



Learning to Share Fairly: The Importance of Spatial Reasoning in Early Partitioning Experiences

Chelsea Cutting
Education Futures
University of South Australia
Chelsea.Cutting@unisa.edu.au

Partitioning is considered the foundational concept that enables children to develop the understanding needed to work with an extended range of fractions because it is derived from division and reassembly of division (i.e., multiplication) (Confrey et al., 2014; Lamon, 2007). Yet, children consistently demonstrate difficulties with this concept throughout primary and middle in Australia and internationally, despite it being a concept that it introduced and taught from the early years of schooling (Callingham & Siemon, 2021). Young children often explore partitioning as the idea of fair sharing in contexts where equal parts are created and distributed based on spatial constructs of the objects rather than enumerating parts or collections. For example, several studies illustrate that children pay explicit attention to the geometric structures, arrangements, and attributes of objects to determine the magnitude and equality of shares (Wilson et al., 2012). Such arrangements included arrays or visual patterns (including symmetry and congruence of the arrangement of the objects) to justify the fair shares. However, the presence of spatial reasoning in children's early fraction experiences is implicit within much of the literature and has not been explored pedagogically in a range of early schooling contexts.

This study reports on a selection of data from a larger Design Based Research study that demonstrates the power spatial reasoning plays in developing early partitioning, specifically for creating fair shares, justifying equal shares, and justifying proportionally equal shared in both discrete and continuous contexts. This study provides strong support for how spatial reasoning can be used as a powerful teaching and learning tool for developing flexible and sophisticated understandings of partitioning in the junior primary years of school.

References

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