Hearing Syntax

Joseph Hilferty*
Javier Valenzuela**

*Universitat de Barcelona
**Universidad de Murcia
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 warmth’
- *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 there are sad times’

- *Hay riesgos y hay oportunidades*
  ‘There are risks and there are opportunities’

- *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 interpretation:
  - 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 an 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 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

Enumerative Context → Enumerative Intonation → Hay X y X

Contrastive Intonation
Experimental design

Contrastive Context

Enumerative Intonation

Contrastive Intonation

Hay X y X
Experimental design: predictions

- **Enumerative Context**
  - Congruent Condition: Quicker!
  - Incongruent Condition: Slower

- **Contrastive Context**
  - Congruent Condition: Quicker!
  - 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

![Bar chart showing contrastive and enumerative results]

- **Contrastive**
  - Cong: 1450
  - Incong: 1550

- **Enumerative**
  - Cong: 1250
  - Incong: 1350
Preliminary results

Contr-2-syl  Contr-3-syl  Enum-2-syl  Enum-3-syl
congruent  incongruent
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

<table>
<thead>
<tr>
<th></th>
<th>2 syllable contrastive phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 syllable contrastive phrase</td>
</tr>
<tr>
<td></td>
<td>2 syllable enumerative phrase</td>
</tr>
<tr>
<td></td>
<td>3 syllable enumerative phrase</td>
</tr>
</tbody>
</table>
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
Contact information

- Joseph Hilferty: hilferty@ub.edu
- Javier Valenzuela: jvalen@um.es