

RESEARCH IN PROGRESS

ESTABLISHING ABSTRACTED STIMULUS CONTROL BY THE BEGINNING SOUND OF SPOKEN WORDS IN AN ADULT WITH MENTAL RETARDATION

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The term abstraction refers to a "discrimination based on a single property of stimuli, independent of other properties...[or] generalization among all stimuli with that property" (Catania, 1998; see also Skinner, 1957). Some of the research in our laboratory has focused on identifying the conditions under which abstraction of individual letters and sounds will develop (Saunders, Johnston & Brady, 2000). This paper will describe an on-going experiment investigating the conditions under which a participant with mental retardation will show abstracted control by the onset sound of spoken one-syllable words.

Our first condition involved training conditional relations between spoken one-syllable words and printed letters, and testing for the development of generalized control by the onset sound over letter selection. Sessions always consisted of 60 trials. Responses on the baseline and probe trials produced no consequences during test sessions, but correct responses produced a chime and the delivery of coins during the training sessions. The subject learned to select the printed letters *s* and *m* in the presence of spoken words that started with S and M (e.g., sad-mad), respectively. Following this, tests were presented to determine whether the subject would select the printed letters *s* and *m* conditional upon a novel pair of spoken words that began with S and M. During probe sessions, 20 probe trials were intermixed with baseline trials. When overall accuracy on the probe trials was greater than 80%, the word pair became part of the baseline words and generalization to a new word pair was tested. When accuracy on probe trials was below 80%, the performance was directly trained using a blocked-trials procedure (Saunders & Spradlin, 1993). After at least two sessions of random presentation with greater than 90% accuracy, the trained words were mixed with all previously used word pairs. After the same criterion was met in the mixed baseline sessions, the next word pair was tested.

The first author was supported by a NIH Institutional NRSA T32 HD07525, and the work was also supported by NIH 35562 to the University of Kansas. We appreciate the help of Joseph Spradlin. The first author is now at the University of North Texas.

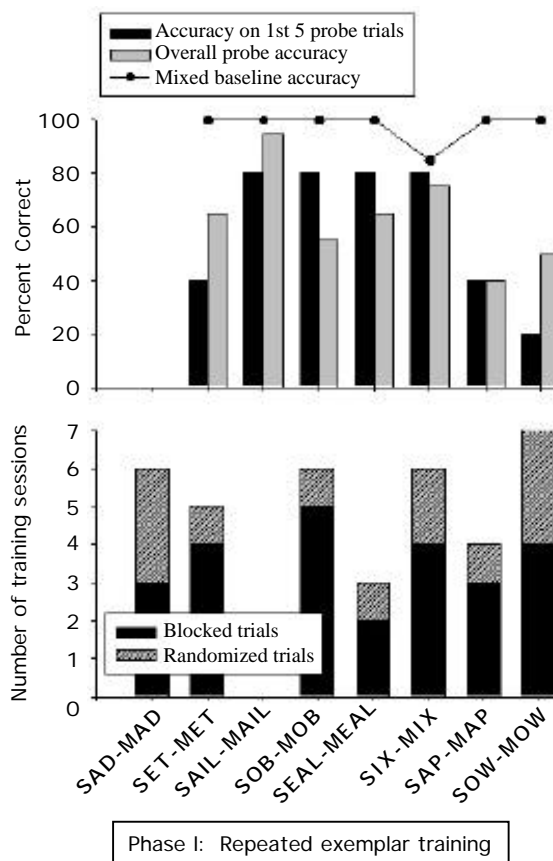


Figure 1

The bottom panel of Figure 1 presents the number of sessions required to establish individual conditional discriminations (that were not highly accurate in the test sessions). The top panel in Figure 1 presents accuracy data for the probe (bars) and baseline trials (line) from the first probe session for each word pair. Taken together, these data show that a) the subject readily acquired the conditional relations (bars in bottom panel), b) these trained conditional relations were maintained across the phase (line in top panel) and, c) these conditions were insufficient to produce reliable generalized stimulus control by the onset sound (bars in top panel).

Because probe accuracy was sometimes above chance levels, we reasoned that adding feedback

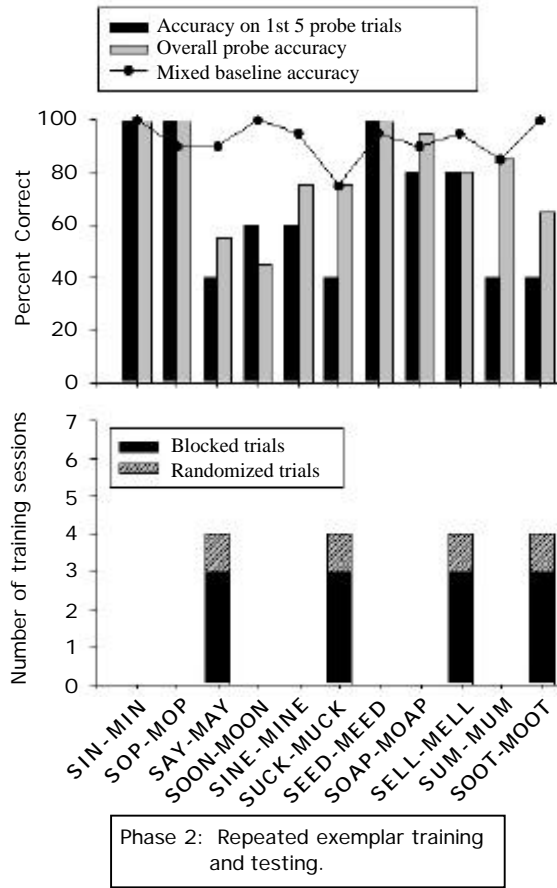


Figure 2

to test trials might produce highly accurate performance. The next phase, therefore, was identical to the first except that reinforcement was in effect during testing sessions as well as training sessions. The bottom panel of Figure 2 shows a decrease in the number of sessions required to meet criterion. The top panel of Figure 2 shows no significant change in accuracy on the probe trials. Taken together, the data from Phases 1 and 2 suggest that, for this subject, repeated exemplar training was insufficient to produce reliable generalized control.

Our next strategy was to lengthen the onset sounds to ten times their normal duration. All training and testing trials were presented with the elongated onsets. All other features of the training and testing sessions were identical to the immediately preceding condition with the exception that the blocked-trials procedure was no longer used. The line plot in the top panel of Figure 3 shows that the subject's performance on baseline trials was highly accurate and consistent. The data from the probe trials, however, suggests no generalized control by onset sounds.

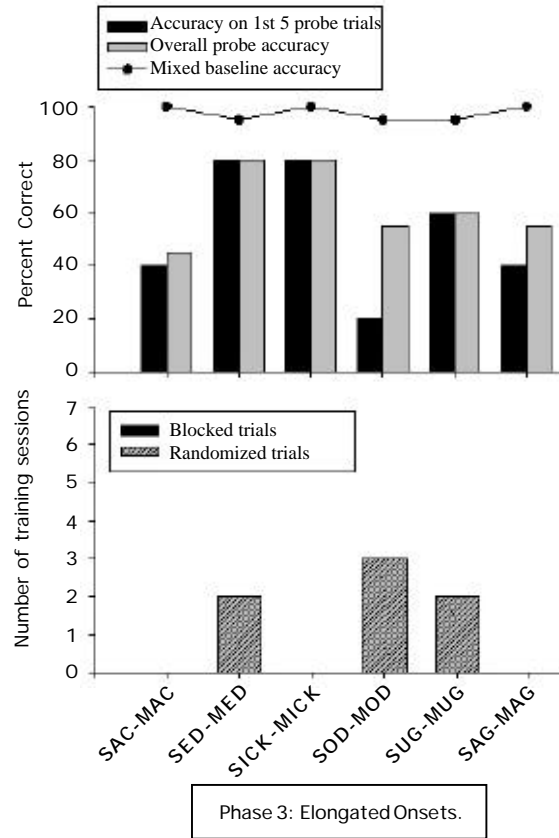


Figure 3

The next condition involved removing the comparison selection part of the task and establishing a simple successive discrimination. The subject was trained to say "ss" in the presence of words that began with S and "mm" in the presence of words that began with M. Experimenters sitting in the room initiated and ended the trials (presented on the computer as before) and determined the accuracy of the response. Trials with the correct vocal response (and nothing else) produced a chime and the delivery of coins. Incorrect responses ended the trial and initiated the ITI during which the subject was told which sound was correct. The subject's responses on the first four training trials for the first two word pairs were prompted. All other procedural details relating to the structure of the session and the delivery of reinforcers remained unchanged from the previous condition. Figure 4 shows that the subject readily learned the simple successive discrimination. The data further show that, for the first time, there was substantial generalization to other word pairs, including four pairs that had not previously been presented.

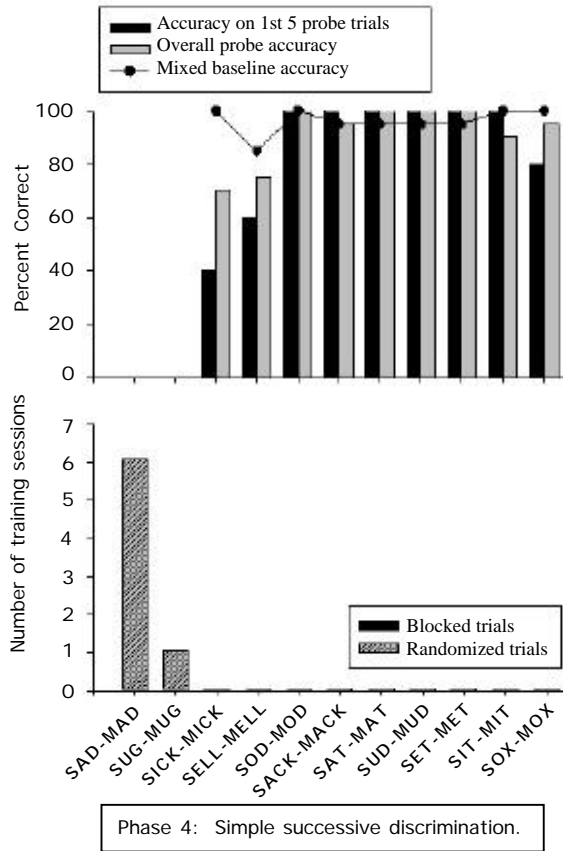


Figure 4

Further work will attempt to produce generalized control of letter selection (i.e., the performances sought in Phases 1 and 2) by building on the subject's generalized ability to produce the onset sounds (i.e., the results from Phase 4). A longer-term goal is to determine whether generalized control by new onset sounds can be produced more rapidly as a function of this experience.

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