Syntactic bootstrapping with minimal verbal morphology
Learning Mandarin Chinese attitude verb meanings
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Learning the meanings of attitude verbs via syntactic bootstrapping

- Belief and desire verbs describe mental states that lack stable physical correlates.
- Their meanings are difficult to learn from the situational context alone.
- How do children learn that these verbs have different semantics?

Syntactic bootstrapping: learners relate observed morphosyntactic cues to meanings, using principled links, e.g. Gleitman ‘90; Gleitman et al. ‘05, also Lasnik ‘83/’89.

Hypothesis: the learner
(i) Observes that in morphosyntactic terms, there are two classes of attitude verbs, and
(ii) Infers that this corresponds to a difference in verb semantics.

What kinds of morphosyntactic cues might children be sensitive to?

Cross-linguistically, the complements of belief and desire verbs differ morphosyntactically in a principled fashion.

"Declarative main clause syntax" hypothesis: complements of belief verbs have the syntactic features found in declarative main clauses, e.g. Dayal & Grimshaw ’09; Hacquard ’14; White et al. ’16.
- Feasible in Romance, English, German, e.g. Bolinger ’68, Scheffler ’09.

Verbs

Syntactic property of complement

Belief
- Romance Indicative
- English Finite
- German V2 possible

Desire
- Subjunctive
- Non-finite
- No V2

Declarative main clauses
- Indicative
- Finite
- V2


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Can syntactic bootstrapping help one learn attitude verb meanings in languages with minimal (verbal) morphology?

Mandarin Chinese:
- No mood / tense / case morphology
- No finiteness distinction (Hu et al. ’01)
- Allows null subjects

Certain syntactic properties distinguish belief verb complements from desire verb complements

While exceptions exist, overt subjects and auxiliaries are possible in belief verb complements and in declarative main clauses.
- Consistent with the declarative main clause syntax hypothesis.
- Some of these properties have been discussed in the syntax literature, on whether Chinese makes a finiteness distinction.

Overt subject possible in complement (Huang ’89)

   L think / believe J eat-vegetarian
   ‘Lisi thinks/believes John is vegetarian.’

1b. Lisi (yao / xiang) (‘John’) chi-su.
   L want J want J eat-vegetarian
   Intended: ‘Lisi wants John to be vegetarian.’

Modal auxiliary (e.g. future, epistemic modal) (pace Hu et al. ’01)

2a. Lisi renwei John (‘hui / yiding’) chi-su.
   L think J will necessary eat-vegetarian
   ‘Lisi thinks that he [will / must] be vegetarian.’

2b. Lisi (yao / xiang) (‘hui / yiding’) chi-su.
   L want J will necessary eat-vegetarian
   Intended: ‘Lisi wants to be vegetarian (in the future).’
   In all of Lisi’s desire worlds, it is necessary that he is vegetarian.

A-not-A yes/no question morphology (Huang ’82, McCawley ’94)

3a. Lisi renwei John chi-bu-chi-su?
   L think J eat-NEG-eat-vegetarian
   ‘Does Lisi think John is vegetarian, or does Lisi think John is not?’

3b. * Lisi (yao / xiang) chi-bu-chi-su?
   L want eat-NEG-eat-vegetarian
   Intended: ‘Does Lisi want to be vegetarian, or does Lisi want to not be vegetarian?’

Syntactic cues in the input in Mandarin are distributed differently for belief and desire verbs.

Next step: apply a learning algorithm to the data. Is the distribution of syntactic cues sufficiently different for a child to infer meaning differences?