

Introduction

- ❖ Towards the end of their first year, infants are developing the ability to build complex structures composed of simpler components.
- ❖ Construction, or the ability to merge multiple objects into a single, unifying structure, requires sensorimotor and cognitive abilities, particularly during infancy when the skill is emerging. In fact, research has suggested a link between early construction ability and other cognitive abilities, including language (Greenfield, Marcinowski & Campbell, in prep)
- ❖ Construction ability has rarely been investigated longitudinally from the onset (i.e., infancy) until toddler ages. The purpose of this project is to investigate how constructing ability changes longitudinally from infancy through toddlerhood and whether infant construction ability is an indicator of toddler construction ability.
- ❖ We predict that infants showing a high level of ability will subsequently show high levels of skill as toddlers. In addition, infants showing a low level of ability will show lower levels of skill as toddlers.

Methods

Participants:

- ❖ 131 infants (61 females) and 42 toddlers (x females)
- ❖ **Infant constructing task:** 5 monthly visits from 10 – 14 months
- ❖ **Toddler constructing task:** 7 monthly visits from 18 – 24 months.
- ❖ Visits were video-recorded.

Infant construction task (10-14 months)

- ❖ **7 toys affording construction:** ABC blocks, round blocks, rings, nesting cakes, stacking cakes, magnet sticks, and magnet spheres
- ❖ At a table, a researcher demonstrated construction using all pieces, the structure was disassembled, and then were presented to the infant's midline.
- ❖ The number of construction actions in the infant's most "numerous" structure was coded (e.g., a 3-block tower, would result in a score of "2").

Toddler Construction Task

- ❖ **10 toys affording construction:** sombreros, nesting cakes, stacking cakes, 1" blocks, 2" blocks, magnet spheres, Velcro cauliflower, Velcro orange, bristle blocks, wood rings and stick
- ❖ (Nesting cakes, stacking cakes, and magnet spheres are the same as in the infant portion.)
- ❖ Same procedures as the infant construction task.

(There will be a picture of the infant and toddler toys here... Unless you think it's not necessary.)

- ❖ **Dependent variable:** (Total number of items constructed) / (Total number of items available)

Results

Infant Construction Classifications

- ❖ A Poisson group-based trajectory model (GBTM) was used to determine groups within the infant construction data (Jones, Nagin, & Roeder, 2001)
- ❖ 3 performance groups were identified: high (n=17), medium (n=24), and low (n=14) groups (see Figure 2).

Does Infant Construction Classification Predict Toddler Skill?

- ❖ The relation between infant construction classification and toddler construction skill was analyzed, using a multilevel model (Singer & Willett, 2003). Age was centered at 18 months.
- ❖ Toddler construction changed quadratically ($\beta_0 = -0.006, p < 0.00$) and showed significant variability at the intercept ($r_0 = 0.09, p < 0.00$).
- ❖ High infant constructors scored significantly higher at the intercept ($p < 0.00$) than the medium and low infant constructors (see Figure 3).
- ❖ No other group differences were found in the linear ($p > 0.50$) or quadratic slopes ($p > 0.50$).

Figure 2. Construction Groups using GBTM (n=131).

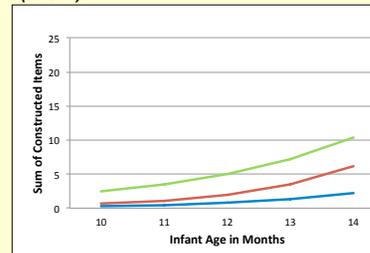
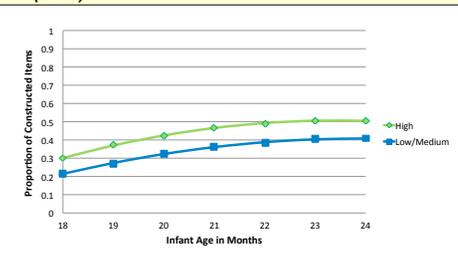


Figure 3. Toddler Construction by Infant Group (n=42)



Discussion

- ❖ Toddler construction ability increased across the 18-24 month ages; however the rate of toddler construction decreased. Prior research has shown that the rate of construction skill is increasing from 10-14 months (Marcinowski, Faldowski, & Michel, in prep). Since infants are rapidly acquiring the skill from approximately 12 – 20 months, these ages might indicate an important time in the acquisition of construction skill.
- ❖ Infant construction trajectories predicted toddler ability, such that high infant constructors were consistently higher than medium and low infant constructors across the 18-24 month period. Interestingly, infant construction groups had no effect on trajectory change across toddler ages.

References

Marcinowski, E., Faldowski, R., & Michel, G. (in prep). The development of constructing skills during infancy.
Singer, J. D., & Willett, J. B. (2003). *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. New York, NY: Oxford University Press.

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Toddler Construction Task

- ❖ 10 toys affording construction: sombreros, nesting cakes, stacking cakes, 1" blocks, 2" blocks, magnet spheres, Velcro cauliflower, Velcro orange, bristle blocks, wood rings and stick
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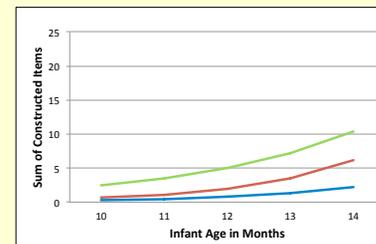
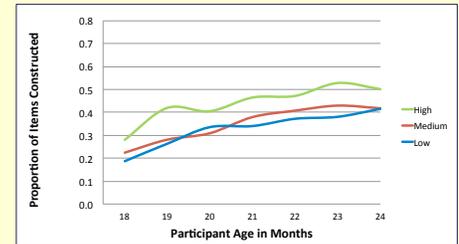


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