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Individual Differences in Coordinating Between Graphs and Equations of Functions: Effects of CMR Facilitation

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Abstract: Success in calculus undoubtedly requires the ability to coordinate multiple representations (CMR; i.e., coordinate among graphs, equations, tables representing the same function). This presentation will describe a study in which calculus and pre-calculus high school students are presented with CMR activities involving graphs and equations, first in their standard format, and then in an enhanced format designed to facilitate coordination between the order/sign of the function and the shape/direction of the graph. Students will also be tested on their visuospatial working memory, conceptual knowledge of calculus, spatial skills, and their knowledge of strategies for completing CMR problems. We will investigate whether individual or group-level differences in these background measures and their class placement lead to different levels of responsiveness to the enhanced presentation format. Both success vs. failure on the CMR problems and the particular strategies students use to solve the problems will be evaluated.