

Pragmatic Enrichment and Non-restrictive Relatives

Doug Arnold and Robert D. Borsley
University of Essex

Language and Computation Day 2008, Essex

Terminology

- Non-Restrictive Relative (NRRC) vs Restrictive Relative:

(1) a. I bought the cheapest book, which was a paperback. [NRRC]

(\approx I bought the cheapest book, (and) it was a paperback.)

b. I bought the cheapest book which was a paperback. [RRC]

NRRCs can have sentential/propositional antecedents:

(2) United won the title, which was not a surprise.

- Ellipsis:

(3) a. Kim owns a dog, but Sam doesn't Δ . (VP-ellipsis)

b. Kim has two dogs, but Sam has three Δ . (N'-ellipsis)

c. Kim has a dog, but I don't know why Δ . (Sluicing)

...

- Propositional Lexeme: *yes*, *no*, *probably*, etc.

Outline (1)

⇒ **1 Introduction**

2 Phenomena

3 Analysis

4 Other Forms of Ellipsis

5 Subtleties and Details

6 Conclusion

7 References

1 Introduction

Blakemore (2006) notes the interpretation of B's utterance in (3):

(1) A: What did Jo think?

B: Just as we predicted, you should say nothing.

*(Our prediction \approx **Jo thinks** you should say nothing)*

(Our prediction $\not\approx$ You should say nothing)

- The host of the *as*-parenthetical is 'pragmatically enriched' with content from the preceding question.
- Parentheticals are inserted into conceptual/pragmatic representations, and are absent at syntactic levels.

We have similar data with non-restrictive relative clauses (NRRCs).

In (4), B expresses surprise that **Jo thinks** you should say nothing (not surprise that you should say nothing):

(2) A: What did Jo think?

B: You should say nothing, which is surprising.

(\approx *It is surprising that **Jo thinks** you should say nothing*)

($\not\approx$ *It is surprising that you should say nothing*)

- NRRCs attach to ‘pragmatically enriched’ hosts;
- NRRCs are attached at conceptual/pragmatic (not syntactic) levels, *contra* syntactically integrated approaches, such as Arnold (2004, 2007).

However, on closer inspection it turns out that:

- such examples provide evidence **against** a ‘conceptual attachment’ analysis, and **in favour** of syntactically integrated approaches;
- the analysis of such examples follows straightforwardly from a syntactically integrated approach and Ginzburg and Sag (2000) (G&S)’s approach to ellipsis and anaphora.

These observations, seem to be novel — there seem to be no previous explorations of the interaction between NRRCs, ellipsis and anaphora.

- 1 Introduction
- ⇒2 **Phenomena**
- 3 Analysis
- 4 Other Forms of Ellipsis
- 5 Subtleties and Details
- 6 Conclusion
- 7 References

2 Phenomena

Basic examples (no ellipsis or anaphora):

(3) Kim owns a dog, which is regrettable. (*which* \approx *Kim owns a dog*)

(4) Kim owns a dog, which is a dachshund. (*which* \approx *a dog*)

Given an NRRC following a clause with a final NP, the antecedent/host can be either the clause (*Kim owns a dog*), as in (5); or the NP (*a dog*), as in (6).

2.1 Ellipsis: 'bare argument ellipsis'

(5) A: Who owns a dog?

B: Kim.

(Kim ≈ Kim owns a dog)

(6) Lee owns a dog — and Kim.

(Kim ≈ Kim owns a dog)

Here *Kim* is interpreted as *Kim owns a dog*, with the same conceptual representation, presumably.

But with an NRRC:

(7) A: Who owns a dog?

B: Kim, which is regrettable.

(which ≈ Kim owns a dog)

B': Kim, who has many pets.

(who ≈ Kim)

B'': *Kim, which is a dachshund.

(which ≈ a dog)

Compare, without ellipsis:

(8) A: Who owns a dog?

B: Kim owns a dog, which is a dachshund.

(which ≈ a dog)

Compare, normal pronominal anaphora:

(9) A: Who owns a dog?

B: Kim, and it's a dachshund.

2.2 Anaphora: propositional lexemes

(10) A: Does Kim own a dog?

B: Yes.

(*yes* \approx *Kim owns a dog*)

Conceptually, *yes* is equivalent to *Kim has a dog*.

But with an NRRC:

(11) A: Does Kim own a dog?

B: Yes, which is regrettable.

(which ≈ Kim owns a dog)

B': *Yes, which is a dachshund.

(which ≈ a dog)

Compare, without anaphora:

(12) A: Does Kim own a dog?

B: Kim does (indeed) own a dog, which is a dachshund.

Compare, normal pronominal anaphora:

(13) A: Does Kim own a dog?

B: Yes, and it's a dachshund.

This is mysterious if *Kim* and *yes* in these contexts have the same conceptual representation as *Kim owns a dog*, and NRRCs are integrated only at conceptual levels of representation.

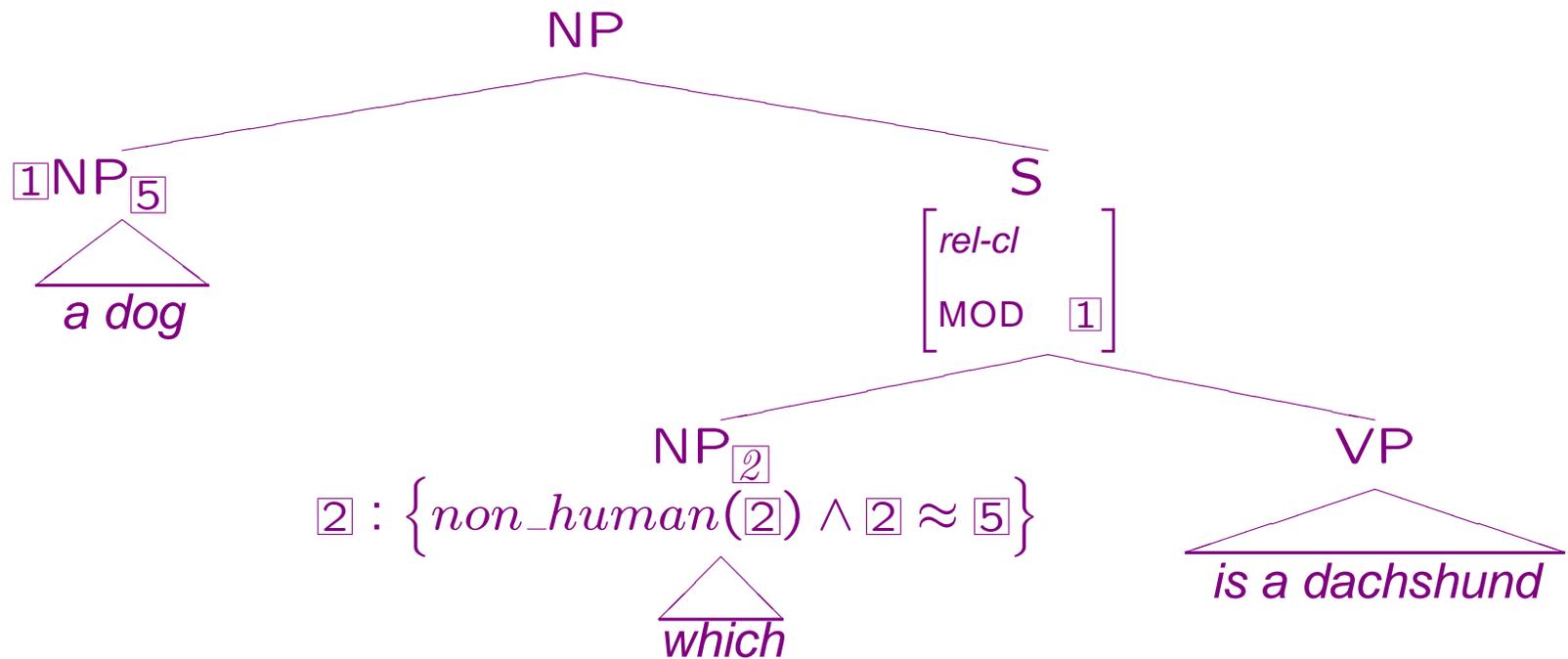
But it follows naturally when a ‘syntactically integrated’ approach to NRRCs is combined with an approach to ellipsis and propositional lexemes such as that proposed in G&S.

- 1 Introduction
- 2 Phenomena
- ⇒**3 Analysis**
- 4 Other Forms of Ellipsis
- 5 Subtleties and Details
- 6 Conclusion
- 7 References

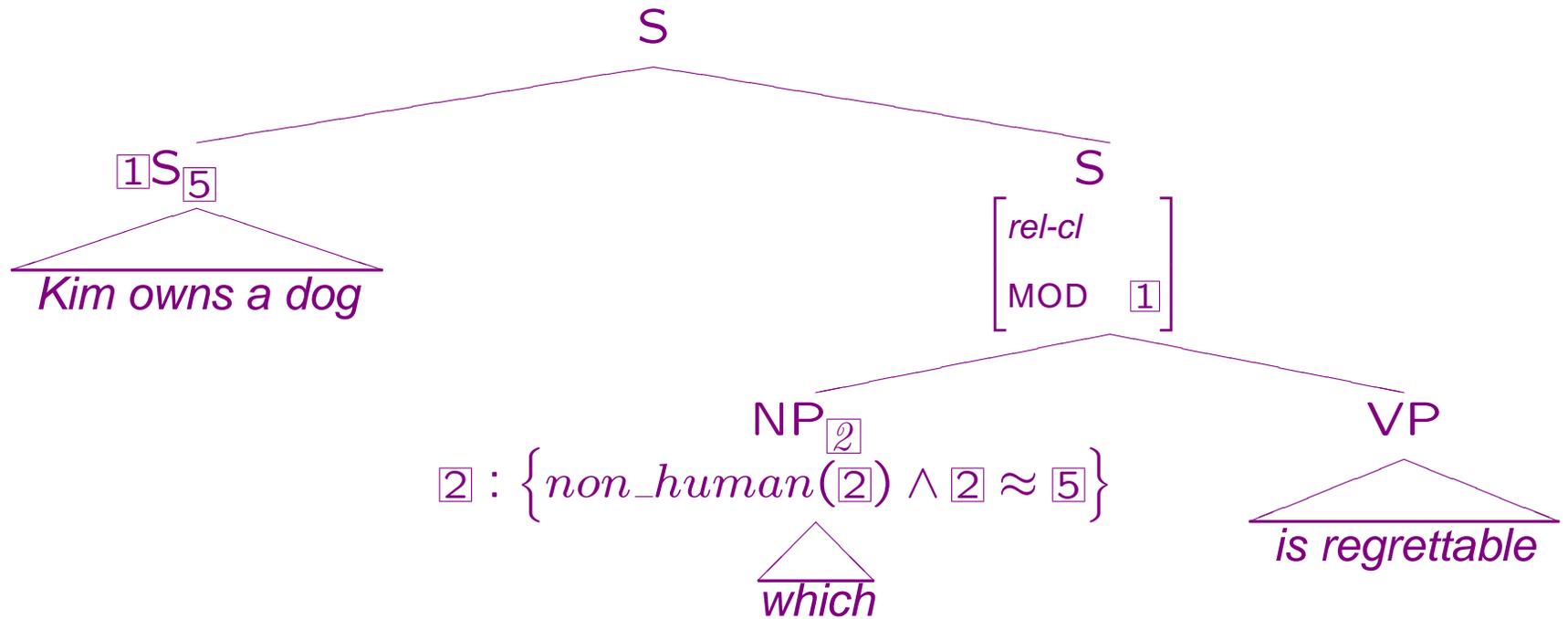
3 Analysis

3.1 NRRCs

(14)



(15)



Abbreviations/simplifications:

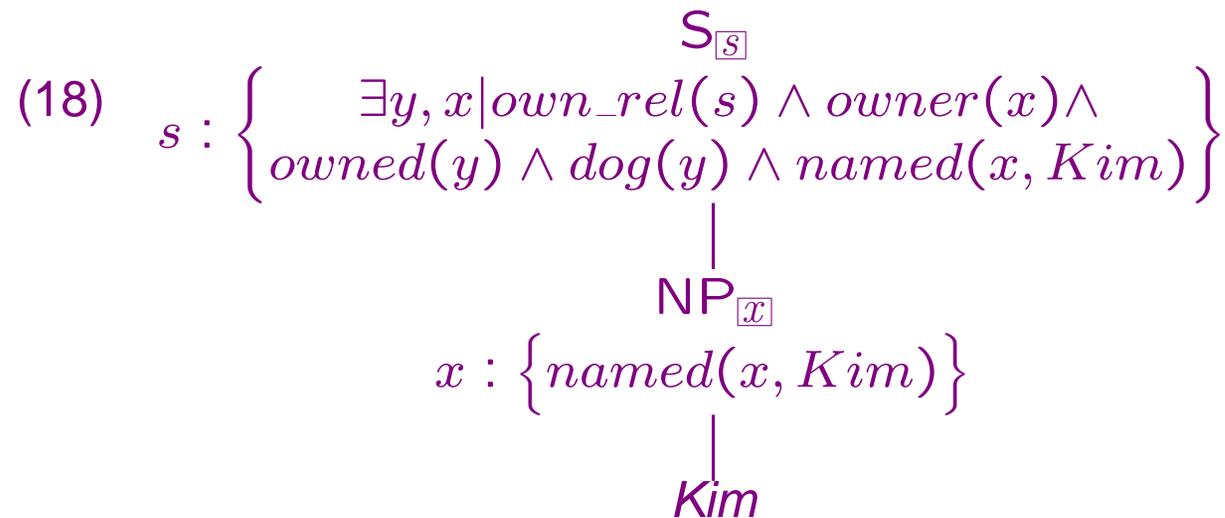
- $NP_{\boxed{1}}$ — an NP whose CONTENT | INDEX is $\boxed{1}$.
- $S_{\boxed{1}}$ — an S whose CONTENT | SITUATION value is $\boxed{1}$.
- CONTENT values — pairs consisting of an ‘index’ and a set of restrictions:
 - $y : \{dog(y)\}$ *(a dog)*
 - $s : \left\{ \begin{array}{l} \exists y, x | own_rel(s) \wedge owner(x) \wedge \\ owned(y) \wedge dog(y) \wedge named(x, Kim) \end{array} \right\}$ *(Kim owns a dog)*

The crucial point is the requirement of anaphoric dependence between the index of the relative phrase and the index of the host — the phrase to which it is attached (syntactically).

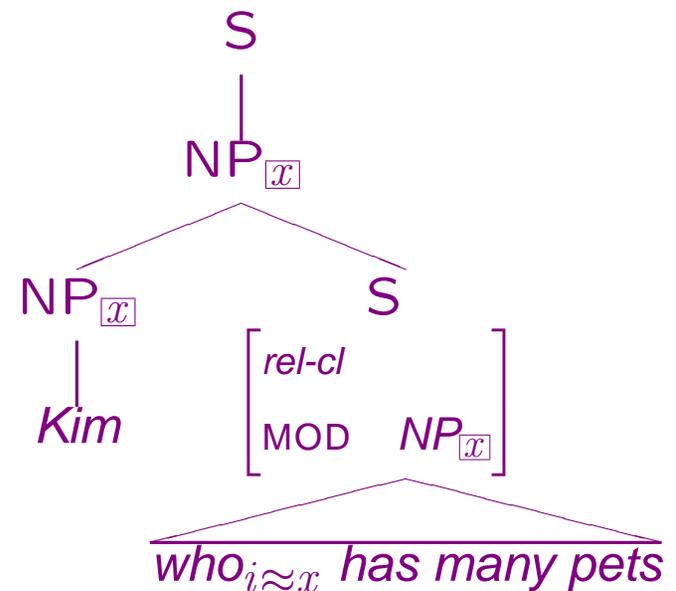
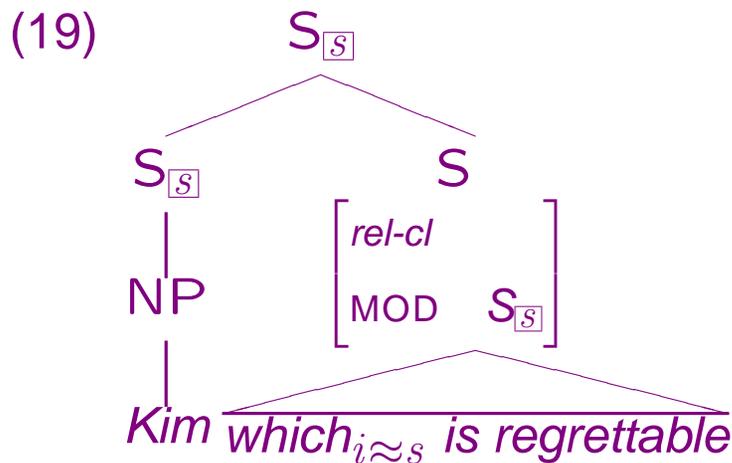
3.2 Ellipsis: Bare Argument Ellipsis

- (16) A: Who owns a dog?
B: Kim.

The key points of the analysis can be seen in the representation in (16).



There are only two attachment points for an NRC:



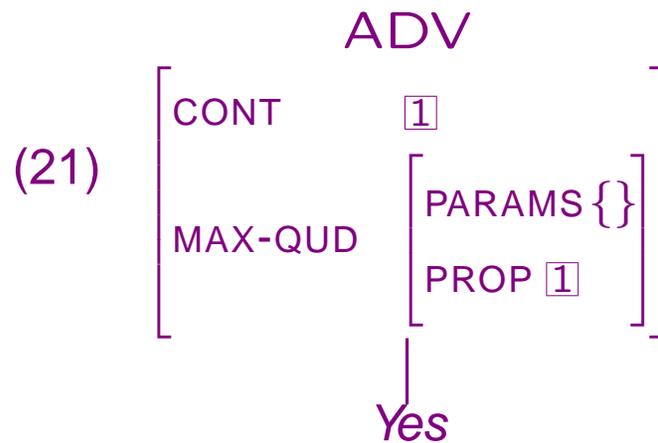
- (20) A: Who owns a dog?
 B: Kim, which is regrettable.
 B': Kim, who has many pets.
 B'': *Kim, which is a dachshund.

The impossibility of having an NP inside the 'missing material' as antecedent for the NRRC falls out automatically.

3.3 Anaphora: Propositional Lexemes

Items such as *yes*, *no*, *probably*, *regretably*, *unfortunately*, etc.

G&S's analysis:



(22) A: Does Kim own a dog?

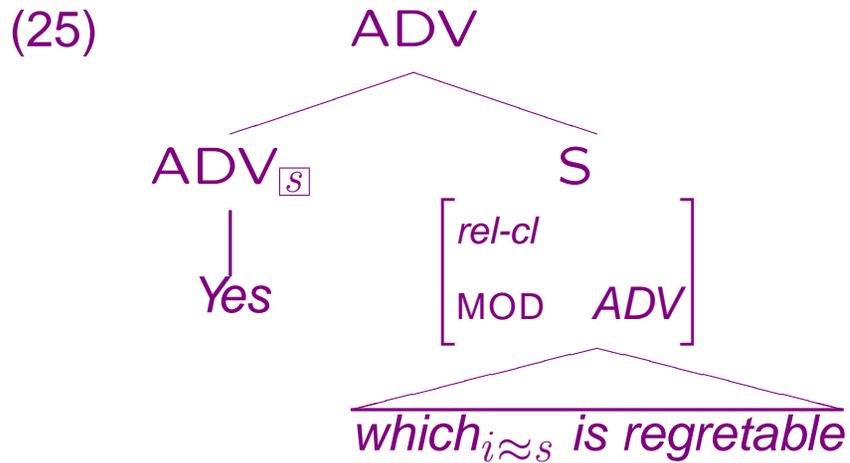
B: Yes.

$$(23) \quad s : \left\{ \begin{array}{l} \exists y, x | \text{own_rel}(s) \wedge \text{owner}(x) \wedge \\ \text{owned}(y) \wedge \text{dog}(y) \wedge \text{named}(x, \text{Kim}) \end{array} \right\}$$

$$(24) \quad s : \left\{ \begin{array}{l} \text{ADV}_{\boxed{s}} \\ \exists y, x | \text{own_rel}(s) \wedge \text{owner}(x) \wedge \\ \text{owned}(y) \wedge \text{dog}(y) \wedge \text{named}(x, \text{Kim}) \end{array} \right\}$$

↓
Yes

This gives us just one attachment point for an NRRC:



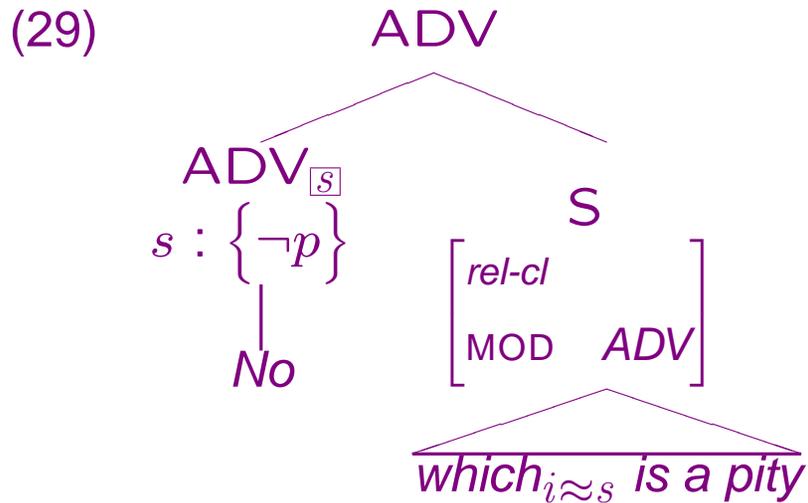
- (26) A: Does Kim own a dog?
 B: Yes, which is regrettable.
 B': *Yes, which is a dachshund.

- (27) A: Does Kim own a dog?
 B: Yes, and it's a dachshund.

Similarly:

(28) $ADV_{\boxed{S}}$
 $s : \{ \neg p \}$
|
No

($p \approx$ Kim owns a dog)



- (30) A: Does Kim own a dog?
 B: No, which is a pity.
 B': *No, which would be a pity.

- (31) A: Does Kim own a dog?
 B': No, and it would be a pity.

- 1 Introduction
- 2 Phenomena
- 3 Analysis
- ⇒4 **Other Forms of Ellipsis**
- 5 Subtleties and Details
- 6 Conclusion
- 7 References

4 Other Forms of Ellipsis

Other kinds of ellipsis show the same pattern.

4.1 N' Ellipsis

- (32) Lee took two pictures of Sandy, so Kim took three Δ . (=pictures of Sandy)
- (33) a. Lee took two of pictures of Sandy, so Kim took three pictures of Sandy, who must be one of the most photographed people around.
b. *Lee took two of pictures of Sandy, so Kim took three Δ , who must be one of the most photographed people around.
c. Lee took two of pictures of Sandy, so Kim took three Δ , she must be one of the most photographed people around.
d. Lee took two of pictures of Sandy, so Kim took three Δ , which turned out well.

4.2 Sluicing

- (34) I know Frazier beat Ali, but I don't remember how/why/when. (=Frazier beat Ali)
- (35) a. I know Frazier beat Ali, but I don't remember how/why/when Frazier beat Ali, who many think was the the greatest champion ever.
b. *I know Frazier beat Ali, but I don't remember how/why/when, who many think was the the greatest champion ever.
c. I know Frazier beat Ali, but I don't remember how/why/when — many think he was the the greatest champion ever.
d. I know Frazier beat Ali, but I don't remember how/why/when, which is not surprising, given my memory.

4.3 Comparative Ellipsis

- (36) a. Sam is happier in London than Kim was in London.
b. Sam is happier in London than Kim was Δ .
c. Sam is happier in London than Kim Δ .
- (37) a. Sam is happier in London than Kim was in London, which was too busy for her.
b. *Sam is happier in London than Kim (was) Δ , which was too busy for her.
c. Sam is happier in London than Kim (was) Δ , it was too busy for her.
d. Sam is happier in London than Kim (was) Δ , which is not surprising.

4.4 VP Ellipsis

(38) I have never ridden a camel, but Kim has. (=ridden a camel)

(39) a. I have never ridden a camel, but Kim has ridden a camel, which stank horribly.

b. *I have never ridden a camel, but Kim has, which stank horribly.

c. I have never ridden a camel, but Kim has, it stank horribly.

d. I have never ridden a camel, but Kim has, which surprises me, because she is scared of animals.

(This might be problematic for interpretive accounts of VPE based on full syntactic reconstruction.)

Outline (5)

- 1 Introduction
- 2 Phenomena
- 3 Analysis
- 4 Other Forms of Ellipsis
- ⇒**5 Subtleties and Details**
- 6 Conclusion
- 7 References

5 Subtleties and Details

Notice that the relation between the relative phrase and the antecedent is anaphoric dependence, not identity or co-indexation.

- (40) a. Kim likes muffins, but Sandy prefers scones, which they eat with jam.
b. Then Kim started talking to her friends in Italian, which I think sounds really sexy.
c. Kim turned the hot dog down flat, which would not have happened with the filet mignon.

This is reminiscent of normal anaphora: the interpretation of the relative pronoun can be some ‘extension’ or ‘abstraction’ of the antecedent, but notice that such extensions/abstractions are only accessible via the index of the syntactic host of the NRRC (unlike normal anaphora).

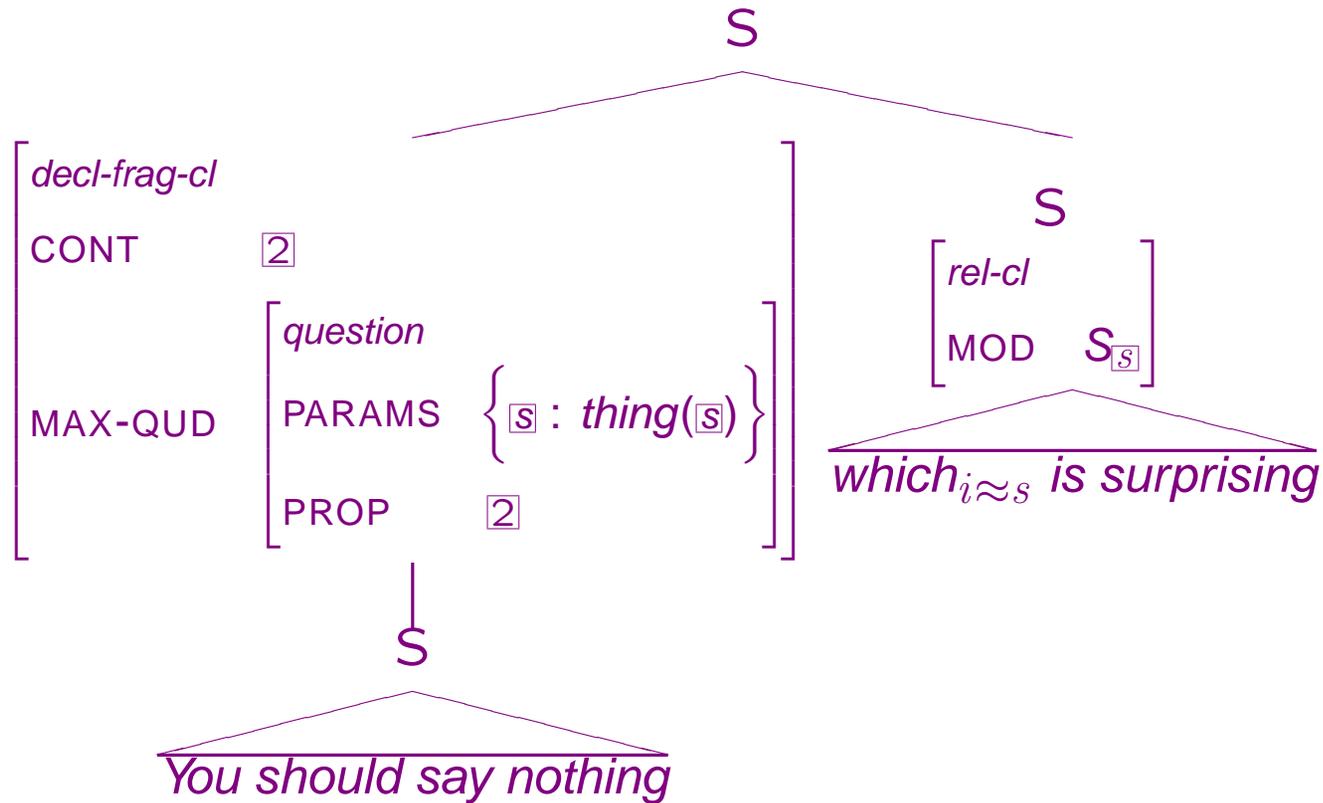
The example we began with (4):

(41) A: What did Jo think?

B: You should say nothing, which is surprising.

- *You should say nothing* is a *declarative-fragment-clause*;
- where the question is ‘for what X does Jo think X?’ involving the proposition ‘Jo thinks X’;
- so $(\text{You should say nothing} \approx \text{Jo thinks you should say nothing})$.

(42)



- 1 Introduction
- 2 Phenomena
- 3 Analysis
- 4 Other Forms of Ellipsis
- 5 Subtleties and Details
- ⇒ **6 Conclusion**
- 7 References

6 Conclusion

- There is strong evidence that NRRCs attach to their hosts 'in the syntax' rather than at a conceptual level. (Phew!)

- There is strong evidence that NRRCs attach to their hosts ‘in the syntax’ rather than at a conceptual level. (Phew!)
- These facts about the interaction of ellipsis, anaphora and NRRCs fall out automatically from existing, independently motivated, HPSG analyses without modification. (Good!)

- There is strong evidence that NRRCs attach to their hosts ‘in the syntax’ rather than at a conceptual level. (Phew!)
- These facts about the interaction of ellipsis, anaphora and NRRCs fall out automatically from existing, independently motivated, HPSG analyses without modification. (Good!)
- There is nothing specific to English in any of this. We predict that the facts should be parallel in any language that has a relative clause construction that can take sentential/verbal antecedents.

- 1 Introduction
- 2 Phenomena
- 3 Analysis
- 4 Other Forms of Ellipsis
- 5 Subtleties and Details
- 6 Conclusion
- ⇒7 **References**

7 References

- D.J. Arnold. Non-Restrictive relative clauses in construction based HPSG. In Stefan Müller, editor, *Proceedings of the 11th International Conference on Head-Driven Phrase Structure Grammar*, pages 27–47, Stanford, 2004. CSLI Publications. URL <http://csli-publications.stanford.edu/HPSG/5/arnold.pdf>.
- D.J. Arnold. Non-Restrictive relatives are not orphans. *Journal of Linguistics*, 43(2):272–309, 2007.
- D Blakemore. Divisions of labour: the analysis of parentheticals. *Lingua*, 116: 1670–1687, 2006.
- Markus Egg. The syntax and semantics of relative clause modification. In Khal'il Simanan, Maarten de Rijke, Remko Scha, and Rob van Son, editors,

Proceedings of the Sixteenth Computational Linguistics in the Netherlands, pages 49–56, Universiteit Amsterdam, 2007.

Jonathan Ginzburg and Ivan A. Sag. *Interrogative Investigations: the Form, Meaning and Use of English Interrogatives*. CSLI Publications, Stanford, Ca., 2001.

Ruth Kempson. Nonrestrictive relatives and growth of Logical Form. In *Proceedings of the West Coast Conference on Formal Linguistics*, volume 22, pages 301–314, 2003.

Christopher Potts. *The Logic of Conventional Implicatures*. Oxford University Press, Oxford, 2005.

Ivan A. Sag. English relative clause constructions. *Journal of Linguistics*, 33 (2):431–484, 1997.