



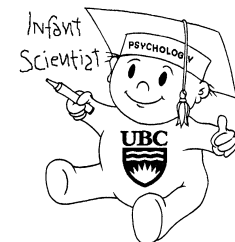
Looking and leaping: Shared gaze and movement by 14-month-old infants in a word association task

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The Point

Measures of magnitude and direction of movement, made automatically and non-invasively, supplement traditional looking time measures, and can provide novel insights into infant behavior in language acquisition tasks, especially in a social learning context.

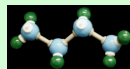
Background

→ 14-month-old infants, tested in a habituation/dishabituation setting (the "Switch task"), can associate two nonsense syllables (/lɪf/, /nim/) with two nonsense objects. However, they **fail** at the same task when the nonsense syllables are minimal pairs (/bɪ/, /dɪ/) (Stager & Werker 1997).

Habituation phase



bI



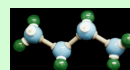
dI

Test phase



bI

"Same" trial



bI

"Switch" trial

"Success" consists of significantly longer looking to the Switch test trial.

→ 14-month-old infants tested in an identical setting, with the inclusion of a social interactor in the form of an Experimenter delivering the auditory stimuli, **succeed** in associating two minimal pair nonsense syllables and two novel objects (Fais et al. 2012).



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Measures

Time spent in shared gaze between infant and Experimenter

Determined two groups of infants: those above (high shared gaze) and those below (low shared gaze) the median of shared gaze across infants.

Infant looking time to the object on the monitor during each test trial

Infant looking time to the Experimenter during each test trial

Overall magnitude of infant movement during each test trial

Average magnitude of movements along the X axis, toward the Experimenter, during each test trial

Non-invasive, automatic measures made from 2D video of infants, using an optical flow algorithm (Barbosa, et al. 2008; Horn & Schunk 1981)

What the results show

The presence of a social interactor in the traditional Switch task, and the ability to measure movement automatically and non-invasively, open up new possibilities for the understanding of the development of infant word-object association.

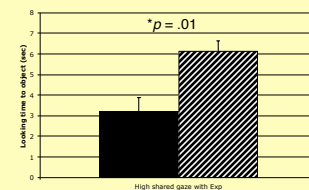
Differences in infant looking behavior, specifically time spent in shared gaze with the Experimenter, identify two groups of infants who demonstrate different patterns of success. These successes are confirmed by measures of overall infant movement in the task.

Measures of movement direction show that these infants may not yet demonstrate the postural alignment to an interactor shown by older toddlers (Pereira, Smith & Yu 2008).

Results for the high shared gaze group

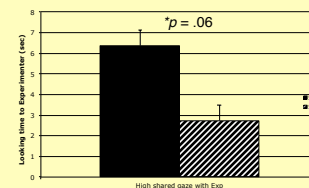
Looking time to the object

- Infants looked significantly longer at the object during the Switch trial.
- This is the standard signature for "success."
- The presence of the Experimenter was necessary to identify this successful group of infants.



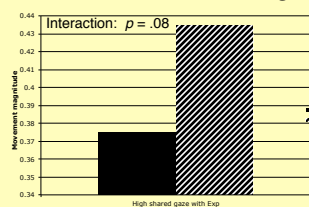
Looking time to the Experimenter

- Infants looked significantly longer at the Experimenter during the Same trial.
- The Experimenter afforded a second, attractive visual target, and a second way for this group to demonstrate success.



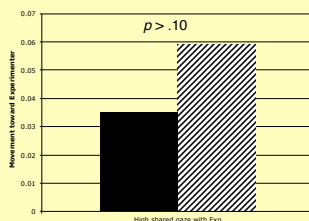
Magnitude of movement

- Infants moved significantly more during the Switch trial.
- Movement was inversely correlated with looking to the Experimenter ($r = -.597, p = .015$).
- Infants were less active when they looked more at the Experimenter.
- Movement measures also reveal success in the task.



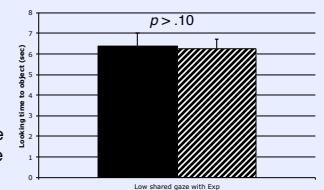
Direction of movement

- Infants did not show a difference in velocity of movements toward the Experimenter during the test trials.
- Looking at the Experimenter did not correlate with postural adjustments toward the Experimenter.

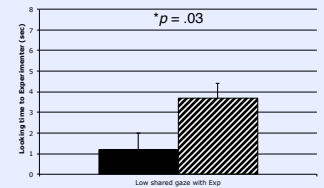


Results for the low shared gaze group

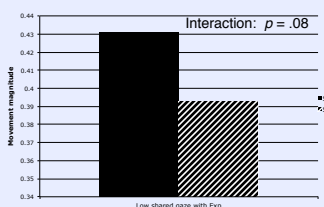
- Infants did not look significantly longer at the object during the Switch trial.
- This is the standard signature for "failure."
- This group of infants behaved quite differently, and did not demonstrate success.



- Infants looked significantly longer at the Experimenter during the Switch trial.
- The presence of the Experimenter made it possible for this differently behaving group to demonstrate success in the task as well.



- Infants moved significantly more during the Same trial.
- They demonstrated the same inverse correlation of movement and looking to the Experimenter.
- Movement measures afforded a second way for this group to demonstrate success.



- Infants likewise showed no difference in velocity of movement toward the Experimenter during the test trials.
- There was no correlation between infant looking at the Experimenter and making postural adjustments toward the Experimenter.

