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**In search for the natural number bias in secondary school students' interpretation of the effect of arithmetical operations.**

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Summary: Although rational numbers are an essential part of mathematical literacy, they cause many difficulties for students. A major cause is the natural number bias. We examined this natural number bias in secondary school students in two related studies. In Study 1, 8th graders judged the correctness of algebraic expressions that address the effect of operations. The higher accuracy level on congruent items than on incongruent items yielded clear evidence for the natural bias. However, this bias was only significant in multiplication and division items. Additional interview data showed that students doubted more about the applicability of natural number principles in items with addition and subtraction. In Study 2 we additionally confronted 10th and 12th graders with the same tasks. The results of the second study showed that the natural number bias unexpectedly did not decrease towards the end of secondary education and remained present in multiplication and division items.

*Classification:* F43 F44 D73 D74

*Keywords:* rational numbers; natural number bias; literal symbols; effect of operations

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