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Social Learning Strategies in Insight Problem Solving : A Process Analysis Using Colored Cross Recurrence Quantification Analysis

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Abstract

Social learning plays a crucial role in human cognition, yet most studies rely on simplified paradigms with explicit options and immediate feedback, such as two-armed bandit tasks. These paradigms are limited in learning in complex problem-solving situations characterized by uncertainty and delayed evaluability. The present study examined social learning strategies in insight problem solving by reanalyzing behavioral data from a T-puzzle task (Kiyokawa et al., 2007). Using Colored Cross Recurrence Quantification Analysis (C2RQA), we analyzed temporal correspondence between participants' action sequences across observation conditions and action categories. Observing others was consistently associated with changes in recurrence patterns, whereas self-observation showed no reliable effects. Action category also exhibited robust effects, and observation effects varied across recurrence measures. These findings suggest that social learning in insight problem solving is reflected in temporal interaction structures rather than outcome measures alone, highlighting the importance of process-oriented analyses under uncertainty.