

Examining the Relation Between Language Input and Infant Body Position Across the Entire Day

Hailey Rousey, Maximilian Tang, Chuan Luo and John M. Franchak
Department of Psychology, University of California, Riverside

hrous002@ucr.edu
<https://padlab.ucr.edu>

NSF BCS #1941449

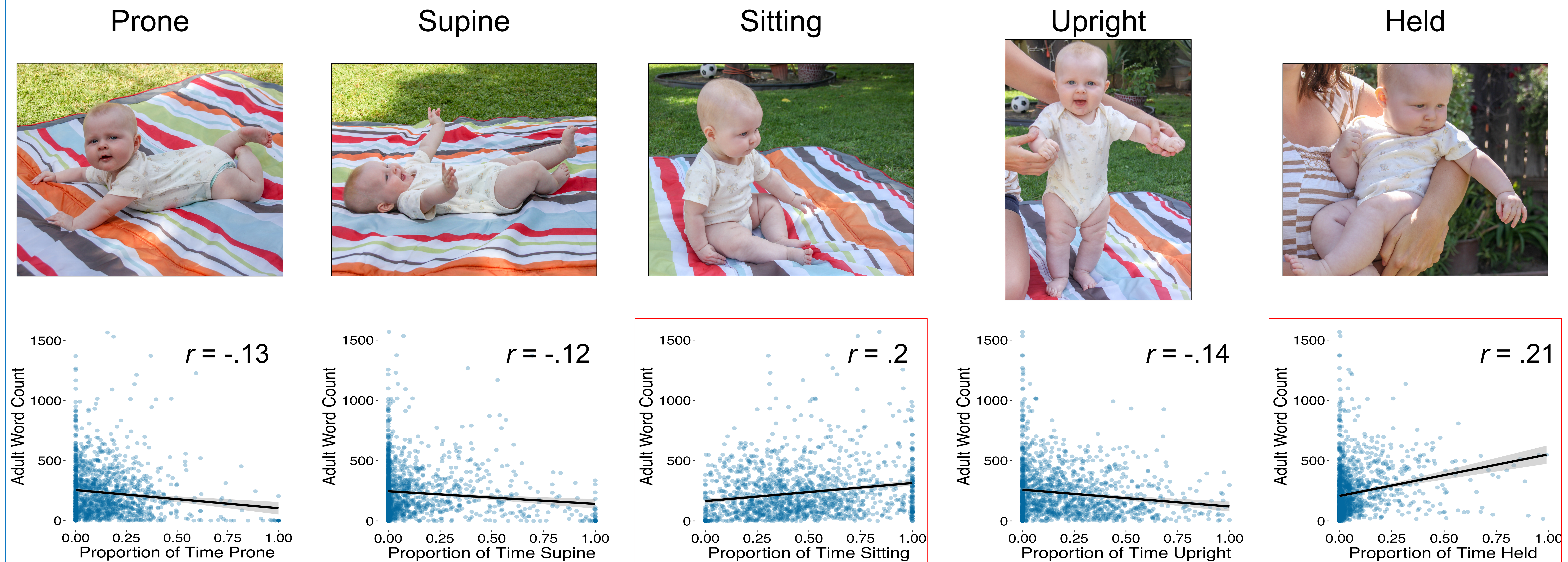
Introduction

- Acquiring one skill can have an impact on infants' development of other skills, known as a developmental cascade
- Language proficiency has been found to be impacted by locomotor development, with the acquisition of walking being associated with a growth in vocabulary even when controlling for age (Walle & Campos, 2013)
- Karasik et al. (2014) found that walking infants elicited different types of parental verbal responses compared to crawling infants
- Research examining the relation between infant motor behavior and adult linguistic input has never been measured across a full day

Hypothesis:

- Variations in the number of words spoken by adults will relate to variations in body position within a day

Time Spent Sitting and Held Correlates with Number of Adult Words Heard



- Separate linear mixed models and correlations were calculated using R to predict adult word count from the amount of time infants spent in different body positions
- There was a positive relationship between adult words heard and sitting/held time, meaning that the more time spent in these two positions was associated with an increase in adult words heard
- There were no significant associations for prone, supine, or upright time

Methods

Participants:

- 20 sessions from 8 participants (5 males)
- 11-, 12-, 13-, and 14-month-olds

Procedure:

- Materials were dropped off at the participant's house the morning of the visit
 - 4 inertial movement unit sensors (IMUs) embedded in a pair of leggings
 - LENA® recording device in a shirt pocket
- The infant wore the IMUs and LENA® until their bedtime

Body Position Annotation:

- The first three hours were annotated by human coders for infant body position – supine, prone, sitting, upright, or held – to train a machine learning model which was used to predict body position categories throughout the day (Franchak et al. 2021)
- Adult word count was automatically generated by LENA® algorithms
- 10-minute bins were analyzed to examine how body position and adult word count relate

Conclusions

- There are various non-linguistic influences that impact language development, with the current study suggesting infant body position to be one such influence
- Infants heard increased adult speech when sitting and held compared to other positions, perhaps because of the increase in social proximity between infants and caregivers
- A future direction is to examine the impact of parents' own motor behavior on infant-directed speech