

On the future of complex problem solving: Seven questions, many answers?

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While research on complex problem solving (CPS) has reached a stage where certain standards have been achieved, the future development is quite ambiguous. Therefore, we were interested in the views of representative authors about the attainments and the future development of that field. We asked the authors to share their point of view with respect to seven questions about the relevance of (complex) problem solving as a research area, about the contribution of laboratory-based CPS research to solving real life problems, about the roles of knowledge, strategies, and intuition in CPS, and about the existence of expertise in CPS.

complex problem solving, dynamic decision making, research strategy, knowledge acquisition, experts

Research on complex problem solving (CPS) has reached a stage where certain standards have been achieved, whereas the future development is quite ambiguous. In this situation, we were interested in the views of representative authors about the attainments. Do we agree on the roles of knowledge and strategies that are important for CPS? Even more, we were interested in collecting ideas about the future development of our field. To stake off a conceptual framework, we introduce current definitions of the central concepts: “Complex problem solving is a collection of self-regulated psychological processes and activities necessary in dynamic environments to achieve ill-defined goals that cannot be reached by routine actions” (Dörner & Funke, 2017, p.6). This definition clearly goes beyond the conception of CPS as a narrowly defined competency. For defining knowledge, we refer to the preliminary process model by Schoppek & Fischer (2017): “Structural knowledge is knowledge about the causal relations among the variables that constitute a dynamic system. I-O knowledge (shorthand for ‘input-output knowledge’) represents instances of interventions together with the system’s responses. Strategy knowledge represents abstract plans of how to cope with the ... problem” (p.2). The strategy notion may include quite specific approaches that might better be characterized as tactics. However, we discourage the use of the term ‘strategy’ for a mere description of a participant’s course of action. We asked the authors to share their point of view with respect to the seven questions listed below. As we were interested in unfiltered opinions, we did not subject the contributions to peer review, but to an editorial review. Authors were free to select only five or six of the seven questions and add one or two of their own questions related to CPS.

The Questions

1. Why should there continue to be problem solving research (in addition to research on memory, decision-making, motivation etc.)?
2. What are the connections between current CPS research practice and real problems? Where do you see potential for development towards stronger relations?
3. Given the artificiality of the laboratory situation, do participants really adopt the presented problems? What insights can be gained despite this artificiality and which cannot?
4. What evidence exists for the influence of other kinds of knowledge besides structural knowledge on the results of CPS? Which of these kinds of knowledge should be examined in future research?
5. What evidence is available for the impact of strategies (except VOTAT) on the results of CPS? Which of these strategies should be examined more closely?
6. Is there intuitive CPS?
7. What distinguishes experts in CPS from laypersons?

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References

- Dörner, D., & Funke, J. (2017). Complex problem solving: what it is and what it is not. *Frontiers in psychology, 8*, 1153. doi:10.3389/fpsyg.2017.01153
- Schoppek, W., & Fischer, A. (2017). Common process demands of two complex dynamic control tasks: transfer is mediated by comprehensive strategies. *Frontiers in psychology, 8*, 2145. doi:10.3389/fpsyg.2017.02145