

## UNDERSTANDING AND USING GRAPHS: A DIDACTIC SEQUENCE FOR PRE-SCHOOL CHILDREN\*

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Several studies (Nunes, 1997; Meira, 1998; Da Rocha Falcão, Brito Lima, Araújo, Lins Lessa & Osório, 2000) have observed the importance of symbolic representations in mathematics conceptualization. We are here particularly interested in investigating the bars graphs comprehension among kindergarten in the exploration of additive-structure problems among six year-old children. We proposed a didactic sequence to children based on graphical representation of quantities derived from tridimensional histograms built with Lego®-blocks. Twenty-four children from a public school in Recife (state of Pernambuco-Brazil), working in pairs took part in a six-week long didactic sequence covering three modules of activities. In the first module, only tridimensional blocks were used to represent and compare quantities, in order to solve additive problems concerning combination, equalization and comparison. A set of blocks was used to construct bars serving as precursor representations of bar graphs. The second module explored aspects of the Block-histogram, like the notion of scale (the previously established relationship between each elementary piece and a specified quantity), and finally the third module explored the activity of passage from Block-histograms to draw and interpret representations in simplified Cartesian plans. In this oral presentation we will analyze the relationship between the previous activity based on blocks and the interpretation and construction of bar graphs on the paper, in the context of additive structures (Vergnaud, 1985). Preliminary results seemed to suggest that the activity provided by modules 1 and 2 helped children to understand information represented by Cartesian graphs in terms of quantities, their relationship and eventually their pattern of change over time.

### References

- Da Rocha Falcão, J.T. , Brito Lima, A.P., Araújo, C.R., Lins Lessa, M.M., Osório, M. (2000) *A didactic sequence for the introduction of algebraic activity in early elementary school*. IN: 24<sup>th</sup> INTERNATIONAL MEETING of Psychology of Mathematics Education (PME), Hiroshima-Japão, Proceedings, vol. 2, pp.209-216.
- Nunes, T. & Bryant, P. (1997). *Learning and Teaching Mathematics – an international perspective*. Psychological Press, East Sussex.
- Meira, L. (1998). Making Sense of Instructional Devices: The emergence of transparency in the mathematical activity. *Journal for Research in Mathematics Education*, vol.29,nº2, 121-142.
- Vergnaud, G. (1985) *El niño, las matemáticas y la realidad*. México, Editorial Trillas.

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