

RESEARCH IN PROGRESS

INVESTIGATING THE RELATION BETWEEN SELF-TALK AND EMERGENT STIMULUS RELATIONS

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We are examining the degree to which overt verbal behavior systematically affects participants' performance on equivalence-based tasks (e.g., Wulfert, Dougher, & Greenway, 1991). We are using a concurrent "think-aloud" procedure (Ericsson & Simon, 1984; Hayes, 1986; Wulfert et al., 1991), in which participants are required to vocalize all thoughts during each experimental session. In our current procedure, participants completed baseline conditional discrimination training in the absence of any programmed consequences for correct responses (see Williams, Saunders, Saunders, & Spradlin, 1995). The purpose of eliminating programmed consequences was so that the relation between self-talk and task performance could be more clearly identified than would be the case if contingencies for correct responses were in place. In other words, it is possible that self-talk and task performance would be altered as a function of exposure to reinforcement contingencies. This would make it difficult to discern whether changes in self-talk were systematically related to task performance or to the prevailing contingencies, and likewise whether changes in task performance were systematically related to self-talk or to the prevailing reinforcement contingencies.

Thus far, data have been collected from 15 typically-developed adults. The 15 participants were divided into three groups of five each. The first group overtly described their thoughts about the task and their performance (i.e., "I'm putting the squiggly with the top-hat," "I just keep clicking on the one on the left," "I wonder if I'm doing this right"). The content of each participant's description was subsequently examined for potential relations between verbal behavior and performance. The second group was not required to talk aloud during the experiment. The third group recited letters of the alphabet aloud during task completion. This group was included to rule out the possibility that private, covert talk influences performance (e.g., Skinner, 1988, p. 282), as could be the case with the second group.

Session events were controlled by a Visual Basic program on an IBM-compatible personal computer equipped with a color monitor and a two-button mouse. Stimuli were nine arbitrarily configured black shapes. The experiment consisted of four phases: Phase 1 was AB arbitrary matching-to-sample (AMTS); Phase 2 was AC AMTS; Phase 3 was a random mix of AB and AC AMTS; and Phase 4 was a test phase which served to determine if novel stimulus relations (BA, CA, BC, and CB) emerged from the AB and AC relations established during Phases 1-3. Throughout all phases, sample stimuli were presented in the top center of the screen for 1 s, followed by the display of three comparison stimuli below the sample stimulus. Participants selected a comparison stimulus by positioning the cursor on the stimulus and clicking the computer mouse once. Phases 1 and 2 both consisted of 60 trials. Phase 3 consisted of 18 trials with nine AB trials and nine AC trials. Phase 4 consisted of 36 trials. The verbal responses of the five participants who were required to talk aloud as they completed the experiment were recorded on audiotapes, as were distinct auditory tones which signaled each trial onset and each change in phase. Verbal responses were subsequently transcribed and coded by two independent observers.

The degree to which the selection of a particular comparison stimulus in the presence of each sample stimulus was shown to predominate during Phases 1 and 2 was evaluated for each participant, and the proportion of trials during each phase that the predominant response patterns were observed was then calculated. For Phase 3, this included response patterns that were consistent with the predominant patterns observed during Phases 1 and 2. Formal statistical analyses were conducted to assess the differences between the three groups of participants in terms of the mean proportion of trials on which consistent response patterns predominated. This value was computed by summing each participant's proportion of trials on which consistent response patterns were observed during Phases 1-3 and dividing by three. A multivariate analysis of variance (MANOVA) was conducted, followed by Tukey's Honestly Significant Difference Test (Tukey HSD) for post-hoc multiple comparisons. The MANOVA test resulted in an F value (5.00), $p = .027$. Tukey HSD post-hoc analyses yielded significant

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differences between the group of participants who were required to talk aloud and the group of participants who completed the distracter task, $p = .028$.

The proportion of trials presented during Phase 4 on which relations emerging from the consistent relations shown during Phases 1-3 was also calculated for each participant. Formal statistical analyses were conducted to assess the differences between the three groups of participants in terms of the proportion of trials on which novel relations emerging from the consistent relations shown during Phases 1-3 were demonstrated. The MANOVA test resulted in an F value (3.70), $p = .056$. Tukey HSD post-hoc analyses yielded significant differences between the performance of the participants who were required to talk aloud and the participants who were required to engage in the distracter task, $p = .047$.

Analysis of the verbal responses emitted by the five participants who were required to talk aloud showed that the two of the five participants who demonstrated the emergence of novel relations on the highest proportion of test trials during Phase 4 also emitted the highest proportion of statements of self-rules during Phase 4 (i.e., "always put the top-hat with the squiggle").

It can be tentatively concluded that overtly describing one's own performance, as opposed to engaging in overt self-talk unrelated to the task, increases the likelihood that stimulus relations will be formed. In fact, acquisition actually may be prohibited when self-talk is unrelated to the task. We are continuing to examine the relation between overt verbal behavior and emergent stimulus relations with more participants by 1) using less cognitively demanding distracter tasks; and 2) using modified procedures with individuals with less sophisticated verbal abilities.

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