

*RESEARCH IN PROGRESS**A SIMPLE PROCEDURE TO TEACH CONDITIONAL DISCRIMINATIONS TO CHILDREN*

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Normally-developing children and children with learning disabilities often have difficulties learning conditional discriminations with standard trial-and-error procedures. For that reason, some researchers have studied the effectiveness of special procedures to teach novel conditional discriminations. One set of these procedures are the blocking procedures, which are based on teaching the components of a conditional discrimination: Discriminating the samples across trials, discriminating the comparisons within trials, and selecting each comparison in the presence of the appropriate sample (Saunders & Spradlin, 1989).

Saunders and Spradlin (1989, 1990, 1993) pioneered the development of procedures to teach conditional discriminations by blocks. They presented the same sample for a number of trials. Then, they presented another sample. These changes continued until the participant made few errors. Then, they progressively reduced the length of trial blocks with the same sample. Finally, they presented the samples randomly. The procedure served to teach conditional discriminations to adults with learning disabilities.

Smeets and Striefel (1994) used a variant of this procedure to teach conditional discriminations to normally-developing five-year old children. They presented the samples randomly while they maintained the comparisons at fixed locations within a trial block. After a mastery criterion was met, they switched the location of the comparisons. Then, they gradually reduced the number of trials per block with the comparisons at fixed locations. Finally, they presented the comparisons at random locations.

They used several conditions; in a condition in which the samples were presented by giving the cards with the samples to the children, 19 out of 20 children learned the conditional discrimination.

Pérez-González and Williams (2002; also Williams, Pérez-González, & Queiroz, in press) combined Saunders and Spradlin's (1989, 1990, 1993) and Smeets and Striefel's (1994) procedures to teach conditional discriminations to children with autism. In the *combined blocking procedure* they presented the samples in blocks. They gradually reduced the number of trials per block across four phases (the comparisons' locations were constant) until the samples were presented randomly. In the next phase, they reversed the comparisons' locations. Finally, they presented comparisons at random locations. The combined blocking procedure proved to be an efficient procedure for teaching conditional discriminations to children that did not learn conditional discriminations with standard procedures.

In our laboratory at the University of Oviedo, we routinely use a short version of the Pérez-González and Williams' (2002) procedure to teach conditional discriminations to normally-developing children (for research purposes) as well as to children with autism (for applied purposes). In the short version of the combined blocking procedure there is only one block with each sample. After criterion is met, the samples are presented randomly. Thus, in the short version there is not a gradual reduction in the size of the blocks and the criteria to move to the next phases are looser than in the full version. There is little research, however, aimed to evaluate the effectiveness of this short version of the combined blocking procedure for teaching conditional discriminations. Therefore, the main goal of the present research was to study the effectiveness of the short version of the combined blocking procedure for teaching conditional discriminations to normally-developing children. The results would provide information about whether the

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progressive reduction of block size is necessary in normally-developing children. In pilot studies, we have found that teaching identity matching first could facilitate learning arbitrary matching to sample. Consequently, we taught participants identity matching to sample before they were taught arbitrary matching to sample. This paper describes the procedures and summarizes the initial results.

METHOD

Subjects and Materials

So far, we have completed data collection with four normally-developing children with ages ranging from 3 years and 8 months to 4 years and 5 months. The stimuli were six simple arbitrary black forms printed on white 8 x 7 cm cards.

Procedure

The participants learned conditional discriminations on an identity matching to sample task first and an arbitrary matching to sample task second. We taught both conditional discriminations with the same procedure, which consisted of five phases. We present below the procedure with the stimuli that were used in the arbitrary matching to sample task—for the identity matching to sample task, stimuli C1 and C2 were samples and comparisons.

Phase 1. In Phase 1, comparison B1 was on the left and comparison B2 was on the right. The experimenter gave the child a card showing sample A1 and told the child, “Take this card;” once the child took the card, she said, “Place it here” and pointed to the correct comparison. Starting with the third trial, the experimenter told the child to do it by him/herself. The mastery criterion for ending Phase 1 was 3 consecutive correct responses with no prompt. Although this criterion is very lean, the short experience with Phase 1 has proven to be sufficient in pilot studies.

Phase 2. Phase 2 was identical to Phase 1, except that we presented sample A2 instead of A1.

Phase 3. In Phase 3, the comparison locations remained the same as in Phases 1 and 2. The experimenter presented samples A1 and A2 randomly. The criterion for ending Phase 3 was 8 consecutive correct responses.

Phase 4. In Phase 4, we switched the comparisons’ locations by placing B2 on the left and B1 on the right. Samples were presented randomly. The criterion for ending the phase was 8 consecutive correct responses.

Phase 5. In Phase 5, we placed the comparisons at random locations and presented the samples randomly. We followed the same criterion as in Phases 3 and 4. After mastering the criterion of 8 consecutive correct responses, we assumed that the participants had learned the conditional discrimination.

In all phases, correct responses were followed by statements such as “Good.” Incorrect responses were followed by the word “No” and a 5-s delay before the next trial. The duration of sessions was about 15 min. An independent observer recorded data besides the experimenter; they agreed on 318 trials out of 320 (99.4%).

RESULTS AND DISCUSSION

Results appear in Table 1. One child learned identity matching to sample without errors. One child made one error in Phase 4. One child made two errors, one in Phase 3 and one in Phase 5. The remaining child made four errors in Phase 2 and two in Phase 3.

The four children learned the AB conditional discrimination in 45 trials or less. They responded with virtually no errors: Two children made only one error. The other children made two and three errors. Errors appeared mainly in Phase 4, when comparison locations were reversed. Two children made one error and another child made three errors in this phase. One child made one error in Phase 3 and another child made one error in Phase 5.

This procedure served to teach conditional discriminations in only 45 trials or less to all four-year-old children that had shown identity matching to sample. Thus, it can be tentatively concluded that the combined blocking procedure can serve to teach conditional discriminations with few errors to most children. The results support the initial thesis that progressively reducing the number of trials per block is unnecessary with normal developing children. We may therefore be in view of a procedure that may guarantee that normally-developing children learn conditional discriminations within few trials, and in a very short time.

The fact that all children learned suggests that the mastery criteria of Phases 1 and 2 served to teach the conditional discriminations; even Participant 3, who made 4 errors in Phase 2, learned Phases 3 to 5 with almost no errors. The results do not permit conclusions to be made about the necessity of including a phase in which

Table 1

Results of the identity matching-to-sample (IMTS) and the arbitrary matching-to-sample (AMTS) trials. Each cell depicts correct responses over total trials (above), and the trial order of each error (below). The value in parenthesis next to each participant number indicates the participant's age in years and months

	Relation	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total trials
Participant 1 (4.4)							
	IMTS	5/5	5/5	13/15 1,7	8/8	9/10 2	43
	AMTS	5/5	5/5	10/11 3	15/16 8	8/8	45
Participant 2 (3.8)							
	IMTS	5/5	5/5	8/8	8/8	8/8	34
	AMTS	5/5	5/5	8/8	15/18 1, 9, 10	8/8	44
Participant 3 (4.5)							
	IMTS	5/5	6/10 1, 3, 5, 7	8/10 1, 2	8/8	8/8	41
	AMTS	5/5	5/5	8/8	8/8	15/16 8	42
Participant 4 (4.4)							
	IMTS	5/5	5/5	8/8	8/9 1	8/8	35
	AMTS	5/5	5/5	8/8	9/10 2	8/8	36

comparison locations were reversed but maintained constant in all the trials (Phase 4). It may be that this phase precludes errors in the subsequent phase, when comparisons are presented at random locations. Alternatively, it may be that this phase is unnecessary for learning the conditional discrimination. We are currently studying whether this phase facilitates learning conditional discriminations in three- and four-year-old normally-developing children. We also are experimenting with procedural modifications to explore if we can produce further reductions in the procedure presented here. The possibility of reducing this procedure can improve further the effectiveness of this procedure to teach a conditional discrimination to normal-developing children.

The authors welcome suggestions, comments, and questions (mrodriguezsmori@yahoo.es, laperez@uniovi.es).

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