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Elementary students' metacognitive processes and post-performance calibration on mathematical problem-solving tasks.

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Summary: Calibration, or the correspondence between perceived performance and actual performance, is linked to students' metacognitive and self-regulatory skills. Making students more aware of the quality of their performance is important in elementary school settings, and more so when math problems are involved. However, many students seem to be poorly calibrated, with a tendency towards over-confidence. The present study analyzes the relationship between post-performance calibration accuracy and the metacognitive process shown by 524 fifth- and sixth-grade students while solving two math problems. After calculating a calibration index and establishing the stability of students' judgments and actual performance, differences in the metacognitive process exhibited by students with different calibration accuracy (Accurate vs. Inaccurate groups) were analyzed. The emergence of different calibration patterns and differences in the metacognitive process as a function of mathematics achievement and grade level were also examined. Results indicated that: (a) students in the overall sample were little calibrated and over-confident, showing high stability in their judgments and actual performance across problems; (b) inaccurate students reported using information representation sub-processes (drawing/summarizing) less frequently, but writing and reviewing (and also correcting mistakes) more frequently than their accurate peers; and (c) differences in calibration patterns and the metacognitive process were found when achievement level was considered, whereas grade level did not generate any important effect. These findings suggest the usefulness of process-based measures to examine the metacognitive processes involved in making post-performance judgments, considering achievement and its possible mediating role in this relationship.

Classification: D53 C33

Keywords: calibration; metacognition; problem solving; process; self-regulation

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