Language Production I

9.19 – Roger Levy – Fall 2023

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Syntactic priming

Principles of speaker choice

Prosody as a syntactic disambiguator in language production?

(Non-)linguistic ambiguity avoidance

Language Production: the main questions

▶ What is the relationship between a speaker's *intended meaning* and *what a speaker says to express that meaning?*

Language Production: the main questions

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- ▶ What factors influence *speaker choice?*

Language Production: the main questions

- ▶ What is the relationship between a speaker's *intended meaning* and *what a speaker says to express that meaning?*
- ▶ What factors influence *speaker choice*?
- ▶ To what extent is speaker choice governed by what might be called *egocentric* considerations, versus considerations of *audience design*?

Syntactic priming

▶ Canonical case: *dative alternation*
  (Prime A) Susan handed Mary a shoe.
  (Prime B) Susan handed a shoe to Mary.

```
    Jane      a shoe
  Stephanie   handed
```

Syntactic priming

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  (Prime B) Susan handed a shoe to Mary.

  ```
      Jane      a shoe
   Stephanie   handed
  ```

- ▶ Classic result:
  - ▶ speakers are more likely to produce type A when primed with type A
  - ▶ speakers are more likely to produce type B when primed with type B

Syntactic priming II

> *(Prime A) Susan handed Mary a shoe.*
> *(Prime B) Susan handed a shoe to Mary.*

▶ Why is this interesting? What does it allow us to probe?

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- ▶ The argument has been that it allows us to probe *underlying linguistic representations*
- ▶ Underlying logic: if a prime P causes production preference of a target T to be more like P, then the way in which the realization is "more like P" must be cognitively represented
- ▶ Prime & target sharing verb *handed* → the word *handed* has cognitive representation

Syntactic priming III

▶ Active/passive alternation

(Prime A) The construction worker was hit by the bulldozer.
(Prime B) The construction worker was digging by the bulldozer.
(Prime C) The construction worker drove the bulldozer.
(Target) [picture of a bee stinging a man]

Syntactic priming III

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- ▶ More active descriptions after active primes than after passive primes

- ▶ What effect do you think the locative primes had?

- ▶ The same effect as the passive primes!

Syntactic priming IV

▶ Prepositional dative & infinitive
(Prime A) Susan brought a book to Stella.
(Prime B) Susan brought a book to study.
(Prime C) Susan brought a student a book.

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▶ Target:

Syntactic priming V

▶ In this case, the infinitive primes acted like the ditransitive (double-object) primes

Syntactic priming V

- In this case, the infinitive primes acted like the ditransitive (double-object) primes
- Speakers distinguish syntactic representations above and beyond surface (word-sequence) form

Principles of speaker choice

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    - ▶ *Gar!!!!*

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  - What I wouldn't give for a {croissant/tofu dog/(etc)}!
  - *Gar!!!!*
- Intuitive answer: *we do!!!*
- But is this a satisfactory answer? Philosophically difficult problem
- Also, everyone has had the experience of words "slipping out of their mouth"

Principles of speaker choice VI

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  - ▶ *the family (that) Micah feeds*

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    the bee stung the man ↔ *the man was stung by the bee*

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    the bee stung the man ↔ *the man was stung by the bee*
- What principles govern our preferences among these?

Principles of speaker choice VII

Some possibilities:

- ▶ AVAILABILITY: say what you are ready to say; if not, delay

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  ▶ If what you need to say isn't available yet, buy time by saying
  something easy to produce:

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     This is the family. . .

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  ▶ If what you need to say isn't available yet, buy time by saying
    something easy to produce:

   This is the family... {ummm/that}...

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Some possibilities:

- ▶ SMALL CAPS AVAILABILITY: say what you are ready to say; if not, delay
    - ▶ Retrieving lemmas is difficult and takes time
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         {bee,man}

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    - ▶ If what you need to say isn't available yet, buy time by saying something easy to produce:

         This is the family. . . {ummm/that}. . . Micah feeds

Principles of speaker choice VIII

Another possibility:

▶ AUDIENCE DESIGN: say things that make comprehension easier for your addressee

Principles of speaker choice VIII

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Principles of speaker choice VIII

Another possibility:

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   ▶ ＼ *bat. . .*

Principles of speaker choice VIII

Another possibility:

▶ AUDIENCE DESIGN: say things that make comprehension easier for your addressee

  ▶ *bat...* → ?

Principles of speaker choice VIII

Another possibility:

▶ AUDIENCE DESIGN: say things that make comprehension easier for your addressee

    ▶ *bat...* → ? → *baseball bat!*

Principles of speaker choice VIII

Another possibility:

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    ▶

Principles of speaker choice VIII

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  ▶ ⟍ *bat...* → 🦇*?* → *baseball bat!*

  ▶ 🐸 *tap the frog with the flower?*

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Another possibility:

- ▶ AUDIENCE DESIGN: say things that make comprehension easier for your addressee

  - ▶ *bat...* → *?* → *baseball bat!*

  - ▶ *tap the frog with the flower?*
    → (instrument interpretation available)

Principles of speaker choice VIII

Another possibility:

- ▶ AUDIENCE DESIGN: say things that make comprehension easier for your addressee

    - ▶ ✎ *bat...* → 🦇*?* → *baseball bat!*

    - ▶ 🐸 *tap the frog with the flower?*
        → (instrument interpretation available)
   → *tap the frog that has the flower!*

Principles of speaker choice IX

Comparison between the principles:

▶ Availability-based production is greedy and speaker-centric

Principles of speaker choice IX

Comparison between the principles:

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▶ Audience design is more altruistic and listener-centric

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▶ The latter is probably harder—why???

Principles of speaker choice IX

Comparison between the principles:

- ▶ Availability-based production is greedy and speaker-centric
- ▶ Audience design is more altruistic and listener-centric
- ▶ The latter is probably harder—why???
- ▶ How can we tell the two apart experimentally???

Disambiguating prosody?

"Tap the frog with the flower."
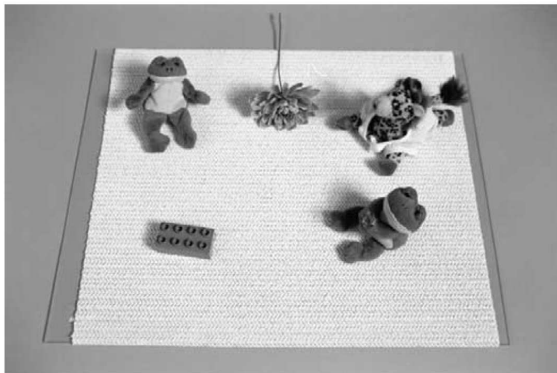
Disambiguating prosody? II
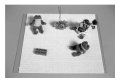
▶ Snedeker and Trueswell (2003) took participant pairs and divided them into Speakers and Listeners; each saw the same scene
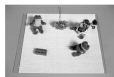
Disambiguating prosody? II
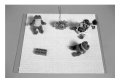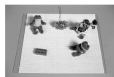

- ▶ Snedeker and Trueswell (2003) took participant pairs and divided them into Speakers and Listeners; each saw the same scene
- ▶ For the Speaker, the Experimenter either:

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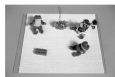
▶ Snedeker and Trueswell (2003) took participant pairs and divided them into Speakers and Listeners; each saw the same scene

▶ For the Speaker, the Experimenter either:
  ▶ used her hand to tap the frog holding the small flower (MODifier demonstration); or

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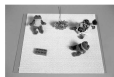
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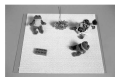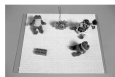- ▶ Speaker got a card with one of these sentences:

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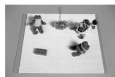
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- Speaker got a card with one of these sentences:
    1. *Tap the frog with the flower.* (AMBIGuous sentence, MOD)
    2. *Tap the frog with the flower.* (AMBIGuous sentence, INST)
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  1. *Tap the frog with the flower.* (AMBIGuous sentence, MOD)
  2. *Tap the frog with the flower.* (AMBIGuous sentence, INST)
  3. *Tap the frog that has the flower.* (UNAMBIGuous, MOD)
 4. *Tap the frog by using the flower.* (UNAMBIGuous, INST)

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  3. *Tap the frog that has the flower.* (UNAMBIGuous, MOD)
  4. *Tap the frog by using the flower.* (UNAMBIGuous, INST)
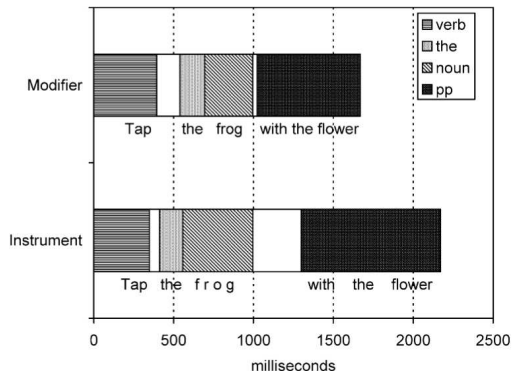- ▶ Speaker then had to speak the sentence to the Listener

Disambiguating prosody? III
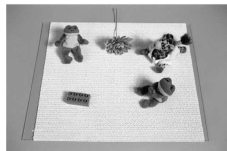
► How did the Listeners fare?
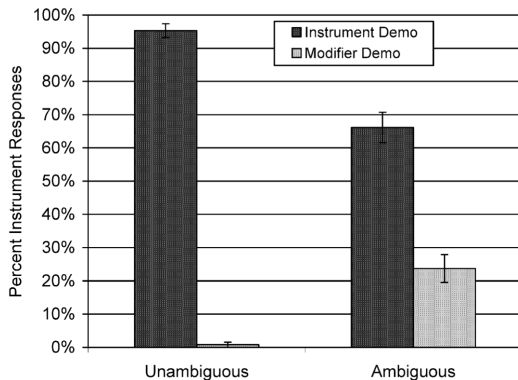
Disambiguating prosody? IV

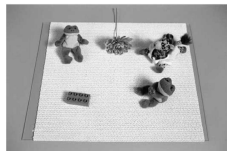▶ How did the ambiguous utterances look?

Disambiguating prosody? V

▶ The experimental manipulation really "hit the participants over the head" with the attachment ambiguity
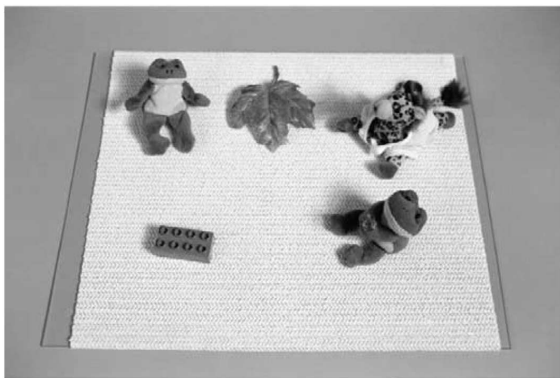
Disambiguating prosody? V

▶ The experimental manipulation really "hit the participants over the head" with the attachment ambiguity

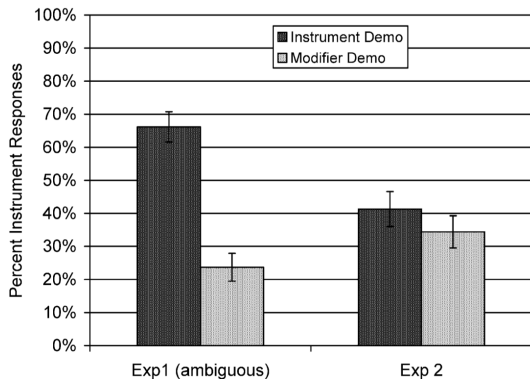▶ What if the context didn't make the attachment ambiguity so apparent?

Disambiguating prosody? VI

Snedeker and Trueswell (2003) Experiment 2: give the Speaker and Listener different scenes!
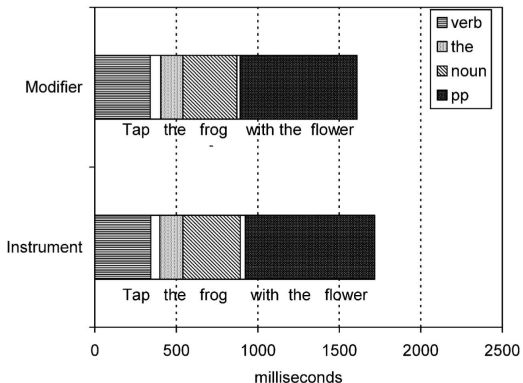
Disambiguating prosody? VII

Comprehension results:

Disambiguating prosody? VIII

Prosody in Experiment 2:

Disambiguating prosody? IX

Bottom lines:

▶ Speakers can use prosody to provide cues for syntactic disambiguation

Disambiguating prosody? IX

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▶ They don't always do this successfully

Disambiguating prosody? IX

Bottom lines:

- ▶ Speakers can use prosody to provide cues for syntactic disambiguation
- ▶ They don't always do this successfully
- ▶ Syntactic ambiguity resolution cues hugely reduced when context doesn't make it hugely evident

Ambiguity avoidance

▶ Recap: speakers use prosody to avoid PP attachment
  ambiguity when the context "hits them over the head with the
  ambiguity"

  Tap the frog with the flower

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▶ Raises other important questions

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▶ Raises other important questions

   ▶ What other means are there of avoiding ambiguity in linguistic
      communication?

Ambiguity avoidance

▶ Recap: speakers use prosody to avoid PP attachment
  ambiguity when the context "hits them over the head with the
  ambiguity"

  Tap the frog with the flower

▶ Raises other important questions
  ▶ What other means are there of avoiding ambiguity in linguistic
    communication?
  ▶ How effectively do speakers use these means?

Ambiguity avoidance

▶ Recap: speakers use prosody to avoid PP attachment ambiguity when the context "hits them over the head with the ambiguity"

Tap the frog with the flower

▶ Raises other important questions
  ▶ What other means are there of avoiding ambiguity in linguistic communication?
  ▶ How effectively do speakers use these means?
  ▶ How does context affect speaker sensitivity to ambiguity avoidance?

Ambiguity avoidance X

- ▶ Let's distinguish what Ferreira et al. (2005) call LINGUISTIC versus NON-LINGUISTIC ambiguity

Ambiguity avoidance X

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  ▶ Linguistic ambiguity:

bat   bat

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- Let's distinguish what Ferreira et al. (2005) call LINGUISTIC versus NON-LINGUISTIC ambiguity
  - Linguistic ambiguity:

(baseball) bat   (flying) bat

Ambiguity avoidance X

▶ Let's distinguish what Ferreira et al. (2005) call LINGUISTIC versus NON-LINGUISTIC ambiguity

    ▶ Linguistic ambiguity:

           (baseball) bat   (flying) bat

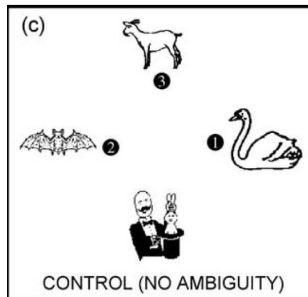   ▶ Non-linguistic ambiguity:

          bat   bat

Ambiguity avoidance X

- Let's distinguish what Ferreira et al. (2005) call LINGUISTIC versus NON-LINGUISTIC ambiguity
  - Linguistic ambiguity:

    (baseball) bat   (flying) bat

  - Non-linguistic ambiguity:

    (big) bat   (small) bat

Ambiguity avoidance XI

▶ How could we test experimentally for possible differences in speaker behavior with respect these two types of ambiguity?
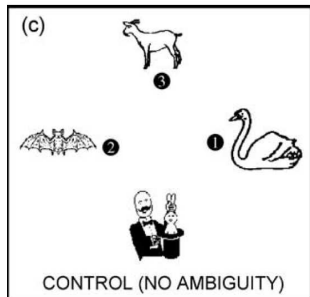
Ambiguity avoidance XII

▶ Ferreira et al. (2005) used three different types of displays.
Control display:

Ambiguity avoidance XII

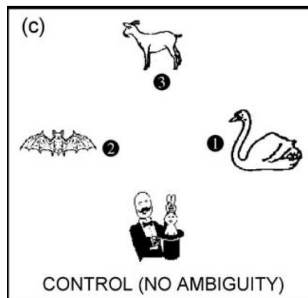▶ Ferreira et al. (2005) used three different types of displays.
  CONTROL DISPLAY:

CONTROL (NO AMBIGUITY)

▶ Participant's task: name either (a) all, or (b) the
  second-to-last, of the figures moved to by the dot

Ambiguity avoidance XII

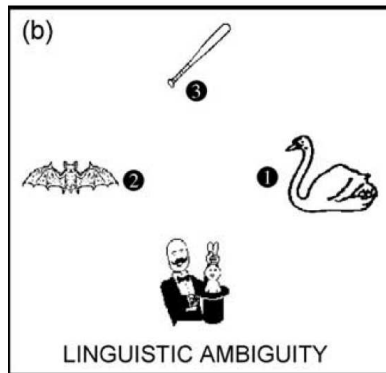- ▶ Ferreira et al. (2005) used three different types of displays.
  CONTROL DISPLAY:

- ▶ Participant's task: name either (a) all, or (b) the
  second-to-last, of the figures moved to by the dot
- ▶ Also: an addressee (real or hypothetical) had to match the
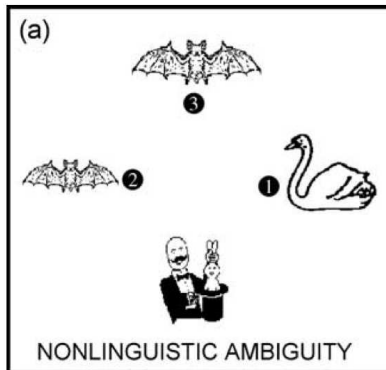 names to the pictures.

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Ambiguity avoidance XIII

▶ Display with linguistic ambiguity:

Ambiguity avoidance XIV

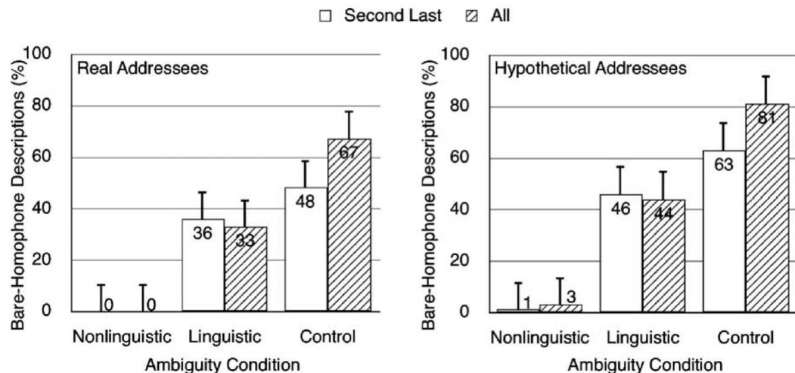▶ Display with non-linguistic ambiguity:

Ambiguity avoidance XV

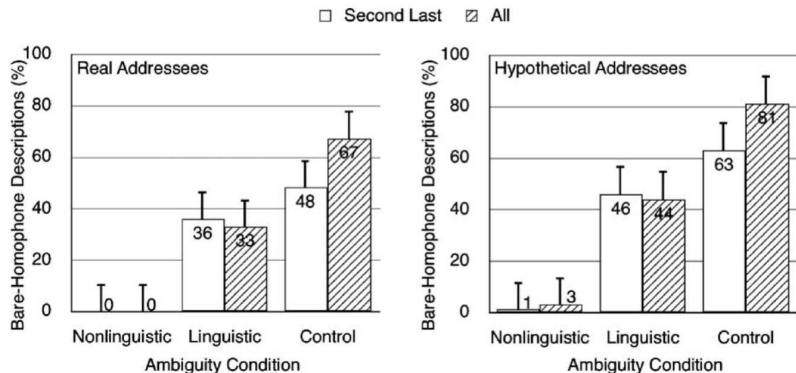▶ So. . . what are the predictions made for this experiment?

Ambiguity avoidance XV

▶ So. . . what are the predictions made for this experiment?

▶ If speakers are aware of a given type of linguistic ambiguity, they should avoid BARE DESCRIPTIONS (e.g., *bat*) for the target figures
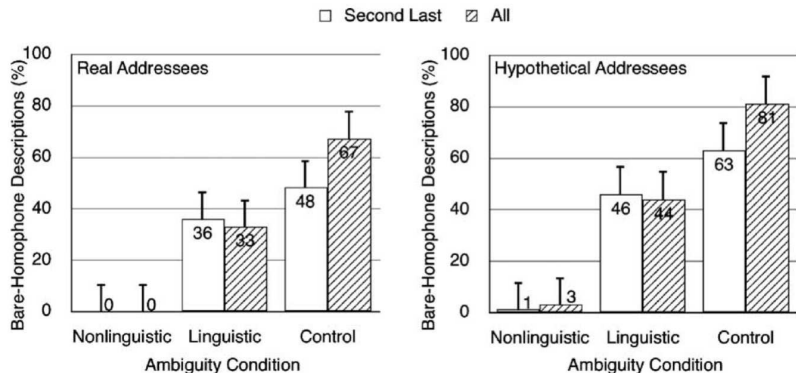
Ambiguity avoidance XVI: results

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- ▶ Speakers were hugely sensitive to non-linguistic ambiguity (small vs. large bat)

Ambiguity avoidance XVI: results

- ▶ Speakers were hugely sensitive to non-linguistic ambiguity (small vs. large bat)
- ▶ Speakers were also sensitive to linguistic ambiguity, but less so

Ambiguity avoidance XVII

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▶ What else could affect ambiguity detection?

Ambiguity avoidance XVII

▶ Any ambiguity would need to be *detected* before it could be consciously avoided

▶ Suggests that speakers are worse at detecting linguistic ambiguity than non-linguistic ambiguity?

▶ This is a really neat result, but there are issues that are left unresolved

▶ What else could affect ambiguity detection?

▶ *Order of presentation* could be hugely important—foil (e.g., is the FOIL ↘ before or after target?)

Ambiguity avoidance XVIII

▶ Two follow-up experiments (minor differences between them) crossed ambiguity condition with foil position (before/after)

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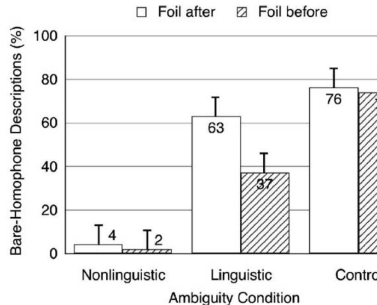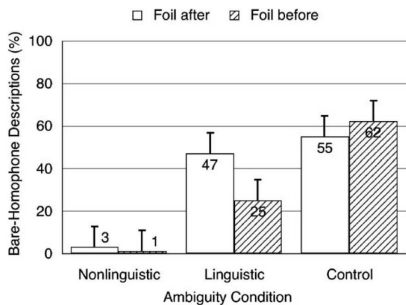
Ambiguity avoidance XIX

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- ▶ After-the-fact-of-prior-production ambiguity avoidance is much easier

Ambiguity avoidance XIX

▶ Foil position *does* have an important effect

▶ After-the-fact-of-prior-production ambiguity avoidance is much easier

▶ Bottom line: even when ambiguity avoidance is an express goal of the speaker, it's hard because ambiguity *detection* is hard

References I

Ferreira, V. S., Slevc, L. R., and Rogers, E. S. (2005). How do speakers avoid ambiguous linguistic expressions? *Cognition*, 96:263–284.

Snedeker, J. and Trueswell, J. (2003). Using prosody to avoid ambiguity: Effects of speaker awareness and referential context. *Journal of Memory and Language*, 48:103–130.