Modification of DPs by epistemic adverbs

Introduction   It is well known that adverbs, including epistemic adverbs, can appear at the periphery of DPs. Ernst (1983) discusses examples such as the following:

(1)   He reduced us to *maybe the size of a pinhead* before dropping us in the bottle.

Adverbs at the initial periphery of DPs are also found in coordinate structures; examples like (2) were first discussed by Collins (1988), and are dubbed 'Collins conjunctions' by Vicente (2013).

(2)   John and *maybe Mary* went to the store.   (Collins, 1988, 5)

It has recently been claimed (Bogal-Allbritten and Weir, 2017) that peripheral modification and Collins conjunction differ in the presence of an existential entailment for the commonly-discussed peripheral modifier cases, but not for Collins conjunctions. This means that epistemic adverbs occurring on DPs in coordination would be ambiguous between an ordinary peripheral modification reading with existential entailment and a Collins conjunction reading without this entailment. Bogal-Allbritten (2014) provides the paraphrases in (3a) and (3b) for example (3):

(3)   Mary hiked Mt. Tom and *possibly the tallest mountain in Ireland* last year.

        a.   Peripheral modifier, existential entailment: Mary definitely hiked two things: Mt. Tom and something which may be the tallest mountain in Ireland.

        b.   Collins Conjunction, no existential entailment: Mary definitely hiked Mt. Tom. She may have also hiked the tallest mountain in Ireland.

Bogal-Allbritten argues that these two readings are syntactically distinct and that the peripheral modifier reading results from a relative clause-like structure ('what may be the tallest mountain') whereas the Collins conjunction reading results from an elliptical structure where the epistemic adverb attaches to the second clause ('and ~~she~~ possibly ~~hiked~~ the tallest mountain').

On the other hand, Schein (2017) argues that there is only a weak reading (without existential entailment) and that hence (4) is infelicitous, being equivalent to a disjunction whose first disjunct violates the selectional restriction of the predicate for a group-denoting argument.

(4)   Biff and possibly Tiff met ($\approx$ Biff met or Biff and Tiff met)

We provide new data showing that, contrary to Schein's judgement, sentences like (4) are indeed acceptable. Nevertheless, we argue against Bogal-Allbritten's assumption of structural ambiguity and analyze the data in terms of a single reading (different from Schein's) that can give rise to an implication of existence through pragmatic inference.

New data   Corpus searches reveal examples like (5), parallel to (4), where a coordination of the form 'A and perhaps B' is the subject of a collective predicate, *combine*.

(5)   Ed Dickson and *perhaps the recently-met with Terrelle Pryor* can combine to fill Jimmy Graham's shoes.

This example is problematic for Schein, since it seems to involve a strong reading, but also for Bogal-Allbritten and Weir, who derive the strong reading from ellipsis, which is not suitable here.

Conversely, as shown in (6), we find the weak reading outside of the syntactic context (vz. coordination) which should license it according to Bogal-Allbritten and Weir.

(6)   a.   Wednesday and Thursday will be a mixture of sunny spells and heavy showers with *possibly some thunder and lightning*.

b.   Their analysis of the crime scene suggested that a scuffle occurred in the bedroom with *perhaps a knife*.

These sentences do not have natural paraphrases with existential entailment ('something which may be thunder and lightning', 'something which may be a knife'). And yet there is no coordination which could license ellipsis and thereby clausal scope for the epistemic adverb.

Instead, we suggest that what is special about (6) is that the DPs in question receive semantic roles that are not entailed by the predicate. More generally, we argue that modally modified DPs *never* carry existential entailments and that there is no structural ambiguity. When the existential entailment is obligatory, it is because the event structure entails a particular dependent. For example, (1) asserts the existence of an event of reducing and therefore entails that there was some size that was the endpoint of this event.

A potential problem for this analysis would be examples where *only* the stronger reading exists even when the event structure does not give rise to this entailment. Bogal-Allbritten and Weir (2017) in fact claim that examples like (7) only have a reading with existential entailment, since the weaker reading on their analysis requires a biclausal structure which gives an illicit binding configuration.

(7)   They have praised each$_i$ professor and *perhaps his$_i$ best student*.

We do not agree that (7) has obligatory existential entailment and whereas the reading of this made-up example is hard to judge, it is easy to find natural examples with the same binding pattern that clearly do not have existential entailment.

(8)   a.   Now it was clear that every$_i$ soldier's effort, and *perhaps his$_i$ life*, would be required.
        b.   It is up to each and every$_i$ member, and *perhaps even their$_i$ spouses*. . . to please step forward and grow even more.

Analysis   We assume the sample meanings in Table 1. Following techniques developed in Glue semantics (Dalrymple, 1999; Gotham, 2018), we take a flexible approach to semantic composition, where a functor can 'ignore' unsaturated positions in its argument.[1] So, for example, *Mary* can ignore the abstraction over the event in **agent** and apply directly to term $\lambda x.agent(\mathbf{e}_1) = x$, where $\mathbf{e}_1$ is a dummy free variable which is subsequently abstracted over so that the result is $\lambda e.agent(e) = mary$. Similarly, *perhaps* can take an argument of any boolean type (ending in t), making $\diamond$ scope over the relevant type t part of the meaning. However, an event-oriented adverb is not able to apply unless there is an event variable in its scope.

For the purposes of illustration, we let verbs and DPs that have combined with their thematic role denote sets of events which compose by intersection. The semantic derivations are shown in Figures 1–2. In Figure 1, the assertion (after existential closure) that there is a seeing event will give rise to the implication that there was a theme argument of that event. With non-entailed dependents as in (6) no such implication arises. In Figure 2, the assertion that there was a meeting event with an agent x will give rise to the implication that x is plural and so, if Mary was not part of x, someone else must have been. No such inference will arise with a distributive predicate unless the context supports it in some other way, which results in a strong reading like (3a).

In conclusion, our analysis collapses the two allegedly distinct phenomena of peripheral modification and Collins conjunction and thereby achieves theoretical parsimony, while at the same time improving empirical coverage.

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[1]One prime motivation for this approach to composition comes from quantifiers in object position.

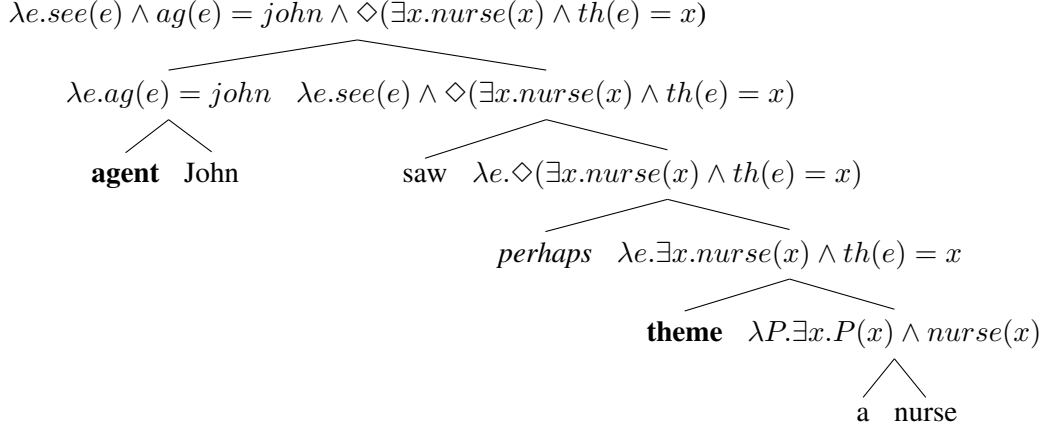|			
meet	$\lambda e.meet(e)$	*perhaps*	$\lambda p.\Diamond p$
Mary	$\lambda P.P(mary)$	*a*	$\lambda P.\lambda Q.\exists x.P(x) \wedge Q(x)$
agent	$\lambda e.\lambda x.ag(e) = x$	*nurse*	$\lambda x.nurse(x)$
and	$\lambda \mathcal{Q}_1.\lambda \mathcal{Q}_2.\lambda P.\exists x.\mathcal{Q}_1(\lambda y.y \sqsubseteq x) \wedge \mathcal{Q}_2(\lambda y.y \sqsubseteq x) \wedge P(x)$		

Table 1: Sample meanings

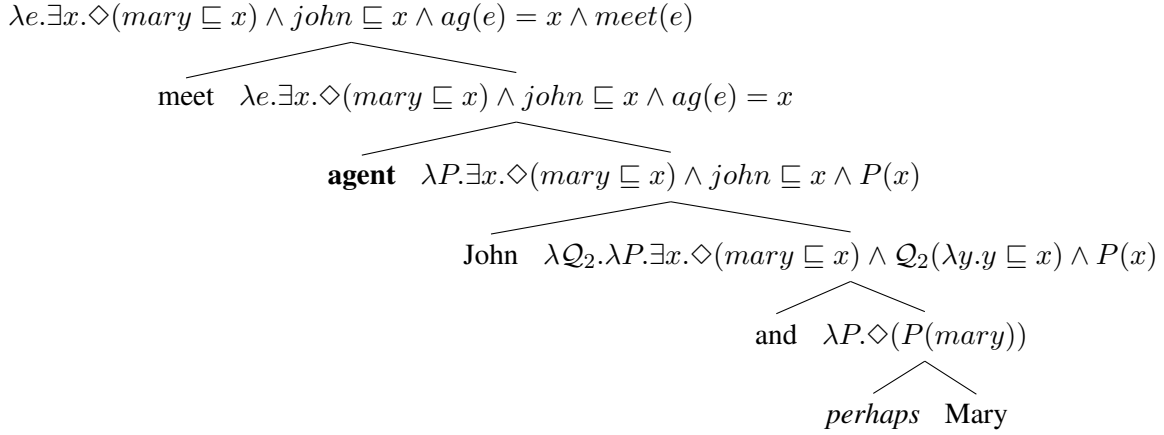Figure 1: Semantic derivation for *John saw perhaps a nurse*

Figure 2: Semantic derivation for *John and perhaps Mary met*

References ► Bogal-Allbritten, E. (2014). Interpreting DP-modifying modal adverbs. Handout of talk presented at SALT 2014. ► Bogal-Allbritten, E. and Weir, A. (2017). Sentential and possibly subsentential modification: The ambiguity of Collins conjunctions. In A. Lamont and K. Tetzloff, eds., *Proceedings of NELS 47*, pp. 89–102. ► Collins, C. (1988). Part I: Conjunction adverbs. Unpublished manuscript, MIT. ► Dalrymple, M., ed. (1999). *Semantics and Syntax in Lexical Functional Grammar: The Resource Logic Approach*. The MIT Press. ► Ernst, T. (1983). *Towards an Integrated Theory of Adverb Position in English*. Ph.D. thesis, Indiana University. ► Gotham, M. (2018). Making Logical Form type-logical: Glue semantics for Minimalist syntax. *Linguistics and Philosophy*, **41**(5), 511–556. ► Schein, B. (2017). *'And': Conjunction Reduction Redux*. The MIT Press. ► Vicente, L. (2013). In search of a missing clause. Handout of a talk given at Universität Potsdam.