Toddler Hand Preference Trajectories Predict 5 Year Language Outcome

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Background and Aims

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- Existing literature highlights the cascading effect of motor development on typically denoted "nonmotor" domains, such as language and academic achievement. 1-3
- Within the fine motor domain, the facet of handedness has also demonstrated links to language development.⁴
- In particular, prior research indicates that consistent hand preference from 18 to 24 months for role differentiated bimanual manipulation (RDBM) predicts language skills at two and three years of age. 5-6
- Aim: The current study investigated the longevity of toddler handedness to language cascades at five years of age.

Methods

Participants: 90 children were assessed for hand preference for RDBM and language ability using a longitudinal design (see Figure 1 for an example RDBM action).

Toddler Hand Preference: Hand

L)/(R+L)] per child for each visit.



Fig.1. RDBM action

- Language: Language was assessed using the Preschool Language Scales (PLS-5) at 5 years old. The PLS-5 has 2 subscales: Expressive Communication (PLSEC) and Auditory Comprehension (PLSAC), allowing for separate analyses relating to expressive and receptive language.
- Analyses: A latent class growth analysis (LCGA) was conducted using monthly HI scores to identify subgroups of children with similar hand preference trajectories. Analyses of variances were conducted to evaluate differences in PLSAC and PLSEC scores across the identified LCGA classes.

Results and Discussion

B)

LCGA analyses identified 3 hand preference groups: a right-mild left (R-Mild L) group, a rightmoderate left (R-Mod L) group, and a R-Mod L group (see Table 1 and Figure 2 for details).

Table 1. Latent class membership size. intercepts and slopes for the selected model.

Class	N (%)	Intercept	Slope
L-Mod R	22 (24.4%)	-0.411***	0.006
R-Mod L	31 (34.4%)	0.417***	-0.009
	,		
R-Mild L	37 (41.1%)	0.791***	0.002
	- ()		
*** Denotes <i>p</i> < .001.			



Analysis of variances comparing classes on language outcomes found significant differences between the three classes on PLSAC scores, F(2, 87) = 4.55, p = .01, and PLSEC scores F(2, 87) = 4.05, p = .02 (see Figure 3 for details).



Fig 3. Comparison of receptive language skills (A) and expressive language skills (B) across RDBM hand preference trajectories. *Denotes p < .05.

Take-Home Points

- Individual differences in hand preference consistency during fine motor skill performance in toddlerhood had cascading effects on language outcomes into the preschool years.
- It is possible that engaging in object manipulation such as RDBM can provide important opportunities for language learning during dyadic interactions.
- Further work is needed to test whether consistency in hand preference matters for the occurrence of rich language interactions during object interactions.

