

Babble and the Brain: Babble Becomes More Left Lateralised As Babies Gain Articulatory Experience

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How babble – babies’ meaningless, adult-like consonant-vowel syllables – contributes to language development is debated. Comparing brain activity in babble and language offers valuable insights. In adults, the left brain hemisphere dominates in language processing, while the right dominates in emotional processing. One previous cross-sectional study observed analogous differential specialisation in 5-12-month-olds’ babble and smiles. This has been interpreted as evidence that an innate left-hemispheric language capacity drives babble. Here, I investigated whether babble is stably left hemisphere dominant from emergence, or becomes more left lateralised with time and/or articulatory experience. Newborns show much less localised, consistent patterns of neural activity than adults: One brain area may participate in many diverse behaviours, and separate instances of one behaviour may involve different networks of brain areas. Through accumulated experience, functions are recruited to specific networks, determined by relative aptitude, and redundant connections are pruned. My study adapted and applied a rigorous, fine-grained method for analysing laterality via asymmetries in lip movements to naturalistic videos from 8 babies. I recorded babies twice before babble emergence (c.5 months) and then twice per month from babble emergence (c.6-10 months) until 12 months. I calculated Oral Asymmetry Indices indicating direction and extent of asymmetry for ~1500 babbles, smiles, and other vocal gestures. I identified the midline of the mouth using three facial landmarks and measured the area of the resulting ‘hemimouths’. I used linear mixed effects models to test for effects of gesture type (babble/smile/non-babble), age, and phonological milestone attainment. Babbles were right-lateralised at emergence and became left-lateralised gradually, with differing trajectories for monosyllabic, bisyllabic, and polysyllabic babbles. This indicates experience-dependent rather than innate or maturational left lateralisation. Smiles were right stably hemisphere dominant. I propose a new, Emergentist conceptualisation of babble as an endogenously-emerging dynamic system, becoming relevant to language only through babies’ own productive experiences.