

**ZMATH 2015d.00549**

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**Obstacles and affordances for integer reasoning: an analysis of children's thinking and the history of mathematics.**

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Summary: We identify and document 3 cognitive obstacles, 3 cognitive affordances, and 1 type of integer understanding that can function as either an obstacle or affordance for learners while they extend their numeric domains from whole numbers to include negative integers. In particular, we highlight 2 key subsets of integer reasoning: understanding or knowledge that may, initially, interfere with one's learning integers (which we call cognitive obstacles) and understanding or knowledge that may afford progress in understanding and operating with integers (which we call cognitive affordances). We analyzed historical mathematical writings related to integers as well as clinical interviews with children ages 6–10 to identify critical, persistent cognitive obstacles and powerful ways of thinking that may help learners to overcome obstacles.

*Classification:* F42 D72 C32 A30

*Keywords:* history of mathematics; mathematical concepts; comprehension; negative numbers; cognitive processes; thinking skills; cognitive affordances; cognitive obstacle; integers

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