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A COMPARISON OF THE EFFECTS OF PROVIDING ACTIVITY AND MATERIAL CHOICE TO CHILDREN WITH AUTISM SPECTRUM DISORDERS

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The present study compares the effects of providing choice between activities or between materials for completion of activities on the on-task behavior of 4 boys with autism spectrum disorders. Results showed that the participants displayed higher levels of on-task behavior during the choice conditions than in the no-choice condition. However, the type of choice opportunity did not seem to have a differential effect.

Key words: autism spectrum disorders, choice opportunities, on-task behavior

Research with individuals with autism spectrum disorders (ASDs) indicates that providing choice opportunities may increase on-task behavior (e.g., Moes, 1998; Watanabe & Sturmey, 2003) and decrease problem behavior (e.g., Carter, 2001; Cole & Levinson, 2002; Dyer, Dunlap, & Winterling, 1990; Koegel, Dyer, & Bell, 1987; Newman, Needelman, Reinecke, & Robek, 2002).

Although there is a growing body of literature demonstrating the effects of various choice opportunities for individuals with developmental disabilities, research comparing the effects of different types of choice opportunities is limited. Dibley and Lim (1999) examined the effects of choice between activities and materials on the frequency of protests and task initiations of a 15-year-old girl with severe intellectual disabilities. In the activity and materials choice condition, the participant could choose between two activities as well as the materials for each activity (e.g., a choice between having morning tea and listening to a tape player combined with a choice of materials or actions associated with the chosen activity). In the materials choice condition, the participant selected the materials for the activity (e.g., a choice between music and a story tape) after the therapist selected the activity (e.g., listening to a tape player). Results showed that choice opportunities provided between materials decreased protests and improved task initiations. Choice between activities and materials further reduced protests and increased the participant's task initiations.

The purpose of the current study was to replicate and extend previous research comparing the effects of choice opportunities between activities and materials on task engagement during one-to-one teaching. In particular, we evaluated whether providing material choice was as effective as providing activity choice.

METHOD

Participants, Setting, and Materials

Four boys with ASD, 5 years to 8 years old, participated in this study. All participants made independent choices among various opportunities, followed one- to two-step instructions, infrequently initiated interactions with others (only Yavuz engaged in one-word vocalizations), and had received one-to-one instruction

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at different special education centers for 2 to 3 hr per week prior to the study.

All sessions were conducted in a private teaching room at a university-based research institute. The room contained a small table for academic instruction, a larger table for task materials, a cupboard for toys and materials, and two chairs. The evaluation was conducted with six different types of activities (i.e., matching, art, sports, fine-motor tasks, imitation, and turn taking), with two tasks per activity and two sets of materials per task. For example, art included coloring or gluing, and there were two sets of materials for coloring (e.g., crayons or colored pencils).

Data Collection and Interobserver Agreement

The dependent variable was *on-task behavior*, defined as (a) looking at the teacher (i.e., the participant's eyes oriented towards the teacher for at least 3 s), (b) answering the question asked by the teacher or saying something related to the activity (e.g., while the student was coloring the picture, he said, ''coloring''), or (c) demonstrating appropriate behavior needed to engage in the activity (e.g., after the teacher put her block in the bucket while saying ''do this,'' the student put his block in the bucket). Activity-specific on-task behaviors were defined for each activity (available from the first author).

The teacher conducted all sessions with each participant for approximately 30 min each day, 3 days per week. Each phase in the evaluation included four sessions, and each session included six activities. All instructional sessions were videotaped, and the videos were analyzed daily to collect 15-s momentary time-sampling data during each session. The observers recorded data on the dependent variable during a 5-s recording period between 15-s observation intervals.

Interobserver agreement was assessed during 34% of sessions. An agreement was scored when two observers simultaneously but independently marked or left blank the same observation boxes on the observation forms. Agreement scores were calculated by dividing the number of agreements by the number of agreements plus disagreements, and converting this ratio to a percentage. The mean agreement for all participants was 92% (range, 84% to 98%). Procedural integrity data were collected to determine whether the experimental procedures were conducted according to the planned steps. For this purpose the steps of each phase were identified and described on the procedural integrity forms. The researchers trained the procedural reliability observer regarding how to score each step as ''performed'' or ''not performed.'' Next, videos of Phases A, B, C, and BC were selected randomly for each participant, and procedural integrity forms were presented to the observer. The observer independently watched the videos and filled out the forms. Procedural integrity was analyzed for 25% of sessions in each phase. The mean percentage of procedural integrity was 100% for Utku and Alp, 99.9% (range, 99% to 100%) for Selim, and 98% (range, 95% to 100%) for Yavuz.

Procedure

The teacher used a discrete-trial format, most-to-least prompting, and a variable-ratio (VR) 3 schedule of reinforcement during all teaching sessions. Prior to the evaluation, an assessment was conducted to determine the participants' highly preferred food items (e.g., modified multiple-stimulus without replacement; DeLeon & Iwata, 1996). The teacher provided the three most highly preferred food items as reinforcers during the study. The participant selected among these three food items prior to each session, and the teacher delivered the selected item for on-task behavior during all activities in that session. The reinforcement and behavior management procedures were held constant across phases. The teacher guided participants back to their seats if they stood up, prompted participants to gather thrown items, and withheld food reinforcers if

the participants engaged in problem behavior while completing the activity.

A reversal design was used to compare the effects of providing activity or material choice to a no-choice condition (baseline) on on-task behavior. The order of choice-making opportunities was counterbalanced across two participants (Selim and Yavuz).

Baseline. The teacher systematically selected activities and materials for each of the six activities (i.e., matching, art, sports, fine-motor, imitation, and turn taking) during each session. The teacher presented each activity and the relevant materials once during each session in a predetermined order. The teacher placed the materials for the activity in front of the participant and presented an instruction relevant to the activity. The teacher delivered more intrusive prompts initially and faded the prompts within the session (e.g., faded from physical prompts to gestural prompts) until the student responded independently to the task direction. The goal of the errorless procedure was to maintain correct responses above 80%. When the student responded incorrectly, the teacher moved back to a more intrusive prompting level. The teacher initially reinforced all correct responses. When participants engaged in unprompted correct responses, the teacher provided reinforcement on a VR 3 schedule. The teacher provided a 2-min break between activities. When the 2-min break had elapsed, the teacher delivered an instruction to initiate the next activity. Activities during the session alternated between a table and floor activity.

Activity choice. Procedures were similar to baseline with one exception. The teacher asked the participant to make a selection between two transparent boxes, each containing two sets of materials related to the activity. For example, one box contained two sets of materials for matching colors, and the other box contained the materials for matching shapes. Once the participant selected a box, the teacher opened that box and randomly selected one of the two sets of materials.

Material choice. Procedures were similar to baseline except that the participant was permitted to choose the specific materials associated with an activity. After the teacher randomly selected an activity, the teacher placed two sets of materials related to that activity in front of the participant and asked the participant to pick one. For example, the participant selected between coloring with colored pencils or crayons. The participant completed the activity with the materials he chose.

RESULTS AND DISCUSSION

Figure 1 shows participants' on-task behavior across conditions. All participants except Yavuz consistently displayed higher levels of on-task behaviors during choice conditions than during baseline. Furthermore, similar levels of on-task behavior occurred during activity and material choice conditions. Yavuz's on-task behavior during the last baseline condition was similar to his on-task behavior in the choice conditions.

The present study replicates previous research that has shown that the provision of choice-making opportunities increases appropriate behavior (e.g., Dibley & Lim, 1999; Moes, 1998; Tasky, Rudrud, Schulze, & Rapp, 2008; Watanabe & Sturmey, 2003). Although Dibley and Lim found that providing both activity and material choices was more effective than providing material choices only, the participants in the current study engaged in similar levels of on-task behavior regardless of whether they could choose between activities or materials. Some teachers may prefer to offer a choice between materials so that they can ensure that the students engage in particular activities. Providing choice opportunities among materials rather than among activities also may be more convenient in some circumstances.

Nonetheless, this investigation had several limitations. First, Yavuz began taking psychi-

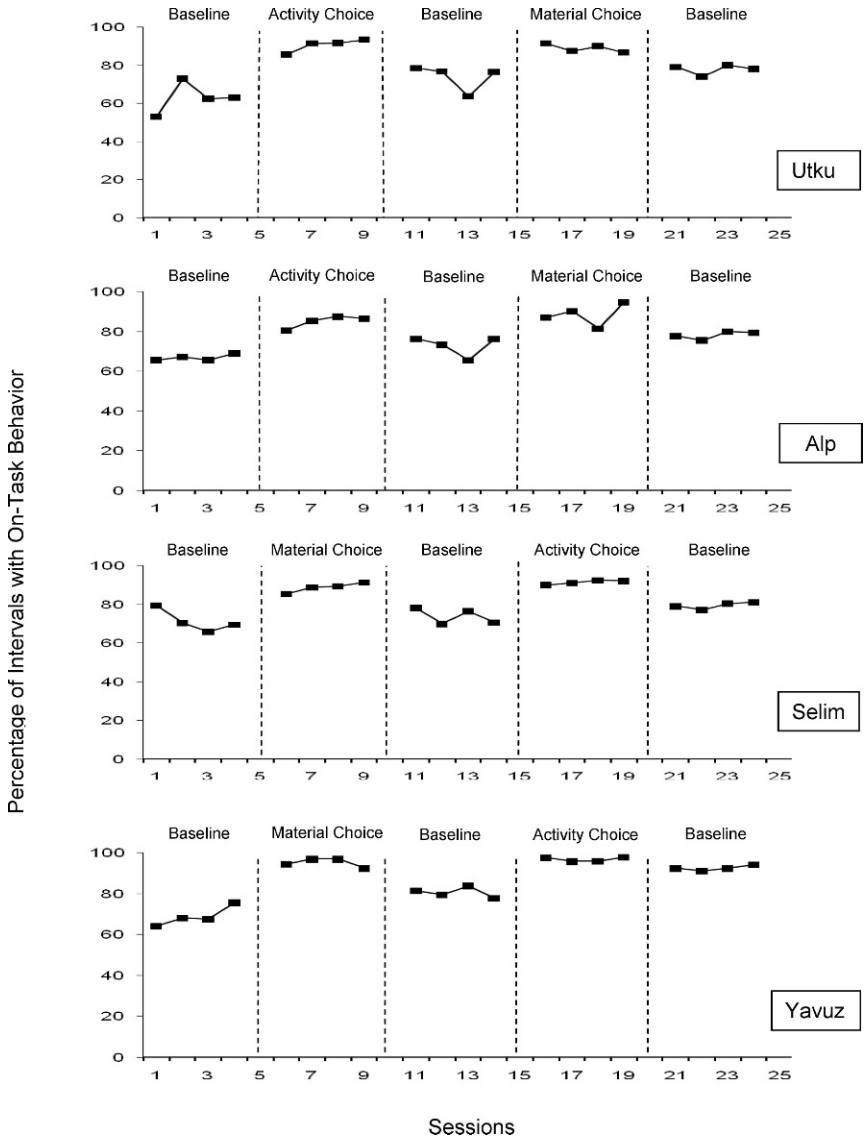

Figure 1. The percentage of intervals with on-task behavior during baseline, activity choice, and material choice conditions.

atric medication toward the end of the study, which may have influenced levels of on-task behavior during the last baseline condition. Second, all of the participants' on-task behavior was relatively high during baseline. Therefore, these results might not generalize to children who typically display lower levels of on-task behavior during academic tasks. Third, activity and material choices were not yoked across conditions. However, participants displayed high levels of on-task behavior regardless of the task selected by the experimenter. Finally, ceiling effects might have prevented a meaningful comparison of the two choice conditions because on-task behaviors increased to nearly 100% for all participants during the implementation of the first intervention.

In the present investigation, on-task behavior was measured when choice was provided during structured, one-on-one activities. However, children with ASDs may be easily distracted in other settings in which multiple students are present or the activity is less structured (e.g., an art project). Further studies could examine on-task behavior when teachers provide choices during group instruction or less structured activities. Similarly, it may be interesting to evaluate how choices provided by siblings or parents in community or home settings influence on-task or problem behavior. Finally, future research should investigate the effects of choice opportunities on other dependent variables such as task accuracy. Although the present study indicates that the participants attended more when the teacher provided choices during academic activities, increases in attending may not result in concomitant increases in accuracy.

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