How Consistency in Handedness is Related to Language Development

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Background and Aims

Language and fine motor skills at school entry predict later achievement in STEM (e.g., math).¹-³

- Handedness is assessed from skilled motor actions as defined by age level such as reaching in infants and bimanual manipulation in toddlers.⁴
- Previously, we reported that some children show consistent handedness from infancy; others are variable as infants, but consistent as toddlers.⁴-⁵
- These trajectories explained 25% of the variance in language ability when children were 2 years old; early right-handed infants had the highest scores.⁵
- The aim of this study was to extend our sample to include infants with an early left hand preference and children with no preference by 2 years of age.

Methods

Fig. 1. Study design.

- Handedness: Handedness was measured from 16 lab visits spanning 6 to 24 months of age; infant visits assessed reaching and toddler visits assessed role-differentiated bimanual manipulation (Fig. 1).
- Language: Language level at 24 months was assessed with either the Bayley Scales of Infant and Toddler Development (Bayley-III; cohort 1) or the Preschool Language Scales (PLS-5; cohort 2). Standardized z-scores were used in all analyses.

Participants

- 69 children (36 females) from a representative sample in a mid-sized metropolitan area in the US.
- Inclusion criteria: English as the primary language and a full-term delivery without complications.

Results

- Inconsistent (N = 10) ■ Early Lateralized (N = 26) □ Late Lateralized (N = 33)
- Handedness trajectories

Discussion

- Take-Home Point: Consistency in handedness during early development from infancy may be associated with advanced language skills at 2 years of age.
- However, the current sample includes only one child who was consistently left-handed throughout testing. We are unable to compare direction of lateralization with respect to the timing of consistency at this time.
- We are also unable to differentiate a consistent lack of preference from children who changed direction during testing, or exhibited a preference as an infant, but not as a toddler. Future studies may address these issues.

Ongoing work will add 22 children to the 2-yr sample. 3-yr visits are being conducted in a subset of children.