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A third grader's way of thinking about linear function tables.

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Summary: This paper is inscribed within the research effort to produce evidence regarding primary school students' learning of algebra. Given the results obtained so far in the research community, we are convinced that young elementary school students can successfully learn algebra. Moreover, children this young can make use of different representational systems, including function tables, algebraic notation, and graphs in the Cartesian coordinate grid. In our research, we introduce algebra from a functional perspective. A functional perspective moves away from the mere symbolic manipulation of equations and focuses on relationships between variables. In investigating the processes of teaching and learning algebra at this age, we are interested in identifying meaningful teaching situations. Within each type of teaching situation, we focus on what kind of knowledge students produce, what are the main obstacles they find in their learning, as well as the intermediate states of knowledge between what they know and the target knowledge for the teaching situation. In this paper, we present a case study focusing on the approach adopted by a third grade student, Marisa, when she was producing the formula for a linear function while she was working with the information of a problem displayed in a function table containing pairs of inputs-outputs. We will frame the analysis and discussion on Marisa's approach in terms of the concept of theorem-in action (Vergnaud, 1982) and we will contrast it with the scalar and functional approaches introduced by Vergnaud (1988) in his Theory of Multiplicative Fields. The approach adopted by Marisa turns out to have both scalar and functional aspects to it, providing us with new ways of thinking of children's potential responses to functions.

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