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Inversion Use Among Students in Grades 2-4

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Abstract

Well beyond the time at which children become competent at addition and subtraction, many children fail to use the principle of *inversion*, that $a + b - b$ must equal a , in solving arithmetic problems. Application of this fundamental mathematical concept renders computationally difficult problems easy and demonstrates an understanding of the inverse relation between addition and subtraction. Although some children show some understanding of this principle prior to formal schooling, many children fail to apply it in symbolic contexts through Grade 4. Thus, the study of inversion use can inform our understanding of how children begin to apply concepts in problem solving more generally. In this study we successfully employed a novel task appropriate for administration in mass testing environments from which children who use inversion and those who do not can be identified. We also investigated the roles of attentional skills, general conceptual understanding, and computational skills in the use of inversion. Unexpectedly, inversion use increased across grades for girls, but not for boys. To further explore the profiles of children who use inversion and those who do not, we examined cluster patterns but found no direct link between inversion use and either computational, conceptual, or attentional skills.