



Appositives in Modal Contexts*

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Abstract. It has recently been argued (by Harris and Potts 2009: 523–552) that so-called non-speaker oriented readings of appositives are a matter of pragmatic perspective shift and thus do not show that appositives contribute to descriptive content. In contrast, I argue that appositives are indeed building blocks of propositions and that non-speaker oriented readings are *de dicto* readings of classical presuppositions (definedness conditions on concepts) in modal contexts. Downward entailing modal contexts, like surprise contexts, provide the key to this conclusion: here, appositives provide a useful means to ensure that an individual retains its relevant properties across the modal space.

1 Introduction

The question whether appositives, like “, a virgin,” as in (1), are building blocks of descriptive meaning is answered in the negative by Harris and Potts (2009) (henceforth: HP) but in the positive by Schlenker (to appear).

- (1) ... she, a virgin, would have a child ...

In particular, HP hold that ‘non-speaker oriented’ readings, as attested by (3) (from Amaral et al. 2007), as opposed to ‘speaker oriented’ readings as attested by (2) (from Potts 2005), are a matter of perspective shift: an appositive is usually used to implicate that the speaker is committed to the proposition that the referent has the property (in (2), that Chuck is a psychopath), but pragmatic factors can shift the attribution of that commitment to someone else, typically the holder of an attitude (in (3): Sheila).

- (2) Sheila believes that Chuck, a psychopath, is fit to watch the kids.
(3) Sheila believes that Chuck, a sweetheart if ever there was one, is fit to watch the kids.

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In contrast, I will argue that ‘non-speaker oriented’ readings of appositives are *de dicto* readings and that under such readings, appositives do contribute to descriptive content: they help build propositions in contexts like (4).

- (4) Mary could not believe that she, a virgin, would have a child.

Generally, I will propose that appositives introduce ‘classical’ presuppositions, i.e., definedness conditions on functions from evaluation indices, starting with individual concepts and projecting to propositions. In extensional contexts and on *de re* readings in intensional contexts, they are “mere” presuppositions, but on *de dicto* interpretations in intensional contexts, they enter into the argument propositions, thus making a genuine contribution to truth conditions.

I thus follow Schlenker (to appear) in pursuing a semantic strategy for dealing with appositives generally and ‘non-speaker oriented’ interpretations particularly.¹ Our tactics are a bit different, though: while Schlenker uses facts about the French *subjonctif* and Sequence of tense to show that non-restrictive relative clauses can interact with mood and tense operators, concluding that they convey a mixture of assertion and presupposition, I will use facts about downward entailing intensional contexts to show that nominal appositives can interact with attitude predicates, constraining their argument propositions, and conclude that they convey more traditional presuppositions.

HP offer two major arguments in support of their pragmatic strategy. First, they present experimental evidence to show that non-speaker oriented readings are available outside intensional contexts. I try to counter this in part by arguing that their extensional contexts are intensional after all and in part by appealing to a mechanism of ‘concealed quotation’.

Second, conducting a corpus study of appositives under attitude verbs, HP report a bias for speaker orientation. However, their attitude predicates are all upward entailing (if monotone). By contrast, in downward entailing attitude contexts, such as surprise contexts, there is a bias for non-speaker orientation. Thus there is no empirical basis for marginalizing this orientation.

I confront the arguments supporting HP’s pragmatic account in Sect. 2. In Sect. 3, addressing the semantics of surprise predicates, I show how the bias for non-speaker orientation in such contexts provides indirect evidence that appositives contribute to propositions, and present direct evidence that they do, in terms of entailment patterns derived from standard analyses.

¹ A note on terminology: the term “appositive”, or “apposition”, is sometimes used to cover both nominal appositives like the indefinite descriptions in (1)–(4) and non-restrictive relative clauses (which form the main concern of Schlenker (to appear)), or even other forms of non-restrictive modifiers; though most of the points made in this paper are probably relevant for appositives in that broad sense, I will concentrate on nominal appositives in the form of indefinite descriptions.

In Sect. 4 I demonstrate how this contribution can be captured through classical presuppositions, i.e., definedness conditions on functions from worlds. The emerging picture is that when they are read *de dicto*, appositives provide a means to ensure that an individual referred to in a modal context retains its relevant properties across the modal space. Sect. 5 brings conclusions.

2 The Arguments for the Pragmatic Strategy

HP offer two major arguments in favor of their pragmatic theory of perspectival orientation for appositives. One is a finding that perspective shift, from speaker to non-speaker, occurs outside intensional contexts. The other is a finding that in intensional contexts, non-speaker orientation is relatively rare. In this section I examine this evidence and try to counter it.

2.1 Perspective Shift in Extensional Contexts?

HP present evidence from experiments eliciting informant judgments to show that non-speaker oriented interpretations are available even when appositives are in “matrix clauses” (pp. 530ff.). One of their cases is (5):

- (5) I am increasingly worried about my roommate. She seems to be growing paranoid.
- a. The other day, she told me that we need to watch out for the mailman, a possible government spy.
 - b. The other day, she refused to talk with the mailman, a possible government spy.

The idea is that in (5a), the appositive *a possible government spy* is in a modal context while in (5b) it is not. Schlenker (to appear) notes, however, that *refuse* may well be an attitude verb. To me, it is clear that it is. A test will be if we can detect a *de dicto/de re* ambiguity in a definite description in a *refuse* context, and it appears that we can. Consider (6):

- (6) Goddess Parvati, wife of God Shiva, lonely during one of her husband’s long absences, molds a son from mud. Ganesh grows up, and one day, Parvati tells him to guard the front door and not let anybody in while she bathes.
- a. Shiva returns home. Ganesh refuses to let his father in, and Shiva beheads him.
 - b. Shiva returns home. Ganesh refuses to let the intruder in, and Shiva beheads him.

(6a) is true on a *de re* interpretation but false on a *de dicto* interpretation, while the converse holds of (6b). This strongly suggests that one of HP's key cases does not show what it is supposed to show, namely, that a non-speaker oriented interpretation is possible in an extensional context. But it is not their only case: they also report non-speaker oriented readings in one or two contexts which are much less clearly intensional, like (7):

- (7) My brother Sid hates school.
He puts off his homework, a complete waste of time, to the last minute.

I see here two ways to salvage the semantic strategy, on which the orientation of the appositive *a complete waste of time* toward my brother Sid is a *de dicto*, intensional phenomenon: either

1. one can argue that *put off* is an attitude verb in disguise, or
2. one can argue that the appositive is a piece of quotation in disguise.²

Way 1 predicts that a non-speaker-orientation reading is unavailable if the verb cannot under any conditions be an attitude verb. (7a) seems to bear this out:

- (7) a. ?My brother Sid hates school. His homework, a complete waste of time, earns him bad grades.

Way 1 also predicts that there can be a *de dicto/de re* ambiguity in a context under a transitive verb like *put off* – and (8) might seem to show that there can; the Senate might or might not subscribe to the characterization of the bill as the most important one ever presented to it.

- (8) The Senate has postponed the most important bill ever presented to it.

Way 2 is to appeal to a mechanism of 'concealed quotation' which can affect descriptions generally, as, for example, in (9):

- (9) The ship that could not sink sank on her maiden voyage in April 1912.

According to Geurts and Maier (2005), pieces of quotation create local *dicendi* contexts with contextually anchored sources (for (9) on a quotation-in-disguise analysis of the definite description, this source might be the White Star Line). On a piece-of-quotation-in-disguise analysis of the appositive, (7) will receive more or less the same interpretation as (7b).

- (7) b. My brother Sid hates school. He puts off his homework,

² At a more general level, this has been suggested by Anand (2007).

“a complete waste of time”, to the last minute.

The contextually anchored sources are subject to constraints, and presumably, one constraint would account for the mild infelicity of (7a) above. Anyway, if the mechanism of concealed quotation is otherwise freely available, it serves to create local attitude contexts with implicit attitude holders and thus to take the edge off the evidence adduced by HP against a semantic strategy.

2.2 A Bias for Speaker Orientation in Intensional Contexts?

HP report on a corpus study designed to measure the frequency of non-speaker oriented readings of appositives in embedded contexts, based on a sample of 31 embedding predicates; attitude predicates and verbs of saying (pp. 540–547). They discover a bias for speaker orientation; non-speaker orientation appears as an exception.

However, apart from non-monotone verbs like *ask*, the attitude verbs in HP’s sample are all monotone increasing (upward entailing): *believe*, *claim*, *say*, etc. Once we turn to downward entailing attitude predicates like *surprised*, the picture actually seems to be reversed: there then appears to be a bias for non-speaker-oriented readings. (10a) is a case in point:

- (10) a. Mary is surprised that John, a Laestadian, wears a necktie.

In Laestadianism, a conservative Lutheran revival movement centered in the extreme north of Scandinavia, men are (often) not supposed to wear neckties. Hence it is surprising if a Laestadian man does wear one.

So the appositive in (10a) seems to contribute to the argument proposition, constraining it; the intuition is that worlds where John is not a Laestadian are not to be counted when the predicate *surprised* is evaluated. True, in contrast to the case (3) in Sect. 1, with the non-factive, upward entailing predicate *believe*, the appositive is here not controversial: there is (due to the factive predicate) no conflict between the beliefs of the speaker and those of the attitude holder, but it is still evident that the appositive is an ingredient in the object of the attitude and hence that it is essentially oriented towards the holder of the attitude.

In fact, it is typical of appositives in surprise contexts that there is not that much of a difference between a conjoined predicate and an appositive:

- (10) b. Mary is surprised that John is a Laestadian and wears a necktie.

To be sure, there is a difference; there is a partition into background and focus in (10a), corresponding to a distinction between ‘old’ and ‘new’ knowledge: the property expressed in the appositive seems to count as ‘old knowledge’ of John on the part of Mary, whereas the property expressed in the carrier clause

seems to count as a piece of knowledge just acquired, triggering the surprise.

Speaker-oriented readings are possible in surprise contexts, but rare:

- (11) Mary is surprised that John, a notorious casanova, betrays her.

That John is a notorious casanova is something the speaker knows, not Mary; that she does not know it is the reason for her surprise.

The asymmetry between upward and downward entailing attitudes as to what is the ‘normal’ orientation – toward the speaker with the former, toward another individual with the latter – calls for an explanation. Could there be a pragmatic explanation? Well, one might think that the ‘normal’ orientation is what provides an explanation for the attitude in discourse relational terms – but note that while that is indeed the normal case under *surprised*, cf. (10a), it is the exceptional case under *believe*, cf. (3); in other words, non-speaker orientation is consistently what would go to explain the attitude.

Other pragmatic explanations may be conceivable, but in the next section I will suggest an explanation building on the semantics of surprise predicates, and also supply more concrete evidence that non-speaker oriented appositives under such predicates play a semantic role.

3 Appositives and the Semantics of Surprise

Below, I go into the semantics of surprise predicates and show that in regard to the inference patterns that standard analyses predict, appositives in embedded clauses commonly behave as if they were integral parts of those clauses. They pattern with conjoined predicates in expressing properties that are relevant for evaluating the surprise predicates, thus serving a significant semantic purpose.

3.1 Surprise Semantics and Contextual Perspectives

HP predict widely different inference properties for (10a) and for (10b): while according to their theory of pragmatic perspective shift, (10a) means the same as (10c) in the dimension of descriptive content and implicates (10d) in the dimension of expressive content, there is no prediction that (10b) entails (10c).

- (10) a. Mary is surprised that John, a Laestadian, wears a necktie.
 b. Mary is surprised that John is a Laestadian and wears a necktie.
 c. Mary is surprised that John wears a necktie.
 d. Mary believes that John is a Laestadian.

In fact, scholars who have analyzed predicates like *surprise* agree that clauses like (10b) do not entail clauses like (10c) but that clauses like (10c) together with clauses like (10d) do entail clauses like (10b). As acknowledged by those

scholars, our intuitions may not be so clear in these regards, and I will return to the reasons for that below; but note at once that (10a) does not seem to entail (10c) any more than does (10b). That is to say: contrary to what HP predict, in certain contexts, appositives are intuitively not more detachable from the descriptive content than conjoined predicates.

Asher (1987) identifies a class of ‘negative factive’ attitude verbs, obeying, i.a., the inference rule ‘weakened downward entailment’ (WDE) (α for the agent, β for *believe*):

- (12) Weakened downward entailment:

$$a \alpha \phi \wedge \llbracket \psi \rrbracket \subseteq \llbracket \phi \rrbracket \wedge a \beta \psi \Rightarrow a \alpha \psi$$

This class contains a variety of predicates, but the adjective *surprised* is usually considered as the paradigmatic case. Thus (10c) and (10d) are to jointly entail (10b), but (10b) is not to entail (10c).³ There is a consensus on this: von Stechow (1999), Sharvit (2002), and van Rooij (2006) concur in predicting (12).

The reason that (weakened) downward entailment is predicted by all is that all assume the basic truth condition to be that the argument proposition is a subset of something (the ‘unexpectedness’ worlds) or has an empty intersection with something (the ‘expectation’ worlds); cf., e.g., Sharvit (2002: 103):

- (13) Semantics of Surprise according to Sharvit (2002: 103):

$$\llbracket \text{surprise} \rrbracket(w)(P)(a) = 1 \text{ iff } P(w) \subseteq \text{NONEXP}(a)(w)$$

And that is of course easier the stronger the argument proposition, $P(w)$, is.

Reality is not quite so simple, though. It may often appear as if *surprised* fails to entail downward, or even as if it entails upward. (14) would provide a case in point for the former, (10b, c) might go to suggest the latter.

- (14) John is surprised that Mary won a medal, but he is not surprised that she won a bronze medal.
- (10) b. Mary is surprised that John is a Laestadian and wears a necktie.
 c. Mary is surprised that John wears a necktie.

The customary way to account for the apparent failure of surprise predicates to entail downward, or their semblance of entailing upward, is to appeal to an implicit restriction, surreptitiously modifying (as the case may be, weakening or strengthening) the argument proposition in the putative conclusion.

³ Strictly, (10c) and “Mary believes that John is a Laestadian and wears a necktie” are to entail (10b), but since (10c) presupposes that Mary believes that John wears a necktie, (10d) is enough.

To be specific, when we pass from (10b) to (10c) to test whether the latter follows from the former, it is very difficult to keep the context constant and not let the property explicitly ascribed to John in the complement of the premiss carry over, as an implicit restriction, to the complement of the conclusion. Thus premiss and conclusion are easily judged to be equivalent.

Kadmon and Landman (1993) call this implicit restriction a ‘perspective’ and propose to code it as a contextual parameter in the meaning of *surprised*:

To be surprised that A is always relative to a certain perspective on A, a perspective that determines what it is about A that is surprising and in virtue of what it is surprising. The perspective is a contextually determined parameter in the interpretation of *surprised*, very much in the same way that a ‘modal base’ (Kratzer 1981) is a contextually determined parameter in the interpretation of modals. [...] The perspective enters into the semantics of *surprised* and affects the truth conditions of sentences containing it. (Kadmon and Landman 1993: 381)

Perspectives “can be at least partly specified by explicit linguistic text”, e.g.:

- (15) – I can’t believe she’s divorcing HIM.
 – Yeah, such a rich man.
 – No, such a KIND man!

von Fintel (1999) elaborates on Kadmon and Landman’s proposal by providing “a semantics for the attitudes that is specifically sensitive to a shifting domain of ordered worlds”. His (main) proposal for *surprised* is, slightly adjusted:⁴

- (16) Semantics of Surprise according to von Fintel (1999: 122–125):

$$\llbracket \textit{surprised} \rrbracket_w^{f,g} = \lambda p \lambda \alpha : \mathcal{B}_\alpha(w) \subseteq p, \mathcal{B}_\alpha(w) \subseteq f_\alpha(w),$$

$$f_\alpha(w) \cap p \neq \emptyset, f_\alpha(w) - p \neq \emptyset. \forall w' \in \max_{g_\alpha(w)}(f_\alpha(w)) : w' \notin p$$

Here f and g are parameters similar to the modal base and the ordering source in Kratzer’s theory of modality, f assigning a set of worlds and g assigning a set of propositions to the subject of *surprised* and the current index of evaluation. The definedness conditions (between : and .) say that the subject of *surprised* believes the complement p and the set of relevant worlds $f_\alpha(w)$ and that the relevant worlds contain p - and *non-p*-worlds. The content proper is, in words, that in all the most expected of the relevant worlds, p is not true. Note that the logical structure of this definition is the same as that of Sharvit’s definition (13); the two definiens clauses are contrapositions of each other, and the attitude is

⁴ von Fintel does not actually define *surprised* but *sorry*, intending that definition to carry over to *surprised* “with suitable adjustments”. I substitute a ‘denotation equation’ for his truth condition, and I omit his coindex on the attitude predicate and on the functions f and g on the understanding that f and g are here the functions fitting *surprised*.

downward entailing. The essential novel feature of von Fintel's definition is the relativization to a set of relevant worlds compatible with the subject's beliefs.

It is natural to think of $f_\alpha(w)$ as the intersection of a set of propositions, e.g., the proposition that Mary is a virgin, or that John is a rich man, or a kind man, or a Laestadian, – or that the topic time is Good Friday:

- (17) Bjarne was in Hamburg on Good Friday in 1984 and was outraged that the brothels were open.

More generally, if the set $f_\alpha(w)$ is the intersection over a set of propositions Φ and p involves rigid or *de re* reference to an individual, with a name, a pronoun, or a definite description on a *de re* interpretation, it is reasonable to expect Φ to include the ascription of a property to that individual.

3.2 Surprise Semantics and Appositives

The way appositives function in the cases so far considered suggests that they provide a means to ensure that individuals referred to in intensional contexts retain their relevant properties across the possible worlds under consideration, making explicit what would otherwise have to be left implicit and ascertaining that certain properties are carried along throughout the modal space at issue. In short, they contribute content that can be much *at issue*. In the next section, I sketch a way to formalize this notion. But first, I will present evidence that appositives matter for the truth conditions of downward entailing attitudes, and provide an answer to the question why non-speaker oriented interpretations are not rare but frequent when appositives are in such contexts.

Consider (18a–c). (18a) contains two instances of complex appositives, appositives consisting of two predicates – *Jewish man*, *Samaritan woman*. In (18b), the second member of each pair is deleted, in (18c), the first member is.

- (18) In John 4 Jesus spoke with a Samaritan woman and asked for a drink. She had two things against her: she was a woman, and a Samaritan.
- a. She was surprised that he, a Jewish man, spoke to her, a Samaritan woman.
 - b. She was surprised that he, a Jew, spoke to her, a Samaritan.
 - c. She was surprised that he, a man, spoke to her, a woman.

There is a strong intuition here that (18a) entails neither (18b) nor (18c). That is to say, surprise contexts are not closed under the weakening of appositives. This is predictable if the appositives help to build the argument propositions, but not – or only with difficulty (see below) – if they do not.

So why does this case present a different picture from a case like (10a, c),

where the intuition that the first sentence fails to entail the second is weaker?

- (10) a. Mary is surprised that John, a Laestadian, wears a necktie.
 c. Mary is surprised that John wears a necktie.

Here, as with (10b) in relation to (10c) (see Sect. 3.1), it is difficult to blot out the property explicitly ascribed to the subject of the first complement clause; it easily influences the second as an implicit constraint on the relevant worlds. This source of error is evidently eliminated in (18a/b) and (18a/c), presumably because by explicating a property, we signal that implicit ones are not relevant.

Now if an appositive can never contribute to a proposition, the missing inferences in (18) are mysterious: (18a–c) should then be equivalent.

Note, in addition, that the appositives in (18a) represent *old information*, both in regard to the common ground and to the belief state of the experiencer: the context entails both that he was a Jew and a man and she a Samaritan and a woman and that she knew that. This makes a theory where appositives just describe separate, scopeless bits of expressive content not seem very plausible; in fact, they would appear to be superfluous in such cases. More clearly still, no one needs reminding that someone referred to with *she* or *Maria* is a female:

- (19) She became accustomed to the double-takes from male firefighters who were surprised that she, a female, could head the station.
 (20) Maria tells us that the students are surprised that she, a woman, talks to them about math and natural sciences.

Admittedly, one might try to account for the missing inferences in (18) while maintaining that (18a–c) are equivalent by appealing to *discourse relations*: it could be argued that experiencer-oriented appositives in attitude contexts are commonly intended as explanations; if the complex appositives in (18a) give full explanations, then the simple ones in (18b or c) cannot be expected to do so too. After all, the semantics of *surprised* refers to contextually determined relevant beliefs, and the appositives could be argued to supply those by general pragmatic principles. Hence it is difficult to actually prove that the appositives make a semantic contribution.

But if we do assume that they do, we are able to answer the question why subject-oriented readings are frequent in downward entailing attitude contexts although they are infrequent in upward entailing ones. If under such readings, appositives do restrict argument propositions, then there is a close analogue in determiner domain restriction, more noticeable, because it is more useful, with downward than with upward entailing determiners, cf. Heim (to appear):

For all we can tell, every determiner may be construed with a covert restrictor in addition to its overt one and thus apply to an effectively narrowed set of contextually relevant or salient entities. We just don't see this as clearly with some determiners as with others. *the*, along with *every* . . . , is not upward monotone, so covert restrictors weaken the presupposition or assertion, giving an otherwise truth-value-less or false claim a chance to be felicitous and true.

By analog, we can say that decreasing attitude contexts show a bias for subject-oriented readings because here, such readings serve to weaken the statement, giving an otherwise potentially false assertion a better chance to be true, while increasing attitude contexts show a bias for speaker-oriented readings because there, subject-oriented readings serve to strengthen the statement. If that is so, we would expect negated versions of increasing attitude predicates to show a propensity for subject orientation as well, and this seems to be borne out:

- (4) Mary could not believe that she, a virgin, would have a child.

I conclude from the evidence that appositives *can* help build propositions. The question is now how.

4 Appositives as Definedness Conditions

Faced with a picture of appositives in different roles in different contexts – in nonmodal contexts or on speaker-oriented readings in modal contexts, they add information on referents in a *de re* mode, but on non-speaker-oriented readings in modal contexts, they add information on referents in a *de dicto* manner – I will attempt to unite these two roles by describing appositives as introducing definedness conditions on partial individual concepts, or more generally, as these project, on partial functions from worlds, ultimately partial propositions. This approach necessitates a method of intensional composition, roughly à la Beaver and Krahmer (2001), and I will now specify the necessary machinery.

4.1 From Appositives to Partial Propositions

At the bottom, I posit a silent appositive functor $\mathcal{A}$ whose meaning is:^{5,6}

$$(21) \quad \llbracket \mathcal{A} \rrbracket = \lambda P_{e(st)} \lambda x_{(se)} \lambda w : x_w \in D_e, P_w(x_w) \cdot x_w$$

Suppose we build the meaning of “surprised that Mary, a virgin, is pregnant”. I consider the indefinite article in the appositive as spurious, i.e., disregard it.

$$(22) \quad \llbracket \mathcal{A} \rrbracket(\llbracket \text{virgin} \rrbracket) = \lambda x_{(se)} \lambda w : x_w \in D_e, \mathcal{V}_w(x_w) \cdot x_w$$

⁵ This is the indefinite case, where the first argument is a function from individuals to propositions; a definite case, where this argument is an individual concept, is also definable.

⁶ Notation: Stuff between : and . are definedness conditions. Convention: $f_w(g) = f(g)_w$.

This is the full appositive meaning, an operation on partial individual concepts. It carries two presuppositions (definedness conditions): one projected from its argument, the other coincident with its own content. ($\mathcal{V} = \llbracket \text{virgin} \rrbracket$.)

The proper name *Mary* is, standardly, taken to mean a constant, though in principle a partial, function from worlds to individuals.

$$(23) \quad \llbracket \mathcal{A} \rrbracket(\llbracket \text{virgin} \rrbracket)(\llbracket \text{Mary} \rrbracket) = \lambda w : \mathcal{M}_w \in \mathcal{D}_e, \mathcal{V}_w(\mathcal{M}_w) \cdot \mathcal{M}_w$$

This is Mary with the definedness condition that she is a virgin.

For partial individual concepts like this to combine with properties like $\llbracket \text{virgin} \rrbracket$ or $\llbracket \text{pregnant} \rrbracket$, which are (as in Beaver and Krahmer 2001) functions from individuals to propositions, they are lifted to functions from such $e(st)$ ‘properties’ to propositions by the abstract filter function $\mathcal{F}$:

$$(24) \quad \llbracket \mathcal{F} \rrbracket = \lambda f_{(se)} \lambda P_{e(st)} \lambda w : f_w \in \mathcal{D}_e \cdot P_w(f_w)$$

$$(25) \quad \llbracket \mathcal{F} \rrbracket(\llbracket \mathcal{A} \rrbracket(\llbracket \text{virgin} \rrbracket)(\llbracket \text{Mary} \rrbracket)) = \\ \lambda P_{e(st)} \lambda w : \mathcal{M}_w \in \mathcal{D}_e, \mathcal{V}_w(\mathcal{M}_w) \cdot P_w(\mathcal{M}_w)$$

This lifted DP meaning can be used directly in subject position, applying to a property like $\llbracket \text{pregnant} \rrbracket$, resulting in (26), or more generally in a position hosting a DP after QR, maybe from object position. ($\mathcal{V} = \llbracket \text{pregnant} \rrbracket$.)

$$(26) \quad \llbracket \mathcal{F} \rrbracket(\llbracket \mathcal{A} \rrbracket(\llbracket \text{virgin} \rrbracket)(\llbracket \text{Mary} \rrbracket))(\llbracket \text{pregnant} \rrbracket) = \\ \lambda w : \mathcal{M}_w \in \mathcal{D}_e, \mathcal{V}_w(\mathcal{M}_w) \cdot \mathcal{P}_w(\mathcal{M}_w)$$

This is the partial proposition that Mary, a virgin, is pregnant.

4.2 From Partial Propositions to Surprise

Now we need a meaning for *surprised* which can take partial propositions and project their definedness conditions appropriately. It is commonly assumed that *surprised* introduces the presupposition that the subject believes the argument proposition.⁷ This will now incorporate the presuppositions brought along by the argument proposition, in particular, the one originating in the appositive, because what the subject must believe is not the partial argument proposition but its positive extension, the set of worlds where it is defined and not negative. By the same token, what must lie outside the subject’s relevant expectations for the attitude predicate to hold of its two arguments is not the first argument itself but the set of worlds where it is true, which means that the definedness

⁷ van Rooij (2006: 217), following Asher (1987), assume that such predicates introduce two layers of presupposition, the argument proposition itself and the proposition that the subject believes it; however, von Stechow (1999), following Heim (1992), only assumes the latter layer, as I will too.

condition (Mary is a virgin) and the content proper (Mary is pregnant) both contribute to define the set of worlds at issue.

(27) is an augmentation of (16) in Sect. 3.1, based on von Fintel (1999):

$$(27) \quad \llbracket \text{surprised} \rrbracket^{f,g} = \lambda \phi \lambda x \lambda w : \mathcal{B}_x(w) \subseteq \lambda w' \phi_{w'} = 1. \\ \max_{g_x(w)}(f_x(w)) \cap [\lambda w' \phi_{w'} = 1] = \emptyset \\ (\max_{g_x(w)}(f_x(w)) = \text{those relevant worlds compatible with } x\text{'s beliefs} \\ \text{that } x \text{ most expects})$$

(28), then, is the meaning of “surprised that Mary, a virgin, is pregnant”.

$$(28) \quad \llbracket \text{surprised} \rrbracket^{f,g}(\llbracket \mathcal{F} \rrbracket(\llbracket \mathcal{A} \rrbracket(\llbracket \text{virgin} \rrbracket)(\llbracket \text{Mary} \rrbracket))(\llbracket \text{pregnant} \rrbracket)) = \\ \lambda x \lambda w : \mathcal{B}_x(w) \subseteq \lambda w' \mathcal{M}_{w'} \in D_e, \mathcal{V}_{w'}(\mathcal{M}_{w'}), \mathcal{P}_{w'}(\mathcal{M}_{w'}). \\ \max_{g_x(w)}(f_x(w)) \cap [\lambda w' \mathcal{M}_{w'} \in D_e, \mathcal{V}_{w'}(\mathcal{M}_{w'}), \mathcal{P}_{w'}(\mathcal{M}_{w'})] = \emptyset$$

Applied to Joseph, this becomes the partial function from worlds to truth values that is defined iff Joseph believes that Mary is a virgin and pregnant and true iff it is defined and the worlds where Mary is a virgin and pregnant all lie outside the most expected relevant belief worlds of Joseph.

That may be a fair first attempt at a definition of the definedness and truth conditions of (29a), but note two problematic aspects of it:

1. The definition of the attitude in (27) fails to predict a difference between (29a) and (29b), that is, between appositives and conjoined predicates in embedded positions.

- (29)
 - a. Joseph is surprised that Mary, a virgin, is pregnant.
 - b. Joseph is surprised that Mary is a virgin and (is) pregnant.

2. It seems contradictory to say, for (30) for simplicity, on the one hand that for the proposition to be defined, the subject must believe that Mary is pregnant, and on the other that for it to be true, the set of worlds where she is must lie outside the subject's most expected relevant belief worlds.

- (30) Joseph is surprised that Mary is pregnant.

Now in fact, both problems can be tackled with one tool, by distinguishing in the definition of *surprised* between the intersection over x 's ‘old beliefs’ in w , $\mathcal{B}_x(w)$, and the intersection over x 's ‘full beliefs’ in w , $\mathcal{B}_x^+(w)$ (a subset of it). It is the old beliefs that x 's most expected relevant worlds should be based on, before the new belief coming from the argument proposition is formed, and it is

the old beliefs that the presupposition inherited from the argument proposition, originating in the appositive, should be required to include. So I propose this amended definition (needless to say, to do a proper job of it, the notions of old and full beliefs should be defined in terms of eventualities of surprise):

$$\begin{aligned}
 (31) \quad \llbracket \text{surprised} \rrbracket^{f,g} &= \lambda \phi \lambda x \lambda w : \mathcal{B}_x(w) \subseteq \lambda w' \phi_{w'} \in D_I, \\
 &\quad \mathcal{B}_x^+(w) \subseteq \lambda w' \phi_{w'} = 1. \\
 &\quad \max_{g_x(w)}(f_x(w)) \cap [\lambda w' \phi_{w'} = 1] = \emptyset \\
 &\quad (\max_{g_x(w)}(f_x(w)) = \text{those relevant worlds from } \mathcal{B}_x(w) \text{ that} \\
 &\quad \quad x \text{ most expects})
 \end{aligned}$$

This definition leads to the following revised definition of the definedness and truth conditions of “Joseph is surprised that Mary, a virgin, is pregnant”, (29a):

$$\begin{aligned}
 (32) \quad \llbracket \text{surprised} \rrbracket^{f,g}(\llbracket \mathcal{F} \rrbracket(\llbracket \mathcal{A} \rrbracket(\llbracket \text{virgin} \rrbracket)(\llbracket m \rrbracket))(\llbracket \text{pregnant} \rrbracket)(\llbracket j \rrbracket) &= \\
 \lambda w : \mathcal{B}_j(w) \subseteq \lambda w' \mathcal{M}_{w'} \in D_e, \mathcal{V}_{w'}(\mathcal{M}_{w'}); \mathcal{B}_j^+(w) \subseteq \lambda w' \mathcal{P}_{w'}(\mathcal{M}_{w'}) &. \\
 \max_{g_j(w)}(f_j(w)) \cap [\lambda w' \mathcal{M}_{w'} \in D_e, \mathcal{V}_{w'}(\mathcal{M}_{w'}), \mathcal{P}_{w'}(\mathcal{M}_{w'})] &= \emptyset
 \end{aligned}$$

$(\max_{g_j(w)}(f_j(w)) = \text{those relevant worlds in } \mathcal{B}_j(w) \text{ that } j \text{ expects the most.})$
 There are two layers of definedness conditions here: Joseph must have believed and believe that Mary is a virgin and he must believe now that she is pregnant (to accord with the truth condition, this must be a new belief); by contrast, on the definition of the definedness and truth conditions of (29b), there is only one substantial level of presupposition: Joseph must believe that Mary is a virgin and (is) pregnant (and, sloppily, one of the two conjuncts must be a new belief). Thus we have now a reasonable truth condition and a distinction between an appositive and a conjoined predicate at the level of definedness conditions.

4.3 The Speaker Oriented Case: *de re*

How about speaker-oriented readings? Consider (33), akin to Potts’ (2):

$$(33) \quad \text{Mary is surprised that John, a notorious casanova, betrays her.}$$

Mary is not aware that John is a notorious casanova. I will treat this reading as a *de re* reading of the DP “John, a notorious casanova”, employing a designated variable for the actual world – v – and an abstract actualizer operator – $@$:⁸

⁸ There are of course various ways of construing *de re* interpretations (for recent surveys of the state of the art, see von Stechow and Heim (2009) and Schwager (to appear)); if $@$ as defined in (34) is considered the general method, it would seem to imply that only definite DPs, with individual concept, type (*se*), meanings, can have such readings; for indefinite descriptions, to the extent that

$$(34) \quad \llbracket @ \rrbracket = \lambda f_{(se)} \lambda w. f_v$$

In extensional contexts, this operator is redundant. To see this, consider (35) and its two semantic structures (36) and (37), one with, the other without @:

(35) Professor Duriarti, a notorious criminal, has escaped from prison.

$$(36) \quad \llbracket \mathcal{F} \rrbracket (\llbracket \mathcal{A} \rrbracket (\llbracket \text{notorious criminal} \rrbracket) (\llbracket \text{Duriarti} \rrbracket)) (\llbracket \text{escaped} \rrbracket) \\ = \lambda w : \mathcal{D}_w \in \mathcal{D}_e, \mathcal{NC}_w(\mathcal{D}_w) \cdot \mathcal{E}_w(\mathcal{D}_w)$$

$$(37) \quad \llbracket \mathcal{F} \rrbracket (\llbracket @ \rrbracket (\llbracket \mathcal{A} \rrbracket (\llbracket \text{notorious criminal} \rrbracket) (\llbracket \text{Duriarti} \rrbracket))) (\llbracket \text{escaped} \rrbracket) \\ = \lambda w : \mathcal{D}_v \in \mathcal{D}_e, \mathcal{NC}_v(\mathcal{D}_v) \cdot \mathcal{E}_w(\mathcal{D}_v)$$

The main difference is that the presupposition stemming from the appositive is on the construal in (37) anchored to v , the actual world. This does not make a difference once the sentence is evaluated, though. What has been built above, and all along, are not sentence denotations (truth values) but propositions. But when these are ‘finished’ and are to be used as assertions or more generally as representatives, they are applied to v , yielding a denotation, a truth value. And then the difference between (36) and (37) is levelled out.

Returning to (33) and the *de re* interpretation of the embedded appositive, when $\llbracket @ \rrbracket$ applies to $\llbracket \mathcal{A} \rrbracket (\llbracket \text{notorious casanova} \rrbracket) (\llbracket \text{John} \rrbracket)$, the result is:

$$(38) \quad \llbracket @ \rrbracket (\llbracket \mathcal{A} \rrbracket (\llbracket \text{notorious casanova} \rrbracket) (\llbracket \text{John} \rrbracket)) = \\ \lambda w [\lambda w : \mathcal{J}_w \in \mathcal{D}_e, \mathcal{NC}_w(\mathcal{J}_w) \cdot \mathcal{J}_w](v) = \\ \lambda w : \mathcal{J}_v \in \mathcal{D}_e, \mathcal{NC}_v(\mathcal{J}_v) \cdot \mathcal{J}_v$$

This is a partial constant function, defined if and only if the name *John* actually denotes an individual and this individual is actually a notorious casanova, and yielding, if defined, that individual no matter what. The partial proposition that John, a notorious casanova, betrays Mary (here the type $e(st)$ property $\mathcal{B}^m$) is:

$$(39) \quad \llbracket \mathcal{F} \rrbracket (\llbracket @ \rrbracket (\llbracket \mathcal{A} \rrbracket (\llbracket \text{notorious casanova} \rrbracket) (\llbracket \text{John} \rrbracket))) (\llbracket \text{betrays Mary} \rrbracket) \\ = \lambda w : \mathcal{J}_v \in \mathcal{D}_e, \mathcal{NC}_v(\mathcal{J}_v) \cdot \mathcal{B}_w^m(\mathcal{J}_v)$$

So far, this is parallel to (37), and the actualizer is redundant. But when (39) is embedded in an intensional context, this changes. The full partial proposition that Mary is surprised that John, actually a notorious casanova, betrays her is:

$$(40) \quad \lambda w : \mathcal{B}_m(w) \subseteq \lambda w' \mathcal{J}_v \in \mathcal{D}_e, \mathcal{NC}_v(\mathcal{J}_v); \mathcal{B}_m^+(w) \subseteq \lambda w' \mathcal{B}_{w'}^m(\mathcal{J}_v).$$

transparent evaluation readings are desired, one could consider a choice function analysis.

$$\max_{g_m(w)}(f_m(w)) \cap [\lambda w' \mathcal{I}_v \in D_e, \mathcal{N}\mathcal{C}_v(\mathcal{I}_v), \mathcal{B}_{w'}^m(\mathcal{I}_v)] = \emptyset$$

There are two cases: either the name *John* actually denotes an individual and this individual is actually a notorious casanova, in which case the proposition is defined iff Mary believes that this individual betrays her and true iff she is also surprised that he does; or not, that is, John is not actually a notorious casanova; then the proposition is only defined if Mary believes the empty set of worlds. That may be thought to be possible; after all, one can have inconsistent beliefs. If we want the proposition to be plainly undefined in case John is not actually a notorious casanova, we could consider including the factive presupposition in the definedness condition introduced by the attitude: $\lambda \phi \lambda x \lambda w : \phi_w = 1 \dots$

Importantly, though, however the definedness conditions are dealt with, in contrast with the *de dicto* construal, on the *de re* construal the content of the appositive plays no role in the content of the clause (the second line in (40)) and so does not affect its truth conditions: if John is indeed a notorious casanova, the conjunct $\mathcal{N}\mathcal{C}_v(\mathcal{I}_v)$ is superfluous.

4.4 Discussion

The analysis developed above has some welcome consequences but also some problematic features. First, since the actualizer can apply below an appositive, the analysis predicts that there can be *de re* readings of definite descriptions with appositives read *de dicto*, – and this seems to be borne out:

- (41) Thoas wants Iphigenia to sacrifice her own brother, a stranger who has tried to steal the statue of Artemis.

Thoas is not yet aware that Orestes is Iphigenia's brother. But he is well aware that Orestes has tried to steal the statue of Artemis, and he is convinced that Orestes is a stranger. If this is a natural reading of (41), it is derivable.

By the same token, however, it is predicted that there cannot be *de dicto* readings of definite descriptions with appositives read *de re*, – and this question seems more open. To test it, we may consider cases like (42).

- (42) ?Gloucester wants his loyal son, a traitor to him, to inherit his title.

The only sensible interpretation is that the son that Gloucester wants to inherit his title is Edmund, loyal in his belief worlds but actually a traitor. To the extent that this interpretation is unavailable, it serves to confirm the prediction that if the appositive is in the scope of @, so must the expression it applies to be. But it may not be obvious that (42) is dubious. (43) is predicted not to be dubious: the son that Gloucester wants to disinherit is Edgar, a traitor in his belief worlds but loyal in reality. It is not clear that this derivable reading is more accessible

than the intended but not derivable reading of (42).

(43) ?Gloucester wants to disinherit his loyal son, a traitor to him.

If (43) is indeed felt to be no more felicitous than (42), this reflects unfavorably on the formalism developed in this section.

Another, more general, point of discussion that should be raised concerns what Schlenker (to appear) terms the *epistemic status* of appositives in relation to the presupposition-as-definedness-condition that their contribution has been identified as. According to Schlenker, nonrestrictive relative clauses introduce conditions similar to presuppositions but special in being easy to accommodate (*translucency*). Thus their content, while not trivial, should be uncontroversial. The close parallel between (35) and (44) indicates that Schlenker would intend this characterization of nonrestrictive relatives to carry over to appositives.

(44) Professor Duriarti, who is a notorious criminal, has escaped from prison.

(35) Professor Duriarti, a notorious criminal, has escaped from prison.

The analysis proposed in this paper simply predicts that (35) lacks a truth value unless Professor Duriarti is actually a notorious criminal, and the question is how this definedness condition on the world of evaluation can be brought into accord with Schlenker's notion of a 'translucent' condition. On the face of it, the two notions seem very different; in particular, it seems too strong to deny (35) a truth value should the professor turn out not to be a notorious criminal.

The relevant notion of presupposition has been referred to as a 'classical' or 'traditional' notion, and my intention has been that this notion is appropriate for some but not all triggers and coexists with a context oriented conception, apt for triggers like *again* and *also*, *start* and *stop*, non-emotive factives, and anaphoric definite descriptions. In these and more cases, being entailed by the context is the ideal and accommodation is difficult. Appealing to a definedness condition for appositives or nonrestrictive modifiers more generally can be seen as a way to decrease the demands on the context and to allow for a comparative ease of accommodation, and thus as a way to emulate 'translucency'.

Thus as long as the information contained in the appositive, though new, does not conflict with the information state of the addressee, she will typically be willing to accept it on faith. Conversely, if that information does conflict with the addressee's information state, she may well be prepared to disregard it and still assess the information contained in the carrier sentence:

(36) It says here: "Professor Duriarti, a notorious criminal, has escaped

from prison.” Since he is innocent, I am glad to learn that he is a free man.

The additional assumption needed is thus that (simplex) sentences containing nonrestrictive modifiers can still have a truth value even if the modifier should be false or undefined – and the need for such a notion of ‘accommodation’, consisting not in adding information but in disregarding it, is shared by other presupposition triggers which lend themselves to a definedness analysis, like referential definite descriptions, as in (45), or gender markers, as in (46).

- (45) – Who is the man drinking a martini? (from Donnellan 1966)
 – It’s not a martini, but anyway, it’s Smith.
- (46) – Pirmins Mathelehrer ist ein pädagogisches Genie! (German)
Pirmin’s mathteacher_{masc} is a pedagogical genius
 – Es ist eine Lehrerin, aber ja, genial ist sie.
it is a teacher_{fem} but yes genius is she

On the whole, a critical point of discussion is whether and to what extent the analysis of appositives presented in this paper should be expected to extend to nonrestrictive modifiers such as those exemplified by (47)–(49):

- (47) The pharmacist was surprised that this *old woman* was interested in condoms.
- (48) My friends are surprised that *shy and sweet* me is learning self defense.
- (49) She was startled to see the *devoted detective* Mickey Mouse shake hands with his ruthless rival Black Pete.

In all these cases, the italicized NP or AP is redundant in the sense that it does not contribute to the identification of the referent of the description it is part of. In (47), *this individual* would be sufficient for the identification of the referent, in (48), the pronoun *I (am)* would, and in (49), the name *Mickey Mouse* would (cf. Matushansky (2008: 595ff.) for a recent analysis of this last construction). All three descriptions are embedded in a downward entailing modal context, and seem to give the same interpretive effect as the above-studied appositives: they may not convey new, or even nontrivial, information, but the information that they convey plays a critical role for the evaluation of the modal predicate. What made it surprising to the pharmacist that this individual was interested in condoms was the property of being an old woman, etc. So at least with respect to the contexts in focus in this paper, a parallel treatment of several, if not all, sorts of nonrestrictive modifiers appears as desirable – and to the extent that the

different sorts turn out to display a different behaviour in other environments, for instance, in simplex sentences, it is to be hoped that this can eventually be described as a variation within the general frame of analysis developed above: Supplements, including nominal appositives, nonrestrictive relatives, and the types of nonrestrictive modifiers exemplified in (47)–(49), can contribute to the content of a clause because they introduce presupposition-like conditions.

5 Conclusions

The point of departure for this study was the following double claim made by Harris and Potts (2009) concerning the perspectival orientation of appositives:

1. Non-speaker oriented readings are independent of intensionality; they are possible even in extensional contexts.
2. However, speaker-oriented readings predominate even in intensional contexts.

I have disputed both claims, the first by arguing that the relevant extensional contexts are intensional after all, in the spirit of Hintikka (1973: 214):

Surprisingly often modal notions are tacitly being considered in apparently non-modal contexts.

The second claim was countered by pointing out that the intensional contexts considered by Harris and Potts are not representative; in fact, once downward entailing attitude contexts are taken into consideration, non-speaker oriented readings predominate. In turn, this realization paves the way for a recognition that appositives are not generally vehicles of expressive meaning, orthogonal to descriptive meaning, but that they do sometimes help to build propositions. The prime piece of evidence for that consists in the observation that weakening appositives fails to preserve the truth of certain attitude ascriptions, primarily ascriptions of surprise. If a pharmacist is surprised that Mrs. Otis, an old lady, is interested in condoms, it does not follow that she is surprised that Mrs. Otis, a lady, is interested in condoms. Another fact which supports the ‘semantic strategy’ is that appositives in surprise contexts often represent old information.

The function that appositives fill in this type of context is best understood against the background of the theory of emotive factive attitudes like *surprised*. When we ascribe surprise to somebody at a certain individual having a certain property (like being pregnant or interested in condoms), we tacitly understand some additional relevant properties (like being a virgin or an old lady), and these are encoded in a contextual parameter providing a set of relevant (‘old’) belief worlds. If, for fear of being misunderstood because the context might not be sufficiently clear in this regard, we want to make a property explicit,

expressing it in the form of an appositive is a natural move.

Thus in modal contexts, appositives act as reminders of properties which are to follow an individual along through the set of worlds under consideration. They provide a means to ensure that a thing retains its relevant properties across the modal space. This task can be argued to be more important in downward entailing than in upward entailing modal contexts, and that could be the reason that (non-speaker oriented) appositives are more frequent there.

For modelling this behaviour of appositives in a way that also allows for speaker-oriented interpretations, in extensional as well as intensional contexts, a treatment in terms of partial meanings along the lines of Beaver and Krahmer (2001) commends itself. I hope to have shown how such an approach can yield coherent results in a fully compositional fashion: Starting from an abstract so-called appositive functor, appositives add definedness conditions to individual concepts, conditions that become definedness conditions on higher intensions, finally on propositions. When these propositions are embedded under attitudes, those definedness conditions (on the usual, *de dicto* construal) become integral parts of them (to be exact, their positive extensions), and thus the intuition that agent-oriented appositives convey attitude-relevant properties is accounted for.

As far as speaker-oriented interpretations are concerned, it is difficult to discern a decisive difference between a ‘bidimensional’ view of appositives as belonging to the dimension of implicature, to do with expressive meaning only, and a ‘unidimensional’ view where appositives give definedness conditions on partial concepts and propositions. Once we take non-speaker oriented readings seriously, however, not only in upward entailing but also in downward entailing modal contexts, it becomes clear that, at the very least, the two ‘dimensions’ should be able to communicate: the piece of content expressed in the appositive should be allowed to merge with the larger piece expressed in its local context. The present paper has presented one way to produce this effect.

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