A Self-Organizing Map Connectionist Modeling for Cross-Situational Word Learning in Early Infants

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Abstract: Infants receive constant pairing of acoustic and visual stimuli across various contexts during their daily lives. In face of changing environmental experiences, disparate behavioral performance of infants mainly is not task-driven but mechanism-driven. However, the factual manner of how information is processed to develop cross-situational word learning is yet unclear. In the present study, SOM networks were firstly fed with the input of looking time for the learning phase and then the competitive layer of the SOM networks gradually formed recognizable clusters for the associations of acoustic and visual information. The study results showed that the simulations of SOM networks fit infants' behavioral patterns observed in the experiments and the structures of the presentation are computationally presented. The well-modeled outcome to the behavioral data offers a possible mechanism for interpreting how infants build up their early cross-situational word meanings.