Hearing Syntax

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Introduction

- Work on syntax by the cognitive linguistics movement has tended to focus on how semantics can constrain grammatical constructions.

  - construal (e.g., figure and ground, perspectivization)

  - information structure

Introduction

- We want to focus on the other side of the Saussurean coin to show how phonology can act as a constraint on grammatical constructions.

- The grammar fragment we have chosen is the Spanish *Hay X y (hay) X'*-construction, which is similar, though not identical, to its English counterpart (2):

  (1) *Hay mentiras y (hay) mentiras.*
  (2) *There are lies and ((then) there are) lies.*

Some ways in which phonology correlates with syntax

- *Phonological complexity:* Grammatical words tend to be phonologically less complex cross-linguistically than lexical words in terms of, e.g., tonic accents, vowel duration, and syllabic structure (see, e.g., Kelly 1992, Morgan *et al*. 1996, Shi *et al.* 1998, 1999).

Some ways in which phonology correlates with syntax

- *Regularity in morphophonology:* Morphophonological cues often correlate very well to grammatical classes and features (see e.g. Kelly 1992, MacWhinney 1998, Maratsos 1988)

Some ways in which phonology correlates with syntax

- *Intonation units and prosodic cues:* Croft (1995) has shown that intonation units correspond very closely to grammatical units. Furthermore, prosody and intonation-unit segmentation seems to provide parsing cues that help indicate and disambiguate grammatical structure (see, e.g., Gilboy & Sopena 1996, Morgan *et al.* 1987, Schafer *et al.* 2000).

Some ways in which phonology correlates with syntax

- *Grammaticality judgments:* Intonation can dictate whether a given syntactic string is well-formed or not:

  - *Mad Magazine*-sentences

    (3) a. *HIM, finish his thesis?*
        b. **Him finish his thesis.*

Some ways in which phonology correlates with syntax

- Spanish *pero si-* construction (Montolío 1999)

  (4) *Pero si   YA   lo he   hecho.*

      But   if already it have-I done

      'What are you talking about: I've already done it'

      *? Pero si ya lo he hecho.

          But   if already it have-I done

          'But if I've already done it'

The Hay X y (Hay) Y-construction

- The Spanish construction "Hay X y hay Y" has two versions:

Enumerative:

(5)

- *Hay vida y hay calor* (from "Viva España")
  'There's life and there's wamth'

- *Hay crimen y hay injusticia*
  'There's crime and there's injustice'

- *Hay infraestructura y hay tecnología*
  'There's infrastructure and there's technology'

The Hay X y (Hay) Y-construction

Contrastive:

(6)

- *Hay ricos y hay pobres*
  'There's the rich and there's the poor'

- *Hay alegrías y hay tristezas*
  'There are happy times and and there are sad times'

- *Hay riesgos y hay oportunidades*
  'There are risks and there are oportunities'

- *Hay frío y hay calor*
  'There's coldness and there's warmth'

The Hay X y (Hay) X variant

- Special case: Hay X y (hay) X':

    (7) *Hay libros y hay libros*

    'There are books and there are books'

- Likely intepretation:
    - There are *(good)* books and there are *(bad)* books

    Other contextual possibilities:

a. There are *(interesting)* books and there are *(boring)* books

b. There are *(expensive)* books and there are *(cheap)* books

c. There are *(well-written)* books and there are *(poorly-written)* books

The [Hay X y X] variant

This [Hay X and (hay) X] construction can again have two readings:

(8) Enumeration

- *Hay días y días*

  'There are many days'

- *Hay mujeres y mujeres*

  'There are many women'

The [Hay X y Y] variant

(9) Contrast:

- *hay marxistas y marxistas* (Che Guevara)
  'There are marxists and marxists'
- *hay lágrimas y lágrimas*
  'There are tears and tears'
- *hay clientes y clientes*
  'There are customers and customers'
- *hay comentarios y comentarios*
  'There are comments and comments'

Contrastive Hay X y X

- Morphosyntactically, the contrastive version tends overwhelmingly to be plural, count nouns with a "generic" reading

- Semantically, the contrastive version could be considered a 'hedging' construction, informing the hearer about the existence of different subgroups within a given category (cf. *There are books and books*)

Brief phonological description

- *Rhythm*

In the contrastive version, there is a pause between the first X variable and the conjunction 'y':

(10) Hay mentiras / y mentiras

    'There are lies and lies'

In the enumerative version, no separation or alteration of the rhythm is found

(11) Hay mentiras y mentiras

Brief phonological description

- ***Intonation***

In the contrastive version, the first conjunct has a rising tone, while the second decreases

(12) Hay mentiras ↑ y mentiras ↓

In the enumerative version, both conjunct have a rising tone

(13) Hay mentiras y mentiras ↑

An experimental study

- Research questions:

- (1) Since phonology (specifically, intonation) is basic to syntactic constructions, can we use intonation to prime syntax?

- (2) Could this intonational priming be done through another domain of cognition, namely, musical notes (so, can music prime syntax?)
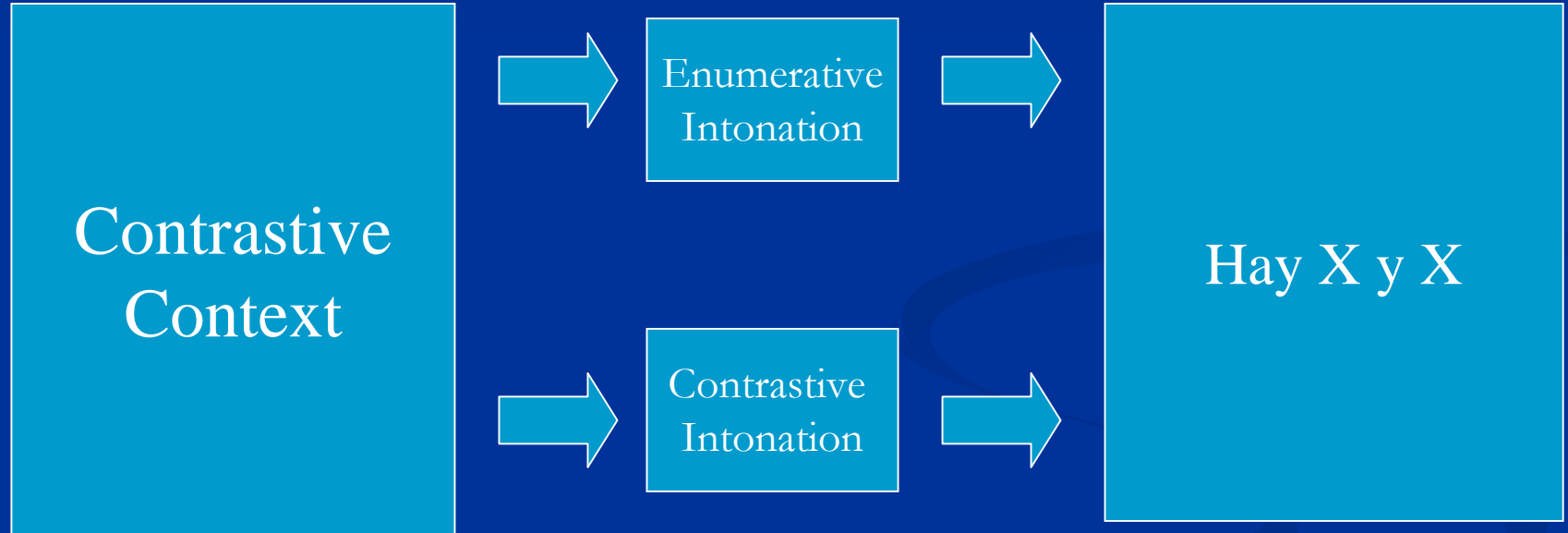
Our experimental study

- Participants read a text that can bias them to a enumerative or a contrastive reading of the last sentence (with the form 'hay X y X')

- Before reading the last sentence of the text ('hay X y X'), they hear a musical phrase (which was was played with a synth, using a violin sound) that resembles the intonational curve of one of the two intonations.

- The idea is that when context and intonation match, the last phrase will be understood quicker
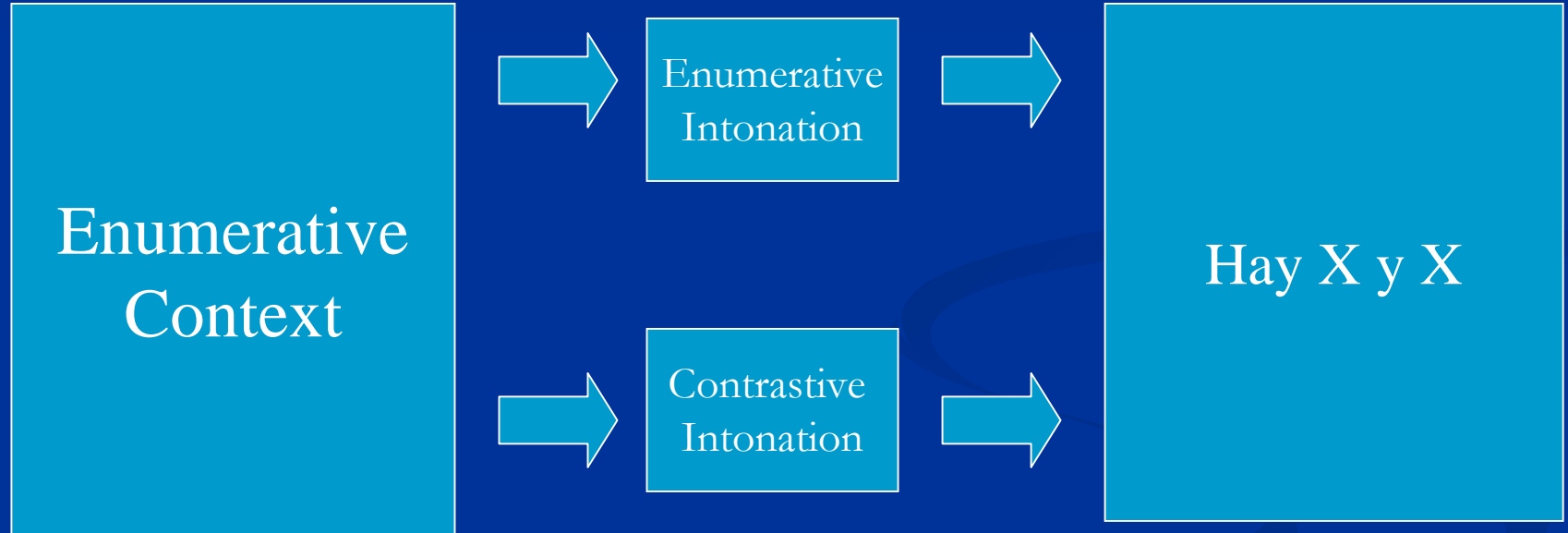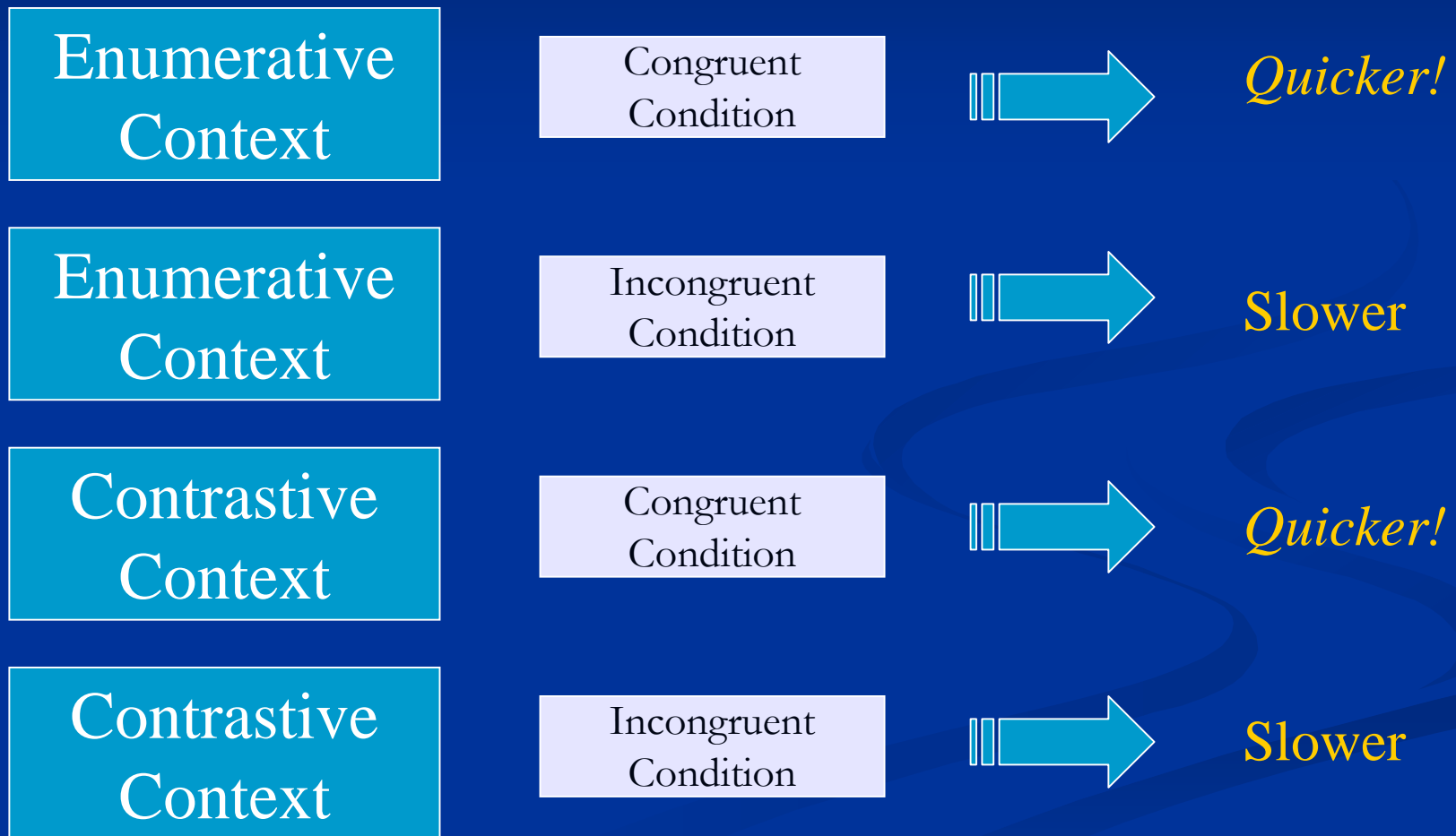
Experimental design

Experimental design

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┌──────────────┐         ┌──────────────┐         ┌──────────────┐
│              │  ──▶    │ Enumerative  │  ──▶    │              │
│              │         │ Intonation   │         │              │
│ Contrastive  │         └──────────────┘         │   Hay X y X  │
│   Context    │         ┌──────────────┐         │              │
│              │  ──▶    │ Contrastive  │  ──▶    │              │
│              │         │ Intonation   │         │              │
└──────────────┘         └──────────────┘         └──────────────┘
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Experimental design: predictions

Enumerative Context	Congruent Condition	→	*Quicker!*
Enumerative Context	Incongruent Condition	→	Slower
Contrastive Context	Congruent Condition	→	*Quicker!*
Contrastive Context	Incongruent Condition	→	Slower

An example

I though John didn't like reading. However, when I went to his house, everywhere...
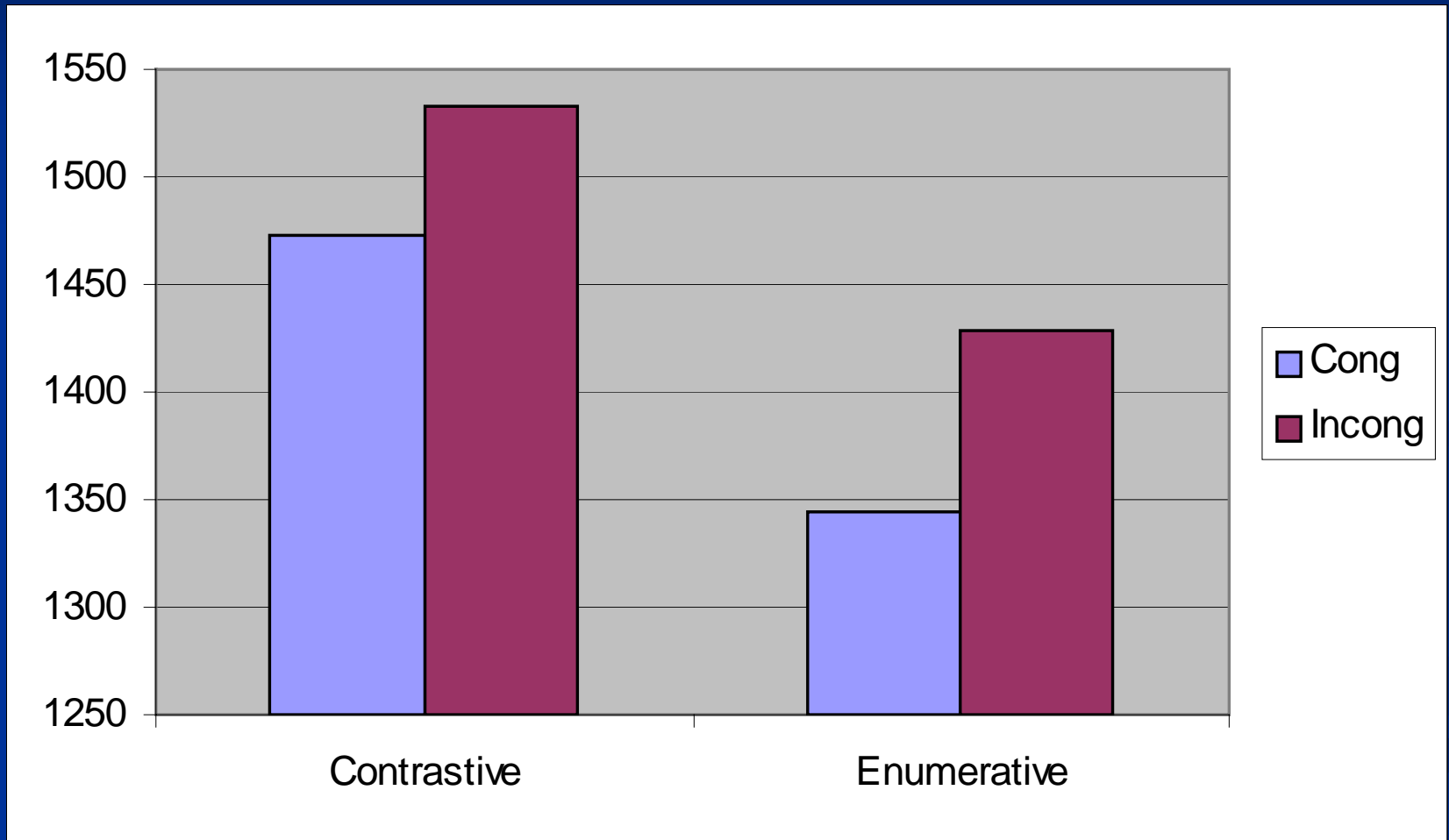
There were books and books

Pilot study

- Subjects: 16 participants
- Materials:
  - 10 enumerative-biasing texts and 10 contrastive biasing texts
  - Four musical phrases (2 & 3 syllabled contrastive and enumerative intonations)
- Task: a self-paced reading task
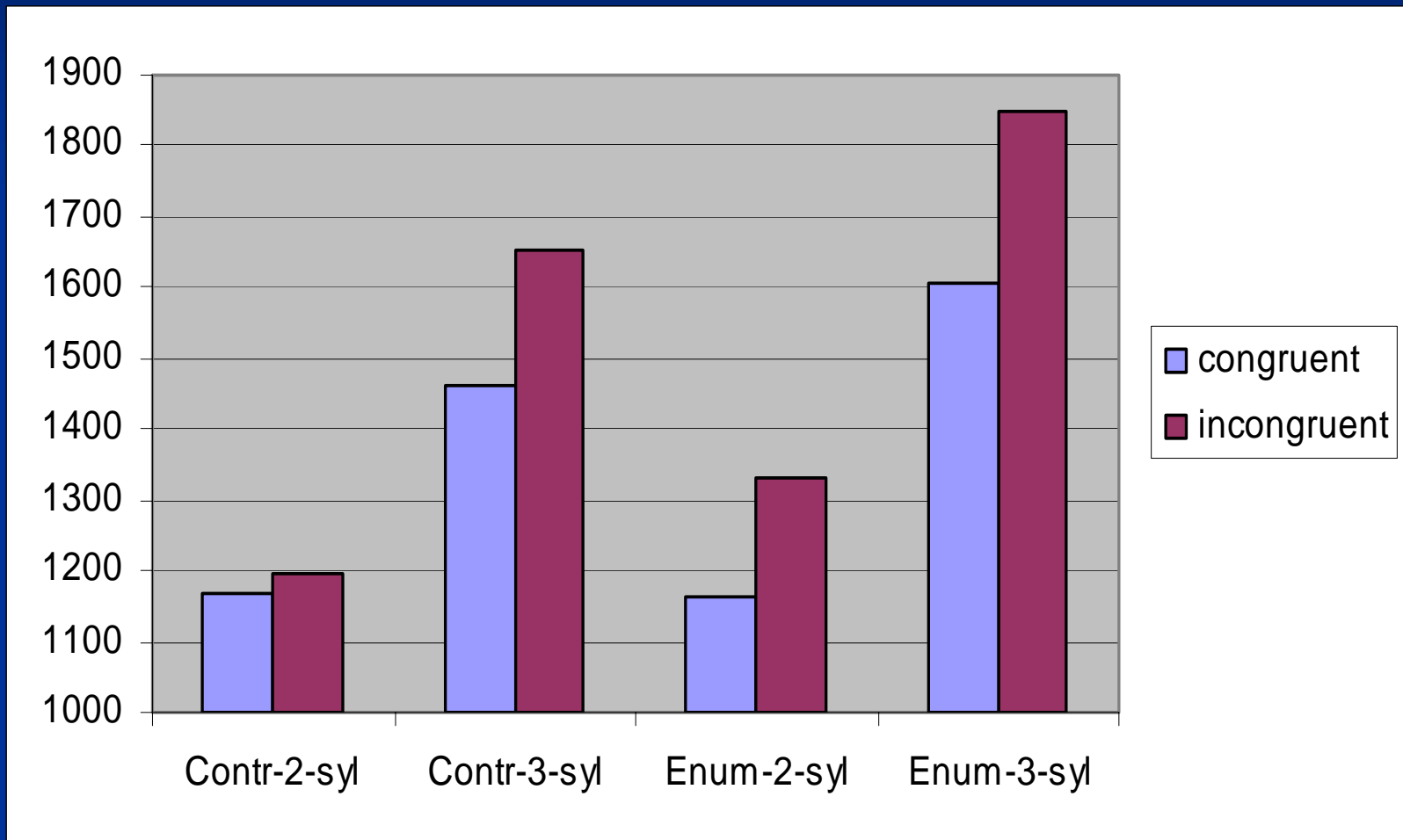- Goal: to understand the texts presented to them

Preliminary results
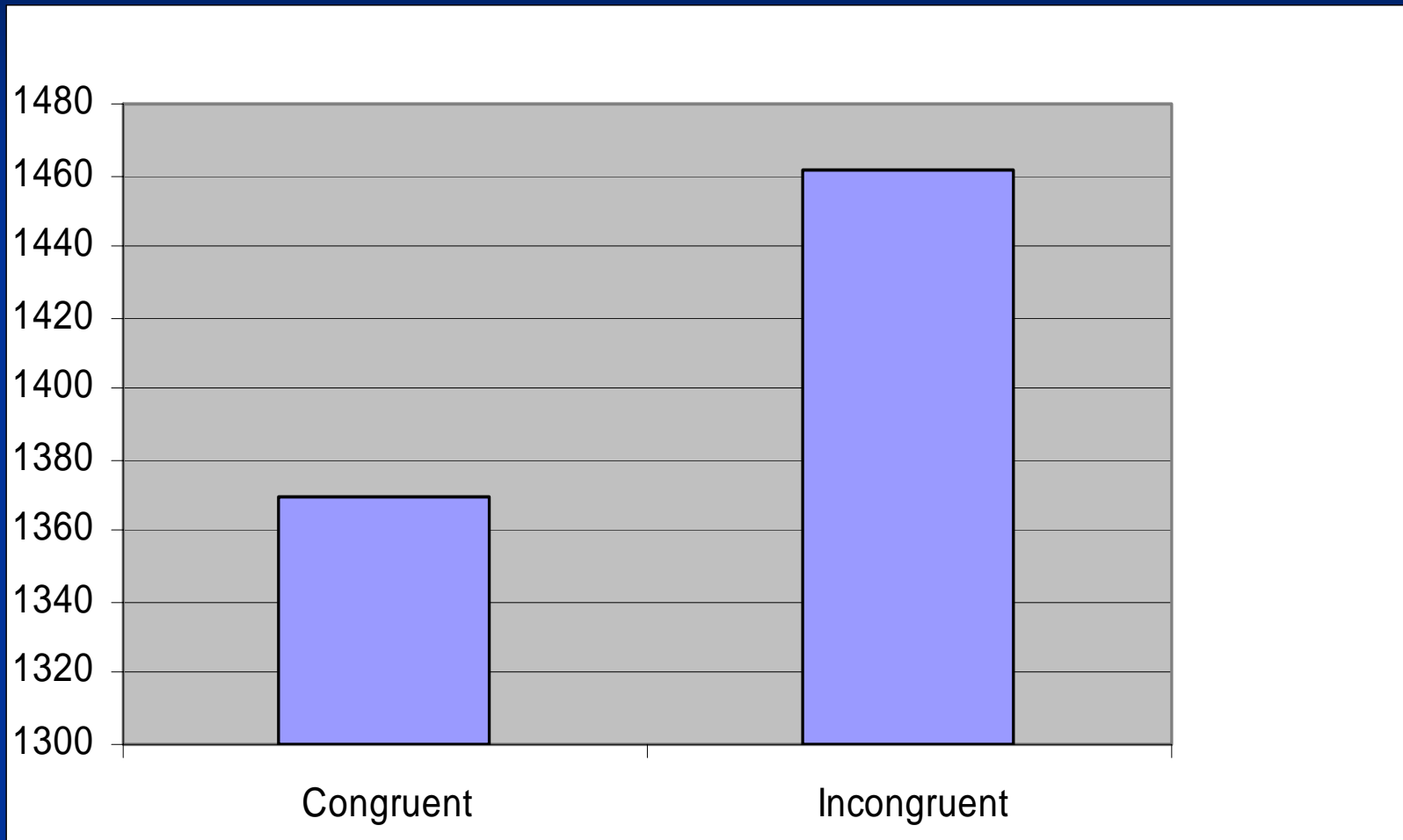
Preliminary results

Preliminary results

Conclusion

- Semantics is the "holy grail" of linguistics and cognitive science in general. As such, there is nothing wrong with focusing on the semantics of a given grammatical construction

- Nonetheless, as our pilot study seems to suggest, the phonology of grammatical constructions could be equally important in some cases

Conclusion

- We believe, then, that intonational patterns are certainly bound up with syntactic patterns.
  - This is coherent with the notion of grammatical construction;
  - it is *not* coherent with the notion that syntax is a modular system.
    - This is especially evident because our paradigm is cross-modal (music/syntax)

Conclusion

Stay tuned!

Appendix

🔊	2 syllable contrastive phrase
🔊	3 syllable contrastive phrase
🔊	2 syllable enumerative phrase
🔊	3 syllable enumerative phrase

Appendix II

- Experimental design details:
  - Critical stimuli:
    - 10 enumerative and 10 contrastive biasing stories ending with the target sentence "Hay X y X"
  - Fillers:
    - 10 enumerative and 10 contrastive biasing stories ending with similar endings (e.g., "there were many X" or "not all X are the same")
  - Thus, each subject read 40 stories
  - The stories had a mean length of 30,34 words

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