Title: On the Significance of Speech: How Infants Discover Symbols and Structure.
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Abstract

Recent developmental studies have found evidence of learning mechanisms that may give infants an early start in acquiring language. One such early-emerging mechanism for extracting generalizations ('algebraic' rules) about ordered sequences of discrete elements is hypothesized to play a role in the especially difficult task of acquiring natural language grammars. As early as 7 months, infants exposed to syllable sequences (e.g., *la_ni_ni*, *li_we_we*, etc.) instantiating one underlying pattern (e.g., ABB) can differentiate between unattested sequences such as *wo_fe_fe* following the training pattern from sequences (e.g., *wo_wo_fe* or *wo_fe_wo*) following a different pattern (AAB and ABA respectively) (Marcus et al, 1999). Although this early productive behavior is analogous to the rule-governed productivity of language users, little data exists on the contribution of the hypothesized rule learning mechanism to language development.

The current work presents research bearing on the nature and function of the 'algebraic' rule learning mechanism. In the context of prior research suggesting that infants' learning mechanisms are characteristically general-purpose, applying comparably to speech and (say) music, Experiments 1-2 principally tested infants' ability to generalize patterns from sequences of discrete musical sounds. 7-month-old infants successfully generalized a pattern from pitch-varying speech-syllable sequences, but not from pure tones, piano notes or instrument timbre sounds. In contrast, infants in Experiment 3 generalized patterns learned from speech to non-speech sequences, indicating not only that that the non-speech test sounds were discriminable, but also that prior exposure to the individual sounds is not a pre-requisite for productive generalization. Finally, Experiment 4 confirmed extant claims that infants do not have an early preference for speech in learning arbitrary cross-modal associations between sounds and objects; 7-month-olds in this study learned such associations both with speech and musical sounds.

These findings indicate that the rule learning mechanism is unique among early learning mechanisms in privileging speech over other auditory input and raise the intriguing possibility that this mechanism is specific to language. However, preliminary data from studies with visually presented material, along with well-documented evidence of an early preference for speech, leave open the alternative hypothesis of an externally constrained domain-general rule learning mechanism.