

The role of agreement in NPI licensing

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Brain Talk, Lunds Universitet

3rd June, 2008

Objectives

- To argue for an **incremental** parsing of constructions that are within the syntax-semantics interface and that, besides the syntactic component, require a semantic component to be licensed => **Negative Polarity constructions**
- To look at languages that show a specific agreement in NPI constructions in order to examine the timing and the specific information the parser is using when licensing these constructions in real-time comprehension,
 - => Basque = partitive morphology at the complementizer
 - => Spanish = subjunctive mood at the verb

Negative Polarity Item (NPI) licensing:

Basic Requirements

- Negative Polarity Items (NPIs) are lexical items that need to be licensed under certain semantic/syntactic environments.
- The most common of these environments is **negation**.

Negative Polarity Item (NPI) licensing:

Basic Requirements

- They must occur in a context in which the proper semantic properties are accessible,
 1. there needs to be a licenser: **Negation**
John wouldn't **ever** eat that.
*John would **ever** eat that.
John wouldn't speak **any** French.
*John would speak **any** French.
 2. the NPI needs to be **c-commanded** by its licenser:
No kid would **ever** eat fish.
*The kid who **no** seafood liked would **ever** eat fish.
- otherwise, the licensing conditions for the NPI are violated.

NPI Licensing:

Main Questions

- Is it the semantic properties of individual licensors **or is it the semantic properties of the whole proposition that matter** for the licensing of NPIs?
- Testing a context where the NPI is not licensed could provide more information on how the syntactic and semantic components interact in real-time sentence comprehension and on whether NPI licensing proceeds locally or at a sentence level

Processing Long-distance Dependencies...

- In long distance dependencies, the parser builds a relation between two lexical items, or a lexical item and a gap position and it has to respect the structural conditions of the construction at hand (i.e. binding, c-command).

Processing Long-distance Dependencies...

- **Filler-Gap (wh-dependencies)** (Crain & Fodor 1985, Stowe 1986, Frazier 1987, Aoshima et al. 2004, Lee 2004)
Who did John talk to **Mary** about **<gap>**?
- **Backwards Anaphora** (van Gompel & Liversedge 2003, Sturt et al. 2004, Kazanina 2005, Kazanina et al. 2006, Aoshima et al. 2006)
While **she** was reading a book, **Mary** remembered...
- **Antecedent-Pronoun** (Nicol 1988, Nicol & Swinney 1989, Gordon & Hendrick 1991, Gordon et al. 1999, Sturt 2003)
John told Mary that **he** wanted to be a writer.
- **Topic-clitic dependencies** (Pablos 2006, Pablos & Phillips, in prep.)
Mary, it was **her** they took to the doctor.

Processing Long-distance Dependencies...

- The question is how does the parser build a relation when the conditions to be respected are not only structural but semantic too (i.e. scope).
- What happens then when the item that has to be licensed is **only** licensed **when** specific *semantic* and *syntactic* conditions are met?

Can NPI processing be paralleled with the processing of other dependencies?

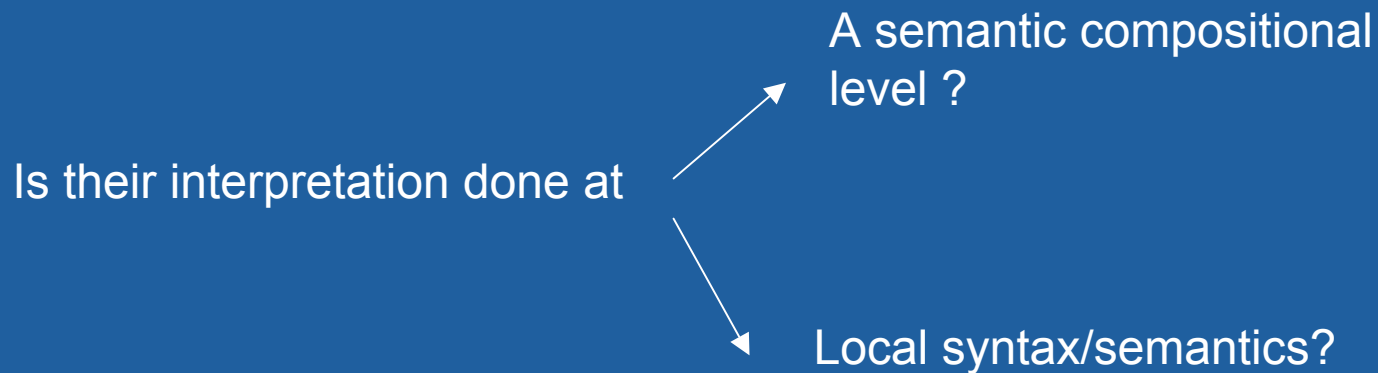
- **Negative Polarity Licensing** (Shao & Neville 1998, Saddy et al. 2004; Drenhaus et al. 2005, 2006; Vasishth et al. 2007, Xiang et al. 2007)
 1. **Accessible licensor (structurally c-commands the NPI):**
No bills that the Democratic senators have supported will *ever* become law.
Kein Mann, der einen Bart hatte, war *jemals* glücklich.
'No man who had a beard was *ever* happy'
 2. **Inaccessible licensor (structurally the potential licensor cannot c-command the NPI because it is within a RC):**
*The bills that *no* Democratic senators have supported will *ever* become law.
*Ein Mann, der *keinen* Bart hatte, war *jemals* glücklich.
'A man who had no beard was *ever* happy'
 3. **No licensor (the NPI is not licensed by any previous licensor):**
*The bills that the democratic senators had supported will *ever* become law.
*Ein Mann, der einen Bart hatte, war *jemals* glücklich.
'A man who had a beard was *ever* happy'

NPI licensing: German & English

- NPI licensing in German and English has shown that the parser does **not** always respect structural conditions when trying to license NPIs
 - There is an intrusion effect in the inaccessible licensor conditions (=spurious licensing effect)
- German NPI effects elicited N400 and P600 components
 - Differences with respect to accessible/ inaccessible licensing showed differences in the latency of the components (=P600, Drenhaus et al. 2006)
- Overall, the evidence from German and English indicates the process has to do **with a more general issue about the context and the composition of the whole proposition**

Nature of Polarity constructions: *long-distance interpretation phenomena*

- Which is the licensing mechanism in the processing of constructions involving NPIs?

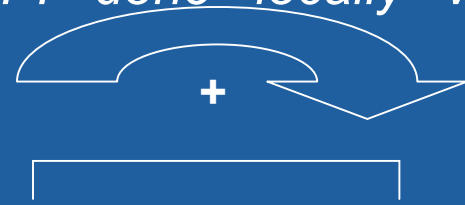


How could this dichotomy be tested?

NPI licensing in languages with rich agreement

- Is the licensing of the NPI done locally within the embedded clause?

1



1. Pellok **onartu** du [festara **inor** etorriko a) ***dela** [-Neg]]
P-ERG confirm aux party-to anyone come-fut aux-comp-dcl
 b) * **denik** [+Neg]
aux-comp-prtt

‘Pello has denied that anybody would come to the party’



2. Pedro asegura [que en breve a) ***vaya a venir** **nadie**]
P-nom confirms that shortly come-subjunctive mood anyone
 b) ✓ **va a venir**
come-indicative mood

‘Pedro has confirmed that anybody would come shortly’

NPI licensing in languages with rich agreement

- *Or is it done at clause level and it requires the whole proposition to have the right context?*

2

1. Pellok onartu du [festara **inor** etorriko a) ***dela** [-Neg]]
P-ERG confirm aux party-to anyone come-fut aux-comp-dcl
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‘Pedro has confirmed that anybody would come shortly’

NPI licensing in languages with rich agreement

- *How does this local vs. long distance licensing process change when there is **no NPI** in the embedded clause?*

1. Pellok onartu du [festara **Itxasne** berandu etorriko a) ✓ **dela** [-Neg]
P-ERG confirm aux party-to I-ABS late come-fut aux-comp-dcl
b) ***denik** [+Neg]
aux-comp-prtt

‘Pello has denied that Itxasne would come late to the party’

2. Pedro asegura [que en breve a) ***vaya a venir** **Ines**]
P-nom confirms that shortly come-subjunctive mood Ines
b) ✓ **va a venir**
come-indicative mood

‘Pedro has confirmed that Ines would come shortly ’

The role of agreement in NPI licensing

- *We used a positive context where the NPI is not licensed and we examined whether **agreement information** is relevant when trying to decide if these constructions are grammatical.*
 - *Is the parser equally sensitive to ungrammaticalities related to agreement information as to ungrammaticalities related to NPI items?*

The role of agreement in NPI licensing

- Previously Manipulated Factors (German & English):
 - Lack of licensor
 - Accessibility of licensor to license NPI (c-commanding position)
 - Frequency of licensor
- Currently Manipulated Factors (Basque & Spanish):
 - Lack of licensor (no negation)
 - Lack of NPI (no licensee)
 - Presence of specific agreement required to license NPI constructions
 - Position of agreement with respect to NPI in the sentence

NPI licensing in Basque & Spanish:



Properties

- A **negative partitive complementizer** is obligatorily required in Basque NPI constructions when:
 1. **NPI is in preceding context** and is **clause-mate with the Complementizer**
 2. **Negation is in the main clause** (*overt* or *covert* through a negative verb, i.e. deny, reject)
 3. **semantics of the verb scoping over the NPI license it**
(Laka 1990, Uribe-Etxebarria 1994, Hualde & Ortiz de Urbina 2003)
- In Spanish NPI constructions a **subjunctive mood in the verb is required**. If there is indicative mood in the verb, the NPI cannot be licensed in the sentence (Uribe-Etxebarria 1994).

Basque & Spanish:

Testing within a Positive Semantic Context

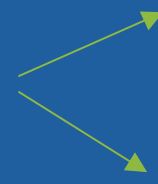
BASQUE

-Neg V
(confirm)

[NPI AGR]

-Neg V
(confirm)

[NP AGR]



Partitive-Complementizer

Declarative-Complementizer

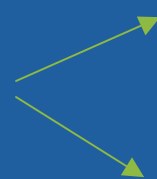
SPANISH

-Neg V
(confirm)

[AGR NPI]

-Neg V
(confirm)

[AGR NP]




Subjunctive Mood
Verb form

Indicative Mood
Verb form

Basque & Spanish:


Testing within a Positive Semantic Context

BASQUE



-Neg V	[* NPI	Partitive-Comp]
-Neg V	[NI	*Partitive-Comp]
-Neg V	[* NPI	Declarative-Comp]
-Neg V	[NP	✓Declarative-Comp]

SPANISH



-Neg V	[* Verb-Subjunctive	NPI]
-Neg V	[* Verb-Subjunctive	NP]
-Neg V	[Verb-Indicative	* NPI]
-Neg V	[Verb-Indicative	✓ NP]

Relevantly for the timing of the licensing of these constructions, the ungrammaticality should be detected at different stages in the sentence and, in principle, these ungrammaticality detection points should coincide with slower reading times.

NPI licensing in Basque:

Basic Stimuli Paradigm

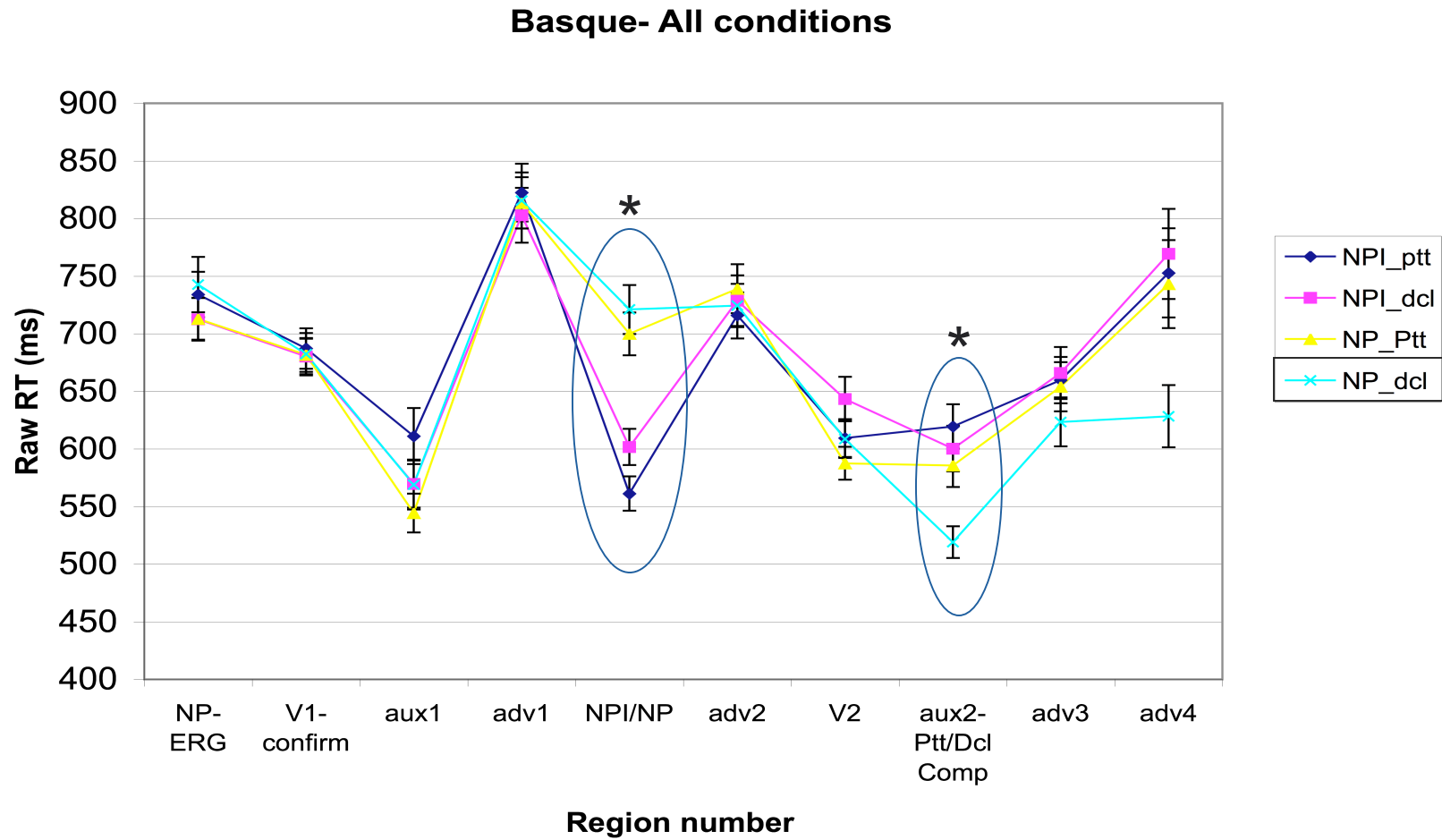
- a. *Pellok onartu du [festara **inor* berandu etorri **denik* gauean]
P-ERG confirm aux party-to anyone late come-fut aux-comp-*prtt* tonight-at
'Pello has confirmed that anybody would come to the party tonight'
- b. *Pellok onartu du [festara **inor* berandu etorri **dela* gauean]
P-ERG confirm aux party-to anyone late come-fut aux-comp tonight-at
'Pello has confirmed that anybody would come to the party tonight'
- c. *Pellok onartu du [festara *ltxasne* berandu etorri **denik* gauean]
P-ERG confirm aux party-to I-ABS late come-fut aux-comp-*prtt* tonight-at
'Pello has confirmed that ltxasne would come to the party tonight'
- d. Pellok onartu du [festara *ltxasne* berandu etorri ✓*dela* gauean]
P-ERG confirm aux party-to I-ABS late come-fut aux-comp tonight-at
'Pello has confirmed that ltxasne would come to the party tonight'

Basque on-line experiment:

Method

- Self-paced reading task - Moving Window-
- Word-by-word visual presentation
- 4 conditions
- 24 paired items in a Latin Square design + 72 fillers
- Comprehension questions
- 32 subjects (all had Basque as their first language)

Basque-Results



Basque NPI Licensing

Results

- The RT was slower at the NP conditions than at the NPI conditions at the NPI/NP position.
- No significant effect appeared between the NP and NPI conditions.
- There was a significant effect between the NPI partitive condition and the NP declarative condition at the auxiliary that carried the Complementizer.

Basque NPI Licensing

Discussion

- The lack of slowdown at the NPI position seems to indicate that the licensing of NPIs in Basque is done at a sentence level, and not at a local level.
- No significant differences for the Complementizer position in the NPI conditions
- The parser seems to be sensitive at the end of the sentence to ungrammaticality.
- It seems that in Basque the parser is not doing a final diagnosis of the sentence until the end => the parser does not seem to be behaving as incrementally as expected.

NPI Licensing within a Positive Semantic Context

BASQUE

∅

- | | | |
|--------|---------------|--------------------|
| -Neg V | [* NPI | Partitive-Comp] |
| -Neg V | [NP | *Partitive-Comp] |
| -Neg V | [* NPI | Declarative-Comp] |
| -Neg V | [NP | ✓Declarative-Comp] |

SPANISH

??

??

- | | | |
|--------|---------------------|---------------|
| -Neg V | [* Verb-Subjunctive | NPI] |
| -Neg V | [* Verb-Subjunctive | NP] |
| -Neg V | [Verb-Indicative | * NPI] |
| -Neg V | [Verb-Indicative | ✓ NP] |

NPI Licensing in Spanish:

Basic Stimuli Paradigm

- a. Pedro asegura [que en breve **vaya a venir* *nadie*]
P-nom confirms that shortly come-*subjunctive mood* anyone
'Pedro has confirmed that anybody would come shortly'
- b. Pedro asegura [que en breve ✓*va a venir* **nadie*]
P-nom confirms that shortly come-*indicative mood* anyone
'Pedro has confirmed that anybody would come shortly'
- c. Pedro asegura [que en breve * *vaya a venir* *Inés*]
P-nom confirms that shortly come-*subjunctive mood* Ines
'Pedro has confirmed that Ines will come shortly'
- d. Pedro asegura [que en breve ✓*va a venir* *Inés*]
P-nom confirms that shortly come-*indicative mood* Ines
'Pedro has confirmed that Ines will come shortly'

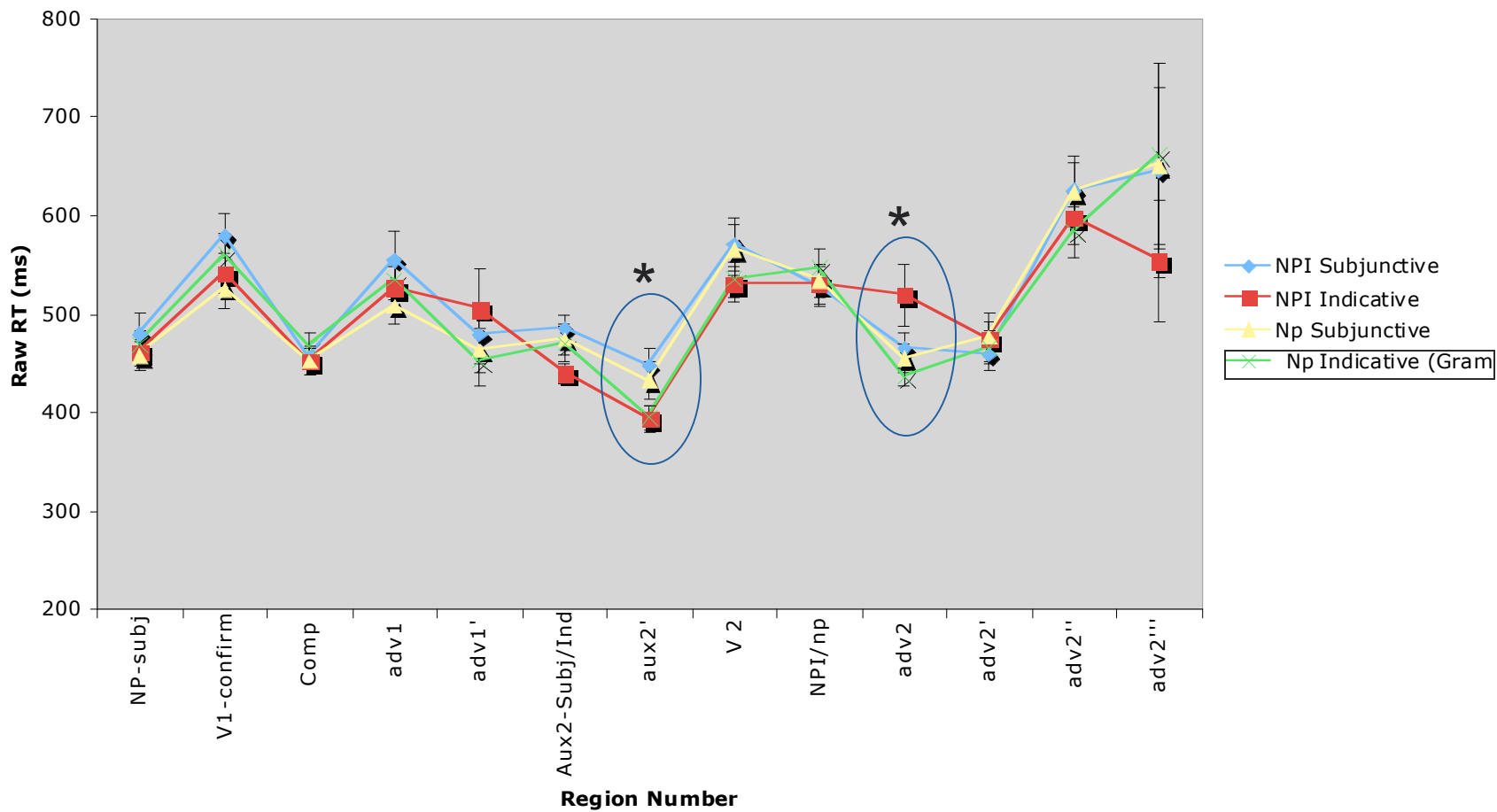
Spanish On-line Experiment:

Method

- Self-paced reading task - Moving Window-
- Word-by-word visual presentation
- 4 conditions
- 24 paired items in a Latin Square design + 72 fillers
- Comprehension questions
- 35 subjects (all had Spanish as their first language)

Spanish: Results

Spanish NPI - All conditions



Spanish NPI Licensing

Results

- There was a significant effect between the NPI subjunctive condition and the NPI indicative condition at the auxiliary that carried the mood information
 - NPI subjunctive condition > NPI indicative condition
- The second significant effect occurred at the region following the NPI in the NPI conditions
 - NPI indicative > NPI subjunctive condition

Spanish NPI Licensing

Discussion

- Results from the Spanish study show that the parser is sensitive to agreement information and to NPI licensing in that, there are RT slowdowns at the expected ungrammaticality detection points.
- It seems that in Spanish the parser is working incrementally in doing a diagnosis of the licensing of the NPIs and that, as in the case of Basque, it recognizes which sentences violate the NPI licensing constraints.

Basque and Spanish NPI licensing:



Conclusions

- This study provides further insight on the kinds of cues that are required to license NPIs in real-time comprehension, when, besides the NPI, the licensing requires a specific agreement to be present within the clause where the NPI is contained.
- Overall, agreement seems to provide more information into how the timing in the licensing of these constructions proceeds and it seems to be a reliable cue to detect unlicensed or ungrammatical constructions.
- Even if the evidence is not conclusive, it seems to point to a sentence level rather than to local licensing, where the whole semantic composition of the sentence has to be taken into consideration when doing the final diagnosis of the sentence
- ERP components that this kind of NPI licensing violations generate? (*ongoing research*)

Tack! Thank you!

Doug Saddy

Peter beim Graben

Theodoros Marinis

Nina Kazanina

Colin Phillips

Patrick Sturt

Masaya Yoshida

Manuel Carreiras

Itziar Laka

Jon Ortiz de Urbina

Myriam Uribe-Etxebarria

Urtzi Etxeberria

Angel Gallego

Lara Reglero

Itziar San Martin