VARIETIES OF STIMULUS CONTROL IN MATCHING-TO-SAMPLE: A KERNEL ANALYSIS

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Conditional discrimination or matching-to-sample procedures have been used to study a wide range of complex psychological phenomena with infrahuman and human subjects. In most studies, the percentage of trials in which a subject selects the comparison stimulus that is related to the sample stimulus is used to index the control exerted by the relation between the stimuli. Performances indexed by percentage correct based on an aggregation across single trials, however, cannot identify the stimulus control topographies that exert momentary control of responding in a matching-to-sample milieu. The behavioral kernel is a unit of analysis that can provide such a measure. When a two-choice matching-to-sample procedure is used, analysis in terms of behavioral kernels permits the measurement of 16 potential stimulus control topographies. The kernel analysis provides the potential of assessing the many stimulus control topographies that control performances on a transient basis prior to the emergence of experimenter-specified conditional discriminative control. This sort of analysis could clarify the behavioral processes involved in the formation of learning set and problem-solving strategies when subjects are faced with complex discriminations, as well as the variables that influence these phenomena. As such, it is also related to accounts of discrimination learning as addressed by error-factor theory, hypothesis-based learning, and stimulus control topography coherence theory. Finally, a kernel analysis could also be used to diagnose specific sources of stimulus control that interfere with the formation of conditional discriminations by individuals with learning disabilities.

Key words: conditional discriminations, matching-to-sample, relational stimulus control, stimulus control topography, behavioral kernel