

## Discussion and outlook

# Formal Approaches to The Interface of Syntax and Information Structure

## Part 5: Discussion and outlook

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- Summary of the open issues of the information structure approaches in
  - LFG
  - HPSG
  - CCG
- A major problem for all approaches: discontinuous information units
- A desiderata checklist

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## Open issues in the LFG approaches

- The representation and integration of information structure remains to be fully worked out, in particular
  - the interface between semantic structure and information structure
  - the interface between prosody and information structure
- Empirical issues: How can
  - focus projection,
  - multiple focus constructions, and
  - non-constituent focusbe dealt with?

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## Open issues in the CCG approach

- Interaction of word order and information structure, and a combined approach integrating prosody, word order and information structure.
- Motivation or elimination of the extensive use of empty categories for inaudible phrase boundaries.
- Treatment of multiple focus construction and discontinuous theme or rheme.
- Principles restricting focus projection

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## Open issues in the HPSG approaches

- Integration of a more elaborate prosody component including a finer grained distinction of pitch accents and boundary tones.
- An interface between the finer grained prosody, information structure, and syntax.
- Treatment of non-constituent focus.

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## A key problem for structured meaning approaches and CCG

- The HPSG approach, integrating a structured meaning approach to focus, is built on the assumption that focus is realized by a constituent, i.e., focus projection involves contiguous material. (Note that this is not required of the background.)
- The CCG approach is based on the assumption that the informational units correspond to syntactic constituents, i.e, they need to be contiguous.
- There are two two types of problematic cases for this assumption (cf. Pulman 1997):
  - I. informational units that do not form a constituent under a traditional syntactic analysis, but are realized as a continuous sequence
  - II. informational units that are realized discontinuously

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## I. Informational units as non-standard constituents

- Krifka (1992) notes examples where the focus consists of adjacent words that do not form a syntactic constituent.
  - (1) Q: What happened to John?  
A: SUE KISSED him.
- Krifka tentatively suggest to analyze example as in (1) as topic-comment structures, claiming that such examples always involve a background (here = topic) that is a constituent.
- The structured meaning could thus be derived via the background; but the idea remains to be worked out (e.g., when is the information structure derived based on focus or background, and how does topic/comment interact with focus/background?).

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## CCG and non-constituent focus

- The availability of non-standard derivations in CCG makes it possible to produce the right kind of structure for examples with non-standard constituents as in (1). The analysis in terms of non-standard constituents seems convincing since the same non-standard constituents are needed for non-constituent coordination, as illustrated in (2).
  - (2) [[Mary admires] but [Susan detests]] musicals.
- An important problem for such an account, raised by Joshi (1990) and reported by Pulman (1997), is that there are sentences in which the constituent structure needed for the information structuring conflicts with the one needed for the syntactic structure, as illustrated in (3).
  - (3) Q: What about Mary? What does she admire?  
A: Mary admires MUSICALS but detests opera.

For the information structure, the first conjunct has to include a constituent '[Mary admires]' realizing the theme. But for the VP conjunction, the first conjunct needs to have the structure 'Mary [admires musicals]'.

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## From non-standard to discontinuous constituents

Interestingly, the German example parallel to Krifka's non-standard constituent case involves a discontinuous focus:

(4) Q: Was ist denn mit John passiert? / What happened to John?

A: [SUE hat] ihn [GEKÜSST.]<sub>F</sub>  
Sue has him kissed

While rarely discussed, examples in which the focus resulting from one pitch accent does not correspond to a constituent are already noted by Höhle (1982), who mentions (5).

(5) Q: Was hat das Kind erlebt? / What did the child experience?

A: [Karl]<sub>F</sub> hat dem Kind [das BUCH geschenkt]<sub>F</sub> .  
Karl has the child the book given  
'Karl gave the child the book as a present.'

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## II. Discontinuous constituents

- Krifka (1992) also mentions some cases in which the *focus* occurs on a discontinuous constituent:

(6) a. Q: What is the only thing he did?

A: Er hat [sich] nur [RASIERT.]<sub>F</sub>  
he has himself only shaved

b. Q: What did John do with the radio?

A: He only [turned] it [OFF.]<sub>F</sub>

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## II. Discontinuous constituents (cont.)

- In a theory with multiple levels of representations, it could be possible to argue that such discontinuous focus is in fact on a constituent at some 'deep level'. However, the HPSG and CCG approaches (and according to Krifka (1992) also the traditional structured meaning approaches) are surface-oriented and it thus is unclear how such cases can be properly handled.
- CCG, for example, would need more complex "wrapping" operations to provide the type of derivation needed to construct constituents out of non-adjacent words. However, the general availability of such operations would greatly increase the "spurious ambiguity problem" that categorial grammar already has.

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## A desiderata checklist

The "ultimate" approach to information structure should encompass

- an encoding of intonation, including pitch accents and boundary tones
- an interface between intonation, word order and information structure.
- the representation of the informational units in a serious semantic formalism which enables the correct interpretation of the information structure of an utterance within a larger discourse.
- treatment of the following phenomena:
  - focus projection (and its interaction with word order, lexical restrictions, etc.)
  - multiple focus constructions
  - non-constituent and discontinuous information units

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## References

- Höhle, Tilman N. (1982). Explikationen für 'normale Betonung' und 'normale Wortstellung'. In Werner Abraham (ed.), *Satzglieder im Deutschen*, Tübingen: Gunter Narr Verlag, pp. 75–153.
- Joshi, Aravind (1990). Phrase Structure and Intonational Phrases. In Gerry TM Altmann (ed.), *Cognitive Models of Speech Processing*, Cambridge, MA: MIT Press, pp. 457–482.
- Krifka, Manfred (1992). A Compositional Semantics for Multiple Focus Constructions. In Joachim Jacobs (ed.), *Informationsstruktur und Grammatik*, Opladen: Westdeutscher Verlag, pp. 17–54.
- Pulman, Steve (1997). Higher Order Unification and the Interpretation of Focus. *Linguistics and Philosophy* 20, 73–115.