An investigation of the origin of logical quantification: infants and adults representations of collective and distributive actions in complex visual scenes

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Abstract

The human mind can compress visual experiences via universal quantification, expressed with the words All and Each. We tested adults and infants representations underlying the tracking of collectively-exhaustive actions or distributively-exhaustive actions. In Experiment 1, adults spontaneously used the word All to describe movies where agents all pursued a single ball together and Each for those where each agent chased its own ball. Crucially, the use of Each, but not of All, significantly decreased when there were more than 3 chasers, suggesting that Each piggybacked on the representation of discrete individuals, while All on the representation of a single collective event. In Experiment 2, infants habituated to the All movies successfully dishabituated to the Each movies and vice versa, when the chasers were 3. These findings begin to suggest that the representations of collectively-exhaustive and distributively-exhaustive actions that connect with natural language quantifiers are in place early in life.