Social Dynamics of Division-of-Labor Tasks

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Abstract

Collective action is a fundamental tool used by social animals. Individual members of groups must coordinate their behavior to accomplish goal-oriented joint tasks. In doing so, they dynamically impact their environment, which in turn results in global constraints which impress upon the group's possibilities for action. This self-organizing process is common and successfully used in many social species (e.g., honey bees, termites, buffalo), but human collective success is highly variable and context-sensitive. Here, we present a pilot study investigating the efficiency of human groups during a joint task simulated after the division-of-labor and task-switching processes of a colony. Using cross-recurrence quantification analysis (CRQA; a nonlinear time series analysis), we detail the dynamic coordination of dyads working together to complete a collaborative joint task. By analyzing performance across task constraints and communicative capabilities, our results contribute to the study of collective action in the context of dynamical systems theory.

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