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Infants' detection of increasing numerical order comes before detection of decreasing number.
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Summary: Ordinality is a fundamental aspect of numerical cognition. However, preverbal infants' ability to represent numerical order is poorly understood. In the present study we extended the evidence provided by *V. Macchi Cassia* et al. [ibid. 124, No. 2, 183–193 (2012; ME 2015b.00556)], showing that 4-month-old infants detect ordinal relationships within size-based sequences, to numerical sequences. In three experiments, we showed that at 4months of age infants fail to represent increasing and decreasing numerical order when numerosities differ by a 1:2 ratio (Experiment 1), but they succeed when numerosities differ by a 1:3 ratio (Experiments 2 and 3). Critically, infants showed the same behavioral signature (i.e., asymmetry) described by Macchi Cassia et al. [loc. cit.] for discrimination of ordinal changes in area: they succeed at detecting increasing but not decreasing order (Experiments 2 and 3). These results support the idea of a common (or at least parallel) development of ordinal representation for the two quantitative dimensions of size and number. Moreover, the finding that the asymmetry signature, previously reported for size-based sequences, extends to numerosity, points to the existence of a common constraint in ordinal magnitude processing in the first months of life. The present findings are discussed in the context of possible evolutionary and developmental sources of the ordinal asymmetry, as well as their implication for other related cognitive abilities.

Classification: F21 C31

Keywords: number; infants; ordinal; increasing order

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