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A warning intervention improves students' ability to overcome intuitive interference.

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Summary: Students' difficulties in mathematics and science may stem from interference of the task's salient irrelevant variables. Here, we focus on a comparison of perimeters task, in which the area is the irrelevant salient variable. In congruent trials (no interference), accuracy is higher and reaction time is shorter than in incongruent trials (area variable interference). A brain-imaging study related to this task indicated that correctly answering the incongruent condition is associated with activation in prefrontal brain regions known for their executive inhibitory control. These findings suggested that intervention aimed at activating inhibitory control mechanisms could improve students' success. In this paper, we explore the effect of an intervention that explicitly warns about the possible interference of the variable *area*. Eighty-four sixth graders performed the same comparison of perimeters reaction time test, with warning intervention (warning group) or without it (control group). Accuracy in the warning group was significantly higher in incongruent conditions and reaction time was significantly longer in all conditions than in the control group. The results suggest that the explicit warning activates inhibitory control mechanisms and thus helps students overcome the interference. The findings point to the possibility of improving students' problem-solving abilities through simple and focused interventions that explicitly warn them about the trap in the task. Such research-based simple interventions appear to require only teachers' knowledge and awareness and could complement the traditional educational technique of supporting relevant content knowledge.

Classification: C33 C43 D43 G43 D73

Keywords: comparison of perimeters; congruity; inhibitory control mechanisms; intuitive interference; reaction time; warning intervention

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