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Research report

Event-related potential correlates of stimulus equivalence classes: A study of task order of the equivalence based priming probes with respect to the stimulus equivalence tests, and among the distinct trial types with each other.

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HIGHLIGHTS

►Two groups of healthy subjects received successive tasks in different order.
►Associations between pseudo-words were selected by feedback.
►EEG was recorded during presentations of related and unrelated stimulus pairs.
►Response times to related stimuli were faster than those to unrelated stimuli.
►Two ERP waveforms were sensitive to the relatedness among the stimulus pairs.

ABSTRACT

This study investigates the influences of: 1) the task order of two stimulus equivalence classes (SEC) probes, and 2) the possible differences within the equivalence trial types. These factors were analyzed together on both behavioral and event-related potentials (ERP) data. Two groups of normal subjects participated in two successive sessions. In the first session, all participants were trained in the baseline relations among visual stimuli (pseudo-words). In the second session, one group performed the matching-to-sample (MTS) equivalence tests before the equivalence-relatedness-priming (EBRP) task, while the other group performed both tasks in reverse order. In the EBRP task related trial types included trained, symmetrical and equivalence relationships while the unrelated trial types included the same stimuli but without relationships. Event related potentials were recorded separately for related and unrelated conditions during the EBRP task. Results showed that response times to related trials were shorter than those to unrelated ones. At the electrophysiological level, two late waveforms were sensitive to the differences among the stimulus pairs of the EBRP task: Both waveforms were larger for the unrelated than the related conditions. Conversely, there were no main influences of the task order or of the trial types with each other. These results provide evidence that 1) the EBRP task exhibits priming effects among the SEC stimuli, 2) the behavioral and electrophysiological effects were similar regardless of whether the EBRP task was done before or after the MTS tests, and 3) there were no differences within the baseline and derived trial types in the EBRP task

Keywords: Stimulus equivalence
Matching to sample
Priming effects
Event-related potentials
Semantic processes

1. Introduction

It has been proposed that stimulus equivalence research is relevant to the understanding of semantic processes (e.g., [1]). In this