

# Grasping Ability at 6 Months Predicts Language Development at 24 and 36 Months

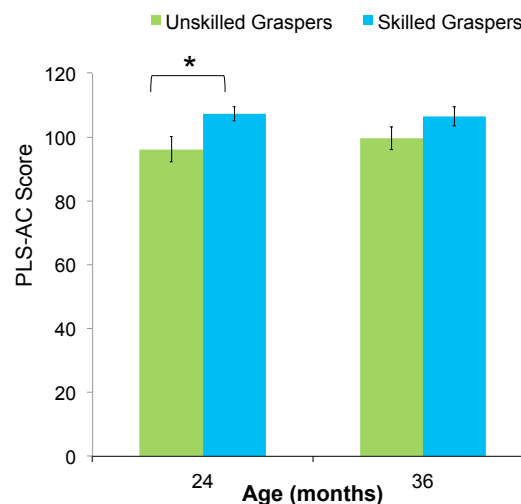
## Background and Aims

- Early motor skills can have cascading effects on language.<sup>1,2</sup>
- Manual skills such as grasping provide the foundation for speech, gestures, and language acquisition.<sup>3,4</sup>
- Fine motor skills assessed in infancy have been found to predict later language skill up to 36 months.<sup>5</sup>
- Autism has been linked to weakened fine motor skills and decreased grasping activity.<sup>5,6</sup>
- Understanding the connection between motor and language can help detect potential issues in development.
- **Aims:** Assess the effect of grasping ability at 6 months on later language comprehension and expression.

## Methods

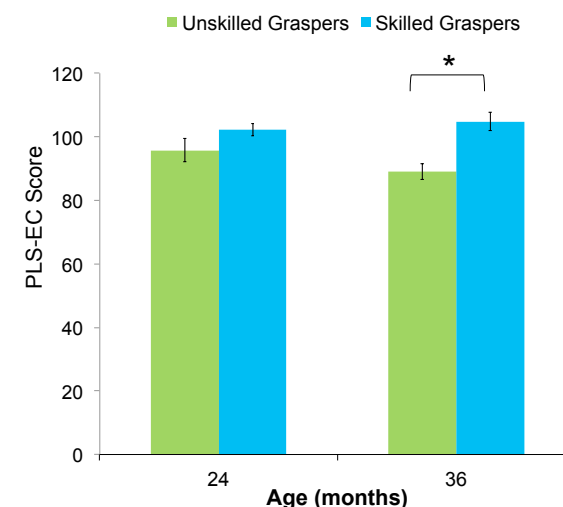
- **Participants:** Participants were part of a large longitudinal study spanning 6 months to 5 years of age. Outcome data were examined in 51 children (29 male) at 24 months and 30 (15 male) children at 36 months.
- **Touwen's Infant Neurological Examination:** Neuromotor development was tested at 6-months-old using Group III of Touwen's neurological assessment.<sup>7</sup> From these items, infant grasping skill was examined for this project. Grasping skill was rated on a scale of 0 to 5 with 0 indicating no grasping and 5 indicating holding two objects simultaneously in one hand while holding a third in the other hand.
- **Grasping Groups:** Infants scoring 3 or higher were classified as "Skilled Graspers". Infants scoring less than 3 were categorized as "Unskilled Graspers." A score of 3 indicated that the infant can grasp and hold one object with one hand.
- **Preschool Language Scale 5<sup>th</sup> edition:** The PLS-5 was used to assess the language level of the children at 24 and 36 months. The PLS-5 includes 2 subscales measuring language comprehension and production: Auditory Comprehension (PLS-AC) and Expressive Communication (PLS-EC).
- **Analyses:** Independent samples t-tests were conducted to determine differences in language comprehension (**Figure 1**) and production (**Figure 2**) at 24 and 36 months between "Skilled Graspers" and "Unskilled Graspers".

## Results and Discussion



**Fig. 1. PLS-AC scores at 24 and 36 months**

24 months,  $t(49) = -2.61$ ,  $p = .012$ ,  $d = .73$   
36 months  $t(28) = -1.25$ ,  $p = .221$ ,  $d = .56$



**Fig. 2. PLS-EC scores at 24 and 36 months.**

24 months  $t(49) = -1.69$ ,  $p = .098$ ,  $d = .47$   
36 months  $t(28) = -3.14$ ,  $p = .004$ ,  $d = 1.47$

### Take-Home Points:

- ✓ Infants who could grasp successfully at 6 months had higher language comprehension at 24 months.
- ✓ Infants who could grasp successfully at 6 months had higher language production at 36 months.
- ✓ Results for comprehension at 24 months match with the age children are mastering language comprehension.
- ✓ Results for production at 36 months match with the age children are beginning to form words and phrases.

## References and Acknowledgements

- 1 Nelson et al., (2013), DOI: 10.1037/a0033803
- 2 Nelson et al., (2017), DOI: 10.1002/dev.21560
- 3 Arbib (2006), ISBN: 1139458132
- 4 Iverson, J.M. (2010), DOI: 10.1017/S0305000909990432
- 5 LeBarton & Iverson (2013), DOI: 10.1111/desc.12069
- 6 Libertus et al (2014). DOI: 10.1111/cdev.12262
- 7 Touwen (1976), ISBN: 0521442869

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