Syntactic priming in two-year-old children

Anouschka Foltz 1,2, Karolin Knopf1, Kristina Thiele1,3 & Prisca Stenneken 1,2,3

1 Clinical Linguistics, Bielefeld University; 2 Collaborative Research Center 673 “Alignment in Communication”, Bielefeld University
3Center of Excellence “Cognitive Interaction Technology” (CITEC), Bielefeld University

Introduction

- Debate about the abstractness of young children’s syntactic representations:
  - Item-based accounts (e.g., Tomasello, 2000)
  - Vs. early abstractionist accounts (e.g., Fisher, 2002)
- Syntactic priming studies: evidence of abstract syntactic representations in production as early as three years of age (e.g., Shimpi, Gámez, Hultenhecher & Vasilyeva, 2007)
- Debate about the mechanism behind syntactic priming:
  - Short-lived activation
  - Vs. longer-lived implicit learning (cf. Pickering & Ferreira, 2008)
- This study extends the syntactic priming paradigm for use with German-speaking two-year-old children
- Research question:
  - Can we find evidence for abstract syntactic representations in two-year-olds?
  - Is syntactic priming short-lived or longer-lived?

Syntactic priming task

- Simple syntactic structures so that two-year-olds can do the task
- Comprehension-to-production task
- Task pragmatically embedded in a question-answer context: Was macht Emma? (What is Emma doing?)
- First 6 baseline trials (child describes what Emma is doing)
- Then 12 priming trials (experimenter and child alternate descriptions)
- No lexical overlap between prime and target
- Early-acquired nouns and verbs

Experiment 1

Syntactic priming in older two-year-olds (2;7 to 2;11)
- Participants 15 (7 male, 8 female) native German-speaking children (mean age = 2;9; SD = 0;1)

Results

- Baseline: clear preference for intransitive over transitive responses (49 intransitive vs. 17 transitive)
- We therefore look whether children are primed to use transitive infinitive structure.
- Mixed-effects models with treatment coding.
- Priming effect:
  - Significantly more transitive infinitive responses following transitive prime compared to baseline (p < 0.01)
  - Significantly more transitive infinitive responses following transitive prime compared to intransitive prime (p < 0.05)
- What is primed? Syntax (abstract syntactic structure) or semantics (number of thematic roles)?
- If merely the number of thematic roles was primed (i.e. producing an action and a patient/theme rather than just an action), transitive primes should also have led to an increase in transitive conjugated responses
- But not more transitive conjugated responses following transitive prime compared to baseline (p = 0.405)
- But not more transitive conjugated responses following transitive prime compared to intransitive prime (p = 0.788)
- Thus, the priming effect is syntactic in nature

Preliminary evidence for implicit learning:
- Priming was marginally stronger in the second (marginal priming effect; p = 0.08) compared to the first half of the experiment. (no priming effect: p = 0.16)

Experiment 2

Syntactic priming in younger two-year-olds (2;0 to 2;6)
- Participants 15 (7 male, 8 female) native German-speaking children (mean age = 2;3; SD = 0;2)

Results

- Baseline: clear preference for intransitive over transitive responses (52 intransitive vs. 8 transitive).
- We therefore look whether children are primed to use transitive infinitive structure.
- Mixed-effects models with treatment coding.
- No priming effect:
  - Not more transitive infinitive responses following transitive prime compared to baseline (p = 0.135)
  - Not more transitive infinitive responses following transitive prime compared to intransitive prime (p = 0.143)
- Observation: numeric increase in noun responses following transitive primes - failed attempts to use transitive structure?

Discussion and Conclusions

- Older two-year-olds:
  - Clear priming effect: First study to show that children this young possess abstract syntactic representations.
  - Priming found from comprehension-to-production and on a trial-by-trial basis: evidence that representations are “relatively robust and accessible” (Messenger et al. 2011, 2012)
- Younger two-year-olds:
  - No priming effect.
  - Suggests that abstract syntactic representations develop (or strengthen) during the third year of life.
- Item-based vs. early abstractionist accounts:
  - Results better compatible with early abstractionist accounts.
- Abstract syntactic representations (at least for transitive structures) develop earlier than assumed in item-based accounts.
- Short-lived activation vs. longer-lived implicit learning:
  - Tentative support for implicit learning account of syntactic priming: Priming marginally increased over the course of the experiment.

References: