Prediction and Postdiction (Metacomprehension in Problem Solving)
CueThinkEF+ R&D Team
Last updated 11.5.25

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This measure assesses students' metacomprehension in relation to their direct performance on a mathematical problem-solving task using multiple timepoints of self-reflection.

Purpose

- This measure provides insight into students' metacomprehension, also known as objective metacognition, as measured by how accurate their predictions and post-reflections of their performance are with respect to their actual performance on a task.
- Metacomprehension is a component of metacognition, referring to one's ability to monitor their own understanding and knowledge. One's metacomprehension is connected to a specific task at hand and should be measured within that context.

Measure Details

- The measure consists of two identical items: one administered immediately prior to a mathematics task, and the other administered immediately after the task.
- The items describe the mathematical content being covered in the math task students will solve. Students are asked to rate how well they think they will score on the math task, given the content topic(s) covered.
- Each item uses a 0 - 100 scale. The closer to 0, the lower the student believes they will score on the math task; the closer to 100, the higher they believe they will score.
- The measure calculates the absolute difference between the students' predicted scores and their total score on the mathematical task. A smaller absolute difference score represents a higher level of metacognitive accuracy.

Contribution to the Field

- Metacomprehension tasks are common in metacognition research; however, specific measures must be adapted to fit the exact task or skill under study. This measure offers an approach to assessing metacomprehension in the context of middle grades problem-solving.

Development History and Previous Uses

- This prediction and postdiction measure has been used in several small scale efficacy studies, as well as two mid-to-large-scale evaluation studies for a mathematics problem-solving learning platform, CueThinkEF+, with middle grades students.

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Accessing the Measure

- To access the measure, please contact:
    - Dr. Sam Rhodes at rhodessr2@vcu.edu

Associated Publications

Rhodes, S., Bryck, R., Gutierrez de Blume, A., Lee, A., Wang, J., Sethuraman, S. (2025). The impact of a web-based application on mathematical problem-solving proficiency in middle school students. In Yao, X., McCloskey, A., & Zbiek, R.M. (Eds.), *Proceedings of the forty-seventh annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Penn State University.

Smith, T., Williams, R., Cade, W., Joshi, M., Meyer, C., Dedrick, D., Margolin, J., Zhu, B., & Pruitt-Britton, T. (2025, August). *CueThinkEF+ phase 4 evaluation: Final report*. American Institutes for Research. https://osf.io/y2wr5