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Meta-analytic evidence for a core problem solving network across multiple representational domains

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HIGHLIGHTS:

- Identified meta-analytic brain networks associated with diverse problem solving tasks
- A shared managerial and attentional network supports generalized problem solving
- Problem solving within content areas engages representationally specific sub-networks
- Problem solving relies on cooperation between sub-network and whole-brain systems

ABSTRACT

Problem solving is a complex skill engaging multi-stepped reasoning processes to find unknown solutions. The breadth of real-world contexts requiring problem solving is mirrored by a similarly broad, yet unfocused neuroimaging literature, and the domain-general or context-specific brain networks associated with problem solving are not well understood. To more fully characterize those brain networks, we performed activation likelihood estimation meta-analysis on 280 neuroimaging problem solving experiments reporting 3,166 foci from 1,919 individuals across 131 papers. The general map of problem solving revealed broad fronto-cingulo-parietal convergence, regions similarly identified when

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