

*USING A COMBINED BLOCKING PROCEDURE TO
TEACH COLOR DISCRIMINATION TO
A CHILD WITH AUTISM*

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A combined blocking procedure was used to teach a child with autism to select two colors on request. First, two color cards were placed at fixed locations on a table and the experimenter repeatedly requested the child to touch one of the colors. After 10 consecutive correct selections, the child was asked to touch the other color. Blocks of trials with each color were systematically thinned until requests were presented randomly with few errors. Subsequently, the location of the selection cards was systematically alternated until the child was able to touch the correct card when both requests and card positions were presented in random fashion.

DESCRIPTORS: color discrimination, learning disabilities, autism, conditional discrimination

Conditional color discriminations that consist of the selection of a color as a function of a request to identify a specific color by another person are often taught using trial-and-error procedures. These procedures, however, may not always be effective to teach this skill to many children with learning disabilities, who often do not learn to name colors or to select appropriate colors when requested to do so.

Some researchers have demonstrated success in teaching conditional discriminations to people with severe learning difficulties. Saunders and Spradlin (1989, 1990, 1993) described a blocking procedure to teach conditional discriminations. They used a match-to-sample procedure in which a single sample was presented consecutively across a number of trials (e.g., a block of 32 trials). Then, a second sample was presented for another block of trials. As students made fewer errors, the size of the blocks was gradually reduced until, finally, the two samples were presented randomly and errors occurred only rarely. Smeets and Striefel (1994) devised a similar procedure to teach conditional discriminations to small children. In their revised blocking procedure, samples were presented randomly, but comparisons (two shapes) were presented at fixed locations for a number of trials. The size of the blocks was gradually reduced until the comparisons were presented at random locations. Pérez-González

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and Williams (2002) designed a combined blocking procedure, in which both sample stimuli and the location of comparison stimuli were held constant. The procedure was effective to teach object discrimination to children with autism that did not acquire the discriminations with standard procedures. The current study extended these findings to determine if the combined blocking procedure could be used to teach color discrimination.

METHOD

Participant

The participant was Sam, a 14-year-old boy who had been diagnosed with autism. He repeated statements of at least four words (e.g., "It is cold today"), requested items (e.g., "I want to eat candy"), named at least 50 objects and 10 actions, and selected objects and pictures in response to requests (e.g., "Give me the [name of the object]"). His score on the Peabody Picture Vocabulary Test was 2.2 years. Previous attempts to teach color discriminations had been conducted since the age of 3 years, and included over 1,000 trials using trial-and-error, exclusion, and delayed prompt procedures. No prior attempt to teach color discriminations had been successful.

Materials and Procedure

Sessions were conducted in a therapy room at the child's home. The experimenter and the child sat at a table, facing each other. The experimenter placed one black card and one white card on the table and said either "Show me black" or "Show me white." Then she waited 5 s. If the child touched the correct card, the child received brief praise and a small edible item (e.g., piece of cracker). If the child emitted an incorrect response, his hand was gently guided to the table top for 3 s. After 10 consecutive incorrect responses, the experimenter provided prompts for three trials and reinforced correct prompted card touches. The child received, on average, 132 trials per day

(approximately three to four trials per minute), on 6 days distributed across 2 weeks.

The combined blocking procedure started with blocks of 10 trials. As the child's responses met criterion, we introduced slightly more difficult procedures. We followed five steps:

Step 1: Names presented in blocks of 10 trials, fixed location of cards. The experimenter placed the two color cards (black and white) on the same location on the table in each trial. She asked the child to touch the same color in all trials until the child produced 10 consecutive correct responses (a block of 10 trials). Then the experimenter asked the child to touch the other color until the child had made 10 consecutive correct responses. She repeated this procedure, alternating blocks of color requests until the child gave 10 consecutive correct responses without errors in each of four consecutive blocks. When this criterion was met, Step 2 was initiated.

Step 2: Names presented in blocks of five trials, fixed location of cards. The procedure in Step 2 was identical to that used during Step 1, except that blocks with each color request consisted of five trials. After the child performed 30 consecutive correct responses, Step 3 was initiated.

Step 3: Names presented in blocks of two or three trials, fixed location of cards. The procedure in Step 3 was identical that used during Step 2, except that requests to touch colors changed after either two or three trials, randomly. After the child performed 30 consecutive correct responses, Step 4 was initiated.

Step 4: Names presented quasirandomly, fixed location of cards. The procedure in Step 4 was identical to that used during Step 3, except that requests to touch colors were distributed quasirandomly, with the condition that each request was made five times during each block of 10 trials. After the child performed 20 consecutive correct responses, Step 5 was initiated.

Step 5: Names presented quasirandomly, quasirandom location of cards. The procedure in

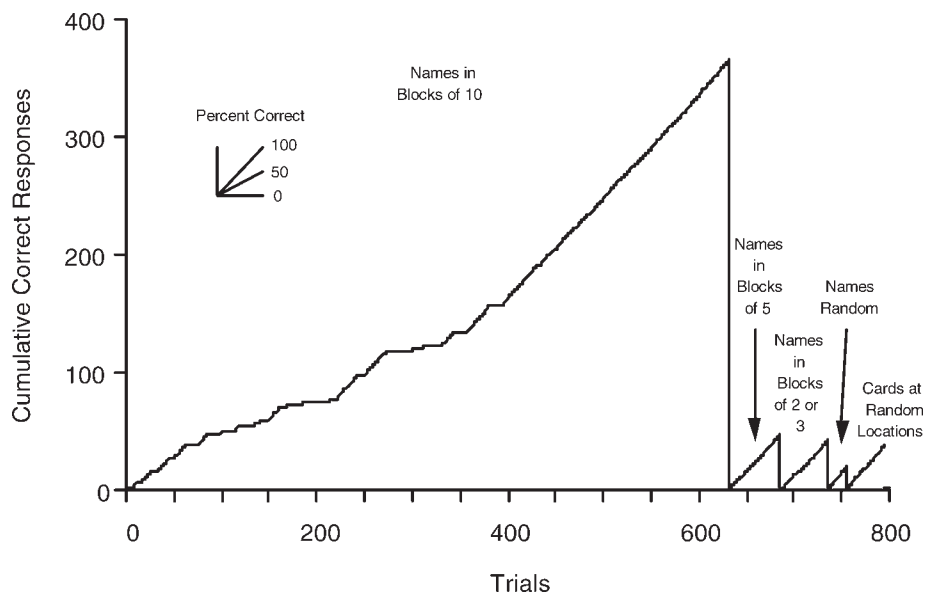


Figure 1. Cumulative record of correct responses. Vertical lines indicate reset of the record after meeting criterion on a step.

Step 5 was identical to that used during Step 4, except that the left-right location of the cards on the table was alternated quasirandomly, with each card presented five times on the left and five times on the right every 10 trials. The criterion for successful completion of this step was 20 consecutive correct responses.

Response Definition, Data Collection, and Interobserver Agreement

Correct responses were defined as touching the card that corresponded to the spoken color name within 5 s of a request. Fifty percent of the sessions were videotaped for interobserver agreement purposes. A second observer scored the videotapes, and the records were compared on a trial-by-trial basis. Agreement was 100%.

RESULTS AND DISCUSSION

With the combined blocking procedure, a child with autism who had previously been unresponsive to several attempts to establish color discriminations learned to touch black or

white cards when requested to do so in 795 trials, implemented across 6 days. As shown in Figure 1, he completed Step 1 in 632 trials. During that period, he made 300 correct responses. During the first 400 trials, he responded correctly in 42% of the trials; however, after approximately Trial 400, relatively few errors occurred. During the first 340 trials (across eight blocks) a correct response to the first trial of the block (when the sample shifted) occurred in four blocks; after Trial 340, however, correct responses occurred for all subsequent "first trials." Steps 2 to 5 were completed with 93% accuracy across 163 trials. Finally, he correctly completed 20 consecutive trials with randomly presented samples and random comparison locations.

Before the current intervention, more than 1,000 trials with trial-and-error, exclusion, and delayed prompt procedures had been conducted in attempts to teach color discrimination to the child. He had never previously produced 10 consecutive correct responses when samples were presented randomly and comparisons were

presented at random positions. Furthermore, the child produced errors during the first part of Step 1, which indicates that these conditional discriminations were not present prior to intervention. After the intervention, the child continued to acquire additional color discriminations with variations of the combined blocking procedure. He generalized the black and white discrimination to objects, and he learned additional discriminations with red, blue, and other colors.

The results of this study replicated those of Pérez-González and Williams (2002), in which object discriminations were taught, and extended those results to the acquisition of conditional discriminations with other stimulus forms. Some limitations of the current study should be noted; further research with more participants would determine the range of stimuli to which this procedure can be applied, as well as the general utility of the procedures. In addition, replications in which the necessity of each step could be determined

could result in the development of more efficient procedures.

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