**PREFERRED CURRICULAR ACTIVITIES AND REDUCED
PROBLEM BEHAVIORS IN STUDENTS WITH
INTELLECTUAL DISABILITIES**

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This research examined the relation between students' preferences for curricular activities and the occurrence of problem and desirable behaviors in 3 students with moderate intellectual disabilities. Activity preference was determined with a systematic assessment procedure. Subsequently, the influence of activity preference on student behavior was evaluated using a reversal design. Results showed that preferred activities were associated with reduced levels of problem behavior and increased levels of desirable behaviors. The findings of this investigation contribute to the applied literature on activity preference and suggest directions for future research in the areas of curriculum design, preference, and curricular modifications as a viable behavior-management strategy.

DESCRIPTORS: preferred activities, problem behavior, preference

The use of preferred stimuli and the provision of opportunities to make choices are increasingly acknowledged as motivational factors in skill acquisition. These factors have been associated with improved task performance (Mithaug & Mar, 1980; Parsons, Reid, Reynolds, & Bumgarner, 1990), increases in spontaneous speech (Dyer, 1987; Peck, 1985), and gains in response accuracy (Pace, Ivancic, Edwards, Iwata, & Page, 1985).

There is limited but growing evidence that these strategies can also be used as management tools for preventing and reducing problem behaviors (Cooper et al., 1992; Dyer, 1987; Dyer, Dunlap, & Winterling, 1990).

Choice and preference strategies have been used successfully to decrease social avoidance (Koegel, Dyer, & Bell, 1987), aggression, noncompliance (Cooper et al., 1992; Dyer et al., 1990), and stereotypic behaviors (Dyer, 1987). A body of literature lends support to these phenomena, especially for individuals with developmental disabilities. Currently, research efforts are validating the use of preferred stimuli and choice-making strategies for individuals with emotional and behavioral disorders (Cooper et al., 1992; Dunlap et al., 1993).

The research related to preference has concentrated on methods that assess preference for a variety of stimuli, including fans and radios (Steege, Wacker, Berg, Cigrand, & Cooper, 1989); mirrors, coffee, juice, and heat (Pace et al., 1985); auditory and visual stimuli (Dattilo, 1986); and edibles and toys (Dyer, 1987; Dyer et al., 1990). In general, these stimuli were then used as reinforcers for successful performance of an instructional activity to which they were often not naturally related. Fewer studies have examined the effects on student behavior when the instructional *activity* is preferred or reinforcing. In this case, it is the cluster or set of stimuli and behaviors that produces a preferred effect rather than one specific stimulus.

The identification of preferred activities becomes

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desirable in the context of the current focus on content of instruction (curriculum) as a critical aspect of skill acquisition and the reduction of problem behavior. Horner, Sprague, and Flannery (1993) argue that a curricular activity should be designed to be performed in a way that produces an outcome that is valued by the individual (i.e., the natural stimuli associated with the activity are presumed to be reinforcers).

Only a few studies indicate that preferred activities may result in increased task productivity and decreased problem behavior. For example, Parsons *et al.* (1990) found that participants worked longer on tasks that were selected most frequently in a prior preference assessment than they did on tasks that were least often selected. Dunlap, Kern-Dunlap, Clarke, and Robbins (1991) examined curricular modifications that included choice, meaningful activities, and task duration with a student with emotional and behavioral challenges. Although a formal preference assessment was not conducted, the results of hypothesis testing suggested that the participant had a preference for gross motor activities, as indicated by differences in the incidence of on-task and problem behavior. The subject in this study showed improved task engagement and decreased problem behaviors. Cooper *et al.* (1992) also found that a participant's problem behavior was reduced when he was given preferred activities.

The process of identifying preferred stimuli is a critical component of the empirical studies related to preference and choice. A variety of strategies have been used for different studies and populations (Cooper *et al.*, 1992; Dyer, 1987; Pace *et al.*, 1985; Parsons & Reid, 1990; Steege *et al.*, 1989). In this study, we measured approach behaviors to an activity presented to a participant. The measurement of approach responses made to a standard set of stimuli repeatedly presented has been shown to provide a reliable assessment of preference (Dyer, 1987; Green *et al.*, 1988; Steege *et al.*, 1989).

This study had two purposes. The first was to examine the influence of activity preference on both appropriate and problem behaviors of 3 individuals with intellectual disabilities. The second was to present an alternative preference-assessment strat-

egy based on the work of Dyer (1987). This procedure identified preference based on student interactions with the activity and tested whether the assessment instrument and the process could be modified so that it could be used with activities rather than specific stimuli.

GENERAL METHOD

Participants

Three students with moderate to severe disabilities participated in this study. Charles, Cathy, and David were nominated by school staff because they displayed problem behaviors that were generally disruptive to the classroom routine and reduced opportunities for learning. These problems behaviors included inappropriate use of materials, off-task behavior, noncompliance (Cathy and David), inappropriate vocalizations (Charles and Cathy), and playful responding that disrupted instruction (David). At the time of the study, Charles was 14 years old, and had earned a composite IQ score of 33 on the Stanford-Binet Intelligence Test and scored below 10 on the Peabody Picture Vocabulary Test (Form B) (Dunn & Dunn, 1981). Charles communicated primarily through pointing and limited sign language. Cathy, who was 15 years of age, scored a 37 on the Peabody Picture Vocabulary Test. Although Cathy spoke in phrases and short sentences, her conversations tended to be somewhat disjointed and she had difficulty answering direct questions. David was 9 years old and scored a composite IQ of 28 on the Stanford-Binet. David possessed limited speech, communicating with one- to two-word phrases. All of the participants attended public school programs for students with moderate to severe disabilities. None of the participants was physically impaired or receiving medication of any type. Each student also had adequate receptive language and pointing skills to understand and delineate preferences among visible stimuli.

Setting

Assessment and instructional sessions were conducted in one of several rooms on the public school

campus where the students were enrolled. The rooms all contained at least one table and several chairs, as well as the activity materials that were used in the sessions. The only people in the rooms at the time of the study were one or two students, the instructor, and at least one data collector. In addition, all sessions were videotaped, with the data reported in this study obtained from the videotapes.

PREFERENCE ASSESSMENT

This study was comprised of two phases. The student's relative preference for specific activities was assessed systematically, after which the activities were compared experimentally to evaluate the possible influence of activity preference on problem and desirable behaviors.

Identification of Activities

The preference assessment began by developing a pool of five different activities that were consistent with an individualized instructional objective identified by the student's teacher. As a control for difficulty, all the activities were in a maintenance phase of learning. These activities were similar in the required response topographies, but they involved different materials and contexts and resulted in different outcomes. For example, the instructional objective that was selected for both Charles and Cathy was related to coin identification. The five activities developed for that objective ranged from a straightforward coin-identification requirement (e.g., from an assortment of coins, the student was asked "Please give me the penny"), to a purchasing exercise that required the student to choose an item to purchase and then select the correct coin based on the item's price.

Procedures

The preference assessment was conducted over 3 days. During each daily session, the instructor presented five trials, one for each of the activities. Each trial began with the instructor sitting next to the student and demonstrating the response requirements associated with activity completion. The student performed the activity with the instructor

for approximately 1 min, and then was allowed approximately 30 s to interact freely with the materials. The materials were then removed, and the next activity was introduced. The activities were presented randomly within and across sessions to control for a possible order effect. Instructor prompts and reinforcement were held constant across activities and sessions.

Activity preference was measured with an assessment protocol based on Dyer's (1987) procedures for determining the reinforcing value of stimuli from direct observations of student behavior. The assessment included evaluations of three major elements: (a) the extent to which the student interacted with and manipulated the materials without instructor prompts; (b) the degree of student resistance when the materials were removed; and (c) any student initiation toward the materials when they were moved a short distance away. The assessments were scored by separating each of the three elements into specific behavioral criteria that were representative of that major element. A numeric value that ranged from 0 to 2 was assigned to each behavioral criterion within a major element, with 0 representing a complete lack of the "preferred" behavior (no interaction, no reaching for materials, no resistance) and 2 representing behaviors indicative of high preference (initiating interaction, reaching immediately for the materials, pulling or holding on to materials when they were removed). Across these three elements, a highly preferred activity could receive a preference rating of 6, whereas an activity that was not preferred could score as low as 0. These daily preference ratings were averaged across the 3 days of the preference assessment to obtain a final preference rating for each activity.

Interobserver reliability for the preference assessment was evaluated in two ways: the agreement between raters on the ranking of activities from most preferred to least preferred, and a point-by-point comparison of the three daily preference ratings for each activity. Reliability data were collected by a naive observer for 100% of the preference trials across all the students. Agreement on the rankings was determined by comparing the order

Table 1
Instructional Objectives, Activities, and Preference Ratings Across Students

Student	Instructional objective	Activities				
		Coin ID	Purchase objects	Coin domino	Coin bingo	Coin flashcards
Charles	identify penny	0.0 ^a	5.5 ^b	4.0	4.0	1.7
Cathy	identify penny, nickel, dime, and quarter	0.5 ^a	2.3 ^b	0.7	1.3	0.3
		Number flashcards	Object price tag	Color by number	Connect the dot	Scratch pad number ID
David	identify and trace numbers 1 to 5	0.7 ^a	3.3 ^b	1.3	0.7	4.5

^a Nonpreferred.

^b Preferred.

of the final preference ratings for the five activities. Across all participants, there was complete agreement on the ranking of each of the activities.

For the point-by-point comparison, agreement was defined as having the daily preference ratings fall within 1 point of each other (range, 0 to 6). Reliability was calculated using the number of agreements divided by the number of agreements plus disagreements multiplied by 100%. These reliability scores were then averaged across the 3 days of the preference assessment to obtain an average reliability index for the assessment. The percentage of agreement ranged from 67% to 100% for Cathy ($M = 93\%$), from 33% to 100% for Charles ($M = 80\%$), and from 67% to 100% for David ($M = 87\%$).

Results

The instructional objectives and results of the preference assessment for Charles, Cathy, and David are presented in Table 1. The table delineates the educational objective that is common to the five activities developed for each student. The scores associated with each activity are the final preference ratings.

COMPARISON OF PREFERRED AND NONPREFERRED ACTIVITIES

For each student, a highly preferred activity and a nonpreferred activity were selected for comparison in the second phase of the study. The activities that

earned relatively low ratings on the preference assessment were considered to be nonpreferred, and those activities that resulted in high preference ratings were judged to be preferred. The activities chosen for this phase met the additional criterion that they provide an appropriate educational experience for each student. As a result, the activities selected were not necessarily those that earned the highest or lowest rating. These activities were more functional, were comprised of materials that were readily available in the classroom setting, and were more typical of what would have been presented in the student's classroom. These activities are described in more detail below.

To assess the relative influence of preferred activities on student behavior, the highly preferred activities were compared to the nonpreferred activities. Cathy, Charles, and David worked in groups of 2 with an instructor and were paired according to age and ability level on the educational objectives.

Behavior Definitions, Observation System, and Reliability

The primary dependent variable for this phase of the experiment was the percentage of intervals with problem behaviors. Desirable behavior was also recorded. The problem behaviors exhibited by these students were typical of those encountered in their classrooms. Although the challenging behaviors were not life threatening or excessively severe, they were considered to be problematic by the stu-

Table 2
Individual Problem and Desirable Behaviors and Their Definitions

Problem	off task	A period of 5 consecutive seconds in which the student was not engaged in teacher-directed activity. This was generally accompanied by staring into space, refusal to participate in activity, or another behavior that conflicts with the instructional session.
	inappropriate use of materials	Using materials required for the activity in a way in which they were not intended to be used (e.g., mouthing, rubbing, or hitting the material on the table; or placing hands or other body parts over materials during instruction).
	inappropriate talk or vocalizations	A verbalization or vocalization emitted by the student during instruction that was not an appropriate response to any staff or student interaction or to the activity (e.g., giggling, talking about activities the student did during another class, squeaking, swearing).
	noncompliance	Failure of the student to initiate a response to teacher direction within 5 s of request or refusing to respond or participate in the instructional session.
	disruptive behavior	Inappropriate behavior that disrupted the session and did not fit into the other categories of problem behaviors (e.g., leaving seat, pulling on clothes, head on desk, and playful responding).
Desirable	appropriate vocalizations or verbalizations	Any appropriate vocalization related to the activity made by the student, including asking questions and interactions with classmates.
	following directions	Complying with an instruction within 5 s.
	touch/manipulate materials	Touching, manipulating, or playing with materials in an appropriate manner (i.e., using the toys and activities appropriately).

dent's teachers, were generally disruptive to the instructional session, and prevented the student and his or her session partner from participating in the instruction. Because of the diversity of behaviors across the 3 students, problem behavior was defined as a general category that included self-stimulatory behavior, inappropriate use of materials, inappropriate vocalizations and verbalizations, off-task behavior as indicated by lack of engagement with the activity, disruptive behavior, and other inappropriate or noncompliant patterns of responding. Desirable behavior included appropriate engagement with the activity materials, appropriate vocalizations, and following instructors' directions. The problem and desirable behavior categories were not mutually exclusive or exhaustive. It would have been possible to score intervals during which neither or both desirable and problem behaviors occurred. Specific definitions for the problem behaviors are provided in Table 2, as are definitions for the individual appropriate behaviors classified as desirable.

Data were collected from videotapes using a

partial-interval recording system in which the first 10 s of each interval were used for observation and the remaining 5 s were used to record data. Five observers were trained to record behaviors of individuals with developmental disabilities and received special training in the recording procedures used in this study. Interobserver agreement was assessed for 54% of the sessions for Charles and 52% of the sessions for Cathy and David. Interobserver agreement was calculated on an interval-by-interval basis for agreement of occurrence and nonoccurrence of problem and desirable behavior. The formula used to compute interobserver reliability consisted of the number of agreements divided by the number of agreements plus disagreements multiplied by 100%. Interobserver agreement on occurrence of problem behavior averaged 90% for Charles, 88% for Cathy, and 89% for David. Nonoccurrence of problem behavior resulted in interobserver reliability percentages of 85% for Charles, 92% for Cathy, and 94% for David. The percentages of agreement for occurrence of desirable behavior for Charles, Cathy, and David were 84%,

Table 3
Instructions, Responses, and Materials During Each Experimental Condition

Student	Condition	Instructor directions	Student response	Activity materials
Charles and Cathy	nonpreferred activity	[Presents student with three coins.] "Give me the penny" (Charles). "Give me the [penny, nickel, quarter, dime]" (Cathy).	Selects correct coin and gives to instructor.	Coins.
	preferred activity	[Presents student with three or four items and three coins.] "What do you want to buy?" [Student selects item.] "O.K., that costs a penny. Give me the [appropriate coin for student]." [Student gives instructor coin.] "You can have this item while I am working with [other student]." [Instructor places item aside, but within student's view.]	Selects item that he or she wishes to purchase. [Instructor question.] Selects penny and gives to instructor. [Instructor places item aside, and begins next trial.]	Coins and items to purchase such as magazine, Legos®, Spirograph®, Slinky®, Koosh® ball, scented markers, base-ball cards, stamps and notebook, paper and colored pencils.
David	nonpreferred activity	[Instructor places flashcards with numbers 1–5 on table side by side in front of student.] "David point to the [numbers 1–5 which varied systematically within session]." "Good, now let's trace the [number requested]." [Instructor gives David a pencil and flashcard with imprint of number.] When David finished tracing the number, the card and pencil were removed, and the next trial began with the presentation of the remaining cards (presentation arrangement was varied systematically within session).	Points to the flashcard with the number requested. Traces the number on the flashcard.	Flashcards, pencil, flashcards with imprints of numbers to trace.
	preferred activity	[Instructor places five items on table in front of student and then arranges the flashcards below the items.] "David, point to the [number on flashcard]." "Good, now let's trace the [number requested] to make a price tag so we can know how much these items cost." [Instructor gives David a pencil and card with imprinted number and David traces the number on the card.] David exchanges the "price tag" for the object, which is placed aside for him to play with during noninstruction.	Points to the flashcard with the number requested. Traces the number on the flashcard.	Flashcards, pencil, flashcards with imprints of numbers to trace, items to exchange for "price tags" such as Matchbox® cars, cards, scented markers, crayons, Slinky®, Koosh® ball.

81%, and 83%, respectively. Reliability percentages for nonoccurrences of desirable behaviors were 88% for Charles, 85% for Cathy, and 81% for David.

Procedure

Those activities identified in the preference assessment as highly preferred and nonpreferred were presented in a reversal design. Table 3 lists the curricular and instructional components that comprise the independent variable and constitute the difference between the conditions.

Sessions involving a comparison of preferred and nonpreferred activities were conducted during small-group instruction with behavioral expectations similar to those in the students' classrooms. This was accomplished by working with 2 students for approximately 20 min, alternating between them for periods of 1 to 2 min each. Thus, each student had a total period of instructional time that lasted approximately 10 min, during which all data were collected.

Throughout the investigation, standard instructional procedures were used. Activity instructions were delivered in clear, unambiguous terms, and desirable responding and correct activity performance were followed by praise. Problem behavior was ignored or, if necessary, followed by a mild admonishment (e.g., "David, get back to work") and physical redirection. No problem behavior ever escalated to the point of being dangerous to the student or to the instructor. Incorrect responses were ignored, and the instruction was repeated (i.e., "Point to the 5"). If the resulting response was incorrect, it was acknowledged with verbal redirection (e.g., "No that is the 3, this is the 5"), and continuation with instruction. Instructor prompts and reinforcement were held constant across conditions and sessions.

During the nonpreferred activity condition, the student was presented with the activity that had been determined to be less preferred. During the time the instructor was engaged with a student, the student's partner was expected to watch the instructional session quietly or to interact with the instructional materials of his or her nonpreferred

activity that had been provided at the beginning of the noninstructional part of the session.

During the preferred activity condition, the student was instructed with the activity determined to be preferred, while his or her session partner interacted with the instructional materials associated with his or her preferred activity. All other procedures were identical to those of the nonpreferred activity condition.

Results

Figure 1 presents the data on problem behavior for Charles, Cathy, and David. All 3 students demonstrated a higher percentage of intervals of problem behavior during the nonpreferred activity conditions than during the preferred activity conditions. Charles exhibited variable but gradually increasing problem behavior, averaging 58% of the instructional intervals during the nonpreferred activity condition. Upon introduction to the preferred activity condition, these behaviors were reduced to a mean of 21% of the instructional intervals. Returning to the nonpreferred activity condition increased the problem behaviors to consistently high levels ($M = 82\%$). Reintroducing the preferred activity condition reduced Charles's problem behaviors further to an average of 19% of instructional intervals. Instructor interaction averaged 86%, 93%, 93%, and 98% of the instructional intervals across the four conditions of the study.

Cathy displayed a high percentage of problem behavior during both nonpreferred activity conditions, averaging 73% of the intervals the first time the condition was presented and 76% for the second presentation of the condition. The preferred activity condition had a dramatic effect on Cathy's problem behaviors, reducing them to an average level of 30% of the intervals during the first preferred activity condition and 35% during the second presentation of that condition. Instructor interaction averaged 86%, 94%, 98%, and 97% of the instructional intervals across the four conditions.

David showed increasing levels of difficult behavior during the first nonpreferred activity condition, averaging about 42% of the intervals. When the preferred activity condition was introduced, his

Figure 1. Comparison of the effects of nonpreferred and preferred activities on the problem and desirable behaviors of Charles, Cathy, and David.

problem behavior gradually decreased to an average of 22%. Reintroducing the nonpreferred activity condition resulted in considerably higher levels of problem behavior, and returning to the preferred activity condition reduced his problem behaviors to levels similar to the first preferred activity condition ($M = 16\%$). Instructor interactions averaged 69%, 55%, 64%, and 67% of the instructional intervals across the four conditions.

Figure 1 also shows the corresponding influence of activity preference on the desirable behaviors of these students. Charles's desirable behaviors responded similarly to activity preference. The nonpreferred activity conditions were associated with low levels of desirable behaviors, with an average of 15% of the intervals during the first condition and 8% of the intervals during the second condition. On the other hand, the preferred activity conditions were associated with high levels of desirable responding, averaging 47% during the first condition and 50% during the second condition.

Cathy maintained low levels of desirable behavior during the nonpreferred activity condition, averaging 11%. Desirable behavior increased during the preferred activity condition ($M = 64\%$), decreased during the second nonpreferred activity condition ($M = 20\%$), and again increased with the return to the preferred activity condition ($M = 57\%$).

David's desirable behaviors were not as influenced by activity preference. In general, his desirable behaviors remained at a relatively stable level across all conditions ($M = 43\%$, 47%, 42%, and 48%, respectively).

DISCUSSION

The results of this study extend the literature on preference in several ways. The data from the first analysis provide an additional demonstration that preference can be measured systematically (Dyer, 1987; Mithaug & Mar, 1980). Furthermore, these data apply assessments of preference to curricular activities and show distinctions between activities that address common target behaviors and instructional objectives. The second analysis documented

clear effects of preference on student behavior. These latter data add to a growing body of studies on the positive effects of preferred stimuli (e.g., Dyer et al., 1990; Koegel et al., 1987; Parsons et al., 1990) by showing increases in desirable behavior and decreases in problem responding. Together, the analyses carry implications for the development of curricula for students who are challenged by intellectual and behavioral disabilities.

The assessment of preference has been shown to be possible with a variety of stimuli and activities and diverse participants. In this study, the assessment procedures yielded a numeric value for each of the activities. The extent to which such detail and precision is necessary is an empirical question of applied importance. Although data reported by Green et al. (1988) indicated that systematic assessments were more accurate than the impressions of staff, it is not known how meticulous the procedures need to be in order to distinguish preferred from less preferred stimuli or activities (Ferro, Foster-Johnson, & Dunlap, 1993). Because feasibility is an essential concern, further research on expeditious assessment procedures would be a welcome addition to the literature.

Perhaps the most significant finding from this study is that the students' preference for activities was associated consistently with substantial differences in behavior. These results are consistent with recent studies (e.g., Dunlap et al., 1991, 1993; Dyer et al., 1990); however, they also extend the literature in a manner that may be vital for implementation, especially from the perspective of curriculum development. This study differed from previous efforts in that the preferred and nonpreferred activities were similar in their instructional objectives and in the topography of their target behaviors. The activities that were identified (by the students) as nonpreferred were similar to typical assignments that are scheduled frequently in classrooms for students with disabilities. The preferred activities were identical to the nonpreferred activities in many respects, but they differed in that the instructional contexts (e.g., materials) were embellished and more relevant to real-life circumstances. These observations lead to at least two important

conclusions: (a) Activities that are identified as preferred are associated with reduced levels of problem behavior, and (b) teachers do not need to alter the objectives of their curriculum in order to create preferred activities.

The procedures and results from this investigation raise several questions that have conceptual importance and that may lead to refined procedures for using preference as an instructional medium. A first question concerns the underlying mechanisms that make preference a functional variable. Why is it that relatively preferred activities are associated with decreased levels of problem behaviors and increased levels of desirable responding? One reasonable explanation posits engagement with the less preferred activities as unpleasant compared both to the preferred activities and to the option of not engaging in the activities. That is, off-task or problem behavior may be more desirable for these students than engaging in the less preferred activities. From this perspective, the off-task and problem behaviors might be maintained by negative reinforcement. In contrast, the preferred activities are more pleasant, thereby reducing motivation to escape the activity. In this respect, the operations related to activity preference may be functionally similar to numerous other manipulations that have reduced problem behavior by enhancing the instructional context (e.g., Dyer et al., 1990; Koegel et al., 1987; Winterling, Dunlap, & O'Neill, 1987).

Another issue of conceptual and applied interest pertains to the features or qualities of the preferred activities that contributed to their relatively desirable status. In other words, what is it about the preferred activities that made them more attractive and beneficial than the less preferred activities? Although it is not possible to answer this question with any certainty and the answers are undoubtedly idiosyncratic, it may be useful to delineate some possibilities (see Table 3). One distinguishing feature of the procedures was that the preferred activities incorporated reference to a real-life transaction (purchasing) that might have added meaning in the form of contextual relevance or conditioned reinforcement. In contrast, the less preferred activ-

ities were exercises without relevance to nonschool performances. It is conceivable that this relevance added to the positive qualities of the preferred activities. Another distinguishing feature is that the preferred activities included instructions and interactions that were somewhat more elaborated than the less preferred activities. In particular, for Charles and Cathy, the preferred activities included instructional sequences with choice making (Dyer et al., 1990) and embedded response sequences (Dunlap, 1984; Singer, Singer, & Horner, 1989; Winterling et al., 1987) that were not present in the nonpreferred activities.

Another feature that distinguished the two conditions was the presence of additional stimulus materials during the preferred activities. For Charles and Cathy, a variety of materials were available for purchase; for David, a similar selection was present for him to affix price tags. It is possible that the presence of these stimuli made the environment more alluring during the preferred activities. In addition, these materials were made available through responding to the instructional requests; therefore, these exchanges may have provided more powerful positive reinforcement. The availability of these stimuli may have been an especially significant feature because the materials were available for the students to manipulate during the noninstructional periods (when the teacher was working with the student's session partner). In other words, these breaks in the instructional routine differed across conditions in that the materials that were available were those associated with the preferred versus less preferred activities. Although this is consistent with typical practices, it is possible that these interludes may have served to alter the general pleasantness of the sessions and thereby affected the students' behavior during the instructional periods (Carr & Newsom, 1985; Carr, Newsom, & Binkoff, 1980).

To test whether this variable may have been influential, we followed the current experiment with five additional sessions that were identical in all respects to the less preferred condition except that the preferred materials were available during the noninstructional periods. The data from the instruc-

tional periods of these sessions indicated that this variable produced no effect for Charles and only a minor effect for Cathy. However, David's sessions yielded data that were similar in magnitude to the levels that were previously associated with the preferred activities sessions. These pilot data suggest that the different materials may be an influential variable for at least some participants and identify this as an area that will benefit from further research.

As the previous discussion suggests, the extent to which an activity is preferred may be dependent upon many factors, including the materials, the instructional context, the difficulty of the activity, the instructional outcomes, and any number of variables related to teacher-student interactions. Although it is likely that some common elements may be identified, preferences are idiosyncratic and are clearly affected by environmental and contextual factors. The important point is that preferences can be identified and can be used to improve the quality of educational activities. The present study offers a further demonstration of this important issue.

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