



# Where you're going trumps what you're doing: Infants prefer paths over manners in dynamic displays

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## INTRODUCTION

- To learn relational terms such as verbs and prepositions, infants must parse dynamic events into components (e.g., *path, manner, source, goal, figure, and ground*).
- In this study, we focus on *paths*, or the trajectory of a figure relative to an external ground object, and *manners*, or the way a figure moves relative to an internal axis.
- Although *paths* and *manners* are present in the verbs of all languages, some languages tend to package *manners* in verbs (English; e.g., walk, run) while other languages tend to package *paths* in verbs (Spanish; e.g., ascender, salir).
- Research suggests that young children raised in both English- and Spanish-speaking countries discriminate and categorize *paths* (e.g., over) before *manners* (e.g., twist; Pruden, 2006; Pulverman & Golinkoff, 2004).
- Paths* may be conceptually central to event perception or they might simply be more perceptually salient than *manners*.
- To determine if salience drives *path* primacy, the current study attempts to increase *manner* salience. If infants prefer *manner* when *manner* salience is increased, infant preference is driven by salience. Alternatively, if infants prefer *path* regardless of *manner* salience, *path* is likely a central component of event perception.

## RESEARCH QUESTIONS

- Do infants prefer to look toward familiar paths even when the manner of action is highlighted?
- When manner salience is no longer highlighted, does infant preference change?

## METHOD

### Participants

- 20 English-reared 10- to 12-month-olds (M= 11.06 mo., SD= .87 mo.)
- 18 English-reared 13- to 15-month-olds (M= 14.74 mo., SD= .78 mo.)
- Balanced for gender. Participants were randomly assigned to condition in a between subjects design.

### Stimuli

- The current study used the same animated starfish, Starry, as Pruden (2006) and Pulverman and Golinkoff (2004).
- To heighten manner salience, Starry's arms were stretched to half of the original width and twice the original length. Stretched Starry's total circumference was then matched to Original Starry.
- Thus, Original Starry and Stretch Starry traveled along the identical *path* whereas the movement of each *manner* was greater for Stretch Starry.

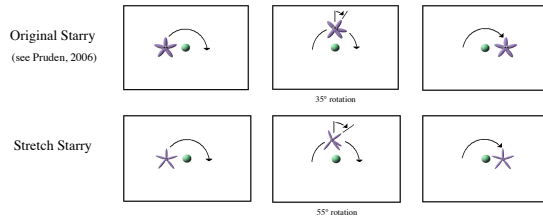


Figure 1. Original Starry (see Pruden, 2006) and Stretch Starry visual stimuli.

## Paradigm and Procedure

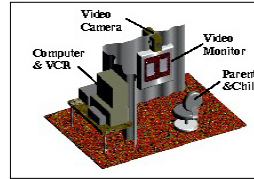


Figure 2. The Preferential Looking Paradigm (see Hirsh-Pasek & Golinkoff, 1996).

- Familiarization Trials (4 trials):
  - Stretch Starry moves around a ball in the center of the screen with a particular *manner* (e.g., twist) in a particular *path* (e.g., over)
  - Importantly, because infants are familiarized (not habituated) to the stimuli, we predict that infants will prefer familiar stimuli at test.
- Test Trials (2 trials):
  - Test trials showed scenes on a split-screen (see Table 1)
  - On one side, Starry moved around the ball in the Old Path (over) with a Novel Manner (spin). On the other side of the screen, Starry moved around the ball in a Novel Path (under) with the Old Manner (twist)
  - One test trial used Stretch Starry and one test trial used Regular Starry
  - Order of test trials was counterbalanced

	Visual Stimuli		Duration
Familiarization (4 trials)	Twist Over		12 sec. for each trial
Test Trial 1 Stretch Starry	Twist Under <i>Old Manner, Novel Path</i>	Spin Over <i>Novel Manner, Old Path</i>	12 sec.
Test Trial 2 Regular Starry	Twist Under <i>Old Manner, Novel Path</i>	Spin Over <i>Novel Manner, Old Path</i>	12 sec.

Table 1. Video Sequence

### Coding

- Each child's head and shoulders were videotaped for offline coding of gaze duration.
- Gaze direction was also coded during phases where the child saw a split-screen.
- Significant results differed from the chance looking rate of 50% to either side.

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## RESULTS

### Do infants prefer to look toward familiar paths even when the manner of action is highlighted?

- 10- to 12-month-old infants looked significantly longer toward the familiar path than the familiar manner.
- 16 of 20 younger infants preferred to look at the familiar path ( $p = .01$ )
- 13- to 15-month-old infants did not significantly look to either side of the screen, but a trend indicates familiar manner preference.

### When manner salience is no longer highlighted, does infant preference change?

- Both younger and older infants looked similarly in both the Stretch Starry and Regular Starry test trials.

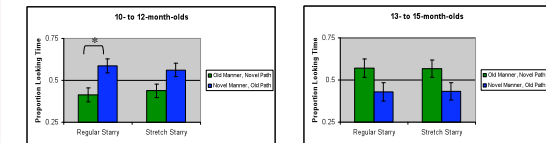


Figure 3. Proportion of looking time to *old manner-novel path* and *old path-novel manner* by 10- to 12- and 13-15-month-olds.

## DISCUSSION

- Discrimination of paths and manners provides a foundation for learning verbs in one's native language.
- Young infants attend to the familiar path even when the stimulus parameters are made more salient, suggesting that path may indeed be a central component of events.
- Parallel to previous research (Mandler, 2004; Pruden, 2006) these results suggest that path is among infants' first conceptual primitives.
- The current study also indicates that a shift from path preference toward manner preference occurs between 13 and 15 months of age.
- Further research should investigate this same question with older children to determine if the shift toward manner preference occurs only in manner-biased languages. For example, Maguire et al. (in prep) show that 3-year-old children's preference for manner is determined by their native language.

## References

- Hirsh-Pasek, K., & Golinkoff, R. M. (1996). *The origins of grammar: Evidence from early language comprehension*. Cambridge, MA: MIT Press.
- Maguire, M., et al., (in prep). A developmental shift from similar to language-specific strategies in verb acquisition: A comparison of English, Spanish and Japanese.
- Mandler, J.M. (2004). *The foundations of mind: Origins of conceptual thought*. New York: Oxford University Press.
- Pruden, S. M. (2006). Finding the actions: Factors that aid infants' abstraction of path and manner. Unpublished Dissertation, Temple University.
- Pulverman, R., & Golinkoff, R.M. (2004). Seven-month-olds' attention to potential verb referents in nonlinguistic events. In A. Brugos, L. Micculla, & C.E. Smith (Eds.), *Proceedings of the 28th annual Boston University Conference on Language Development* (pp. 473-480). Somerville, MA: Cascadia Press.