

ASSOCIATIONS BETWEEN LOCOMOTOR EXPERIENCE AND SPATIAL SEARCH PERFORMANCE IN 12-MONTH-OLD INFANTS

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INTRODUCTION

Past literature has shown an association between locomotor experience in the form of hands-and-knees crawling and spatial cognition abilities in infancy (Acredolo, 1978, 1990; Acredolo & Evans, 1980; Acredolo, Adams & Goodwyn, 1984; Bai & Bertenthal, 1992; Bell & Fox, 1997; Bertenthal, Campos & Kermoian, 1994; Kermoian & Campos, 1988). Briefly, it has been evidenced that hands-and knees crawlers perform more successfully on spatial memory and cognition tasks. Recent literature suggests that the transition from crawling to walking may entail similar processes which would require the infant to learn how to manipulate the environment all over again from this new vantage point (Adolph, 1997, 2000; Corbetta & Bojczyk, 2002; Zelazo, 1983).

The present study examined the effect of walking experience on spatial memory performance in 12-month-old infants.

PARTICIPANTS

50 12-month-old infants, aged 52-55 weeks, (26 male, 24 female) were recruited through the Virginia Tech Developmental Sciences database for this study. Behavioral and physiological data were available for 43 infants. The behavioral data are presented here. Infants were born to middle- and upper-middle-class parents. All parents had at least a high school diploma. The sample was predominantly Caucasian.

PROCEDURE

Spatial Memory Performance: Infants participated in the Object Retrieval (Diamond, 1990) task and the classic reaching A-not-B task. Both tasks required the infant to recall where the object was in space. The tasks differed in the occlusion of the toy. During A-not-B, the toy was not visible, whereas during Object Retrieval the toy was visible but not attainable via line of reach on difficult trials.



A-not-B coding (Bell & Fox, 1997):

- 1= object partially covered
- 2= object completely covered
- 3= object hidden under 1 of 2 cloths
- 4= 0-sec delay
- 5= 2-sec delay
- 6= 4-sec delay
- 7= 6-sec delay
- 8= 8-sec delay
- 9= 10-sec delay

Object Retrieval coding (Bell & Fox, 1992, as per Diamond):

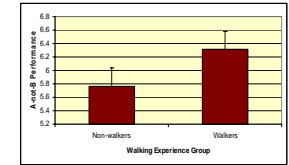
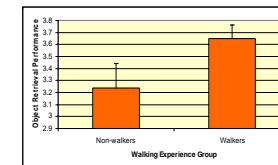
- 1= Failed side trials
- 2= Lean and look while reaching
- 3= Lean and look, sit up and reach
- 4= No lean and look



Locomotor Assessment: A questionnaire was administered to all parents asking whether or not their infant was walking. If so, they were asked to provide the date the infant took his/her first independent steps. The infant was then videotaped at the end of the assessment and the parent was questioned to verify locomotor status and approximate walking onset date.

RESULTS

Using a one-way ANOVA, a trend was shown for walkers (n=26) to score higher than non-walkers (n=17) on the Object Retrieval task ($F(1, 41) = 3.90, p = .055$). No difference was seen on the A-not-B task ($F(1, 41) = 1.81, p = .19$). However, the means were in the hypothesized direction.



CONCLUSION

In this study, infants who were walking showed a trend for higher performance on an Object Retrieval task than non-walkers. This suggests there may be support for the hypothesis that changes which occur due to the transition from crawling to walking may influence spatial memory performance. However, there were no differences between walking groups on the A-not-B task. The Object Retrieval task may have been more successful at evidencing differences in performance abilities among infants with varying locomotor experience because this task requires the integration of spatial knowledge and transparency. These factors have been found to be relevant for distinguishing barrier crossing in walking infants at this age (Schmuckler, 1996). In conclusion, it appears that Object Retrieval may be a more appropriate task for tapping individual differences in spatial memory performance in walkers.