Shared attention and follow-in labeling in early word learning
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Background

Toddlers learn words in the context of social interactions.

- Learners infer word meanings by observing a speaker’s intention to refer to particular objects with particular words.
- One way that children track people’s intentions is to engage in joint attention.

Joint attention skills are critical for word learning.

- 12-month-olds can use visual cues (e.g., gaze direction, pointing) to follow an adult’s focus of attention (e.g., Carpenter et al., 1998).
- 18-month-olds know that the speaker’s intention is relevant for determining the meaning of a novel word (Baldwin, 1996). They can use the speaker’s focus of attention to avoid mapping words to the wrong referents (Baldwin, 1991; 1993).
- Joint attention skills are predictive of future language skills (e.g. Carpenter et al., 1998; Morales et al., 2000; Mundy et al., 2007; Tomaszewski & Todd, 1983).

When do children become “expert” word learners?

- Younger children may learn words more easily when caregivers provide follow-in labels (Tomaszewski & Farrar, 1986; Tomaszewski & Todd, 1983).
- Although 18-month-olds may be able to use social cues to avoid mapping errors, they don’t always succeed in learning the correct mapping (Baldwin, 1991; 1993).

Current Study

How can toddlers use attention cues to learn object labels?

This experiment expands on Baldwin (1991) by adding a “shared attention” condition and more trials.

Follow-in: Speaker labels target while the child is holding and looking at it.

Disruptive: Speaker labels target while the child is holding and looking at a distractor.

Procedure

- Familiarization: Experimenter presents two novel objects and introduces each (see conditions above). One object is labeled; the other is not (Look at that! What do you have? etc.).
- Test: Experimenter presents two objects on a tray and asks for one of them (e.g. I put the box in here! Do you see the box? Point to the box?)
- Alternating novel and familiar pairs: 3 trials with novel objects, 2 trials with familiar objects.
- 6 items (2 per labeling condition) * practice item with familiar objects only

Results

- 6 participants excluded for poor accuracy on familiar items (<67%, n=5), or low number of completed trials (<18 trials out of 35, n=1).
- Significant main effect of vocabulary size (see figure), and interaction with labeling condition: vocabulary effect weaker in the disrupt condition.
- No effect of age.

Word Learning

How well can toddlers use attention cues to learn object labels?

Joint Attention

Are joint attention skills related to vocabulary size?

- Adults sit next to child. After obtaining eye contact, the adult turns, looks, and points (short arm) toward one of two targets.
- Coded child behavior for 6 seconds following the point:
  - no eye contact at beginning of trial
  - immediate or delayed look to target
  - never looked to target
  - 20 points total

Results

- Children with larger vocabularies are significantly more likely to follow a point to the target.
- Age was not a significant predictor of looking behavior.

Parents Labeling

How do parents label novel objects for their children?

- Recorded 10 minutes of play interaction between parent and child. Provided a box of 12 toys with unfamiliar labels (e.g. pterodactyl, rake, etc.). (See pictures in first section.)
- Coded all parent utterances containing a label for one of the provided toys.
- Follow-in: parent labels toy that child is holding and looking at
- Shared attention: parent labels toy in shared space that child and parent are both looking at
- Disruptive: parent labels toy while child is focused on a different toy

Results

- Number of target labels ranged from 6 to 68 across dyads.
- 2 dyads excluded from further analysis because parent/child behaviors were not visible in the video for >50% of labels.
- Labels in shared attention contexts were significantly more common than labels in follow-in or disruptive contexts (see figure).
- No significant relationship between the parents’ labeling strategies and the child’s vocabulary size.
- Disruptive labels become less likely as the child gets older.

Future Directions

- Longitudinal data are needed to infer the causal relationships between joint attention skills, parent behavior, and vocabulary size.
- Skills that underlie such a prolonged developmental trajectory in typically-developing children may be particularly valuable in developmental disorders. In an ongoing study we are comparing word learning and joint attention skills in typically-developing children and children with Williams syndrome.

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Conclusions & Future Directions

18-24 month-olds have some difficulty using social cues for word learning.

- Only the most advanced 18-24 month-olds succeed in the word learning task. Even the high-vocabulary group shows chance performance in the disrupt labeling condition.
- However, children perform as well or better in the shared attention condition as the follow-in condition. Since word learning requires social inferences, not just associations, follow-in labeling isn’t necessarily easier.

Parents usually label objects in shared attention contexts, but show sensitivity to their child’s joint attention skills.

- Parents provide more follow-in labels for children with weaker joint attention skills.
- The reduction in disruptive labels for children with stronger point following skills (and older children) may reflect the child’s increasing contributions to coordinating social interactions.

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