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# The Relation Between Infant Construction Strategy and Language Development in Toddlers

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# The Relation Between Infant Construction Strategy and Language Development in Toddlers

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## Introduction & Purpose

- Infants acquire sensory information through interaction with physical objects in their environment.
- Self-guided object manipulation is important to cognitive development during infancy and toddlerhood.
- One such manipulation is object construction, or merging individual objects into a single structure.<sup>1</sup> Infants initially combine two objects together, and then graduate on to combine three pieces or more.
- The way in which an infant develops the ability to combine objects is similar to the way word combinations (like sentences) develop during toddlerhood.<sup>2,3</sup> Therefore, the development of object construction may be related to the development of language.
- The purpose of this project is to explore if infant construction ability is related to language in toddlers.

## Hypothesis

- The more advanced the infant's construction ability at 14 months, the more advanced their language ability will be at 24 months.

## Participants

- 47 typically-developing infants from Greensboro, NC
- Assessed at 14 months for object construction skill and at 24 months for language.

## Methods

- Infants given sets of nesting cups (4 to infants, 10 to toddlers) to assess construction strategy while video-recorded.<sup>3</sup>
- Examiners presented disassembled cups two different ways: one with the open side up and second with the open side down.
- Examiners demonstrated assembly of the cups, and infants were given 20 seconds to interact with the objects.

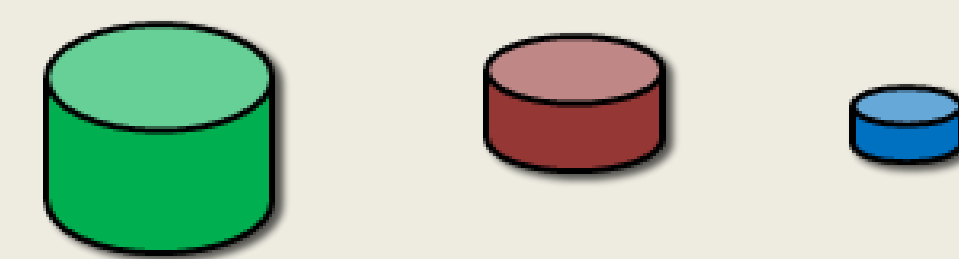


- Expressive and receptive language was assessed at 24 months of age using the *Preschool Language Scales*, 5<sup>th</sup> edition.<sup>4</sup>
  - Expressive language – the ability to communicate and produce language
  - Receptive language – the ability to comprehend language

## Construction Strategies

- Construction strategies were coded using the following:

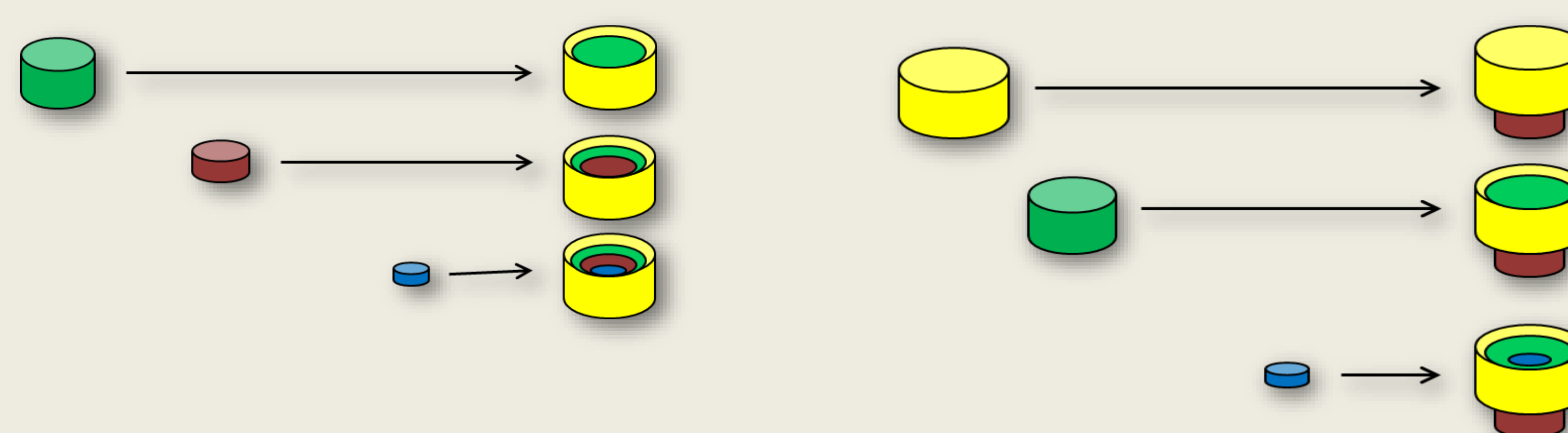
Nothing: no cup combination



Pairing: one cup placed in or stacked on a second cup



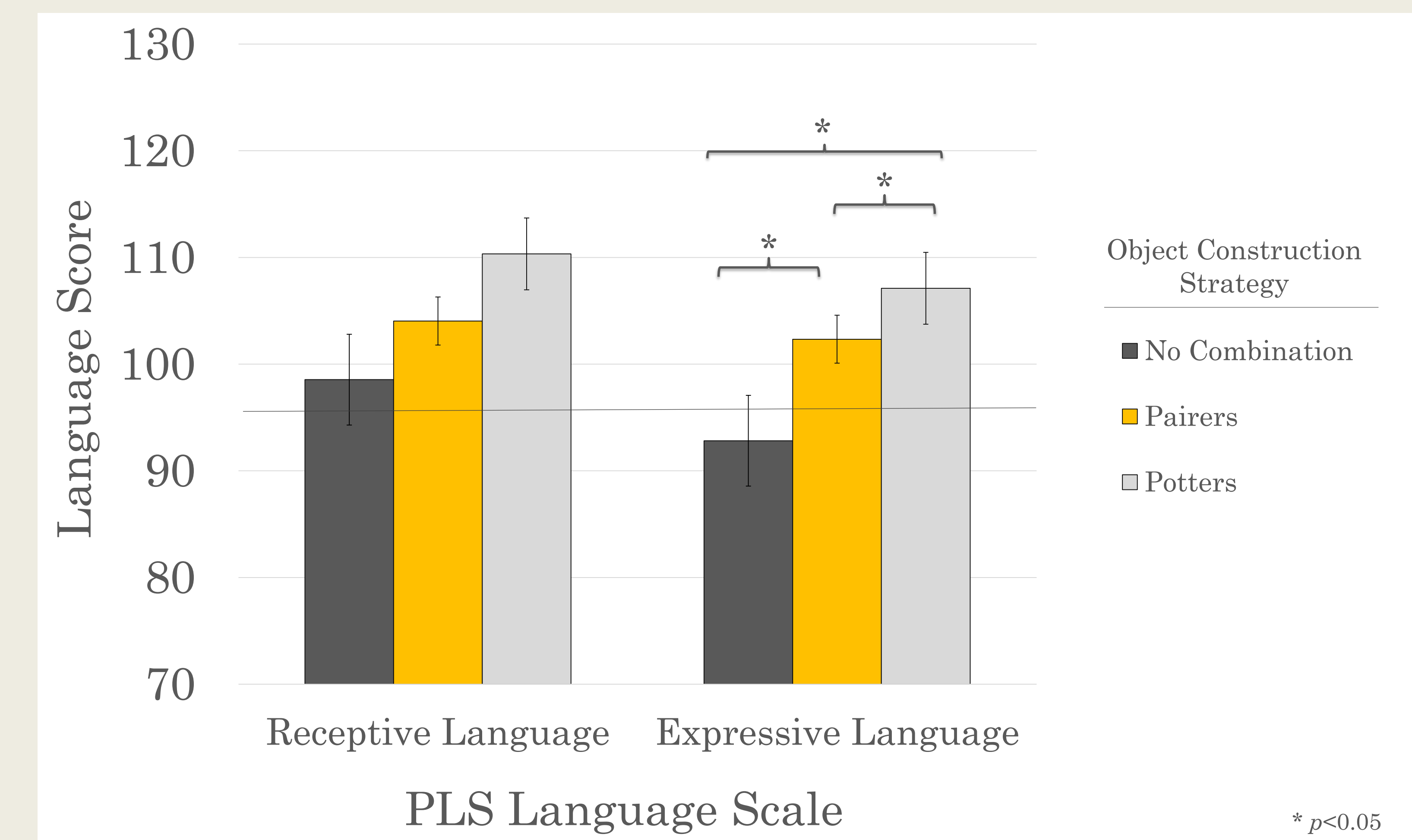
Potting: two or more cups placed in or stacked on a third cup



- Infants were grouped according to the highest level of construction ability.

## Results

- Data was analyzed using a regression model, using Hierarchical Linear Modeling 7 (Student version).
- Of the 47 infants sampled at 14 months:
  - 11 infants exhibited no combination
  - 27 infants paired cups
  - 9 infants potted cups
- Infants who paired ( $\beta=14.29$ ,  $t(44)=2.62$ ,  $p=0.01$ ) or potted ( $\beta=9.52$ ,  $t(44)=2.19$ ,  $p=0.034$ ) cups scored higher on expressive language, than infants who performed no combination ( $M=92.82$ ) at 14 months.
- Infants who potted at 14 months also scored higher on expressive language at 2 years, than infants who only paired at 14 months ( $\chi^2=7.27$ ,  $p=0.026$ ).
- No differences were found for receptive language between infants who combined no cups ( $\beta=-5.49$ ,  $t(44)=-0.91$ ,  $p=0.37$ ), paired cups ( $\beta=11.79$ ,  $t(44)=1.67$ ,  $p=0.102$ ), or potted cups ( $\beta=5.49$ ,  $t(44)=0.98$ ,  $p=0.37$ ).
- Infants who potted scored higher on expressive language ( $t(8)=2.39$ ,  $p=0.03$ ) than the population average ( $M=100$ ) at 2 years, while infants who could pair ( $t(26)=1.21$ ,  $p=0.19$ ) or did not combine ( $t(10)=-1.90$ ,  $p=0.07$ ) did not score differently from the population.



## Discussion

- This project found that object combination ability at 14 months relates to higher expressive language scores at 24 months, but not receptive language scores.
- Combining objects at a younger age may relate to the development of greater expressive language abilities.
  - Physical object combinations could lay a foundation for combining abstract concepts, such as word combinations (e.g., more cookie) or sentences (e.g., I want more cookie); however more study is needed to identify how these skills relate to one another.
- However, the development of receptive language may be more related to other developmental mechanisms.
- Future study could investigate how more complex object combination strategies performed at older ages, such as interrupted strategies, may uniquely affect the development of language at older ages.
  - This will provide more evidence on the relations between infant interaction with physical objects and language development throughout early childhood.

## References

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