Mind the Bind: Mapping Expertise in Semantic Schemata Using Network Science

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Abstract

Expertise shapes the organization of semantic knowledge, yet prior work using cognitive network science remains sparse and limited in methodological diversity. Study 1 used a free-listing task to identify the concepts constituting the visual art schema in experts and laypeople. Study 2 collected pairwise relatedness judgements of these concepts to construct individual semantic networks. Higher expertise was associated with richer and more diverse schemata, more individualized networks, higher clustering coefficients, shorter average shortest path lengths, and unchanged modularity. Node-level analyses showed that fluency enhanced the structure of basic concepts, while the full advantage of experts emerged through integration of advanced concepts. These findings link expertise to more efficient and differentiated semantic networks, suggesting a mechanism by which knowledge organization supports expert-level cognition.

Keywords: expertise; semantic knowledge; network model; art schema

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