Using Graph Theory to Understand the Structure of Event Knowledge in Memory

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Abstract

There are several competing theories regarding how event knowledge is represented in the mind, ranging from a strictly temporally ordered list of activities to sets of connected scenes which may themselves consist of ordered activities. We employed a network science approach to provide data-driven insight into event structure. We converted sets of human generated activity sequences, in which roughly 25 participants list up to 12 activities for 81 different events (making a sandwich, cleaning the house, taking money out of an ATM, etc.), into directed, weighted networks. Analyses of the event networks revealed a complex and varied temporal structure to events. In addition, we were able to identify scenes within events, and use graph theory to understand activity centrality, popularity, and influence, as well as the coupling between these activity characteristics. In the aggregate, we find that network science makes multiple data-driven, empirically testable predictions about event structure.