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Van Hoof, Jo; Vandewalle, Jolien; Van Dooren, Wim

In search for the natural number bias in secondary school students when solving algebraic expressions.

Lindmeier, Anke M. (ed.) et al., Proceedings of the 37th conference of the International Group for the Psychology of Mathematics Education “Mathematics learning across the life span”, PME 37, Kiel, Germany, July 28–August 2, 2013. Vol. 4. Kiel: IPN–Leibniz Institute for Science and Mathematics Education at the University of Kiel (ISBN 978-3-89088-290-1). 329-336 (2013).

Summary: Dealing with rational numbers causes difficulties for many children, even though it is an essential part of mathematical literacy. The natural number bias is considered a major source of this difficulty. By means of two studies we investigated if and to what extent students who are just introduced into expressions involving literal symbols suffer from the natural number bias when interpreting algebraic expressions that address the effect of the four basic operations. Evidence for the natural number bias was found in the significantly higher accuracy levels on congruent items (where interpreting the letter as a natural number leads to a correct answer) than on incongruent items (where interpreting the letter as a natural number leads to an incorrect answer).

Classification: F43 H23 H33

Keywords: algebraic expressions; natural number bias; rational numbers; difficulties; basic operations