SPATIAL METAPHOR PROVIDES AN ADVANTAGE FOR WORD LEARNING

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INTRODUCTION

Spatial language is often used metaphorically to describe other domains (e.g., a *long* meeting, a *high* sound)[1]

Could spatial metaphors be widespread in part because they help children overcome the challenge of learning words for less concrete concepts?

- Children may learn spatial meaning of words before abstract meanings because abstract meanings are grounded in spatial meanings[2]
- Children may learn spatial meanings of words first because it is easier to solve the mapping problem for spatial referents compared to abstract referents[3]

Our study: Teach children novel word in one domain (space/pitch) and test for extension to other domain

1) Are words learned more easily for space than sound?
2) Once learned, can children metaphorically extend the novel word to a new domain?
3) Are children better at extending the new word from space to sound than the reverse?

METHODS

Participants: 154 3-, 4-, and 5-year-olds

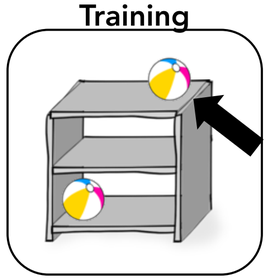
Is there a directional advantage for learning and extension?
Space to Sound **vs.** Sound to Space

Does extension depend on familiarity with metaphorical mappings?
Familiar mapping (height-pitch) **vs.** Unfamiliar mapping (thickness-pitch)

METHODS

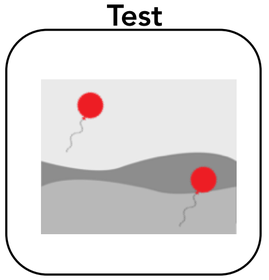
Space to Sound - learn word in spatial context, extend to auditory

Training



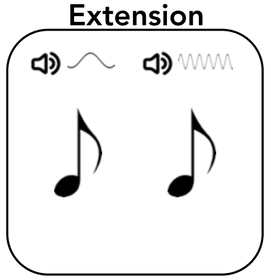
This ball is *daxy*! It is a *daxy* ball!
(2 unique trials)

Test



Can you point to the *daxy* balloon?
(4 unique trials, with feedback)

Extension



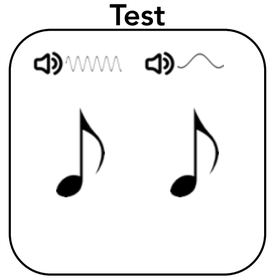
Which sound is *daxy*?
(4 unique trials, without feedback)

Sound to Space - learn word in auditory context, extend to spatial

Training

This sound is *daxy*! It is a *daxy* sound!
(2 unique trials)

Test



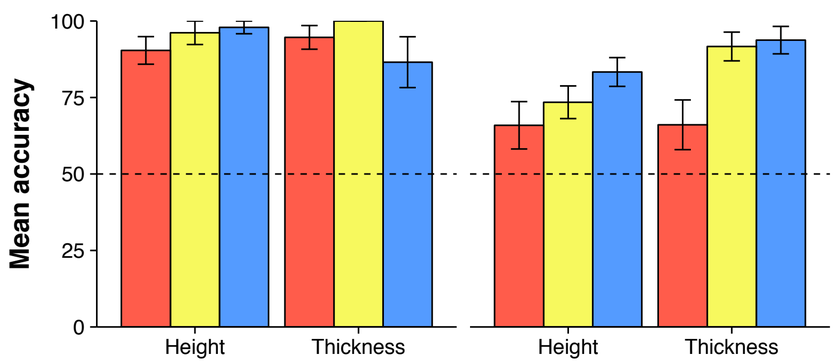
Which sound is *daxy*?
(4 unique trials, with feedback)

Extension

Can you point to the *daxy* cloud?
(4 unique trials, without feedback)

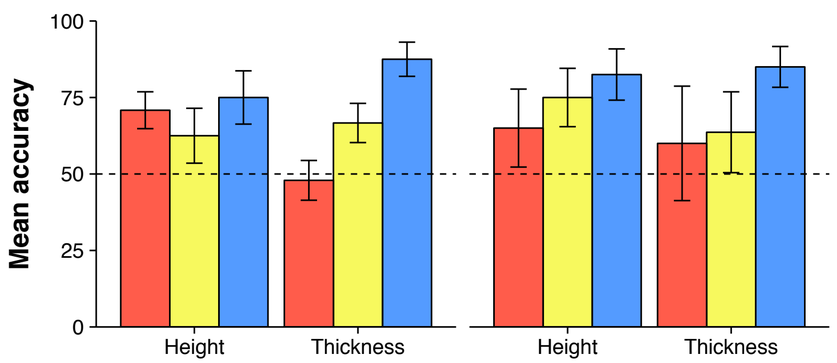
RESULTS

Learning words for space is easier than learning words for sound



Significant effects of Age, Dimension, Age by Dimension interaction; no effect of Familiarity

Metaphorical extension occurs in both directions and improves with age



Significant effect of Age only; no effect of Dimension or Familiarity; overall all age groups performed above chance

3-year-olds 4-year-olds 5-year-olds

SUMMARY

Children learned new words more easily in the spatial domain than in the pitch domain

Children metaphorically extended the new words to an untrained dimension, regardless of direction or familiarity

It may be easier to learn words for more abstract concepts when these words also carry structurally-similar spatial meanings

Historical asymmetry in metaphorical extension (concrete to abstract) can be explained by demands of word learning

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References
1. Lakoff & Johnson, (1980). *Metaphors We Live By.*
2. Casasanto et al., (2010). *Cognitive Science.*
3. Snedeker & Gleitman, (2004). *Weaving a Lexicon.*

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