

ZMATH 2015c.00589

Pittalis, Marios; Pitta-Pantazi, Demetra; Christou, Constantinos

The predictive nature of algebraic arithmetic for young learners.

Liljedahl, Peter (ed.) et al., Proceedings of the 38th conference of the International Group for the Psychology of Mathematics Education “Mathematics education at the edge”, PME 38 held jointly with the 36th conference of PME-NA, Vancouver, Canada, July 15–20, 2014, Vol. 4. [s. 1.]: International Group for the Psychology of Mathematics Education (ISBN 978-0-86491-360-9/set; 978-0-86491-364-7/v.4). 433-440 (2014).

Summary: The present study revalidated a measurement model describing the nature of early number sense. Number sense was shown to be composed of elementary number sense, conventional arithmetic and algebraic arithmetic. Algebraic arithmetic was conceptualized as synthesis of number patterns, restrictions and functions. Two hundred and four 1st grade students were individually tested on four different occasions. Data analysis suggested that elementary number sense follows a logarithmic growth, while conventional arithmetic and algebraic arithmetic adopt a linear growth rate until the third measurement and then they accelerate. Analysis showed that the growth of algebraic arithmetic directly predicts students’ mathematics achievement in second grade and the growth of conventional arithmetic and indirectly the growth of elementary number sense.

Classification: F32 H22

Keywords: numbers sense; algebraic arithmetic; conventional arithmetic