REPRESENTATIONS AND SOLVING PROCEDURES IN WORD DIVISION PROBLEMS: COMPARING FORMAL AND INFORMAL KNOWLEDGE IN CHILDREN

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When solving word division problems children have to consider three basic elements: the size of the whole, the number of parts, and the size of the parts (quota) which must be the same for all the parts (Correa, Nunes & Bryant, 1998; Kornilaki & Nunes, 1997). It is important to know how children deal with these elements when solving word division problems presented under situations that involve different systems of signs (Nunes, 1997) and manipulative material, which are often present in classrooms. It is also important to explore the role played by formal and informal knowledge in children when solving word division problems.

This study aimed to investigate how children before learning division in school (Group 1: 20 children) solve word division problems by using informal knowledge. In this research we compared their solution procedures and representations to those used by children who had been formally taught about division in school (Group 2: 20 children). Each child was individually asked to solve two word division problems (partitive and quotitive) by using paper and pencil, and manipulatives (objects). The analysis of children's performance took into account the graphic representation used, the solving procedures adopted and the types of errors presented. Differences were found between groups in relation to the graphic representations adopted ($p<.01$) and to the way problems were solved ($p<.001$) in each situation (graphic and manipulative material). The results suggest that in the classroom close attention should be given to: (a) the role played by different systems of signs children adopt when solving word problems; (b) the differences between formal and informal knowledge in children; and (c) the importance of informal knowledge to the teaching of division.

References:

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