A comparison of object permanence progression during sitting development in infants with typical development and infants with motor delay

Mihee An, PT, PhD1, Regina Harbourne, PT, PhD1, Jaclynn Stankus, M.S.Ed1, Lin-Ya Hsu, PT, PhD2, Emily C. Marcinowski, PhD3, Stacey C. Dusing, PT, PhD3, and START-Play Consortium

1Duquesne University, Pittsburgh, PA. 2University of Washington, Seattle, WA. 3Virginia Commonwealth University, Richmond, VA

BACKGROUND

Object Permanence is the ability to understand that objects continue to exist even when they are not observed. Object permanence is fundamental to representing objects and an important cognitive construct that develops during early life. The construct of object permanence links to motor experience such as sitting and self-mobility. Adequate postural control in sitting allows infants to process visual information and use their hands freely to manipulate objects, which facilitates cognitive development.

Participants

Infants were recruited as part of two larger studies (START-Play and CHoR) at the onset of sitting emergence.

Object Permanence Scale (OPS)

- Consists of 7 tasks extracted from developmental studies on object permanence.
- Developed to measure object permanence from minimal to advanced skills, in which the child has an opportunity to earn a score (0-10).
- During the test, infants sit on the floor or sit in a supported chair depending on their ability to maintain a sitting position.

Purpose

To compare the development of object permanence between infants with and without motor delay, by examining change on a scale of object permanence over 6 months.

RESULTS

- Results of a mixed analysis of variance (Figure 1)
  - Main effect for time (F(3, 210) = 20.48, p < 0.001).
  - No between group difference (F(1, 70) = 0.43, p = 0.52).
  - No interaction between group and time (F(3, 210) = 2.53, p = 0.06).
- The mean score on the OPS increased over time in both groups, but did not differ between groups.
- But, mean age at baseline was significantly older in infants with motor delay than typically developing infants (p < 0.001), indicating delayed development of object permanence by age, but coinciding with sitting emergence.

CONCLUSIONS

- Infants with motor delay demonstrated delayed development of object permanence, as measured by the object permanence scale (OPS).
- Although infants with motor delay were approximately 5 months older than typically developing infants, their performance on the OPS was similar to typically developing infants at the onset of sitting.
- Progression of object permanence continued over 6 months for both groups, but the slope of progression in infants with motor delay tended to be less.
- Interventionists targeting early motor skills should track the progression of cognitive skills such as the object permanence construct, which may be closely related to change in motor skill.

REFERENCES


This research was funded by the IES grant (NCT2593825) awarded to the START-Play Consortium. The CHoR grant (674408) awarded to SCD & ECM.

For any questions about this research, please contact Mihee An: anm@duq.edu