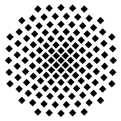

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Pseudo Relatives are easier than Relative Clauses: Evidence from Tense

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Outline

- Relative Clause Attachment
- Pseudo Relatives
- PR-first Hypothesis
- Summary of previous findings
- Experiment 1 & 2: Acceptability Judgment
- Experiment 3: Eye-Tracking (Preliminary Results)

Asymmetries in RC Attachment

(Cuetos and Mitchell, 1988, among many others)

Someone shot the maid of the actress [that was standing on the balcony]

Algúien disparó contra la criada de la actriz [que estava en el balcón]

Asymmetries in RC Attachment

- These findings raised problems for:
  1. Local attachment preference found for other structures in the same languages, (Hemforth et al., 2000; Phillips and Gibson, 1997).
  2. Universality of parsing principles, (Kimball, 1973; Frazier, 1978; Gibson, 1991; Phillips, 1996);
  3. Theories of acquisition (Fodor, 1998a,b).

Asymmetries in RC Attachment

- Several factors have been shown to influence RC-attachment **in similar ways across languages**, including syntactic, pragmatic, prosodic and individual differences in memory span
- Residual (significant) asymmetries still observable across languages once these factors are controlled for.
- Today's account aims at completing, **not replacing**, previous accounts.

The role of Pseudo Relatives (Grillo, 2012; Grillo and Costa, 2014)

- Asymmetric availability of **Pseudo Relatives** confounded previous work on RC attachment:
- In Spanish (and other High Attachment languages) RCs are string identical to so called Pseudo Relatives (PRs), i.e. a type of Small Clause.
- Other languages, including English, do not allow PRs.

Pseudo Relatives

Pseudo-relatives (PRs) are constructions found in many languages that look superficially like RCs but are comparable to an English Small Clause:

(1) a. Jean a vu **Bolt qui courait**. (French)
J. has seen Bolt that ran.IMPF.
'John saw Bolt running'

b. Jean l'a vu qui courait.
J. him.has seen that run.IMPF.
'John saw him running.'

c. *John saw him that was running.

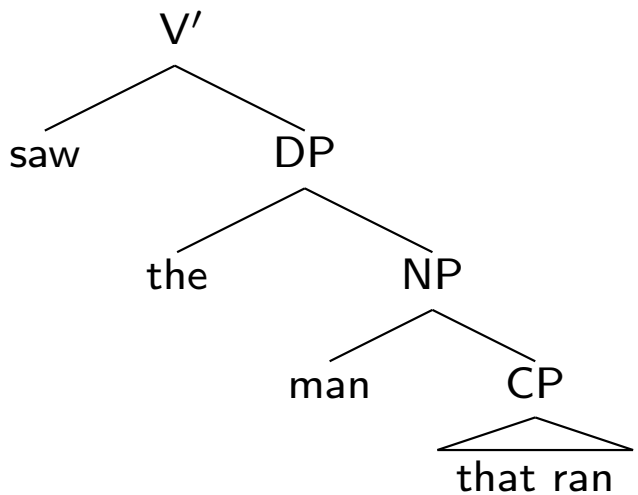
. . . Also available in Dutch, Catalan, Galician, Asturian, Serbo-Croatian, Greek, a.o. (Rafel, 1999; Grillo and Costa, 2014).

RCs vs. PRs: Structure (Cinque, 1992, a.o.)

(2) Jean a vu l'homme qui courait.
J. has seen the'man that run.IMPF.
'John saw the man (that was) running.'

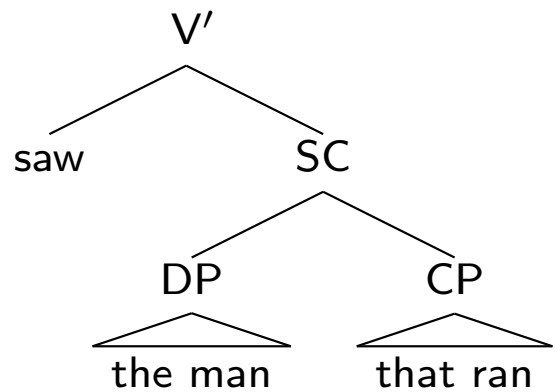
Relative Clause

(3)



Pseudo Relative

(4)



RCs vs. PRs: Meaning

Relative Clause

John saw the man that runs

∃e [see(e) & experiencer(e)(John) & stimulus(the unique man that ran)(e)]

Pseudo Relative

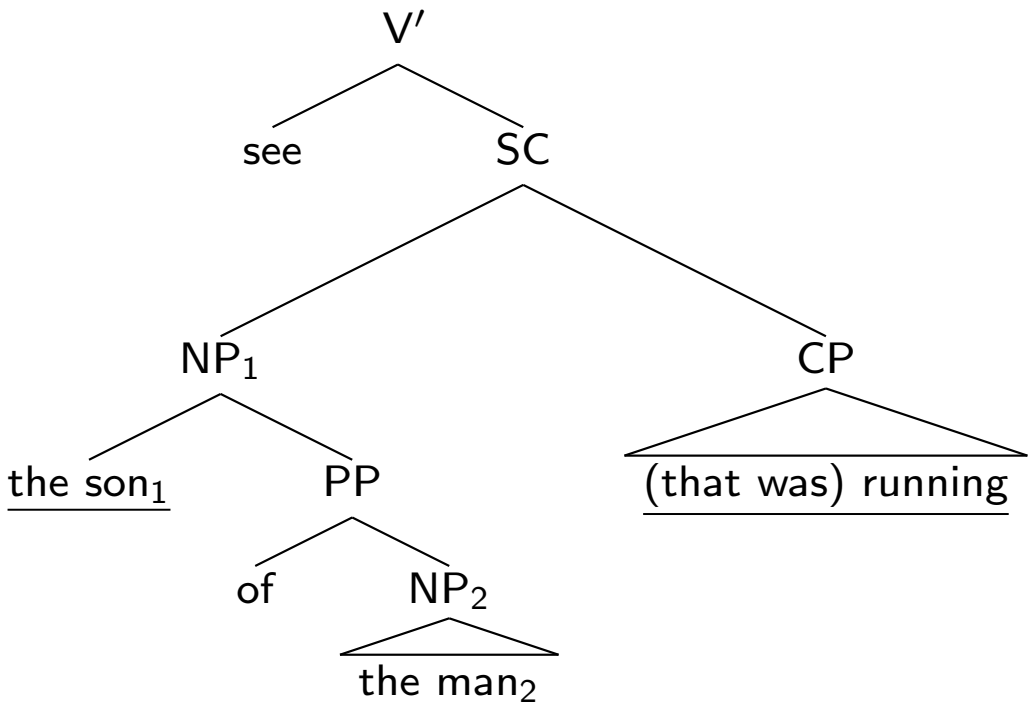
John saw the man running

∃e∃e'[see(e) & experiencer(e)(John) & stimulus(e')(e) & run(e') & agent(e')(the man)]

Obligatory High Attachment with PRs

With PRs & SCs, NP1 is the only accessible subject

(5) a. Jean a vu [$_{PR}$ le fils de l'homme qui courait.]
b. John saw [$_{SC}$ the son of the man running.]



PR-first Hypothesis (Grillo, 2012; Grillo and Costa, 2012, 2014)

When PRs are available they will be preferred over RCs.

Everything else being equal:

A. Low Attachment preference is observed, across languages and structures, with genuine RCs, i.e. when PRs are not available.

B. High Attachment preference is observed in languages and structures which allow for a PR reading.

PR-first Hypothesis (Grillo, 2012; Grillo and Costa, 2012, 2014)

Why?: PRs are structurally and interpretively simpler than RCs

- PRs (SCs) have simpler syntax /semantics than RCs
- PRs, but not RCs, are relevant for the main assertion (cf. *Relativized Relevance*, Frazier 1990)
- PRs carry fewer unsupported presuppositions than RCs, as they do not require a contrast set (Crain and Steedman, 1985; Altmann and Steedman, 1988)

PR availability and RC-attachment across languages

Language	Attachment	PRs
English	Low	*
Romanian	Low	*
Basque	Low	*
Chinese	Low	*
Spanish	High	✓
Galician	High	✓
Dutch	High	✓
Italian	High	✓
French	High	✓
Serbo-Croatian	High	✓
Japanese	High	✓
Korean	High	✓
Greek	High	✓
Portuguese	High	✓
German	High/Low	*
Russian	High/Low	*
Bulgarian	High/Low	*

German, Russian and Bulgarian: 1. obligatory Relative Pronoun, 2. preceded by comma (might induce prosodic break).

Alternative explanation under *Anaphoric Binding / Implicit Prosody* (Hemforth et al., 1996; Fodor, 2002).

How do we test for PR-effects?

- One way to test PR-availability effects on RC-attachment is to manipulate the properties of the Matrix Verb
- Not all verbs allow PRs

Constraints on PR availability

PRs, and eventive SCs, are allowed with perceptual verbs, but not with stative predicates:

(6) a. Jean a vu Bolt qui courait. PR
J. has seen B. that run.IMPF.
'John saw Bolt running.'

b. #Jean vivait avec Bolt qui courait. Appositive/*PR
J. lived with B. that run.IMPF.
'#John lived with Bolt that ran.'

V-Type keeps Complex-NP+RC identical & manipulate ±PR

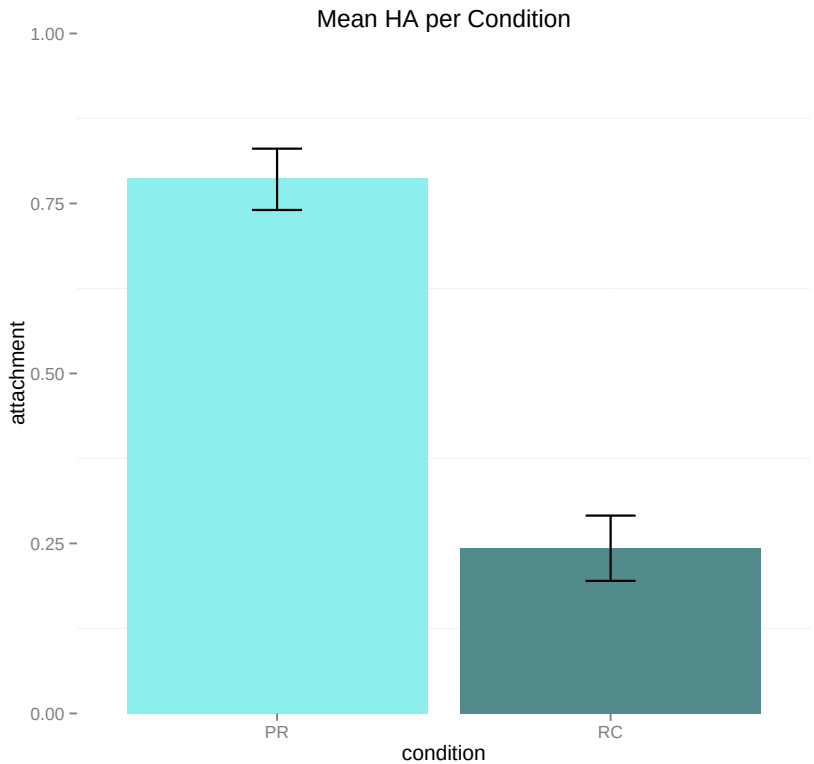
Effects of PR-availability within a language

Contrast:

a. John saw the son of the doctor that was running. PERCEPTUAL

b. John lives with the son of the doctor that was running. STATIVE

ITALIAN
(Grillo and Costa, 2014)



Comparable results from other PR-languages

- Greek (Grillo and Spathas, 2014)
- Portuguese (Grillo et al. 2012a,b, 2013a,b; Fernandes 2012; Tomaz et al. 2014)
- Spanish (Grillo et al., 2012b)

PR-availability or plausibility? (Grillo, Costa, Fernandes & Santi 2014)

- RC-Attachment appears largely determined by PR-availability
- PR-availability, however, covaries with semantics of the main predicate (e.g. perceptual vs. stative).
- Essential to test a nonPR language (e.g. English) to assess whether predicate distinction alone can account for the results.

English (Grillo et al., 2013a, 2014, 2015)

Same stimuli as in PR-languages studies:

Contrast:

a. John saw the son of the doctor that was running. PERCEPTUAL

b. John lives with the son of the doctor that was running. STATIVE

Low Attachment preference in both conditions

Summary

- When PRs are not available, LA is found across languages and structures (all else being equal)
- When PRs are available, High Attachment is found
- Differences in RC-attachment are rooted in grammatical differences

Today's experiments

- Previous studies tested consequences of *PR-first* for RC-attachment
- We provide direct evidence for the preference of PRs over RCs in the absence of attachment ambiguities
- How? We forced RC-reading in otherwise PR-compatible environments

Today's experiments

- How do we force RC-readings in PR-compatible environments?
- Tense (Mis)match

Restrictions on Tense:

PRs require matching Tense between matrix & embedded V:

(7) Marie a vu l'homme qui courait. PR/RC
M. saw.PAST the man that ran.PAST .

Mismatching Tense forces RC interpretation:

(8) Marie voit le garçon qui courait. RC only
M. sees.PRES the boy that ran.PAST .

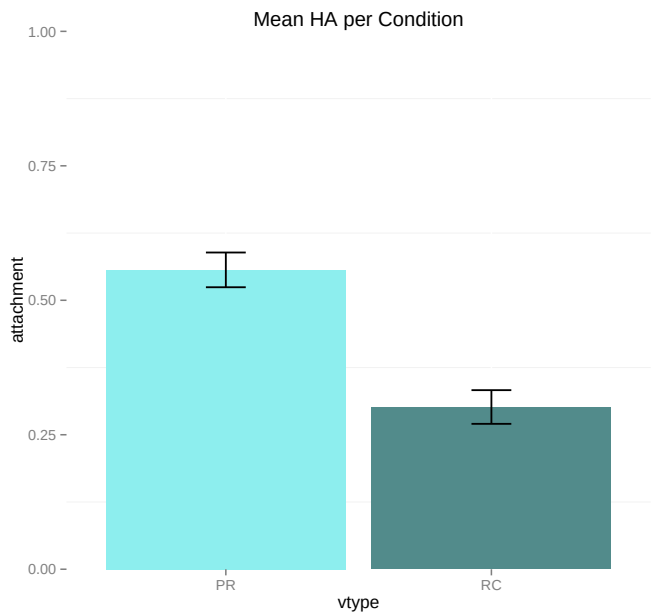
Experiments

1. Effects of PR-availability in RC-attachment
   French
2. Acceptability in 2[V-Type]*2[Tense (Mis)match]
   French/English
3. Eye-tracking
   French

RC-Attachment in French

Marie écoute le fils du policier qui parle. PERCEPTUAL
Marie est employée par le fils du policier qui parle. STATIVE

PERCEPTUAL	STATIVE
60.6%	28.8%



Significant effect of Verb-Type ($p<.0001$)

Experiment 1 & 2: Acceptability Judgments

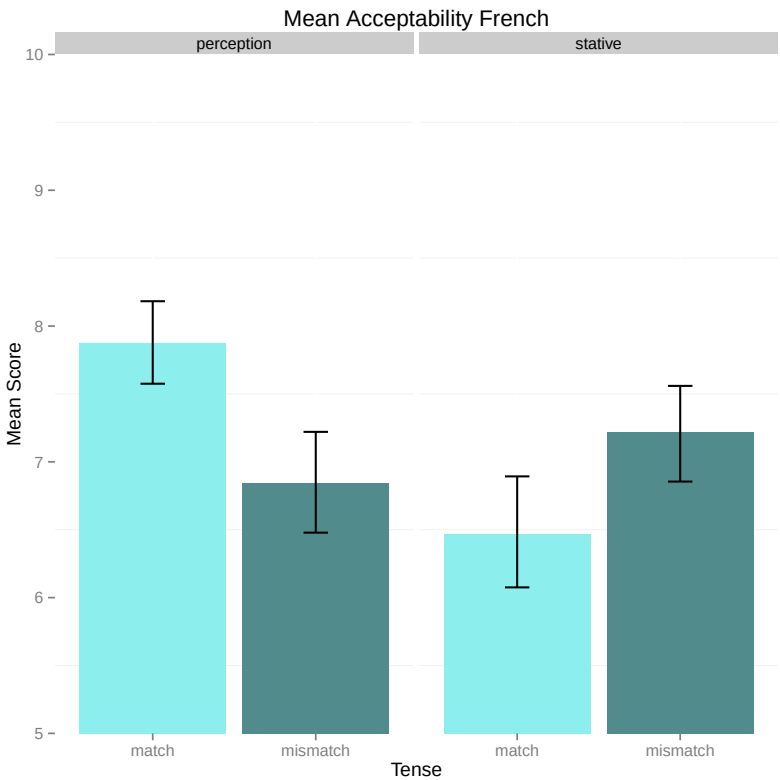
- Acceptability Judgments on a 0-10 scale (10 = completely acceptable) in French & English
- V-Type(*Perceptual/Stative*)*2Tense(*Match/Mismatch*)
- Identical critical regions (embedded verb/clause) across conditions.
- 24 simulus sentences + 48 unrelated fillers
- Predictions:
  - Interaction between V-Type and Tense in French
  - No interaction in English

Experiment 1 & 2: Stimuli

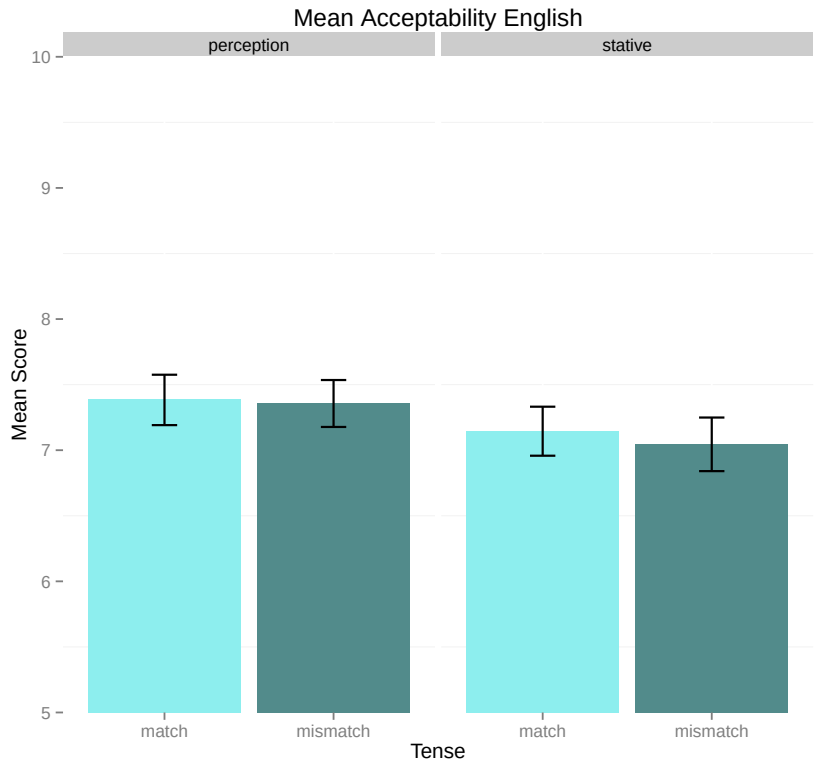
VERB TYPE	TENSE	**Sample Sentence**
Perceptual	*Match*	a. John saw the girl that pushed the lady.
Perceptual	*Mismatch*	b. John sees the girl that pushed the lady.
Stative	*Match*	c. John was married to the girl that pushed the lady.
Stative	*Mismatch*	d. John is married to the girl that pushed the lady.

Experiment 1 & 2: Results

French (N=58):
V-Type*Tense interaction ($p<.01$)



English (N=101):
No interaction!
Marginal effect of V-Type ($p<.1$)



Experiment 1 & 2: Summary

- Results fully support PR-first predictions
- Parser favour PR over RC interpretation
- In line with more general preference for secondary predication over restrictive interpretations

- We predict similar online effects at disambiguating region (embedded Verb)
- Support from *preliminary* eye-tracking data from French (N=24)

Experiment 3: Eye-Tracking while reading

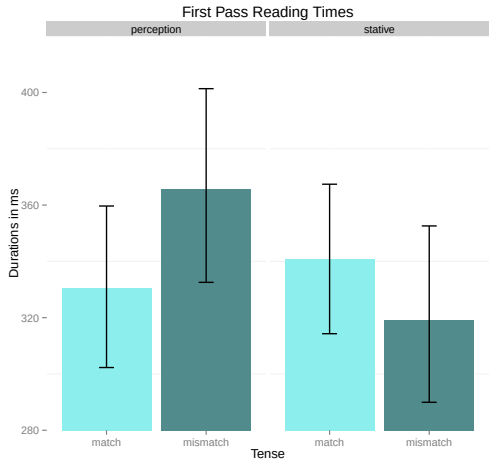
Same stimuli as Experiment 2:

VERB TYPE	TENSE	**Sample Sentence**
Perceptual	*Match*	Jean a vu la fille qui poussait la femme. John saw the girl that pushed the lady.
Perceptual	*Mismatch*	Jean voit la fille qui poussait la femme. John sees the girl that pushed the lady.
Stative	*Match*	Jean était marié à la fille qui poussait la femme. John was married to the girl that pushed the lady.
Stative	*Mismatch*	Jean est marié à la fille qui poussait la femme. John is married to the girl that pushed the lady.

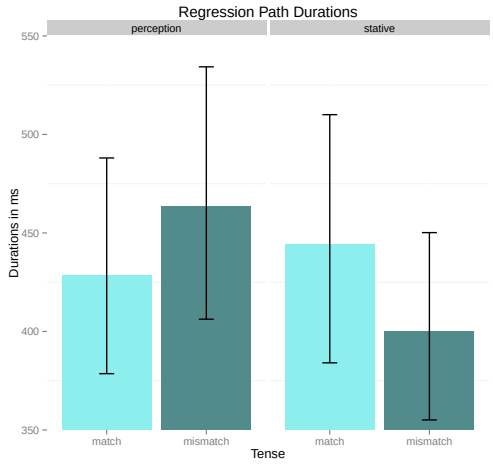
Experiment 3: Preliminary Results - French

Durations at Critical Region

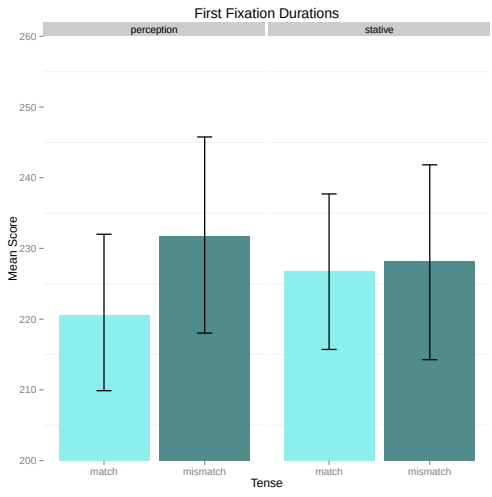
First Pass RTs



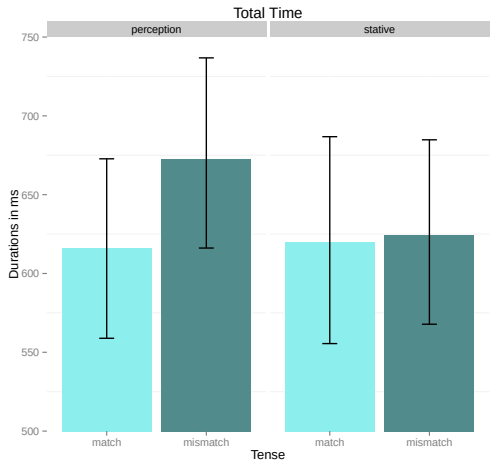
Regression Path Durations



First Fixation Durations



Total RTs



Experiment 3: Eye-Tracking

Preliminary Results from eye-tracking in French match acceptability judgments:

- Preference for PR interpretation observable at critical region
- Tense Mismatch generates longer durations at disambiguating region only in PR-environments.
- English data being collected.

Conclusions

- PR-availability modulates RC-attachment across languages
- Parsing preference for PR over RC interpretation
- In other terms: stronger prediction for an event (rather than an entity) after perceptual verbs
- *PR-first* accounts for residual variation in RC-attachment results not explained by other known factors
- Cross-linguistic Asymmetries in RC-attachment are epiphenomenal

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Thank you!

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DFG Deutsche Forschungsgemeinschaft

FCT Fundação para a Ciência e a Tecnologia
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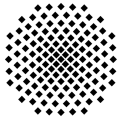

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Thank you!

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Asymmetries between RCs and PR/SC

Property	**RCs**	**PRs**	**SCs**
Long distance 'gap'	✓	✗	✗
Refers to individuals	✓	✗	✗
Available w. objects	✓	✗	✗
Available w. Rel. Pronouns	✓	✗	✗
NP modifier	✓	✗	✗
Conjunction with RC	✓	✗	✗
Conjunction with SCs	✗	✓	✓
Refers to events	✗	✓	✓
Available in SC environments	✗	✓	✓
Available w. Proper Names	✗	✓	✓
VP modifier	✗	✓	✓
Aspectual restrictions	✗	✓	✓
Tense restrictions	✗	✓	✓
Restrictions on matrix V	✗	✓	✓