions. During the choice evaluation phase, Katie experienced one condition in which she was given a choice among tasks and received a 10-s break contingent on problem behavior (i.e., choice within escape condition) and a second condition in which she was given a choice among tasks and received 5 s of attention contingent upon problem behavior (i.e., choice within attention condition). Choice during escape and choice during attention conditions alternated within a multielement design.

Differential reinforcement and extinction. For children who did not benefit from the choice intervention, a functional intervention that consisted of differential reinforcement of alternative behavior (DRA) and extinction was implemented following evaluation of the choice and no-choice manipulations. With the DRA-extinction procedure, the therapist provided frequent praise for task-related responding and ignored problem behavior.

RESULTS

Analogue Functional Analysis

Results of the functional analysis showed that 3 participants (Brooke, Maggie, and Gary) engaged in problem behavior maintained by escape from task demands, 3 participants (Riley, Christy, and Rick) engaged in problem behavior maintained by attention from the therapist, and 1 participant (Katie) engaged in problem behavior maintained by escape and attention (see Figures 1, 2, and 3). All participants engaged in low levels of problem behavior during noncontingent preferred stimuli (alone) conditions,

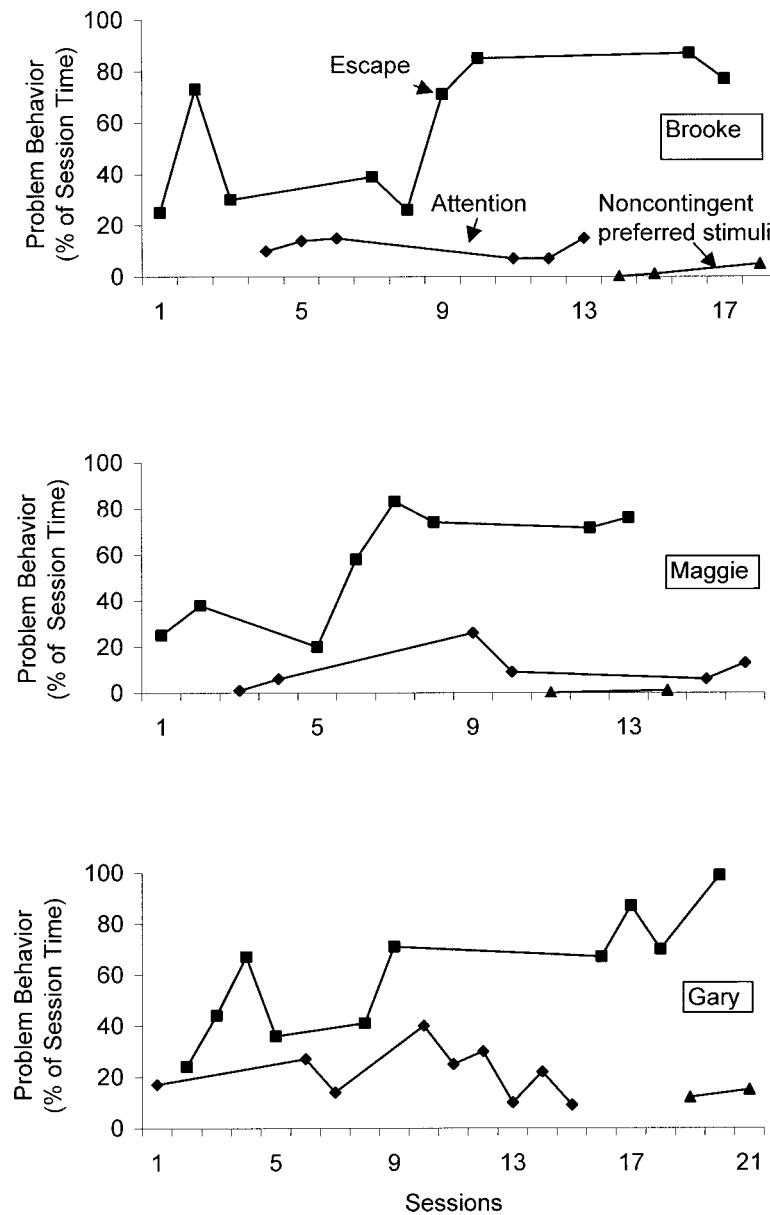


Figure 1. Analogue functional analysis data for Brooke (top panel), Maggie (middle panel), and Gary (lower panel).

suggesting that the problem behaviors were not maintained by automatic reinforcement.

For Brooke, Maggie, and Gary, problem behaviors were consistently highest during the escape condition. The mean percentage of time that problem behaviors occurred was 57% during escape, 11% during attention, and 1% during alone for Brooke; 56% dur-

ing escape, 10% during attention, and 1% during alone for Maggie; and 60% during escape, 22% during attention, and 14% during alone for Gary.

For Riley, Christy, and Rick, problem behaviors were consistently highest during the attention condition. For Riley, the mean rate of problem behaviors was 14.5 responses per

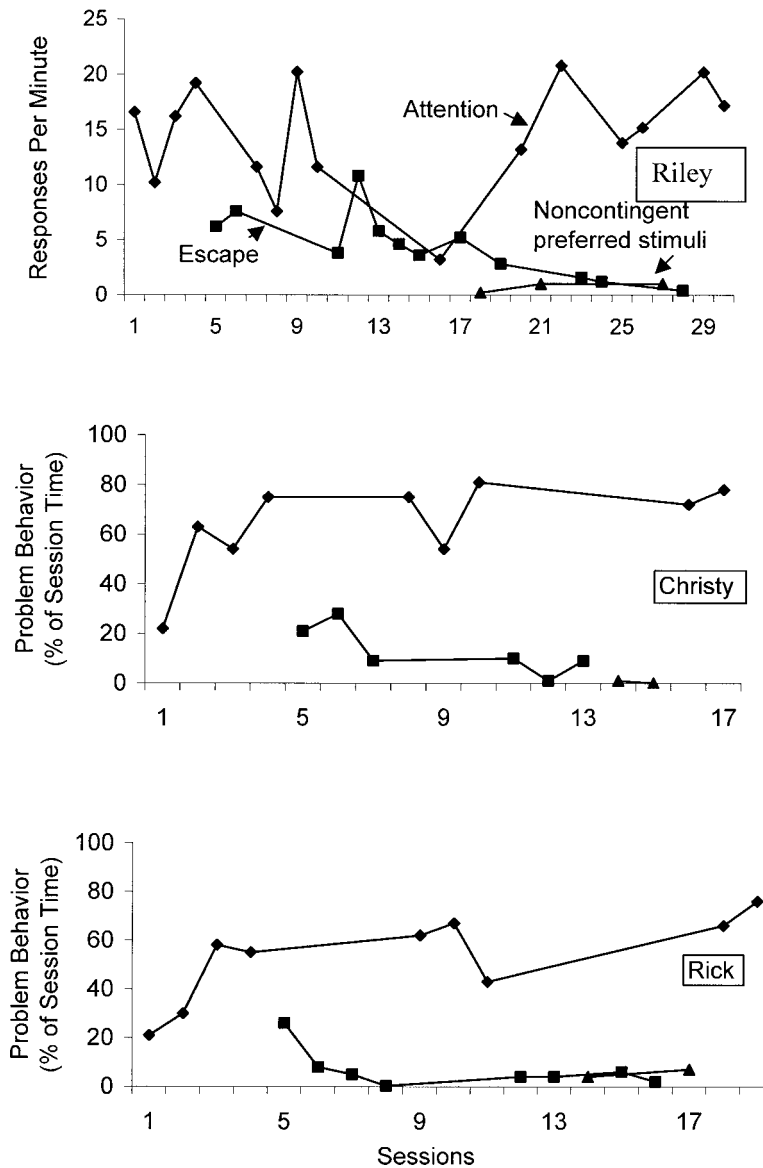


Figure 2. Analogue functional analysis data for Riley (top panel), Christy (middle panel), and Rick (lower panel).

minute during attention, 4.5 during escape, and 0.7 during alone conditions. The percentage of time that problem behaviors occurred was 64% during attention, 13% during escape, and 1% during alone for Christy and 52% during attention, 7% during escape, and 5% during alone for Rick.

Katie exhibited a high level of problem behavior during both escape and attention

conditions (mean percentages were 71% and 55%, respectively) compared to the alone condition (0%).

Choice Evaluation

Results of the choice and no-choice manipulations showed that all 3 participants whose problem behaviors were maintained by escape (Brooke, Maggie, and Gary) had

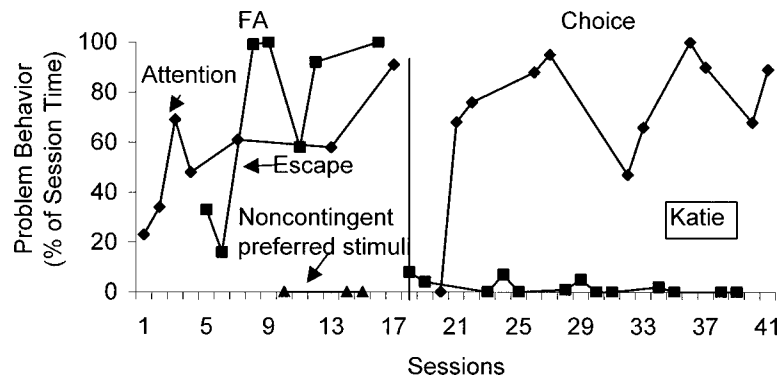


Figure 3. Analogue functional analysis and choice evaluation data for Katie.

substantial reductions in problem behavior during the choice condition compared to the no-choice condition (see Figure 4). Brooke exhibited problem behaviors 71% of the time during no-choice conditions compared to 8% during choice conditions. Maggie exhibited problem behaviors 65% of the time during no-choice conditions and 23% during choice conditions. Gary exhibited problem behaviors 69% of the time during no-choice conditions and 27% during choice conditions. In addition, 1 participant whose problem behaviors were maintained by both escape and attention (Katie) showed substantial reductions in problem behavior when she was offered choice among tasks within the escape condition (see Figure 3). Katie exhibited problem behaviors 2% of the time when offered choice within the escape condition compared to 71% in the no-choice escape baseline during the functional analysis. On the other hand, for the 3 participants whose problem behaviors were maintained by attention (Riley, Christy, and Rick), problem behaviors remained at similar levels during both the choice and no-choice conditions (see Figure 5). Riley exhibited a mean rate of 15.3 problem behaviors during the no-choice condition compared to 20.9 during the choice condition. Christy exhibited problem behaviors 71% of the time during the no-choice condition compared to 88% during the choice condi-

tion. Rick exhibited problem behaviors 63% of the time during the no-choice condition compared to 71% during the choice condition. Katie exhibited problem behaviors 72% of the time when offered a choice in the attention condition compared to 55% in the no-choice attention baseline during the functional analysis (see Figure 3).

Finally, during DRA plus extinction conducted with the participants who did not benefit from the choice intervention (i.e., Riley, Christy, and Rick; see Figure 5), problem behavior decreased to low levels. For Riley, problem behaviors decreased from a mean frequency of 17.3 to 2.9. For Christy, problem behaviors decreased from a mean of 78% of session time to 15%. For Rick, problem behaviors decreased from a mean of 67% of session time to 9%.

DISCUSSION

Overall, the results of the present study suggest that individuals who display problem behavior maintained by escape from task demands are more likely to benefit from interventions that involve choice among tasks than are individuals who display problem behavior maintained by attention. Specifically, students whose problem behaviors were maintained by escape showed substantial reductions in levels of problem behavior when they were given opportunities to make

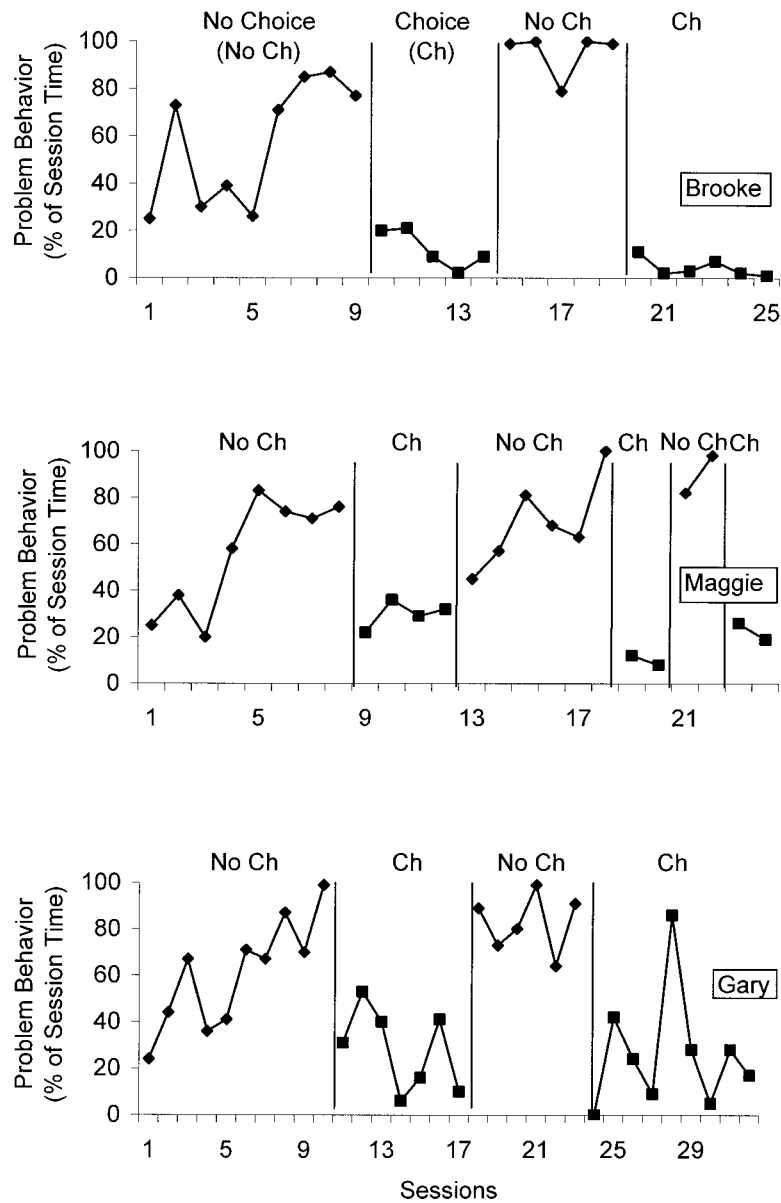


Figure 4. Choice evaluation data for Brooke (top panel), Maggie (middle panel), and Gary (lower panel).

choices among academic tasks. On the other hand, students whose problem behaviors were maintained by attention did not show any beneficial effect when they were provided with the same choice-making opportunities. In addition, 1 student whose problem behaviors were maintained by both escape and attention showed dramatic reductions in levels of problem behavior during the choice

intervention when escape was provided as a reinforcing consequence but not when attention was provided as a reinforcing consequence.

These findings extend those of Berotti (1996), who found an intervention involving choice among tasks to be beneficial for 3 of 4 individuals whose problem behaviors were maintained by escape but for only 1 of

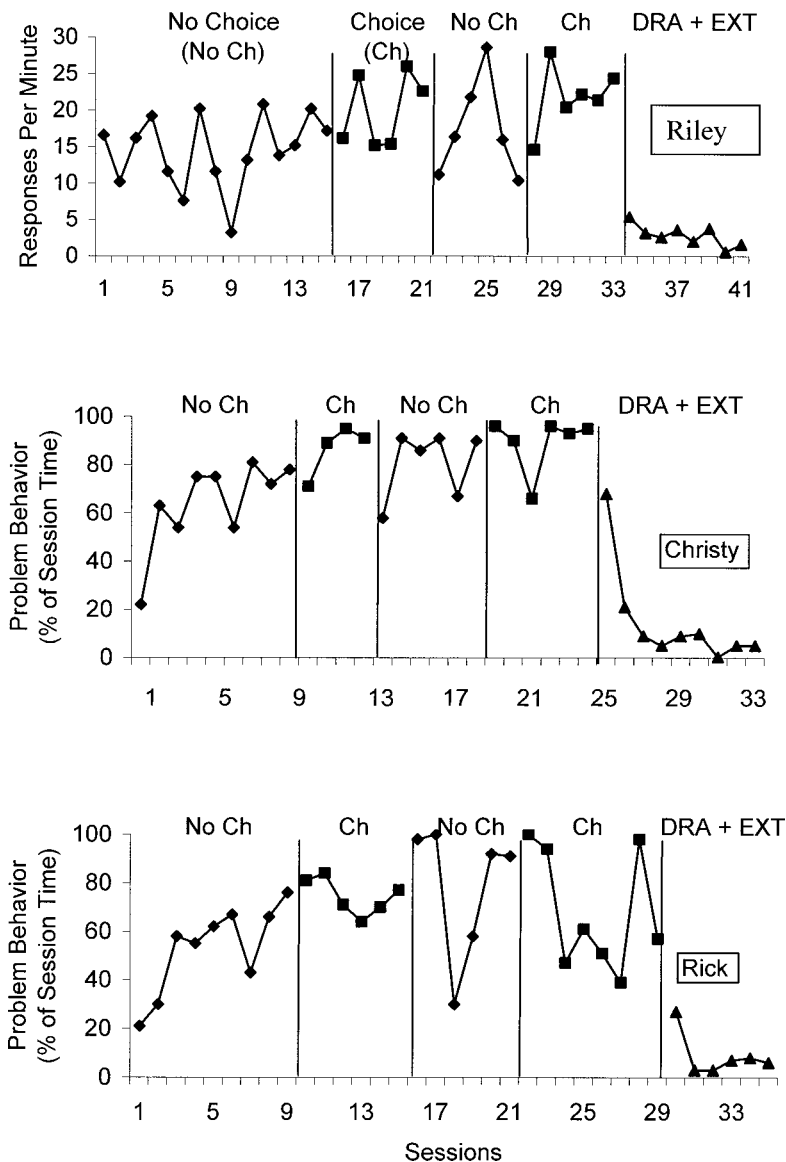


Figure 5. Choice evaluation data for Riley (top panel), Christy (middle panel), and Rick (lower panel).

4 individuals whose problem behaviors were maintained by tangible items. The present study showed a similar pattern of results for the influence of choice of tasks on problem behaviors maintained by escape versus attention. However, several methodological improvements in the current study lend credibility to the results of both studies. In particular, the functional analysis procedures employed in the present study allowed more

conclusive statements to be made regarding the function of each student's problem behavior. In addition, the consequence that reinforced each child's problem behavior continued to be delivered during the choice intervention, providing a "pure" measure of the effects of choice of tasks on problem behavior that was independent of the influence that an extinction or blocking procedure might have had on the student's behavior.

Finally, data were collected and presented in a repeated measures fashion, which permitted the examination of changes in each student's behavior across all phases of the study.

The results of the present study highlight the important role that the function of an individual's problem behavior plays in determining the most effective interventions for that individual. Similarly, these studies point out the importance of conducting functional assessments prior to implementing treatment strategies involving opportunities for choice among tasks. With only two exceptions (Berotti, 1996; Kern et al., 2001), previous researchers have only speculated that individuals who exhibit escape-maintained behavior are most likely to benefit from interventions involving choice among tasks (e.g., Dunlap et al., 1995; Dyer et al., 1990; Seybert et al., 1996; Vaughn & Horner, 1997). The present study demonstrated that this was indeed the case.

A related point involves the mechanism underlying reductions in problem behavior that are seen when individuals who engage in escape-maintained problem behaviors are provided with choice among tasks. One possible mechanism involves a change in the aversiveness of the task. When allowed to choose a task, the individual is likely to choose the task that is least aversive, and thus the establishing operation for escape is minimized. On the other hand, a mechanism that may underlie reductions in problem behavior associated with choice among tasks involves the notion of control over reinforcement. Control over reinforcement may be a type of reinforcer in and of itself (Catania & Sagvolden, 1980; Fisher, Thompson, Piazza, Crosland, & Gotjen, 1997). Thus, allowing individuals to make choices among tasks may allow them to exercise a type of control over their environment that could only be achieved with the problem behavior in the past.

It is important to note that a reduction in

problem behavior is only one benefit of providing choice among activities to individuals with developmental disabilities. Along with improving behavior, the provision of choices has been discussed as a quality of life issue (e.g., Harchik, Sherman, Sheldon, & Bannerman, 1993; Kearney & McKnight, 1997; Lattimore, Parsons, & Reid, 2002; Reid, Parsons, Green, & Browning, 2001). Although historically individuals with severe disabilities have been given very little choice over daily events in their lives, today there are greater expectations for such individuals to participate in making decisions and choices. Thus, although choice may be more effective in reducing escape-motivated problem behaviors, it is important to ensure that all individuals with disabilities are given opportunities to make choices and decisions regarding their quality of life.

The present study was not designed to distinguish the extent to which exposure to less aversive tasks versus control over reinforcement contributed to the reduction in problem behavior for the students who displayed escape-maintained problem behavior. However, several researchers have attempted to separate these variables to determine the factors that contribute to the effectiveness of choice-making interventions (e.g., Bambara et al., 1995; Cole, Davenport, Bambara, & Ager, 1997; Dunlap, dePerczel, et al., 1994; Parsons, Reid, Reynolds, & Bumgarner, 1990; Umbreit & Blair, 1996). Such studies typically employ yoking procedures in which assigned tasks are yoked to tasks that are chosen by participants during previous sessions. Overall, it appears that providing opportunities for choice results in equal or greater improvements over the improvements resulting from assigning preferred alternatives. Although such factors were not directly manipulated in the present study, informal observations suggested that the degree to which exposure to preferred (or less aversive) tasks and control over reinforce-

ment might contribute to the effectiveness of the choice intervention may vary with each individual participant. Future research will be necessary to investigate the relative contribution of exposure to preferred tasks and control over reinforcement to the effectiveness of choice interventions.

It should be noted that the procedures used in the attention condition of the present functional analysis differed from those typically used in analogue functional analyses. In the present study, the therapists provided attention following problem behavior in the context of working on academic tasks. Thus, during both the escape and attention conditions, the therapist interacted with the participant while he or she worked on an academic task. The conditions differed only in whether the student was given attention or a break following the occurrence of problem behavior. This adaptation from previous procedures highlights the importance of tailoring analogue functional analyses to the specific circumstances under which problem behaviors occur.

A few unanticipated events encountered during the study warrant mentioning. First, Rick began taking methylphenidate part way through the choice evaluation. However, this medication was initiated at the end of the first choice phase, just prior to implementation of the second no-choice phase, thus allowing comparisons to be made between choice and no-choice conditions both before and after the medication was started. Thus, the timing of the medication change limited its influence as a confounding variable. Second, during the second choice phase with Maggie, we encountered one session in which she refused to make a choice among the tasks that were offered to her. At this point, the therapist chose a task for her, essentially creating a return to a no-choice phase. Following this, we implemented a final choice phase, during which Maggie did choose a task and exhibited reduced levels of

problem behavior once again. A further interesting observation concerns the increases in problem behavior that can be observed in the data for Brooke, Maggie, and Gary when opportunities to choose tasks were given and then taken away during the second no-choice phase. For all 3 students, taking away the opportunity to choose once they had been allowed to make choices led to increases in problem behavior. Because individuals who respond well to the provision of choice may behave adversely if the opportunity to choose is taken away, interventions involving choice are best implemented under circumstances in which choices can continue to be provided.

Another area for further research concerns the practical limitations involved in implementing choice-making interventions directly in various classroom settings. Although all of the children who displayed escape-maintained problem behavior benefited from the choice-making intervention, their teachers were not able to implement the intervention in the classroom with equivalent ease. For those children who already participated in one-on-one special services, the teachers viewed the choice intervention as a fairly simple addition to an already flexible existing curriculum. However, for those children who were integrated into regular classroom settings, concerns were raised regarding the ease with which choices could be offered during instruction. For example, during classroom-wide instruction, when all children are expected to be working on one activity, it would be difficult to offer choices among tasks. Perhaps in this situation, choices should be offered in more creative ways so that the child is still able to make choices related to the activity.

In summary, this study is one of the first to demonstrate that individuals who engage in escape-motivated problem behavior are more likely to benefit from interventions involving opportunities to choose among tasks

than are individuals who engage in problem behavior maintained by attention. These findings add to a growing body of literature that demonstrates that offering individuals with behavior problems opportunities to make choices regarding events in their environment constitutes a practical and effective strategy for reducing such behavior problems. However, the present study showed that it is important to consider the function of an individual's problem behavior prior to designing an intervention involving choice.

REFERENCES

- Bambara, L. M., Koger, F., Katzer, T., & Davenport, T. A. (1995). Embedding choice in the context of daily routines: An experimental case study. *Journal of the Association for Persons with Severe Handicaps, 20*, 185–195.
- Berotti, D. (1996). *Effects of preference and choice on problem behavior*. Unpublished doctoral dissertation, State University of New York, Albany.
- Carr, E. G., & Carlson, J. I. (1993). Reduction of severe behavior problems in the community using a multicomponent treatment approach. *Journal of Applied Behavior Analysis, 26*, 157–172.
- Catania, A. C., & Sagvolden, T. (1980). Preference for free choice over forced choice in pigeons. *Journal of the Experimental Analysis of Behavior, 34*, 77–86.
- Clarke, S., Dunlap, G., Foster-Johnson, L., Childs, K. E., Wilson, D., White, R., et al. (1995). Improving the conduct of students with behavioral disorders by incorporating student interests into curricular activities. *Behavioral Disorders, 20*, 221–237.
- Cole, C. L., Davenport, T. A., Bambara, L. M., & Ager, C. L. (1997). Effects of choice and task preference on the work performance of students with behavior problems. *Behavioral Disorders, 22*, 65–74.
- DeLeon, I. G., Neidert, P. L., Anders, M. M., & Rodriguez-Catter, V. (2001). Choices between positive and negative reinforcement during treatment for escape-maintained behavior. *Journal of Applied Behavior Analysis, 34*, 521–525.
- Dunlap, G., dePerzel, M., Clarke, S., Wilson, D., Wright, S., White, R., et al. (1994). Choice making to promote adaptive behavior for students with emotional and behavioral challenges. *Journal of Applied Behavior Analysis, 27*, 505–518.
- Dunlap, G., Foster-Johnson, L., Clarke, S., Kern, L., & Childs, K. E. (1995). Modifying activities to produce functional outcomes: Effects on the problem behaviors of students with disabilities. *Journal of the Association for Persons with Severe Handicaps, 20*, 248–258.
- Dunlap, G., Kern-Dunlap, L., Clarke, S., & Robbins, F. R. (1991). Functional assessment, curricular revision, and severe behavior problems. *Journal of Applied Behavior Analysis, 24*, 387–397.
- Dyer, K., Dunlap, G., & Winterling, V. (1990). Effects of choice making on the serious problem behaviors of students with severe handicaps. *Journal of Applied Behavior Analysis, 23*, 515–524.
- Fisher, W. W., Thompson, R. H., Piazza, C. C., Crossland, K. A., & Gotjen, D. (1997). On the relative reinforcing effects of choice and differential consequences. *Journal of Applied Behavior Analysis, 30*, 423–438.
- Foster-Johnson, L., Ferro, J., & Dunlap, G. (1994). Preferred curricular activities and reduced problem behaviors in students with intellectual disabilities. *Journal of Applied Behavior Analysis, 27*, 493–504.
- Golonka, Z., Wacker, D., Berg, W., Derby, K. M., Harding, J., & Peck, S. (2000). Effects of escape to alone versus escape to enriched environments on adaptive and aberrant behavior. *Journal of Applied Behavior Analysis, 33*, 243–246.
- Harchik, A. E., Sherman, J. A., Sheldon, J. B., & Bannerman, D. J. (1993). Choice and control: New opportunities for people with disabilities. *Annals of Clinical Psychiatry, 5*, 151–161.
- Kearney, C. A., & McKnight, T. J. (1997). Preference, choice, and persons with disabilities: A synopsis of assessments, interventions and future directions. *Clinical Psychology Review, 17*, 217–238.
- Kern, L., Mantegna, M. E., Vorndran, C. M., Bailin, D., & Hilt, A. (2001). Choice of task sequence to reduce problem behaviors. *Journal of Positive Behavior Interventions, 3*, 3–10.
- Lattimore, L. P., Parsons, M. B., & Reid, D. H. (2002). A prework assessment of task preference among adults with autism beginning a supported job. *Journal of Applied Behavior Analysis, 35*, 85–88.
- Moes, D. R. (1998). Integrating choice-making opportunities within teacher-assigned academic tasks to facilitate performance of children with autism. *Journal of the Association for Persons with Severe Handicaps, 23*, 319–328.
- Parsons, M. B., Reid, D. H., Reynolds, J., & Bumgarner, M. (1990). Effects of chosen versus assigned jobs on the work performance of persons with severe handicaps. *Journal of Applied Behavior Analysis, 23*, 253–258.
- Powell, S., & Nelson, B. (1997). Effects of choosing academic assignments on a student with attention deficit hyperactivity disorder. *Journal of Applied Behavior Analysis, 30*, 181–183.
- Reid, D. H., Parsons, M. B., Green, C. W., & Brown-

- ing, L. B. (2001). Increasing one aspect of self-determination among adults with severe multiple disabilities in supported work. *Journal of Applied Behavior Analysis, 34*, 341–344.
- Romaniuk, C., & Miltenberger, R. G. (2001). The influence of preference and choice of activity on problem behavior. *Journal of Positive Behavior Interventions, 3*, 152–159.
- Seybert, S., Dunlap, G., & Ferro, J. (1996). The effects of choice-making on the problem behaviors of high school students with intellectual disabilities. *Journal of Behavioral Education, 6*, 49–65.
- Umbreit, J., & Blair, K. S. (1996). The effects of preference, choice and attention on problem behaviors at school. *Education and Training in Mental Retardation and Developmental Disabilities, 31*, 151–161.
- Vaughn, B. J., & Horner, R. H. (1997). Identifying instructional tasks that occasion problem behaviors and assessing the effects of student versus teacher choice among these tasks. *Journal of Applied Behavior Analysis, 30*, 299–312.

Received July 23, 2001

Final acceptance August 12, 2002

Action Editor, Craig H. Kennedy

STUDY QUESTIONS

1. According to the authors, why might choice making be more likely to be effective in reducing problem behavior maintained by escape rather than by attention?
2. How were the choice and no-choice conditions similar and different?
3. The contingencies that maintained problem behavior remained in place during the choice evaluation. Why was this an important control procedure?
4. Briefly describe the DRA + EXT intervention. For whom was this intervention implemented?
5. How did the results of the choice assessment compare to the outcomes of participants' functional analyses?
6. What two mechanisms did the author suggest to account for observed reductions in problem behavior?
7. Given the context of the experimental sessions, what additional data may have been helpful in evaluating treatment effects?
8. What are some potential practical difficulties in implementing choice interventions in classroom settings?

Questions prepared by Claudia Dozier and David Wilson, The University of Florida