

Reaching Performance While Sitting With or Without Support in Infants With Different Levels of Mobility

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Background

Previous research has shown that the provision of external support during sitting can positively impact reaching behavior in typically-developing infants (Bertenthal & von Hofsten, 1998), and a greater level of sitting ability may be associated with better reaching performance (Harbourne et al., 2013; Rochat & Goubet, 1995). However, reaching and sitting have generally been studied as separate behaviors in infants at risk for developmental delays (Hadders-Algra et al., 2007; Heathcock et al., 2008).

The purposes of this study were to identify differences in reaching performance for infants with motor delays when sitting with and without support and to determine the relation between reaching behavior and infants' mobility level.

Methods

- 20 infants (12 males) with mild delays (difficulty sitting up and/or switching between the sitting and crawling position) 1-2 times at their homes (M=12.8±4.5 months).
- Current data represent a subset of completed assessments from an ongoing longitudinal study, in which each infant is tested 5 times over one year.
- Visits were selected where infants were able to sit independently and mobility level could be categorized as "Not Mobile" or "Mobile" (crawling or scooting).
- All infants were assessed in two positions: A) sitting in a supportive chair (supported sitting; Figure 1A), and B) sitting on the floor (unsupported sitting; Figure 1B).
- To assess reaching behavior, one of a small set of interesting toys was presented at the level of infants' hips, chest, and eyes for 20 seconds at each level.
- Assessments were video recorded and behaviors were coded using Datavyu software. Outcome measures were: percent time infants touched toys unimanually or bimanually; and percent time infants visually explored objects.
- Generalized linear mixed modeling was performed to analyze the data.

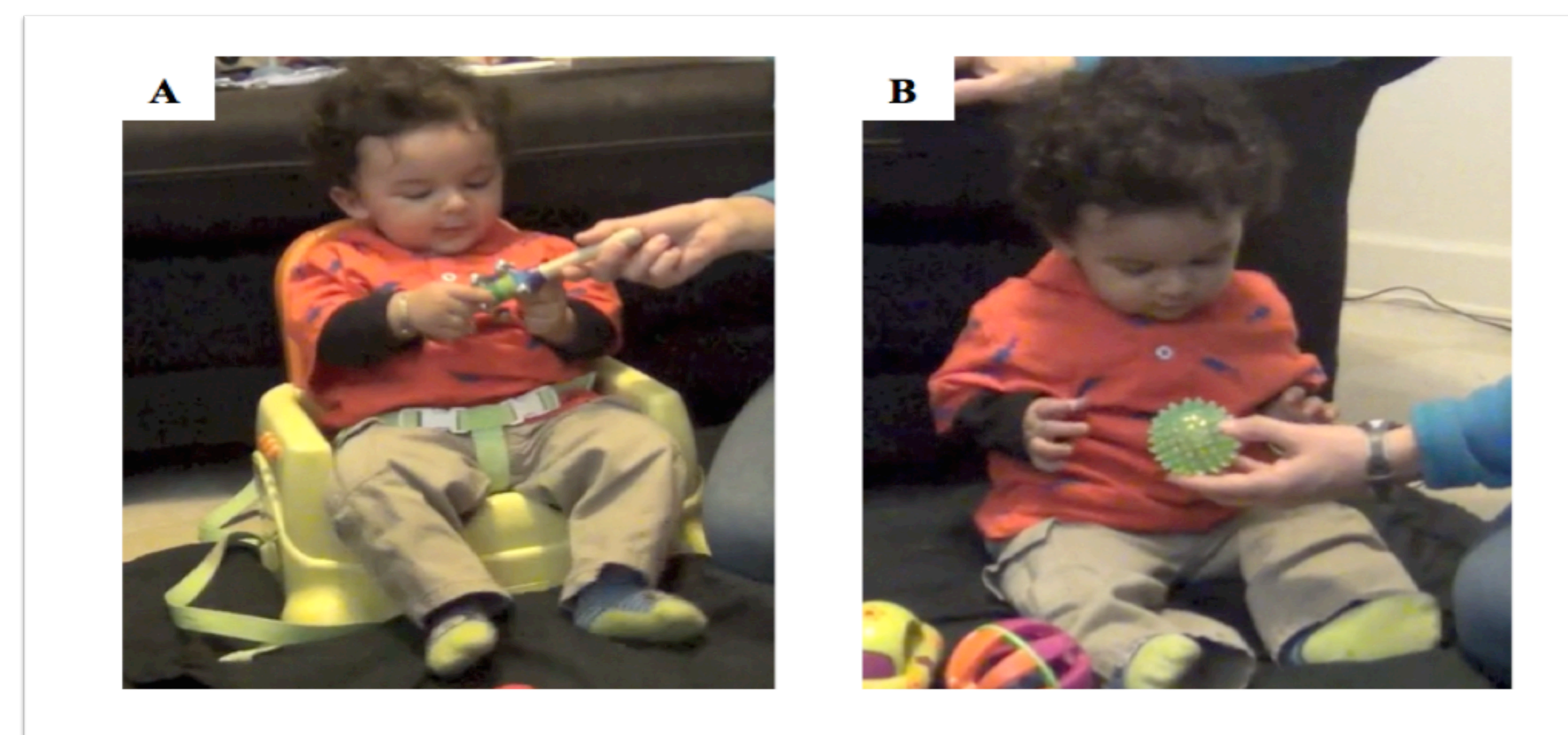


Figure 1. Experimental setup for the supported (A) and unsupported (B) sitting positions.

Results

Controlling for age and mobility level, the percent time contacting objects unimanually at hip level was greater in supported sitting compared to unsupported sitting ($t(37)=-2.11$, $p=.0418$, $OR=.54$). No differences were found for chest, and eyes levels.

There was a significant interaction effect between sitting position and mobility level for contacting objects bimanually ($t(38)=-2.09$, $p=.0431$, $OR=.39$) and looking while contacting objects bimanually ($t(38)=-2.48$, $p=.0179$, $OR=.37$) across all levels (Figure 2).

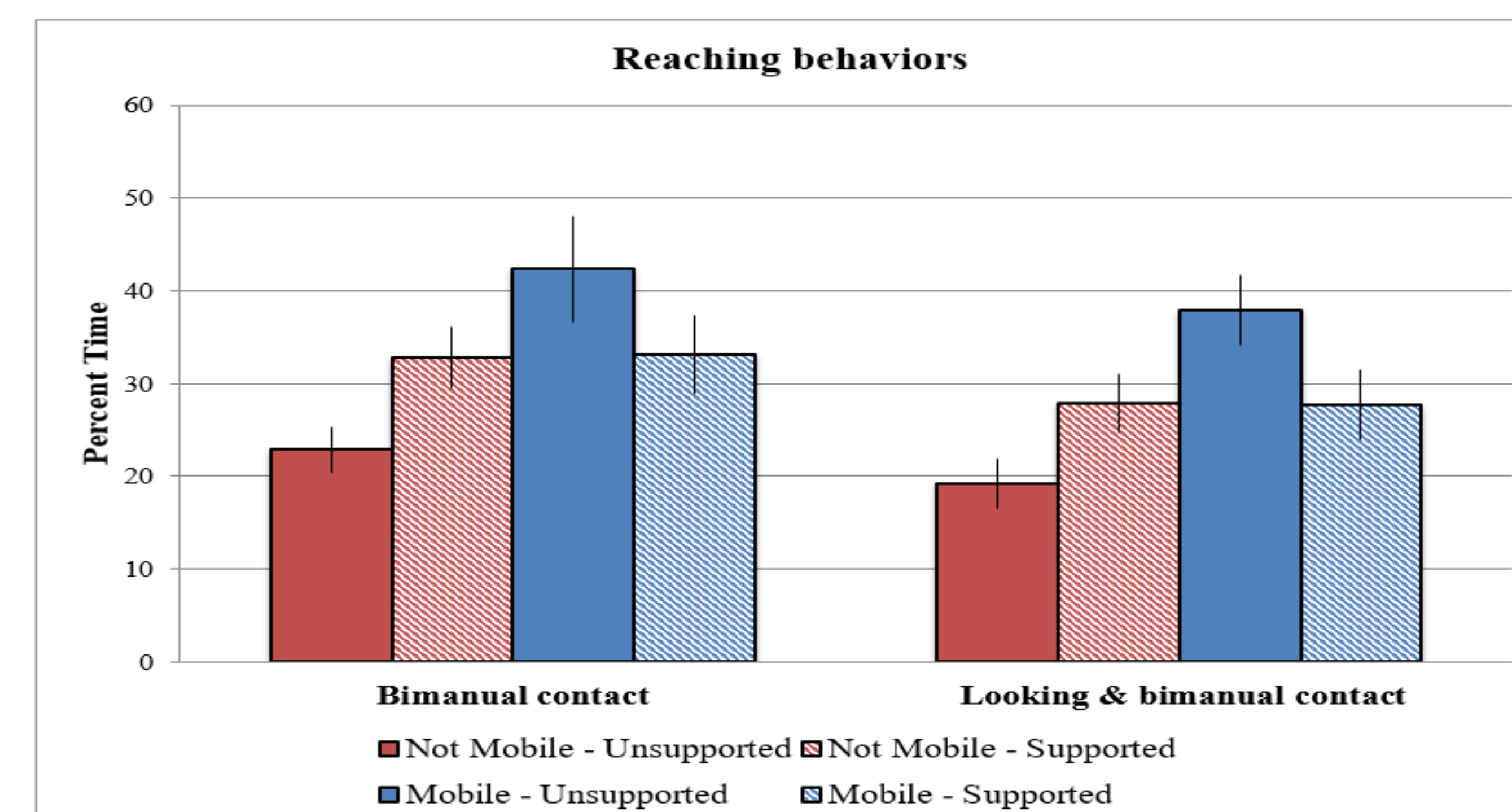


Figure 2. Percent time contacting objects bimanually and looking at objects while contacting them bimanually in unsupported and supported sitting for infants who were not mobile and those who were mobile via crawling or scooting.

Conclusions

In general, infants' reaching performance benefitted from external postural support. Unimanual contacts were greater in the supported sitting position. Bimanual contacts and bimanual contacts while looking were greater in the supported sitting position for infants who were not mobile.

However, whereas external postural support allowed for more sophisticated reaching behaviors for non-mobile sitters, it seemed to inhibit more sophisticated bimanual and multimodal reaching behaviors for mobile sitters. Bimanual contacts and bimanual contacts while looking were greater in the unsupported sitting position for infants who were mobile.

These results demonstrate an interesting interaction between infants' mobility level and the impact of external postural support on reaching performance. They suggest that to facilitate bimanual and multimodal exploration of objects for infants in sitting, external postural support should be provided for infants who are not yet mobile, but removed once infants become mobile.

These findings can help to guide early interventions aimed at facilitating object exploration and learning for infants at risk.

References

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