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Procedures and principles of number: Evidence from the Tsimane

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Abstract

By about age four, children in industrialized cultures can use verbal counting to correctly name the number of objects in sets larger than four. On some accounts, this full counting ability signals abstract knowledge about the fundamental principles governing number (e.g. the successor function and later-greater principle). However, many children who qualify as full counters fail to grasp these principles. Why? This failure could reflect number-specific conceptual deficiencies or domain-general cognitive immaturity. Here we tested these alternatives in the Tsimane, an indigenous group in which age and numerical knowledge are largely unconfounded. Although many Tsimane performed at ceiling, a subset of full-counters demonstrated poor understanding of fundamental counting principles. Performance was not reliably predicted by age or schooling, but rather by highest verbal count. These findings suggest that at any age, the development of numerical abilities is characterized not by sudden induction of abstract principles, but by piecemeal procedural learning.