

# NOTICING FIRST GRADERS RELATIONAL THINKING: A STUDY WITH PRESERVICE TEACHERS

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Recognizing the importance of relational thinking in the context of Early Algebra (Steinweg et al., 2018) and that teaching must be responsive to children's mathematical thinking (Jacobs & Empson, 2021), this study intends to characterize preservice teacher's (PTs) noticing ability about first graders relational thinking, in two training tasks, in a teacher education course. Adopting a qualitative methodology, the research centers on a pair of PTs as participants. Data collection included audio and video recordings of the classes and the PTs' written productions on the tasks. A data analysis framework was developed by crossing the skills of describing and interpreting children's thinking with specific aspects of relational thinking. The results show that in the first task, while analysing children's written productions, the PTs noticed mainly formal aspects related to the representations children used. However, as PTs explored a classroom video, they deepened their analysis. In the second task, the PTs seem to be more conscious of the aspects that are essential to be noticed about relational thinking and focus their analysis on the way children explore the number sentences. The fact that the PTs had themselves the opportunity to solve number sentences similar to those solved by children and the collective discussions that took place in the course's classes seem to have contributed positively to their noticing skills, and thus can be considered in teacher education courses that intend to develop this ability.

## Acknowledgements

The research was supported by the FCT – Fundação para a Ciência e Tecnologia, Portugal, through the REASON Project, *Mathematical Reasoning and Teacher Training* (PTDC/CED-EDG/28022/2017).

## References

- Jacobs V. R., & Empson, S. B. (2021). Profiles of teachers' expertise in professional noticing of children's mathematical thinking. In D. Olanoff, K. Johnson, & S. M. Spitzer (Eds.), *Proceedings of 43 PME-NA* (pp. 652-661). PME -NA.
- Steinweg, A. S., Akinwunmi, K., & Lenz, D. (2018). Making implicit algebraic thinking explicit: Exploiting national characteristics of German approaches. In C. Kieran (Ed.), *Teaching and learning algebraic thinking with 5- to 12-year-olds: The global evolution of an emerging field of research and practice* (pp. 283-308). Springer.