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On Linguistic Complexity, Interfaces and Incomplete Acquisition

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Purpose

- To **reflect** on recent claims about the **complexity** and potential vulnerability of certain linguistic interfaces for L2 and bilingual grammars
- To **question** the theoretical and empirical underpinnings of many of these recent claims
- To **advocate** for greater clarity in our definitions and demarcation of theoretical constructs in order to develop well-conceived empirical studies and to confirm or falsify our hypotheses.

Incomplete Acquisition

Temporary

Typical of developing grammars (L1, bilingual, L2)

Permanent

- Inability to reach native-like attainment in a number of grammatical properties as compared to adult monolingual native speakers of similar cognitive ability and level of education.
- Fossilization in L2 and bilingual grammars
- Indeterminacy/optionality in near-native and bilingual grammars

Structural knowledge typically affected under incomplete acquisition

- Inflectional morphology
- Complex syntax (with embedding)
- Discourse-pragmatics

What contributes to this?

1. Linguistic properties
2. Input properties
3. Learner-related factors

Generative framework

- Many of the “problematic” areas for language acquisition are related to the particular **architecture of language**.
- Many of the “problem” areas are properties of **interfaces**.

Interfaces (White, in press)

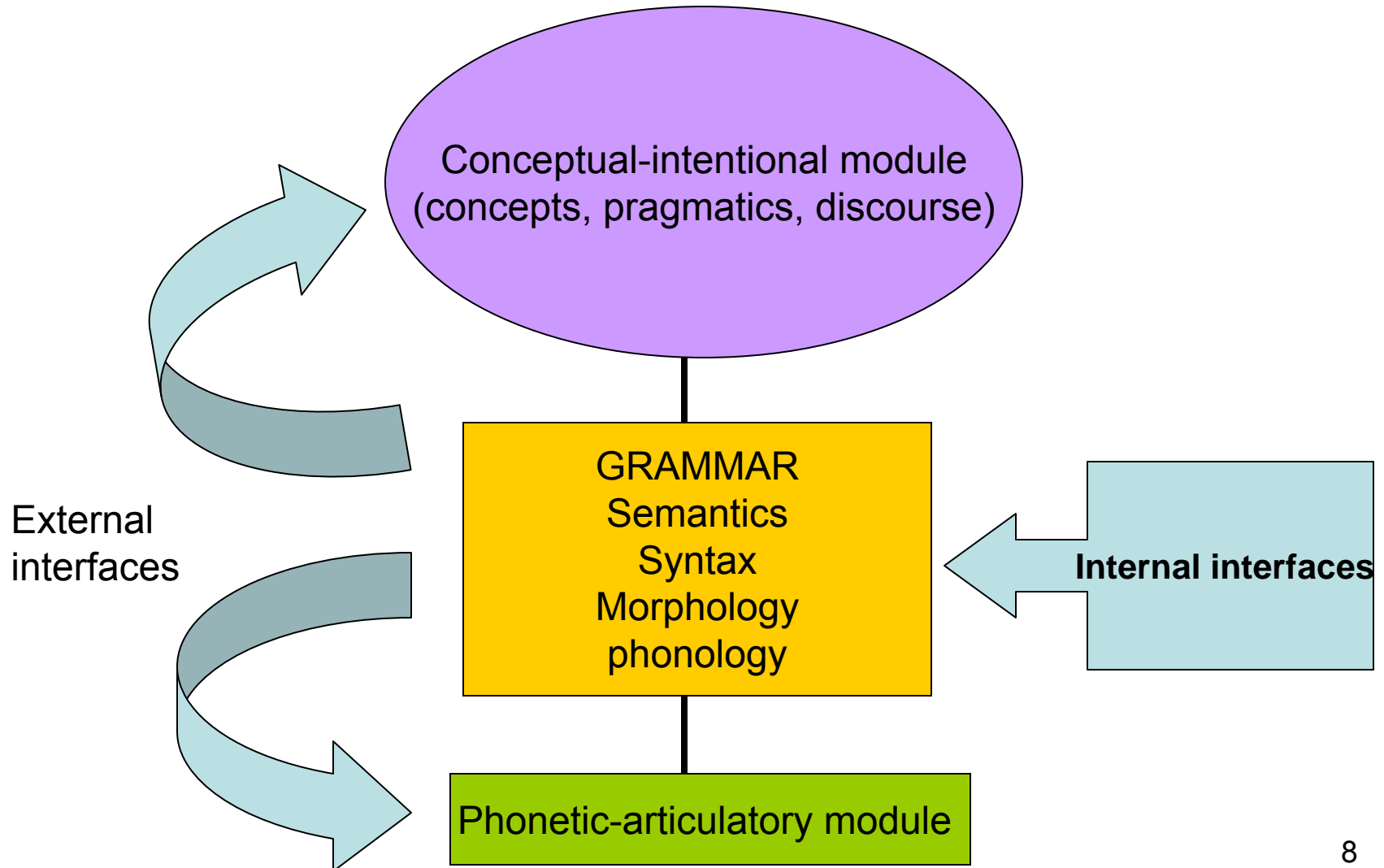
- Can link domains within the language system itself (syntax-semantics, syntax-morphology, morphology-phonology, etc.)

INTERNAL INTERFACES

- Can link linguistic modules with other aspects of world knowledge and cognition (grammar-discourse, grammar-pragmatics)

EXTERNAL INTERFACES

From Meaning to Form



Some recent claims

- Linguistic properties at interfaces are inherently more “complex” than linguistic properties internal to a specific domain (syntax, phonology, etc.)
- Not all interfaces are created equal: some interfaces are more vulnerable or more problematic in L2 acquisition than others.

Slabakova (2008)

The Bottleneck Hypothesis

Functional morphology is the bottleneck of acquisition (developmentally and at the near-native level).

Syntax and semantics are easier:

L2 learners are quite accurate in the eventual acquisition of syntactic reflexes of functional categories and on the syntax-semantics interface.

Sorace and Tsimpli (2006), Sorace and Serratrice (in press)

The **syntax-semantics interface** is **not problematic** (i.e., it is eventually acquired at native-speaker level)

The **syntax-pragmatics interface** presents **prolonged difficulty** in a variety of bilingual situations.

Syntax-semantics Interface

English

- | | | |
|------------|--------------------------------------|----------|
| ∅ | Sharks are dangerous | GENERIC |
| The | sharks at the aquarium are dangerous | SPECIFIC |

Italian/Spanish

- | | | |
|------------|--|----------|
| Los | tiburones son peligrosos | GENERIC |
| Los | tiburones en el acuario son peligrosos | SPECIFIC |

Syntax-discourse Interface

English

While **John** is eating **he** is talking on the phone. = TOPIC

While **John** is eating **he** is talking on the phone. ≠ TOPIC

Italian/Spanish

Mientras **José** come **∅** habla por teléfono. = TOPIC

Mientras **José** come **él** habla por teléfono. ≠ TOPIC

Why?

1. Underspecification of interface conditions in representation of grammatical knowledge
2. Crosslinguistic influence in representation or parsing
3. Processing limitations: either inefficient incremental access to knowledge or coordination of information.
4. Quality and quantity of input received in bilingual grammars
5. Bilingualism per se (executive control of two languages in real time)

Processing Limitations

- “Structures requiring the **integration of syntactic knowledge and knowledge from other “external” domains** require more processing resources than structures requiring **only** syntactic knowledge.”
- “The syntax-discourse interface requires coordination of syntactic knowledge and external domains.”

- “The syntax-discourse interface is **not affected by language combinations (L1 transfer)** whereas the syntax-semantics interface is”
- “**Quality of input** may have a more visible effect on external than on internal interfaces.”

Testable Hypotheses

L2 acquisition: permanent optionality (i.e., non-convergence at the near-native level) at the discourse-syntax interface but not with the syntax-semantics interface.

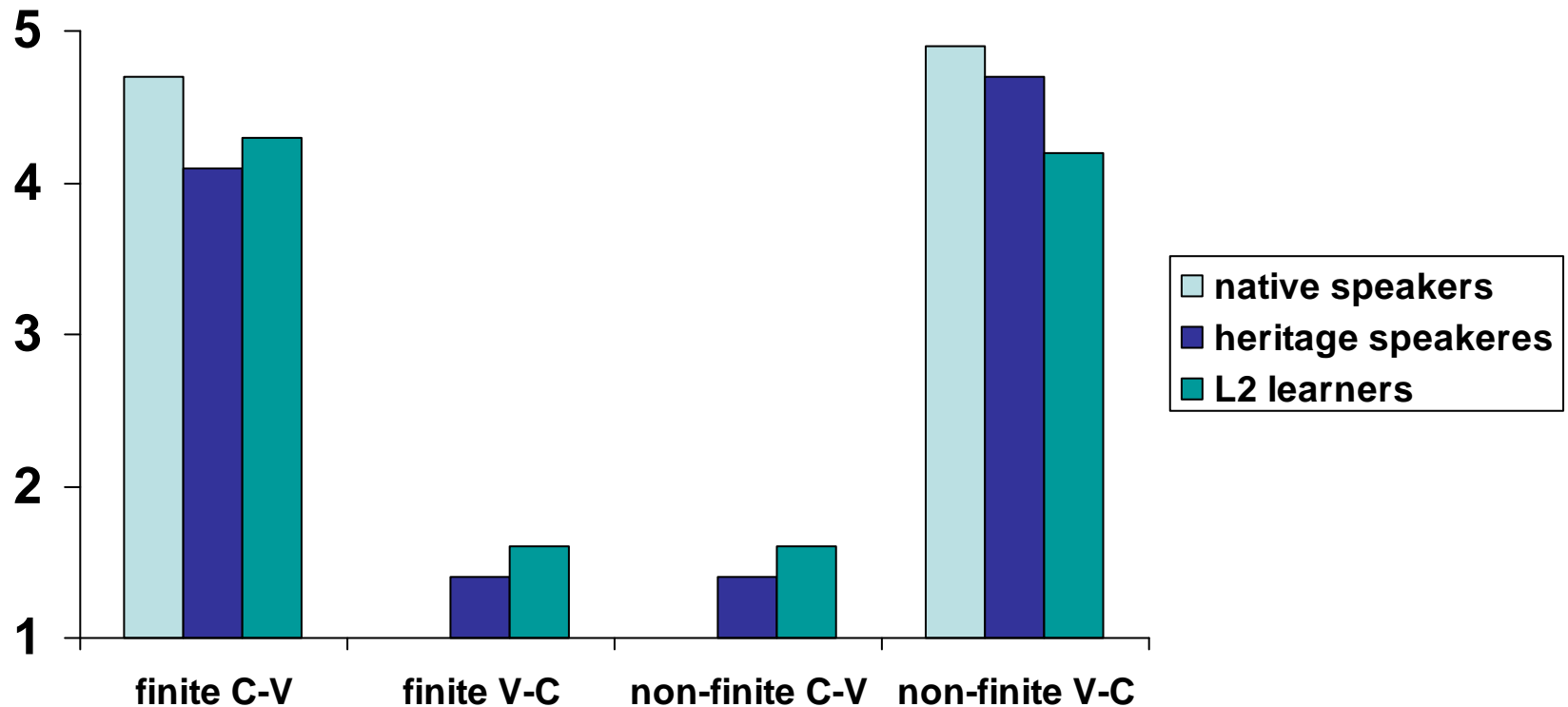
L1 attrition: attrition effects will be manifested first at the syntax-pragmatics interface and later at the syntax-semantics interface.

Montrul (in press)

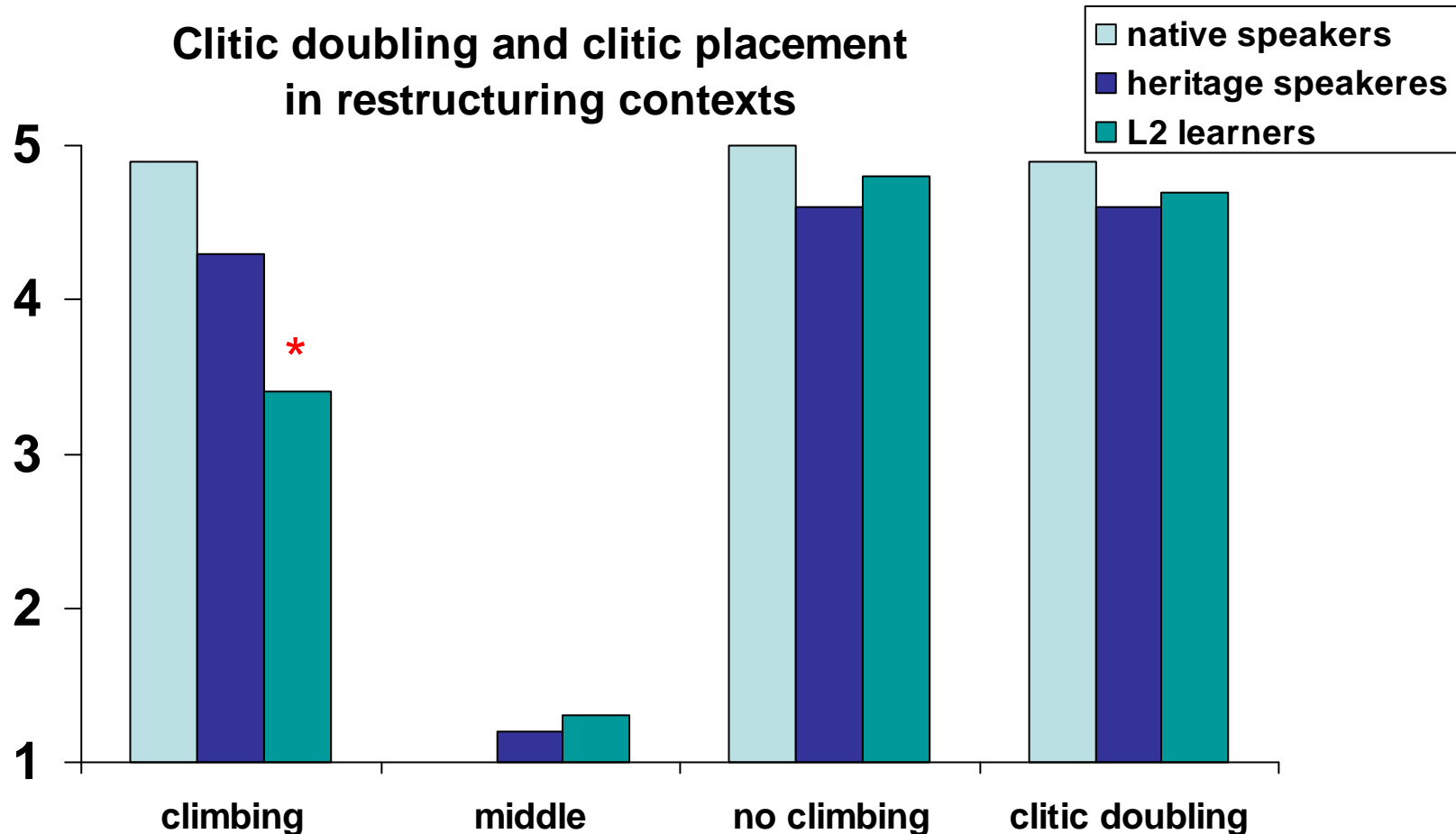
- Study of 72 L2 learners and 67 Spanish heritage speakers from intermediate to advanced levels of proficiency.
- Object clitics in simple sentences (syntax)
- Clitic left dislocations (syntax-pragmatics)

All groups were equally accurate on the syntax of clitics

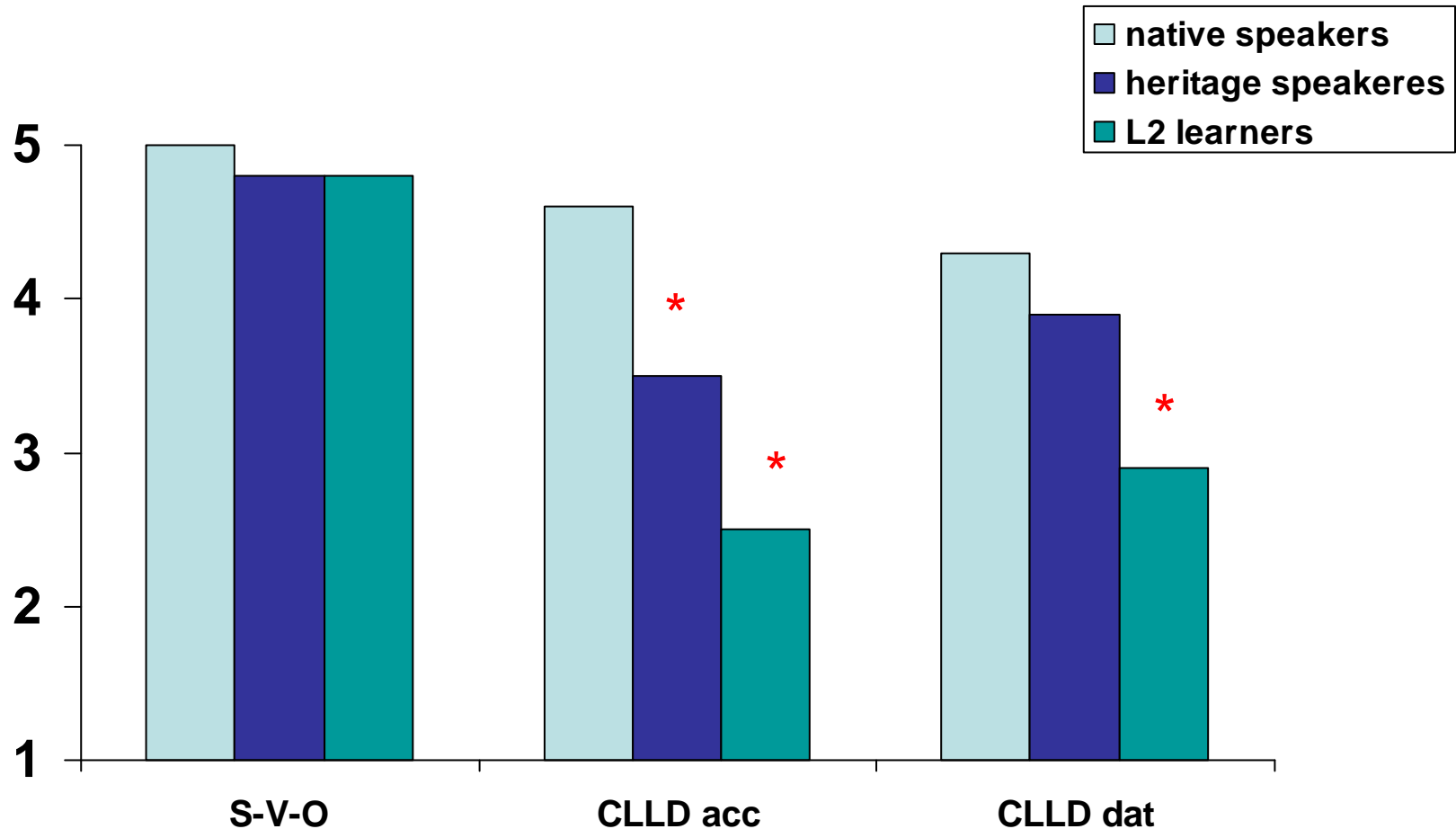
Clitic placement with finite and non finite verbs



All groups were accurate on the syntax of clitics



L2 learners much less accurate than NS and HS on CLLD (syntax-pragmatics interface)



Support for Interfaces?

Maybe:

Simple syntax (clitics) is acquired before complex syntax (CP field, which interfaces with discourse and information structure)

But:

Results are also consistent with a frequency based explanation

PROBLEMS

How do we decide whether a given grammatical property is representative of an interface or the other?

How do we carve interfaces for particular phenomena?

Questions

- How is the syntax-discourse interface “more complex” than the syntax-semantics interface?
- Why should transfer be more crucial for syntax semantics but not for syntax-discourse?
- Why should integrating information at the syntax-discourse interface be more difficult or costly than integrating information at the syntax-semantics interface?

Many linguistic properties cut across interfaces or can be analyzed at different interfaces

- Aspect
- Determiners
- Case

Coercion in Aspect

Slabakova & Montrul (2008)

Grammatical contrasts

Activity coerced into accomplishment by

- object NP (syntax-semantics)
- telic clitic *se* (semantics-morphology)
- grammatical aspect (syntax-morphology-semantics)

El río **corría** por la montaña. (imperfect)

#El río **corrió** por la montaña. (preterit)

Slabakova & Montrul (2008)

Pragmatic contrasts

Activity coerced into accomplishment by

- Animacy of subject (syntax-semantics)
- Adverbials (syntax-pragmatics?)

Ayer el tren del mediodía llegó tarde (punctual)

Por muchos meses el tren del mediodía llegó tarde
(habitual, iterative)

Individuals who accepted coercion

	N	Grammatical aspect	Adverbial (pragmatic)
NS	27	100%	78%
Adv.	27	67%	11%
Interm.	33	24%	36%

The vast majority of intermediate learners did not recognize coercion via grammatical or pragmatic means.

Advanced learners demonstrated knowledge (although not always native-like) of coercion with the 3 “grammatical” conditions and 2 of the 3 “pragmatic” conditions

Problem

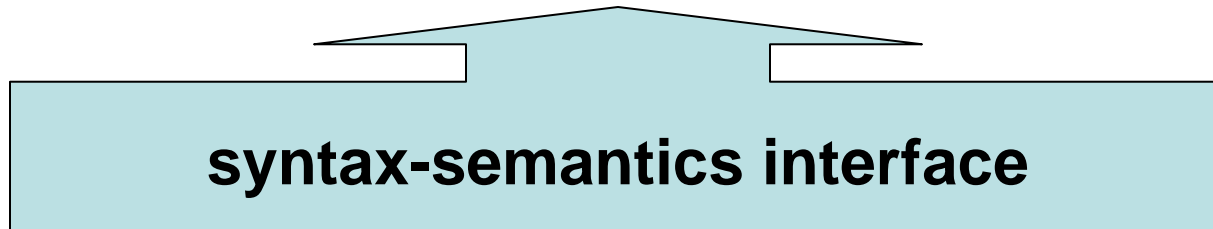
Did we classify structures as “grammatical” or “pragmatic” correctly?

It is not always easy to determine a priori whether a given phenomenon counts as an internal interface or an external interface.

Articles: syntax-semantics or syntax-discourse?

Ionin, Ko, Wexler (2004)

articles crosslinguistically can encode definiteness and specificity



I saw **the** cat.

the [+ definite]

I saw **a** cat.

a [unspecified for definiteness]

- **Definiteness** defines the state of knowledge of both the speaker and the hearer.
- **Specificity** reflects the state of knowledge of the speaker only.

Ionin, Ko, Wexler (2004)

- L2 learners of languages with no articles (Korean, Russian) don't know that definiteness, rather than specificity, is the organizing feature for English articles.
- They do know about the semantics of articles since they associate **the** with [+specific] and **a** with [-specific].

But, like pronominal reference, the grammaticality/acceptability of the article also depends on how we establish reference in discourse

I saw **a** cat. I gave **the** cat some milk.

#I saw **the** cat. I gave **a** cat some milk.

First mention

Second mention

Psycholinguistics of Discourse

Local vs. global discourse structure

Comprehension of connected discourse depends less on the meaning of the individual sentences than on their arrangement.

Isolated sentences

1. However, nobody had seen **one** for months.

2. He thought he saw a/the shape in the bushes.

- 3. Mark had told **him** about **the/ Ø** foxes.

- 4. John looked out **the/a** window.

- 5. Could it be **a/the** fox?

Rendition 1

4. John looked out **the** window.
2. **He** thought **he** saw **a** shape in the bushes.
5. Could it be **a** fox?
3. Mark had told **him** about **the** foxes.
1. However, nobody had seen **one** for months.

Rendition 2

4. John looked out **a** window.
2. **He** thought **he** saw **the** shape in the bushes.
5. Could it be **the** fox?
3. Mark had told **him** about **Ø** foxes.
1. However, nobody had seen **one** for months.

- To understand a simple pair of sentences, we must hold the antecedent in working memory long enough to link it with the anaphor.
- Use of anaphors illustrates the role of communicative conventions in discourse.
- The longer the distance between antecedents and anaphors the more cognitively difficult and burdensome on working memory.

- Although Ionin and collaborators have shown convincingly that errors with article use are conditioned by semantic knowledge, it is also possible that L2 learners have problems integrating discourse knowledge related to article use.
- “Given the subtlety of the discourse triggers related to speaker and hearer knowledge, generalizing from this may be a fairly long and difficult process” (Ionin, Zubizarreta & Maldonado 2008: p. 20)

Ionin & Montrul

Large-scale study of generic reference in Spanish and English by adult L2 learners.

- English L2 study
(Korean and Spanish speaking learners)
- Spanish L2 study
(English-speaking learners)
- Spanish heritage speakers

The acceptability judgment task (AJT)

- 8 test sentence types test article use in non-generic contexts:
 - target responses the same in English and Spanish
 - 4 types acceptable, 4 unacceptable
- 1 test category tests bare plurals in generic contexts:
 - English: acceptable
 - Spanish: unacceptable

AJT test categories (English)

1. **Singular, second-mention, with 'the'**
Mary has a cat. **The cat** is named Steve.
2. ***Singular, second-mention, with 'a'**
Robin owns a dog. **A dog** is named Rollo.
3. **Singular, first-mention, with 'a'**
Sue looked out the window. **A lion** was standing in her garden.
4. ***Singular, second-mention, bare**
Louis has a kitten. **Kitten** is named Sheila.
5. ***Singular, first-mention, bare**
Tom heard a noise. **Cow** was standing outside.

AJT test categories (English)

6. **Plural, second-mention, with 'the'**
Leslie saw two dogs outside. **The dogs** were barking.
7. ***Plural, second-mention, bare**
Maria met four squirrels in the park. **Squirrels** were very cute.
8. **Plural, existential reading, bare**
Thomas heard a noise outside. **Puppies** were playing in the garden.
9. **Plural, generic reading, bare**
Roger's cat doesn't listen to him. **Cats** are very independent.

AJT examples (Spanish)

1. **Singular, second-mention, with 'el'**
Maria tiene un gato. **El gato** se llama Max.
2. ***Singular, second-mention, with 'un'**
Roberto tiene un perro. **Un perro** se llama Rolo.
3. **Singular, first-mention, with 'un'**
Eva miro por la ventana. Pasó **un león** por el jardín.
4. ***Singular, second-mention, bare**
Luisa tiene un gatito. **Gatito** se llama Sheila.
5. ***Singular, first-mention, bare**
Juan escuchó un ruido. **Vaca** estaba parada afuera.

AJT examples (Spanish)

6. Plural, second-mention, with 'los'

Luisa vio dos perros. **Los perros** ladraban.

7. *Plural, second-mention, bare

Maria vio 4 ardillas. **Ardillas** eran chiquititas.

8. Plural, bare, postverbal subject (existential)

Tomas escuchó un ruido afuera. Pasaron **niños** gritando.

9. *Plural, bare, generic reading

El gato de Roger no es cariñoso. **Gatos** son independientes.

Article Accuracy in English

Group	N	mean	range
Spanish EFL	24	64%	38-100
Spanish ESL	11	81%	59-100
Korean EFL	29	68%	41-94
Korean ESL	9	69%	50-100
Native English speakers	19	95%	84-100

Article accuracy in Spanish

Group	N	mean score	range
Beginner L2-Spanish learners	19	63%	50-81
Intermediate L2-Spanish learners	18	75%	41-88
Advanced L2-Spanish learners	21	89%	75-100
Heritage Spanish speakers	31	84%	44-97
Native Spanish speakers	18	94%	47-97

Discourse problem?

- The fact that lower proficiency English and Spanish-speaking learners are not very accurate with articles in this task may have to do with the nature of the task, **which involves the use of articles in discourse.**

Bottomline

- It is not always easy to characterize a given phenomenon as strictly illustrating one interface or the other.

Case marking syntax-morphology interface?

Korean

Yeca-**ka** namca-**lul** anacwuw SOV
girl-nom boy-acc hug

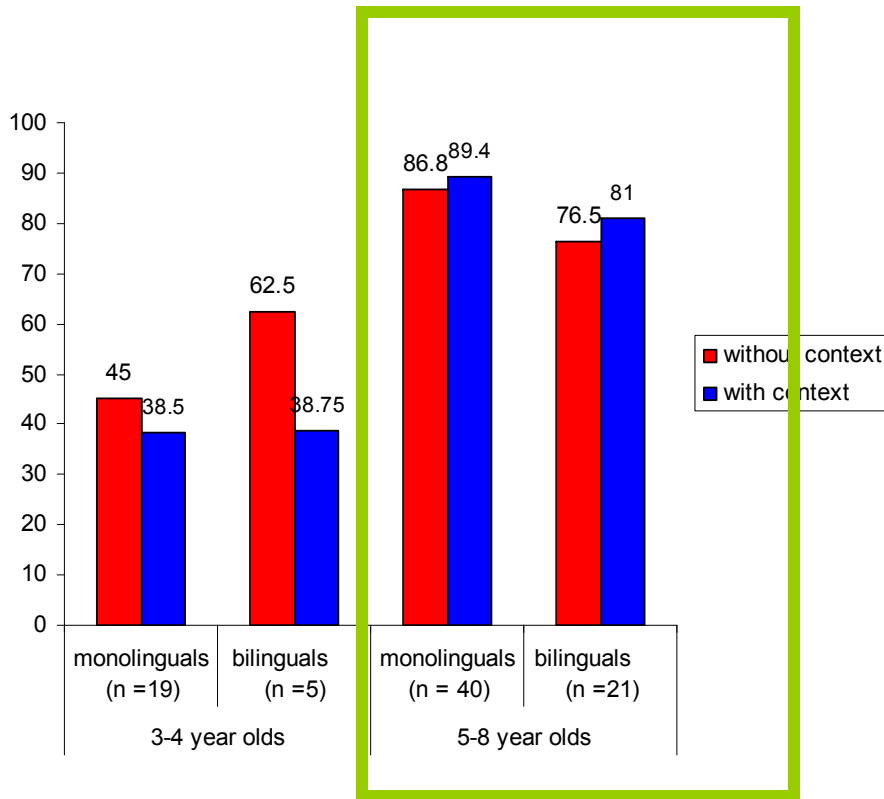
Namca-**lul** yeca-**ka** anacwuw OSV
boy-acc girl-nom hug

The girl is hugging the boy

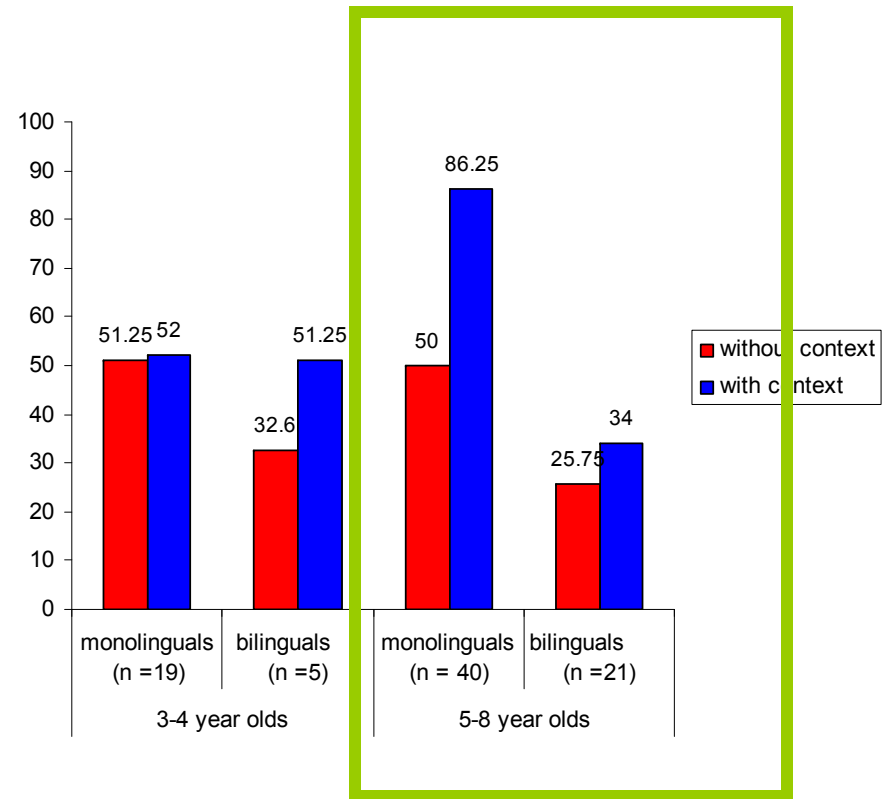
Korean Heritage Speakers

- Have difficulty comprehending OVS sentences with animate subjects and objects and case markers, both in simple sentences and in relative clauses

O'Grady, Cho & Lee (1997)



Percentage accuracy on SOV sentences



Percentage accuracy on OSV sentences

O'Grady, Lee & Choo (2001)

	N	Subject RC		Object RC	
		correct	reversal	correct	reversal
L2 learners (2 nd semester)	20	70	14	46	31
Heritage speakers	16	65	13.7	41.3	23.7

Chung (2009)

- (1) a. **Na(nun/ka) pap(u) an-meke**
I-(TOP/NOM) food-ACC not-eat
'I don't want to eat'
- b. **Mary-ka sakwa(lu) mek-nun-ta.**
Mary-NOM apple-(ACC) eat-NONPST-DECL
'Mary is eating an apple'
- c. **Onul Minsu(ka) hakyoyey kass-ta**
Today Minsu(NOM) school-LOC go-PST-DECL
'Minsu went to school today'

Is case also syntax-discourse interface?

- Case is frequently dropped in Korean speech (56.8% in mother-child dyads, Cho 1981: 45-46)
- When not dropped, accusative case is most often used with animate and specific direct objects (Differential Object Marking)
- The reverse is true of nominative case, which further interacts with the topic marker involving focus and topicality.
- Various semantic and discourse factors determine case drop in Korean monolinguals (Chung 2009)

Judgments on case-marking in Korean are not categorical but are statistical *preferences*

Lee (2006):

Both Focus (i.e. contrastive focus) and Markedness (animacy/definiteness) simultaneously and independently determine **object** case-marking in Korean native speakers, with Focus having a greater effect than Markedness, and animacy having a greater effect than definiteness.

Chung (2009): frequency of case ellipsis in subjects

- [-Contrastive focus] > 82%
- [Definite] > 74%
- [Human] > 65%
- [Inanimate] > 35%
- [Indefinite] > 26%
- [+Contrastive focus] 18%

Similar factors are relevant for objects.

- Is Korean Case problematic for learners because Case is **inflectional morphology** and therefore the **Bottleneck** (Slabakova 2008) or is it because it is a discourse phenomenon in Korean and thus an example of an **external interface** (Serratrice and Sorace, in press)?
- Or is it a problem because it is both?

Spanish DOM

Animate and specific direct objects are typically marked with the preposition “a”

Inanimate objects are typically unmarked.

Marcos vio **a** Lucrecia.

Marcos saw **DOM**-Lucrecia

Marcos vio el auto

Marcos saw the car

Generalization

Marked Object (with A)	[+ animate] [+ specific]
Unmarked Object (no A)	[+ animate] [- specific]
	[- animate] [+ specific]
	[- animate] [- specific]

Nevertheless

In some cases, grammatical sentences are possible with or without *a*:

Human indefinites

Juan necesita **a** un abogado.

[+ animate, + specific]

Juan needs prep a lawyer.

‘Juan needs a (*particular*) lawyer.’

Juan necesita un abogado.

[+animate, -specific]

Juan needs a lawyer.

‘Juan needs *any* lawyer.’

And...

- Negative quantifiers like **nadie** (nobody) receive a mandatory **A**, but are [- specific]
- **A** may also be used to clarify which of two inanimate NPs is the object

*La calma sigue **a** la tormenta*

“The calm follows the storm.”

- **A** can be used if animals are personified

*Vio **al** perro de Juan.*

“He saw Juan’s dog.”

Topicality (Leonetti, 2004)


Ya conocía (a) muchos estudiantes.
already I-knew (DOM) many students
“I already knew many students.”

A muchos estudiantes ya los conocía.

*Muchos estudiantes ya (los) conocía.

A-marking depends on verbs

Scale of affectedness and expected animacy of the objects (von Heusinger & Kaiser 2007)



[+ animate]	[± animate]	[±/- animate]	[(±)/- animate]
matar	ver	considerar	tener
kill	see	consider	have

With inanimates, the thematic properties of the subject also matter

(7) **Un adjetivo califica **a** un sustativo**

“An adjective qualifies a noun.”

(8) a. **El profesor reemplaza el libro.**

“The professor replaces the book
(with something else.)”

b. **El profesor reemplaza **al** libro.**

“The professor takes the place of
the book.”

Multiple interfaces or layers of complexity?

DOM encodes animacy, definiteness, specificity, topicality, agentiveness, among others

It involves both structural and inherent case (Torrego 1998).

Compared to a non-marked object, a marked object must move out of the VP.

More structurally complex than unmarked objects and direct objects.

Truly Interface phenomenon

SYNTAX-SEMANTICS-PRAGMATICS

School-age Spanish-English bilingual children (ages 6-11)

- Data comes from oral narratives collected by Montrul & Potowski (2007) for a study of gender agreement.

Accuracy on DOM marking animate direct objects

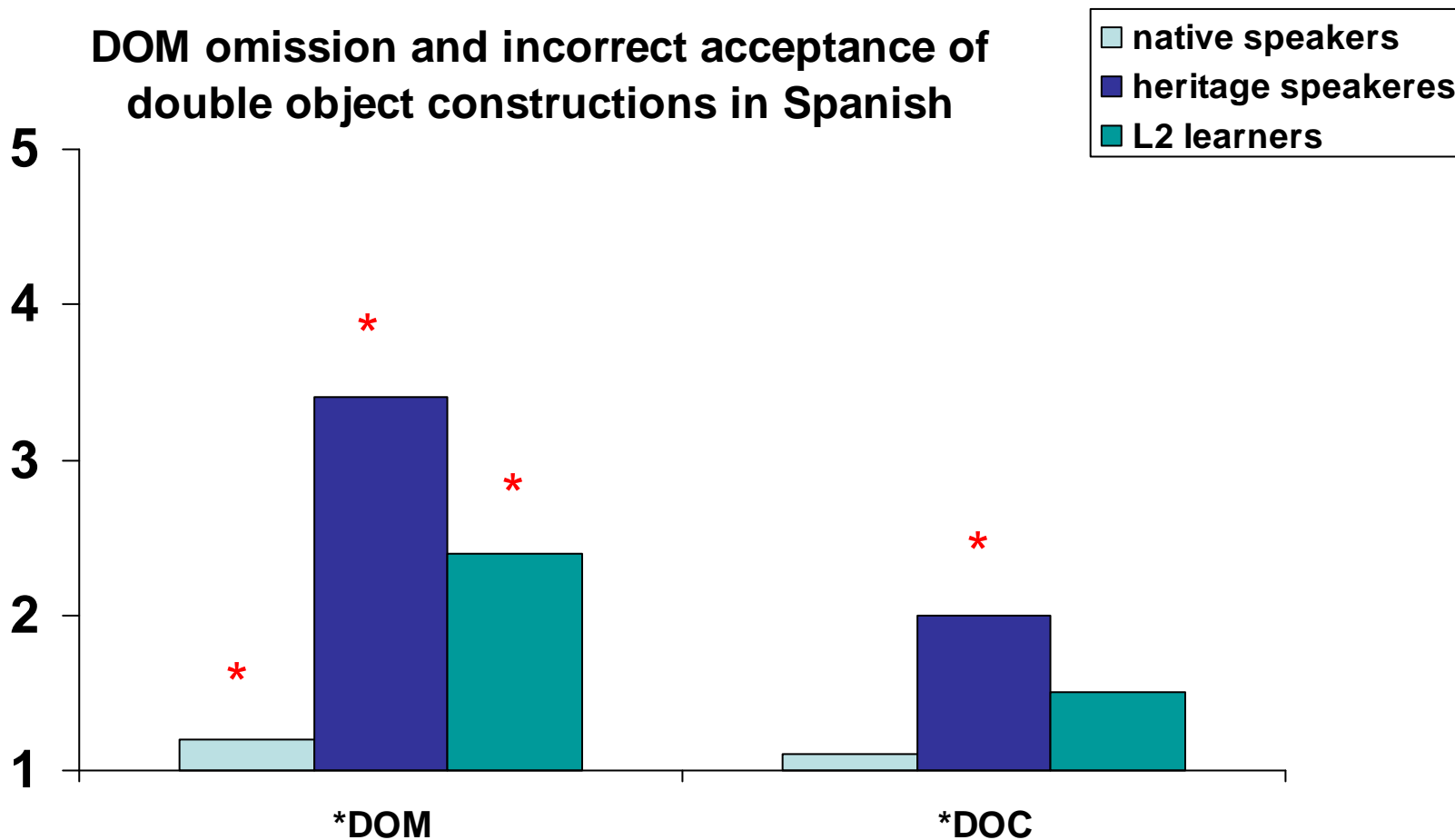
Groups	N	DOM
Monolinguals (tested in Mexico)	15	95%
Simultaneous bilinguals	16	32%
Sequential bilinguals (Spanish L1-English L2)	20	62.9%

Individual Results

- **Simultaneous bilinguals (n =16)**
 - 10 children had 0% accuracy
 - 4 children had 100% accuracy
 - 1 child had 50% accuracy
 - 1 child had 75% accuracy
- **Sequential bilinguals (n =20)**
 - 6 children had 0% accuracy
 - 11 children had 100% accuracy
 - 1 child 33% accuracy
 - 1 child 50% accuracy
 - 1 75% accuracy

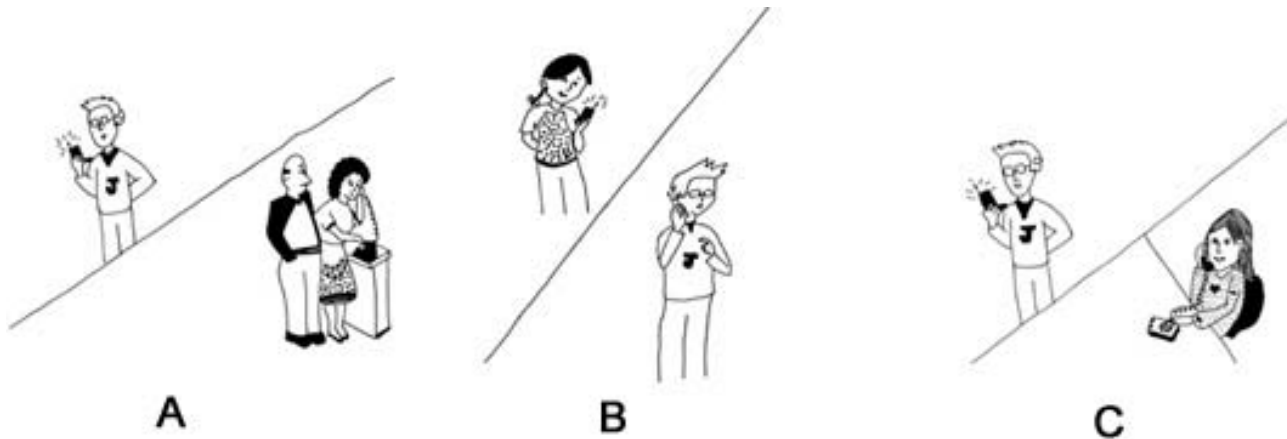
Adult L2 learners and Heritage Speakers (Montrul, in press)

DOM omission and incorrect acceptance of
double object constructions in Spanish



Montrul, Bhatt, Girju (in progress)

Comprehension Task (oral and written)



Accusative condition

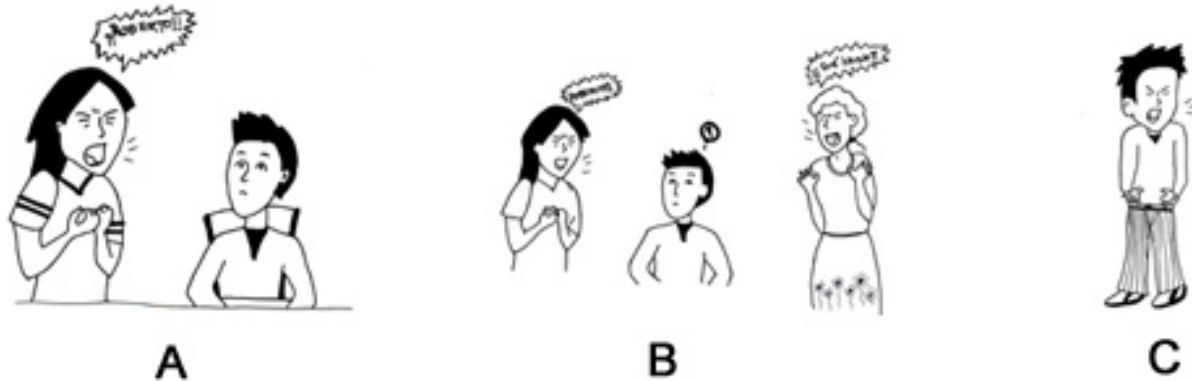
Llamó a Juan pro-V-DOMO-O

Llamó Juan V-S

Llamaron a Juan foil

Montrul, Bhatt, Girju (in progress)

Comprehension Task (oral and written)



Dative condition

Gritó a Roberto pro-V-IOPP

Gritó Roberto V-S

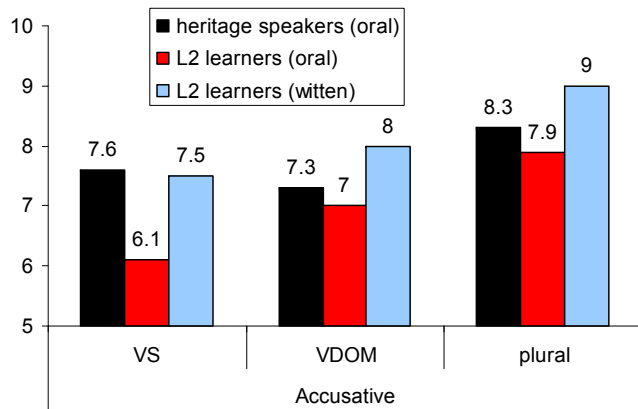
Gritaron a Roberto foil

Interface phenomenon or acoustic salience?

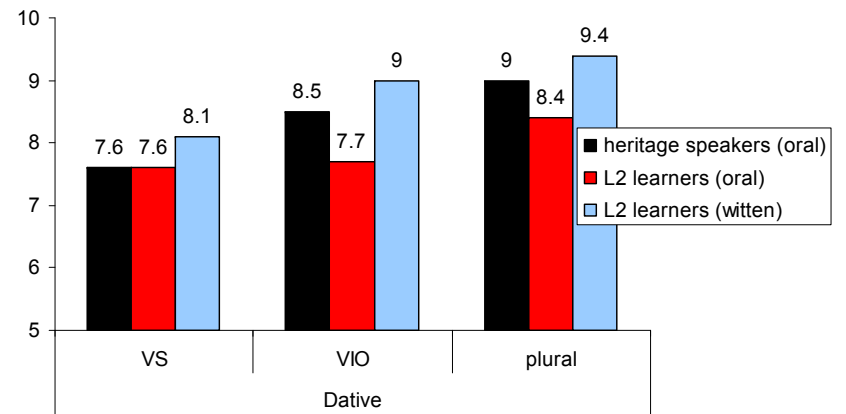
- If the problem is mainly acoustic salience, Spanish bilinguals should be equally inaccurate with “a” in accusative and dative conditions.
- If the problem is integrating linguistic knowledge at the interfaces, then accuracy on dative should be higher than on accusative (due to both linguistic complexity and optionality in input)

Pilot Results

Spanish Picture Matching Task: Accusative Condition



Spanish Picture Matching Task: Dative Condition



Summarizing

- I have argued that many grammatical phenomena that may be conceived as representing one INTERNAL interface or the other (e.g., morphology-syntax or syntax-semantics), can, in fact, involve some sort of discourse-pragmatics as well.
- IS THE INTERNAL EXTERNAL DISTINCTION REALLY USEFUL?

Other areas

Subjunctive morphology

knowledge of complex syntax

knowledge of verb subcategorization

pragmatics (pre-supposition)

Copula choices in Spanish

knowledge of morphology

knowledge of aspect

knowledge of discourse-pragmatics

Conclusion

- Many linguistic properties which we may characterize as strictly syntax-semantics or syntax-morphology cut across interfaces or involve several interfaces, not just one.
- Inflectional morphology is not just a property that interfaces with syntax (an internal interface)
- Tense, aspect, mood, case, copulas, pronouns and determiners, to name a few, also interface with discourse-pragmatics.

Where do we draw the line?

- The concept of interfaces, whether internal or external is still theoretically fuzzy and problematic.
- Without clear theoretical constructs it is difficult to test our hypotheses.
- Right now, all linguistic properties involve some sort of interface.
- The discourse-syntax interface may be more pervasive than we thought.

INTERFACES

- Are they useful as theoretical constructs?
- Do we need this term to keep advancing with our theories and research?

THANK YOU!