Infants exploit relations between linguistic and conceptual structure to infer the types of events that a new verb can label [1-3]. What are these structures, and how do infants map between them?

**Linguistic Structure**

When and how do infants perceive sentences as transitive?

Can infants use verb knowledge to predict a direct object?

- 19-month-olds and some 16-month-olds interpret the *tig* as the patient of wiping in (1-2), but as the instrument of wiping in (3-4) (4):
  1. (1) DIC: She’s *wiping* the *tig*.
  2. (2) PP: She’s *wiping* the *tig*.
  3. (3) DO & PP: She’s *wiping* that thing with the *tig*.
  4. (4) Novel verb: She’s *meeting* with the *tig*.

- Hypothesis: infants predict an upcoming direct object (DO) for known transitive verbs, and can’t revise this prediction
  - Prediction: performance at 16 months depends on experience with these verbs

- Results:
  - 16-month-olds with no verb vocabulary look more to the instrument when they hear PP sentences.
  - Verb-producing 16-month-olds prefer the patient for both DO and PP sentences.

- Further questions:
  - Will infants’ prediction for a DO be satisfied by an object WH-question?
  - Currently testing: What is she *wiping* with the *tig*?
  - How do high-verbability infants parse PP sentences?

Do infants recognize transitivity in non-canonical clauses?

Clauses with non-canonical word orders may be difficult to recognize as transitive:

- Passive: The monkey was fed.
- WH: Which monkey is the frog feeding?
- RC: Find the monkey that the frog is feeding...

- Hypothesis: no, they notice that a predicted object for the verb is missing, and search for referent (i) → Prediction: performance depends on verb knowledge, and therefore vocabulary

- Results: vocabulary, but not age, predicts looks to target (WH: p=0.0057; RC: p=0.0498)

- Further questions:
  - When do infants understand a WH-phrase as an object? Underway.
  - Can infants learn that a novel verb in a WH-object question is transitive? Upcoming.

**Conceptual Structure**

When viewing particular scenes, what participant relations do infants readily perceive?

What events do infants view as having 3 participants?

- Adults perceive the following events as having 3 participants [9], even though they admit transitive descriptions. What about pre-linguistic infants (9-12 months?):
  1. (10) JAMINGBRt(x,y,z) or JAMINGBRt(WITH(x,y,z))?
  2. (11) STEALINGBRt(x,y,z) or STEALINGBRt(WITH(x,y,z))?

- Habituation method: habituate to an event, then measure dishabituation to a change in participant number (critical contrast) or direction/manner (perceptual contrast).

- JIMMY: Infants dishabituate to addition or subtraction of the instrument but not to change in direction → they view the scene under a 3-place event concept with the instrument as a participant.

- STEAL: will infants dishabituate to addition or subtraction of victim, but not change in manner? Underway.

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Do infants expect arguments to match participants one-to-one?

One bootstrapping hypothesis proposes that infants expect one-to-one participant-to-argument matching (PAM) [2,3,10], but previous results [10,11] are consistent with other possibilities:

- (12) PAM: Arguments Name Participants, but need not match one-to-one [12]

- (13) Thematic role sensitivity: objects name participants, clauses with objects often label changes of state [13-18]

- “Violation of Fit” method: familiarize to an event, then measure infants’ surprise upon hearing a particular clause type describing it

- PAM vs. ANP: infants look longer when hearing an intransitive than a transitive description of a KNOCKING-OVER → surmise that hearing an intransitive label this 2-participant event: a stronger strategy than ANP.

- Further questions: PAM vs. thematic roles
  - Is this effect driven by argument number (PAM) or argument role?

  Currently testing intransitives with inanimate subjects (8 just blinked)

  What meaning will infants infer for a novel transitive verb labelling a 3-participant STEALING event? Upcoming.

Mapping between Linguistic and Conceptual Structure

How do infants draw inferences about verb meanings on the basis of linguistic structure?

Can infants filter non-canonical clauses to learn verb transitivity?

Infants who do not perceive object WH-questions as transitive might infer that *fix*, like *eat*, can be intransitive. Infants may need to “filter” non-canonical clauses [1,7,8]:

- (8) What did Amy eat? What did Amy fix?
- (9) Amy ate *Amy fixed.

Problem: infants may need to know verb transitivity to identify non-canonical clauses [6], so how can they filter them for verb learning?

- New solution: filter sentences that may have been mis-parsed, without knowing whether they are non-canonical clauses

- Our model: uses distribution of direct objects within and across verbs as its only signal, jointly infers transitivity of each verb and frequency of parsing errors

- Results: model learns accurate parameters for its input filter and correctly infers transitivity for majority of verbs

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References: