

# Supplements without Bidimensionality\*

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**Abstract.** Potts (2005, 2007) has claimed that the behavior of 'supplements' – appositive relative clauses and nominals – offers a powerful argument in favor of a multidimensional semantics, one in which certain expressions fail to interact scopally with various operators because their meaning is located in a new semantic dimension. We explore an alternative to Potts's bidimensional account in which (i) appositives may be syntactically attached with matrix scope, despite their appearance in embedded positions; (ii) they may also be syntactically attached within the scope of other operators (whether attitudinal or not), in which case they semantically interact with them; (iii) they are semantically conjoined with the rest of the sentence, but (iv) they are subject to a pragmatic rule that requires that their content be relatively easy to accommodate ('Translucency') – hence some non-trivial projection facts for appositives that do not have matrix scope. In effect, our analysis accounts for most of the complexity of these data by positing a more articulated syntax and pragmatics, while keeping the semantics 'lean' and unidimensional.

**Keywords:** supplements, appositives, non-restrictive relative clauses, bidimensionality, parentheticals

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## 1 Introduction: Bidimensional vs. Unidimensional Analyses of Supplements

The contrast between (1)a and (1)b suggests that appositives (non-restrictive relative clauses ('NRRs') as well as appositive nominals ('ANs')) are 'scopeless', in that they do not interact semantically with operators in whose scope they appear. Thus the underlined NRR in (1)a is somehow read outside the scope of negation, unlike the underlined conjunct in (1)b:

- (1) a. I doubt that John, who is smart, is competent.  
=> John is smart.  
b. I doubt that John is smart and competent.  
≠> John is smart

This behavior was taken by Potts 2000, 2005, 2007 and Nouwen 2006 to argue for a *bidimensional semantics*, one in which 'supplements' (= the semantic contributions of appositives) are computed in a separate semantic dimension from assertive content. Their analysis is sketched in (2).

- (2) **Bidimensional Analysis** (Potts 2000, 2005; Nouwen 2006)  
**(i) Syntax:** Appositives are attached in their surface position.  
**(ii) Semantics:** Supplements are computed in a separate dimension, which has two effects.  
**A.** They appear to have 'wide scope'.  
*Version 1* (Potts 2000): They do not interact scopally with other operators.  
*Version 2* (Nouwen 2006): They only interact scopally with operators *to the extent that unembedded E-type pronouns do* (e.g. in *John invited few people, who had a good time*, the NRR does interact with the quantifier; but the truth conditions are similar to those of the discourse *John invited few people. They had a good time*).  
**B.** Supplements have a special epistemic status (they are not 'at issue').

We develop an alternative account within a unidimensional semantics. We suggest that, syntactically, NRRs are preferably attached to the matrix level, but that lower attachments are also possible; we take them to have a conjunctive semantics; and we assume that they are subject to a pragmatic constraint that requires that their content be both non-trivial but easy to accommodate. These assumptions (in part borrowed from McCawley 1988 and De Gobbo 2003, among others) are stated more precisely in (3).

- (3) **Unidimensional Analysis**  
**(i) Syntax** (see McCawley 1988, Del Gobbo 2003)  
 -An NRR can be attached to any node of propositional type that dominates [the LF position of]<sup>1</sup> its associated NP.  
 -Preferences: highest attachment >> lower attachment – attitudinal >> lower attachment – non attitudinal  
**(ii) Semantics** (Del Gobbo 2003)  
 a. In an NRR, the relative pronoun can be interpreted as E-type or as referential.  
 b. AN NRR is interpreted conjunctively.  
**(iii) Pragmatics**  
 The content of an NRR must be 'easy to accommodate', but non-trivial – which gives rise to non-trivial pattern of projection.

We provide three main arguments in favor of our approach.

**(i) Bidimensionalism is undesirable** because there are cases in which appositives can be attached *and interpreted* in the scope of other operators.

**(ii) Bidimensionalism is unnecessary** because there are independent (syntactic) arguments for postulating that appositives may, like parentheticals, be attached much higher than their surface position.

**(iii) Some supplements give rise to non-trivial patterns of projection which are formally similar to presupposition projection.** This suggests that there is a non-trivial interaction between the semantic contribution of some appositives and other operators.

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<sup>1</sup> The role of the bracketed part will be discussed in Section 4.2.1.

We do not attempt in this piece to discuss *expressives* (e.g. the expression *honky*, which indicates that the speaker has a derogatory attitude towards white people). These were taken by Potts (2000, 2005) to provide an important argument in favor of a bidimensional analysis because they too are interpreted as if they had ‘wide scope’ even when they seem to be deeply embedded. Other researchers (e.g. Sauerland 2007, Schlenker 2003, 2007) have argued that expressives can in fact take scope under attitude operators. Harris and Potts (2009a, b) show with experimental means that this is indeed possible, but that the phenomenon is broader: even in the absence of attitude operators, the content of an expressive can sometimes be attributed to someone other than the speaker. They conclude that these data can be dealt with by a pragmatic mechanism of ‘perspectival shift’ which works *on top* of a bidimensional semantics. While we leave expressives out of the present study, we will discuss a similar line of argumentation in the domain of appositives, and we will argue that in some cases this defense of the bidimensional analysis is implausible.

In the rest of this paper, we will occasionally consider data from French in addition to English, for two reasons (beyond expediency).

–First, Cinque 2008 argued that there are two types of nonrestrictive relative clauses, only one of which is present in English. (i) ‘Integrated NRRs’ are according to him ‘essentially identical to the ordinary restrictive construction (as such part of sentence grammar)’; in other words, they are closely integrated to the sentence they appear in. Such NRRs are not available in English; in French, they are exemplified by relative clauses introduced by *qui*. (ii) ‘Non-integrated NRR’ are ‘distinct from the ordinary restrictive construction (with characteristics of the grammar of discourse)’. All English NRRs are of this type. In French, this class is represented by relative clauses introduced by *lequel*. By focusing on French, we will show that *even* integrated NRRs (of the *qui* type) have the ability to attach syntactically much higher than their surface position. In this way, we show that not just NRRs that belong to the ‘grammar of discourse’, but even those that are part of ‘sentence grammar’ display unexpected attachment possibilities.

–Second, French has some moods – notably, the subjunctive – which are obligatorily syntactically *and semantically* embedded. This will be helpful to show that some NRRs have narrow scope (both syntactically and semantically).

The rest of this article is organized in four parts, comprising two sections each. In Part I (Sections 2-3), we lay out our arguments against a bidimensional semantic account, and in favor of one in which NRRs can attach at various syntactic sites. In Part II (Sections 4-5), we develop our positive proposal, based on a simple semantics, a richer syntax, and a pragmatics that predicts non-trivial patterns of ‘supplement projection’. The main semantic and syntactic consequences of the proposal are discussed in Part III (Sections 6-7), and further refinements of the proposal are developed in Part IV (Sections 8-9).

## **Part I. Against Bidimensionalism: Varieties of Syntactic Attachment**

### **2 The Possibility of Narrow Scope**

#### ***2.1 The scope of appositives: Potts 2005, 2007 and Nouwen 2006***

The frameworks developed by Potts (2005, 2007) and Nouwen (2006) are designed to capture the generalization that *appositives never have genuinely narrow scope with respect to other operators*. I write ‘genuinely’ because it is explicit for both authors that whatever mechanisms allow expressions to be intuitively dependent on some operators without being in their syntactic scope should in principle be available for appositives as well. There are three cases in point.

(i) Nouwen 2006 observes that the nominal appositive in (4)a is semantically dependent on the indefinite *a Dutchboxer*; and the same observation holds of the NNR in (4)a'. But by itself this observation does not invalidate the main insight of the bidimensional approach: the same phenomenon arises in (4)b, where *he* is intuitively dependent on the indefinite. By contrast, neither dependency is possible when the indefinite is replaced with a universal quantifier, as in (4)c-d.

- (4) a. A Dutch boxer, a famous one, took part in the event.  
 a'. A Dutch boxer, who is famous, took part in the event.  
 b. A Dutch boxer took part in the event. He is famous.  
 c. #Every Dutch boxer, a famous one, took part in the event.  
 d. Every Dutch boxer took part in the event. #He is famous.

The natural conclusion is that some mechanism allows a singular pronoun to be dependent on an indefinite (but not on a universal quantifier) without being in its syntactic scope; whatever this mechanism is, it probably applies in identical fashion to (4)a-a' and (4)b. Nouwen's system is designed to capture this generalization by allowing variables in an appositive to be dynamically bound by an existential quantifier that appears outside of it (Potts's system does not explicitly handle dynamic binding, but I believe Nouwen's proposal is congenial to the spirit of his own theory).

(ii) Potts 2005 observes that there are apparent exceptions to the claim that appositives are interpreted outside the scope of operators. In particular, he discusses the case of German NRRs in the 'Konjunktiv I' (a form of the subjunctive specialized for indirect discourse) and are embedded under attitude operators:

- (5) Juan behauptet, dass Maria, die sehr schwach sei, krank sei.  
*Juan maintains that Maria who very weak be.konj sick be.konj.*  
 'Juan maintains that Maria, who is supposed to be really weak, is sick.'

In this case, the NRR is interpreted from the agent's rather than from the speaker's perspective: the claim that *Maria is sick* is naturally attributed to Juan, not to the speaker. But as Potts correctly observes, this does not show that the NRR must scopally interact with the attitude operator. As he writes, "when one studies the distribution of Konjunktiv I more broadly, one finds that it can occur in main clauses provided that the context includes an agent to whom the content of the clause can be relativized":

- (6) Juan behauptet, dass Maria krank sei. Sie sei sehr schwach.  
*Juan maintains that Maria sick be.konj She be.konj very weak*  
 'Juan maintains that Maria is sick. According to him, she is very weak.'

Here too, the intuitive dependency between the NRR and the attitude operator does not show that there is a scopal interaction between them.

(iii) This line of reasoning is extended by Harris and Potts 2009 to English examples in which an appositive appears to interact scopally with an attitude verb, as in (7)a.

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

They show with experimental means that in examples such as (7)a, the appositive can be interpreted from the agent's rather than from the speaker's perspective; but they also show that the same phenomenon arises in the absence of any attitude operator, as in (7)b, where it can be understood that it is Sid's opinion (rather than the speaker's) that homework is a complete waste of time. Harris and Potts conclude that an operation of 'perspectival shift', which crucially does *not* require genuine scopal interaction, is responsible for the data in (7)b, and presumably for (7)a as well.

Following the same logic, we will now argue that in several cases NRRs genuinely give rise to scopal interactions. Specifically, we show in six cases (involving various tenses and moods) that:

- (a) an NRR with a certain property P behaves semantically as if it had narrow scope under some operators<sup>2</sup>; while  
 (b) a clausal parenthetical with the same property with the same property *fails* to give rise to this interpretation.<sup>3</sup>

<sup>2</sup> These six properties are: P = (i) 'being in the French subjunctive'; (ii) 'having a modally interpreted imperfect'; (iii) 'having a modally interpreted present tense'; (iv) 'having undergone Sequence of Tense'; (v) 'having a tense interpreted relative to a future moment'; (vi) 'containing a presupposition trigger'.

(In what follows we focus on NRRs rather than nominal appositives, because we believe that the latter present additional complexities; they are discussed in Appendix I, in particular in connection to the analysis put forth in Nouwen 2010.)

## 2.2 *Narrow Scope with the French Subjunctive*

Our argument starts with the French subjunctive, which is normally grammatical only if it is interpreted in the scope of certain licensers; we use this property to argue that some NRRs are genuinely interpreted with narrow scope.

Consider the subject NRRs in (8)a. There is some speaker variation as to which licenser is best (some prefer *imagine* to *it is conceivable*), and how good the result is; but the *contrast* with the clausal parenthetical in (8)b, which is uninterpretable, is usually robust (note that the parenthetical is in this case hard to distinguish from an independent sentence – but this doesn't matter, as the latter forms an equally good control).

(8) *Context*: There was an incident at school.

Il est conceivable / Imagine que Jean ait appelé sa mère,  
*It's conceivable / Image that Jean has-subj called his mother, who has-subj called her lawyer.*  
 'It's conceivable / Imagine that Jean called his mother,

a. qui ait appelé son avocat.  
*who has-subj called her lawyer.*  
 and that she called her lawyer' [literally: '... his mother, who called her lawyer']  
 ≠> If Jean had called his mother, she would have called her lawyer

b. \*(elle ait appelé son avocat).  
*(she has-subj called her lawyer).*

a'. , qui aurait appelé son avocat.  
*who would-have called her lawyer).*  
 'who would have called her lawyer.'  
 => If Jean had called his mother, she would have called her lawyer

b'. ok? (elle aurait appelé son avocat).  
*(she would-have called hear lawyer).*  
 '(she would have called her lawyer).'  
 => If Jean had called his mother, she would have called her lawyer

Nous aurions eu de sérieux problèmes.  
*We would-have had of serious problems.*  
 'We would have had serious problems.'

In this case, the French subjunctive, unlike the German Konjunktiv I, requires a superordinate licenser in the same sentence; (8)b is incomprehensible for lack of one. The argument that (8)a involves a genuine scopal interaction is as follows:

(i) The truth conditions of (8)a are roughly those that would be obtained with an embedded conjunction, namely *it is conceivable that the following holds: Jean called his mother and she called her lawyer* – as is shown in the translation we provided.

(ii) As seen in (8)b, a parenthetical with the same mood is simply ungrammatical, which suggests that no operation of 'perspectival shift' can be responsible for the acceptability of the mood of the NRR.

(iii) Finally, a counterfactual parenthetical can be made acceptable if it contains conditional rather than subjunctive mood, as in (8)b' – but it yields very different truth conditions, characteristic of modal subordination: in (8)b' (and for that matter in (8)a', which also involves conditional mood),

<sup>3</sup> Parentheticals make for better controls than independent sentences because they can usually appear in the same positions as NRRs.

we obtain the inference that *if Jean called his mother, she called her lawyer*. This inference is not obtained in (8)a.

We conclude that these subjunctive NRRs do interact scopally with the constructions that license them.<sup>4</sup> (See Appendix II for a potential objection based on interpretive peculiarities of subject NRRs in French, and a response based on object relative clauses.)

Note that in this argument, which we will reproduce several times in other contexts, the conjunction of (i) and (iii) would have sufficed to make the desired point; but (ii) adds a further argument based on syntactic/semantic licensing, and it also helps bring out the relevant readings in sentences that would otherwise be ambiguous: as we will see, high attachment is in principle a possibility with NRRs, and as is stated in a preliminary fashion (3)(i) (and further discussed in Section 9.3), it is usually the preferred one – which makes it difficult to argue for a narrow scope reading unless the latter is forced.

### 2.3 Narrow scope NRRs in *if*-clauses

We apply the same logic to two properties that are licensed by *if*-clauses: the modal interpretation of past tense morphology (e.g. Iatridou 2000); and the availability of a future interpretation of a present tense. For ease of presentation, we concentrate on English, but similar data hold in French, at least for some speakers.

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<sup>4</sup> One could ask whether the *English* subjunctives can be used to construct a similar argument.

–Some speakers accept a *were* subjunctive in an NRRs, as shown in (i)a and (i)b (we write as 1 and 2 the judgments of two native speakers; \*/? indicates that the same person gave different judgments at different times on the same sentence; but the collection method was quite informal).

- (i) *Context*: A news channel has information about the identity of an American spy in Pakistan, Smith. The following is uttered by a journalist working for that channel:  
If tomorrow we published information about Smith,  
a. 1ok?, 2\*/? who were killed as a result, / 1ok, 2\*who were to get killed as a result,  
b. 1ok?, 2ok and he were killed as a result, / 1ok, 2ok/? and he were to get killed as a result,  
c. 1\*, 2\*(he were killed as a result) / 1\*, 2\*(he were to get killed as a result)  
we could kiss our jobs goodbye.

We include in (ii) the judgments we obtained for restrictive relative clauses, which are not good with the *were* subjunctive (though we don't know why).

- (ii) *Context*: A news channel has information about the identity of American spies in Pakistan. The following is uttered by a journalist working for that channel:  
If tomorrow we published information about a spy  
a. 1??, 2?? that were killed as a result,  
a'. 1??, 2??that were to get killed as a result,  
b. 1ok?, 2ok and he were killed as a result,  
b'. 1ok, 2? and he were to get killed as a result,  
we could kiss our jobs goodbye.

–When it comes the 'bare infinitive' subjunctive, as in (iii)a, one informant we consulted found (iii)a rather acceptable, and found the restrictive relative clause in (iv)a unacceptable. We do not know how this pattern generalizes to other examples or other speakers.

- (iii) *Context*: there was an incident at the office.  
a. ok? It is essential that you call John, who call the director to inform him of the situation.  
b. ok It is essential that you call John and that he call the director to inform him of the situation.
- (iv) a. \*It is essential that you educate children who be nice to their parents.  
b. ok It is essential that you be nice to your parents.

Again, we do not know why there might be a contrast between restrictive and non-restrictive relative clauses in this case.

### 2.3.1 Modally interpreted past under *if*

Consider the paradigms in (9):

- (9) *Context*: someone made a big mistake at the Department.
- a. If tomorrow I called the Chair, who in turn called the Dean, then we would be in deep trouble.  
 $\neq$  > If I called the Chair, he would call the Dean
  - b. \*If tomorrow I called the Chair (he in turn called the Dean) then we would be in deep trouble.
  - a'. If tomorrow I called the Chair, who would in turn call the Dean, then we would be in deep trouble.  
 $\Rightarrow$  > If I called the Chair, he would call the Dean
  - b'. If tomorrow I called the Chair (he would in turn call the Dean), then we would be in deep trouble.

We argue in three steps to show that the NRR in (9) is genuinely embedded.

- (i) The truth conditions of (9)a are roughly those of an embedded conjunction ( $\approx$  *if tomorrow I called the Chair and he called the Dean, then we would be in deep trouble*).
- (ii) The parenthetical in (9)b is deviant: the past tense cannot have a modal interpretation because it is not in the scope of the *if*-clause; and its past tense interpretation cannot be reconciled with the fact that the event referred to is supposed to be in the future (because *in turn* establishes a relation of succession between the speaker's calling the Chair and the Chair's calling the Dean).
- (iii) The parenthetical in (9)b' is acceptable, but it yields a modal subordination reading, hence an inference – absent from (9)a that *if the speaker were to call the Chair, the latter would call the Dean*.

The same reasoning can be made on the basis of the simplified paradigm in (10):

- (10) *Context*: A news channel has information about the identity of an American spy in Pakistan, Smith. The following is uttered by a journalist working for that channel:  
 If tomorrow we published information about Smith,
- a. who later got killed as a result,
  - b. ?? (he later got killed as as result)
- we could kiss our jobs goodbye.

### 2.3.2 Forward-shifted present under *if*

A similar argument can be constructed on the basis of the present tense interpreted in the antecedent of indicative conditional. It is a standard observation that in these environments the present tense can be interpreted with a future meaning (in fact, a future is normally prohibited in these contexts); this is not possible in other environments, unless the present is read with a 'futate' ('planned action') meaning. This makes it possible to contrast the behavior of NRRs and parentheticals in indicative *if*-clauses:

- (11) *Context*: someone made a big mistake at the Department.
- a. If tomorrow I call the Chair, who in turn calls the Dean, then we will be in deep trouble.  
 $\neq$  > If I call the Chair, he will call the Dean
  - b. \*If tomorrow I call the Chair (he in turn calls the Dean) then we will be in deep trouble.
  - a'. If tomorrow I call the Chair (he will in turn call the Dean), then we will be in deep trouble.  
 $\Rightarrow$  > If I call the Chair, he will call the Dean
  - b'. If tomorrow I call the Chair, who will in turn call the Dean, then we will be in deep trouble.  
 $\Rightarrow$  > If I call the Chair, he will call the Dean

The argument is in every respect similar to that in (9), with the difference that present rather than the past tense morphology is interpreted as modal, and is used (as in the preceding case) to refer to a future events.

The same conclusion can be reached on the basis of the simplified paradigm in (12):

- (12) *Context*: There will be a party at the addressee's place next week.  
 If you invite Mary
- a. , who then invites John,
  - b. ??(she then invites John),
  - c. and she then invites John,
- there will be too many of us.

## 2.4 *Narrow scope with temporal dependencies*

### 2.4.1 *Embedding under past tense: Sequence of Tense*

The same logic can be applied to another construction, which involves an uninterpreted past tense under English attitude verbs – a 'zero tense' which is an effect of Sequence of Tense rules. In several frameworks (notably Ogihara 1996 and Abusch 1997), this null tense is obligatorily read *De Se* and must thus be semantically dependent on the attitude verb. For our purposes, zero past tense has two salient properties: (i) it only arises if it is within the syntactic scope of a past tense attitude operator; (ii) it must be *bound* by the attitude verb or by an element associated with it (such as a  $\lambda$ -operator). We will now use zero tenses to construct an additional argument in favor of the claim that NRRs can sometimes interact scopally with other operators. (For this part of the discussion we focus on English, where Sequence of Tense rules have been studied in greater detail than analogous ones in French).

We provide in (13) one of the clearest effects of a Sequence of Tense rule:

- (13) John decided yesterday that tomorrow he would tell his mother over lunch that they were having their last meal together. (slightly modified from Abusch 1997)

The time of the future event ('having a meal together') is tomorrow, which is not before *any* of the other salient moments in this context (namely yesterday, now and tomorrow). This comes as a surprise for any theory that posits that the past tense features of the underlined expression are interpreted as past with respect to *something*. By contrast, the data are expected for theories based on Sequence of Tense rules, for which these past tense features remain uninterpreted by virtue of their identity with the past tense features of a superordinate tense (those of *would tell*, where *would* is viewed as the past tense of *will*).

As mentioned, Sequence of Tense rules can only apply if (i) the target past tense is in the scope of a past tense attitude operator; and (ii) it is bound by this same attitude operator (or a  $\lambda$ -operator associated with it). Condition (i) is illustrated in (14): the underlined past tense can be interpreted as referring to the day following the utterance time in (14)a, but not in (14)b<sup>5</sup>.

- (14) *Context*: John is in London with his cousin Mary, and he is about to go to Vegas to meet his girlfriend Ann. He is planning to marry her there but his parents don't know it.

John decided yesterday that tomorrow he would tell his parents that he was in Vegas and that

a. the woman who *was* there with him was about to become his wife.  
[the woman who was there with him can refer to John's girlfriend Ann]

b. Ann was about to become his wife. #She was there with him.

Condition (ii) is illustrated in (15):

- (15) *Context*: John is in London with Mary, but yesterday he was in Vegas with Ann.  
a. I believe that John told his parents yesterday that the woman who was with him was about to become his wife.  
b. I believe that John told his parents yesterday that the woman who is with him was about to become his wife.

The underlined past tense in (15)a definitely cannot be interpreted as being present, i.e. dependent on the context of speech or, equivalently here, on the matrix present tense of *believe*. But this is what would be predicted if we allowed past tenses to be deleted without regard to the locus of their binder: in (16)a, *told* licenses the deletion of the past tense features of *was*, while *believe* binds the

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<sup>5</sup> The adverb *there* is intended to block a different reading, on which the independent clause in (14)b is read as being in Free Indirect Discourse (Banfield 1982, Doron 1991, Schlenker 2004, Sharvit 2008). Excluding this reading is important because it behaves with respect to Sequence of Tense rules as if it were embedded under an attitude operator (Sharvit 2008). However, in order for such a reading to be obtained, *here* rather than *there* should be used.

corresponding time variable. This incorrectly predicts that (15)a could have a reading on which the description *the woman who was there with him* denotes Mary. By contrast, the Logical Form in (16)b is appropriate: *told* serves both to delete the past tense features of *was* and to bind its situation argument; this predicts a reading which is indeed instantiated (*the woman who was there with him* refers to Ann).

(16) a. [Wrong LF] I believe  $\lambda t_0$  that John told his parents yesterday  $\lambda t_1$  that the woman who was<sub>0</sub> there with him was about to become his wife.

b. [Correct LF] I believe  $\lambda t_0$  that John told his parents yesterday  $\lambda t_1$  that the woman who was<sub>1</sub> there with him was about to become his wife.

With this background in mind, we can turn to the interaction between NRRs and Sequence of Tense rules.

(17) *Situation*: John is in London and he is about to go to Vegas to meet his girlfriend Ann. He is planning to marry her there but his parents don't know it.

a. John decided yesterday that tomorrow he would call his parents from Vegas to tell them that he had just married Ann

a. ok? , who was there with him.

b. #(she was there with him).

As before, our argument is distributional – with the advantage that we have already established that Sequence of Tense rules involve scopal interaction (as shown in (16)).

–In (17)a, the past tense can be understood to denote a future time ('tomorrow').

–This is impossible with the parenthetical in (17)b, or for that matter with an independent clause.

We conclude that the interaction between Sequence of Tense rules and NRRs suggests that the latter can in some cases include a tense which is bound by a superordinate operator which is outside the NRR – which isn't compatible with Harris and Potts's theory based on 'perspectival shift' only.

#### 2.4.2 Embedding under future tense

If embedded under a future tense, an English past or present tense can be interpreted with respect to a future point of reference. This possibility is illustrated in (18)a, where the underlined verb makes reference to an event of winning which is after the time of utterance but before a future moment introduced in the rest of the sentence ('forward shifted past'). As shown in (18)b, this possibility is blocked if the target tense is not embedded under a future tense.

(18) *Context*: we do not know who the next Republican candidate will be. But we know other things about the political situation.

a. After the next elections, we will be in a situation in which the Republican candidate won thanks to the far-right.

b. After the next elections, we will be in a situation in which the Republican candidate won with an overwhelming majority. # The far-right supported him.

Now we can make use of this property to show that NRRs differ from independent clauses and parentheticals in allowing for such forward-shifted readings. Such a reading is present with the NRR in (19)a (in bold), but not with the clausal parenthetical in (19)b.

(19) a. After the next elections, we will be in a situation in which the Republican candidate won thanks to the far-right, with which he struck an alliance.

=> The Republican candidate will strike an alliance with the far-right.

≠> The Republican candidate has already struck an alliance with the far-right

b. After the next elections, we will be in a situation in which the Republican candidate won thanks to the far-right (he struck an alliance with it).

=> The Republican candidate has already struck an alliance with the far-right

Importantly, the forward shifted interpretation of the past tense appears to require that the NRR attach to a clause (underlined in (19)a) which is itself embedded under a future tense (boxed in (19)a). If the only future licenser is in rather than above the clause that the NRR attaches to, the

forward-shifted reading seems rather difficult, as shown by the rather minimal contrast between (19)a and (20):

(20) In the next elections, the Republican candidate will win thanks to the far-right, with which he struck an alliance.

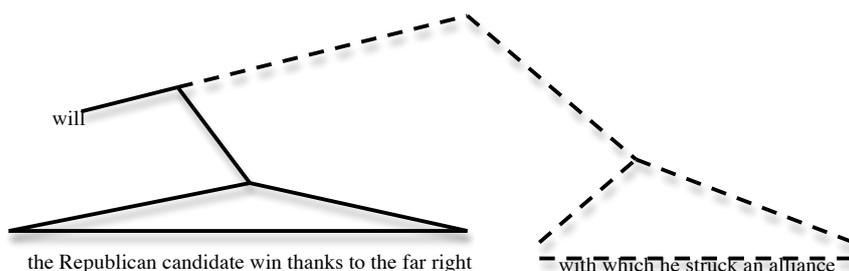
=> The Republican candidate has already struck already struck an alliance with the far-right

A straightforward explanation can be offered:

–In (19)a, the NRR can attach to the underlined clause, which is itself embedded under a clause in the future tense (boxed).

–In (20), the boxed future tense appears *within* the underlined clause, not above it. We posit that the resulting sentence lacks a forward shifted reading because the NRR must attach to a propositional node, hence one which is saturated and in particular has within it the necessary time arguments. As a result, the point at which the NRR attaches is *above* the relevant tense, as is represented in (21); and hence the forward shifted reading interpretation is missing.

(21)



## 2.5 Narrow scope with presupposition projection

A semantic argument can be constructed to show that NRRs can have narrow scope. It is based on constraints on the informational contribution of clauses in their local environment (or 'local context', to use the terminology of presupposition theory). Consider the contrasts in (22):

(22) Context: John and Ann are playing poker. John is making faces.

1. If he is winning, John

- a. ok , who knows that he is,
- b. ? (he knows that he is)
- b'. ok (he always has trouble concealing his feelings)
- c. ok knows that he is and

is smiling out of joy.

2. Either he isn't winning, or John

- a. ok? , who knows that he IS,
- b. ?? (he knows that he IS)
- b'. ok (he always has trouble concealing his feelings)
- c. ok knows that he IS and

is smiling out of joy.

(1)1b and (22)2b are deviant because the conditional and the disjunction alike trigger an implicature to the effect that *it is not known whether John is winning*; but the parenthetical, which attaches with matrix scope, presupposes that *John is in fact winning*, hence an odd result. Importantly, this clash does not result from a general property of presuppositions: the equivalent presupposition triggered in

the second clause of (1)1c-2c is acceptable. This follows from standard theories of presupposition projection (see for instance Beaver and Geurts 2011, Schlenker to appear for recent surveys): a presupposition must be entailed by its local context; the local context of the second clause of (1)1c-2c entails that John is winning<sup>6</sup>, hence it automatically entails the presupposition triggered by *know* – irrespective of whether the *global* context licenses this inference. It is thus interesting to note that (1)1a-2a is more acceptable than (1)1b-2b; we believe that this is because unlike the latter it allows (with more or less difficulty) for a reading in which the NRR is embedded within the second clause – with the result that the presupposition can be satisfied within its local context without clashing with the inference that one doesn't know whether John is winning (the fact that this reading may be difficult for some speakers is related to a general preference for matrix attachment, further discussed in Section 9.3).

### 3 The Possibility of Wide and Intermediate Scope

At this point, we have reached two conclusions:

- (a) There are cases in which NRRs are interpreted with narrow scope.
- (b) In such cases, they systematically differ from clausal parenthetical, which are only interpreted with maximal scope.

Despite (a), it must be granted that in many cases NRRs appear to have widest scope, though they crucially differ from parentheticals in that they occasionally give rise to narrow scope readings. There are two ways in which one could approach the problem.

- (i) One could start from a liberalized version of Potts's and Nouwen's framework, one in which supplements can either be part of the assertive dimension (in which case they have narrow scope), or of Potts's CI (= conventional implicature) dimension, in which case they have wide scope.
- (ii) Alternatively, one could do without a CI dimension, and posit a syntactic mechanism to handle the wide scope data.

We believe that there are several arguments against option (i).

–First, there are independent *syntactic* reasons to posit that NRRs can be attached very high despite appearing in surface position; they are based on the analysis of ellipsis and will be discussed in Sections 3.1 and 3.2.

–Second, we discuss in Section 3.3 cases in which NRRs have neither matrix nor narrow scope: we need a mechanism to guarantee that they can be attached at a variety of scope sites, as we announced in (3):

- (23) AN NRR can be attached to any node of propositional type that dominates [the LF position of] its associated NP.

We now set out to argue for a syntactic theory that allows for a variety of scope attachments, following seminal work by McCawley. As we will see, the arguments work in the same way for English NRRs as for their French counterparts, which for Cinque are of the 'integrated' type.

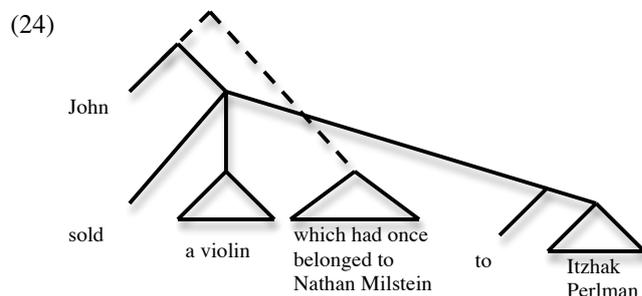
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<sup>6</sup> This is because in sentences of the form *if F, G* and *(not F) or G*, the local context of *G* is obtained by intersecting the global context with the denotation of *F*.

### 3.1 The Possibility of Wide Scope: Ellipsis and McCawley's Analysis<sup>7</sup>

#### 3.1.1 McCawley's Argument: English

McCawley 1988 proposed that English NRRs can/must be attached high despite being apparently embedded. His proposal is illustrated in (24), which gives rise to a discontinuous constituent *sold a violin to Itzhak Perlman* (McCawley's analysis countenanced ternary branching for ditransitive verbs; this assumption orthogonal to the issue at hand).



McCawley's argument for positing such a structure was based on patterns on inference obtained in ellipsis resolution:

(25) John sold a violin, which had once belonged to Nathan Milstein, to Itzhak Perlman, and Mary did too.

McCawley observed that the second sentence does not imply that the violin that Mary sold to Perlman had once belonged to Nathan Milstein. His argument can then be reconstructed as follows:

(i) Ellipsis requires syntactic identity between the elided element and constituent which is antecedent.

(ii) Since the elided clause in (25) does not give rise to the inference that Mary sold a violin which belonged to Milstein, the NRR must be absent from the elided clause; but then there must be a constituent in the antecedent clause which includes the VP while excluding the NRR.

#### 3.1.2 Replicating McCawley's Argument in French

We will now replicate McCawley's argument in French, with two twists: first, we show that the very same facts hold of clausal parentheticals; second, the French facts will demonstrate that even some

<sup>7</sup> In earlier work, I adduced arguments for high attachment based on the obviation of Condition C and Weak Crossover effects in some NRRs. One of the relevant contrasts, pertaining to Condition C, is reproduced in (i):

- (i) [Le Président]<sub>i</sub> est si compliqué qu'  
 [The President]<sub>i</sub> is so complicated that
- a. \* il<sub>i</sub> a donné au ministre qui n' aime pas Sarkozy<sub>i</sub> une tâche impossible.  
 he<sub>i</sub> gave the minister who doesn't like Sarkozy<sub>i</sub> an impossible task.
- b. ok? il<sub>i</sub> a donné au ministre de la Justice, qui n' aime pas Sarkozy<sub>i</sub>, une tâche impossible.  
 he<sub>i</sub> gave the minister the minister of Justice, who doesn't like Sarkozy<sub>i</sub>, an impossible task.
- (Schlenker 2010)

I am setting these binding-theoretic arguments aside for the moment, for two reasons: (i) the judgments are insufficiently solid, in particular in English; (ii) even if they were clear, they wouldn't show as much as one would like: binding-theoretic constraints can usually be analyzed in semantic terms, in which case the obviation of the effect could be a by-product of the wide-scope *semantic* behavior of NRRs rather than of their *syntactic* attachment. For example, in the account of Condition C developed by Reinhart (1983), *Sarkozy* is ungrammatical in (ia) because it could be replaced with a bound variable in such a way as to yield the same overall meaning. Proponents of a bidimensional analysis could explain the acceptability of (ib) by appealing to the fact that binding into an NRR is difficult in this case (for them, because NRRs are interpreted in a supplementary dimension); in effect, the Condition C is obviated because *Sarkozy* has no bound variable competitor to begin with.

of Cinque's 'integrated' NRRs display the same behavior as English NRRs which, for him, are 'non-integrated'.

- (26) *Context:* In each generation, the most famous cellist gets to meet the most talented young musicians.  
 a. Yo Yo Ma a présenté ses élèves préférés, qui vivent à Cambridge, à Rostropovitch. Paul Tortelier aussi, bien sûr.  
*Yo Yo Ma introduced his favorite students, who live in Cambridge, to Rostropovich. Paul Tortelier did too, of course*  
 $\neq$  Tortelier has students in Cambridge.  
 b. Yo Yo Ma a présenté ses élèves qui vivent à Cambridge, à Rostropovitch. Paul Tortelier aussi, bien sûr.  
*Yo Yo Ma introduced his students who live in Cambridge to Rostropovich. Paul Tortelier did too, of course.*  
 $\Rightarrow$  Tortelier has students in Cambridge.

On the assumption that ellipsis is a syntactic operation which targets a constituent, these data suggest that high attachment is possible with NRRs.

C. Potts (p.c.) notes that the same patterns of 'disappearance under ellipsis' hold of expressive adjectives, which certainly don't appear to be attached with matrix scope. This point is discussed in Potts et al. 2009:

- (27) A: I saw your fucking dog in the park.  
 B: No, you didn't—you couldn't have. The poor thing passed away last week.

The crucial observation is that B's reply does not commit B to the attitude expressed by the modifier *fucking*. Whatever mechanism is at play here could defuse McCawley's syntactic argument. We leave this debate for future research.

Now it could be argued that ellipsis is only sensitive to the *semantic* status of the constituent to be copied: if one of its component parts is non-assertive, it might be left out by ellipsis. In order to work, however, this hypothesis would have to be made rather complex: as we will now see, NRRs in the same surface position may or may not have to be copied by ellipsis depending on the syntactic point at which they are attached.

### 3.2 Correlating Attachment Tests

In the preceding sections, we argued that NRRs can be attached at a variety of syntactic sites. To further probe the reality of this analysis, it is worth testing the correlations we predict among various attachment tests. Focusing on ellipsis, we predict a refinement of McCawley's generalization: if we use some tests to force NRRs to be attached low, McCawley's generalization should be obviated, as is stated in (28).

- (28) **Prediction: ellipsis combined with narrow scope tests**  
 If an NRR is shown by tense/mood licensing or by the truth conditions to take narrow scope with respect to an operator *O*, an ellipsis that includes *O* should be resolved as including the NRR as well.

Let us test this prediction.<sup>8</sup> For simplicity, we focus on English, though tests with the French subjunctive can be devised as well.

#### □ *Low vs. High NRR in Ellipsis: present under if*

We start by using the modally interpreted present under *if* to make the point.

- (29) *Context:* There was a row between a professor from your Department and one from mine.  
 a. **Low interpretation**

---

<sup>8</sup> We could just correlate the *readings* obtained in a sentence that allows for high and low attachment of an NRR, and those obtained in its elided counterpart; the prediction is that high attachment allows an NRR to escape ellipsis resolution, which in turn has consequences for the truth conditions of the elided clause. In the text, we follow this logic but add a morphological telltale to indicate whether attachment is high or low; this has the advantage of avoiding complex judgments at attempt to correlate, within an ambiguous discourse, the reading obtained for an elided clause with the reading of its antecedent.

–Me: My secretary says that if tomorrow she calls the Chair, who in turn calls the Dean / (#he in turn calls the Dean), the Department will be in deep trouble.

–You: My secretary does too!

≠> if your secretary calls the Chair, the Department will be in deep trouble

=> if your secretary calls the Chair and if the Chair calls the Dean, the Department will be in deep trouble.

#### b. High interpretation

*Context:* There was a row between a professor from your Department and one from mine.

–Me: My secretary says that if tomorrow she calls the Chair, who I hate / (I hate him), the Department will be in deep trouble.

–You: My secretary does too!

=> if your secretary calls the Chair, the Department will be in deep trouble

In (29)a, both the meaning and the expression *in turn* force the underlined NRR to be interpreted with a future meaning; this future interpretation is possible under embedding under *if*, and it fails, as expected, in a clausal parenthetical. Since low attachment is forced by the interpretive properties of the NRR, the NRR is also copied under ellipsis of the matrix VP. This accounts for the inferences we obtain: the condition for the addressee's Department to be in trouble is that his secretary should call the Chair *and* that the latter should call the Dean. The facts are different in (29)b: the NRR is naturally interpreted as present, and hence nothing forces it to be attached low; when attached at the matrix level, it appears outside the VP which is copied by ellipsis. As a result, the NRR behaves as if it simply were not present in the elided clause: there is no inference that anybody hates the addressee's Chair. (The same argument could be developed with counterfactual conditionals involving a modally interpreted past tense. We will make use of this variant at the end of Section 3.3.)

#### □ *Low vs. High NRRs in Ellipsis: forward shifted past under will*

The same logic is applied in (30)a: the past tense NRR is naturally interpreted as making reference to a future event which in the past of a future speech act; this relative past tense reading requires embedding, as suggested by the fact that it is difficult to obtain with a clausal parenthetical.

(30) *Context:* There was a row between a professor from your Department and one from mine. There are faculty meetings in both departments tomorrow, but the Chairs are away.

#### a. Low interpretation

–Me: At the beginning of the meeting tomorrow, my secretary will say that a few minutes before she called the Chair, who didn't pick up the phone / ≠ (he didn't pick up the phone)

–You: I am sure that my secretary will too!

=> both secretaries will say that their Chairs didn't pick up the phone

#### b. High interpretation

–Me: At the beginning of the meeting tomorrow, my secretary will say that a few minutes before she called the Chair, who I absolutely hate / (I absolutely hate him).

–You: I am sure that my secretary will too!

=> the first Chair is hated

≠> both Chairs are hated

Under ellipsis of the matrix VP, the embedded NRR must be copied, which yields the inference that the addressee's secretary will also say that her Chair didn't pick up the phone. The data are different in (30)b: nothing forces the underlined NRR to be attached with matrix scope, and as a result nothing forces it to appear in the elided clause – which for this reason does not yield the inference that anyone hates the addressee's Chair.

#### □ *Low vs. High NRR in Ellipsis: Subjunctive*

A similar logic is at work with the French subjunctive in (31). In (31)a, the subjunctive NRR must be interpreted in the scope of *want*, and for this reason it appears in the elided clause as well – hence the inference that Marie wants her director's superiors to pressure their minister. In (31)b, by contrast, nothing forces the indicative NRR to be attached under *want*; for this reason, it can be

attached at the matrix level and be ignored by ellipsis resolution – hence the fact that we don't obtain any inference that Mary's director's superiors did or should apply pressure on their minister.

- (31) *Context*: Funds for institutions of higher learning are being cut throughout the country. Academics are launching a campaign to have the policy reversed. Jean and Marie, who work at different universities, are having a conversation.

–Jean: Je voudrais que mon directeur fasse pression sur ses supérieurs,  
*I would-like that my director do-subj pressure on his superiors,*

a. qui fassent ensuite pression sur leur ministre.  
*who do-subj then pressure on their minister.*

b. qui ont déjà fait pression sur leur ministre.  
*who have-ind already done pressure on their minister.*

–Marie: Moi aussi!  
*Me too!*

Inferences in a:

≠> Jean's director's superiors have lobbied their minister.

=> Jean wants his director's superior to lobby their minister

**≠> Marie's director's superiors have lobbied their minister.**

=> Marie wants her director's superiors to lobby their minister.

Inferences in b:

=> Jean's director's superiors have lobbied their minister.

≠> Jean wants his director's superior to lobby their minister

**≠> Marie's director's superiors have lobbied their minister.**

≠> Marie wants her director's superiors to lobby their minister.

The crucial inferences are in bold: in (31)a, the (bound) content of the NRR is understood to be part of Marie's desires; in (31)b, it isn't. This is as predicted: in the former case but not in the latter the NRR is forced by the subjunctive to attach under the attitude verb, and thus to be copied by the process of ellipsis resolution.

### 3.3 *The Possibility of Intermediate Scope*

As we mentioned at the outset, bidimensional theories could be weakened by positing that NRRs need not always be interpreted in the supplementary dimension, and can also be read as part of the assertive component. We now provide an argument against this ambiguity-based theory by showing that a variety of intermediate scope sites are possible for NRRs; the corresponding readings can neither be obtained with a wide scope, Potts-compatible NRR, nor with a narrow scope NRR 'bleached' of its supplementary character.<sup>9</sup> In order to force the relevant readings, we will include an element – a subjunctive in French, or a present tense interpreted with a future meaning in English – to force embedding under a certain operator; at the same time, the truth conditions will guarantee that the NRR still does not have narrow scope.

#### □ *Intermediate scope with the French subjunctive*

Using the French subjunctive to force the NRR to scope under a modal licenser, we can add structure to (8)a to guarantee that the NRR still has scope above another operator. This is achieved in

<sup>9</sup> We believe that another argument against ambiguity-based theories could be constructed. This is because in examples such as (17)b the embedded NRR might be embedded under the attitude verb while still preserving its supplementary character, whereby its content is presented as incidental to the main point of the attitude. Some of the examples discussed in Section 6.3 and in Appendix III make this point, though we leave a systematic investigation for future research.

(32)a, where the underlined subjunctive verb is interpreted in the scope of *conceivable* but outside the scope of *nobody*:

(32) Context: There was an incident at school.

a. ok? Il est **concevable** que **personne** ne se soit [demandé s'il fallait prévenir le directeur], qui en ait été extrêmement choqué.

*It is conceivable that nobody ne SE be-subj asked if it was-necessary to-notify the director, who of-it has-subj been extremely shocked.*

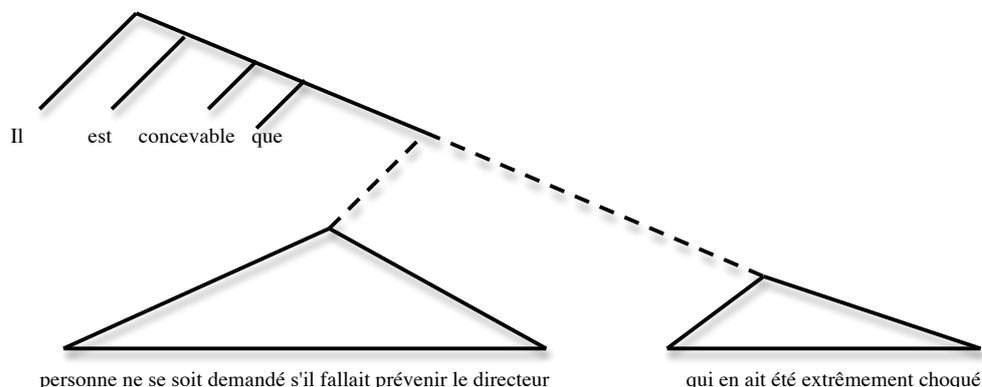
'It's conceivable that nobody wondered whether it was necessary to notify the director, who for this reasons was extremely shocked.'

b. \*Il est **concevable** que **personne** ne se soit [demandé s'il fallait prévenir le directeur] (il en ait été extrêmement choqué).

*It is conceivable that nobody ne SE be-subj asked if it was-necessary to-notify the director (he of-it has-subj been extremely shocked)*

While complex, (32)a is more acceptable than (32)b, and its only plausible reading is that *it is conceivable that (i) nobody wondered whether one should notify the director, and (ii) the director was shocked by this fact*. This is exactly as is expected if the subjunctive NRR attaches above *personne* ('nobody') but below *concevable* ('conceivable'), as shown in (33):

(33) Structure of (32)a



A *wide scope analysis* fails to account for the licensing of the subjunctive, which must be in the scope of the licenser *conceivable*; and it also fails to account for the intuitive truth conditions, which are roughly those of an embedded conjunction ('it is conceivable that the following holds: nobody wondered whether the one should notify the director, and the director was shocked of this fact'). A *narrow scope analysis* is rather implausible from the get-go: the NRR would have to be interpreted within the scope of the attitude verb; it would have a different mood from the one it selects, since *fallait* is in the indicative; and the resolution of the propositional pronoun *en* (= of-it) would be hard to analyze, since it refers to the proposition that *nobody wondered whether one should notify the director*.

Two remarks can be made to rule out some alternative analyses.

–One could posit that the NRR in (32)a is attached as a sister to *the director* on the surface, but is covertly moved to a site above *nobody* and below *conceivable*. But this option is not particularly plausible because it requires movement of the NRR out of a syntactic island, created by the *wh*-complement of *wonder* – a configuration that otherwise blocks movement, as is illustrated in (34)b:

(34) a. Qui est-ce que Jean a pensé qu'il fallait prévenir?

*Who is it that Jean has thought that it was-necessary to-notify?*

'Who did Jean think one had to notify?'

b. \*Qui est-ce que Jean s'est demandé s'il fallait prévenir?

*Who is it that Jean SE is wondered if it was-necessary to-notify?*

–Alternatively, one could try to achieve the desired interpretation *in situ*, by indexing the world argument of the predicate of the NRR to the modal *conceivable* rather than to the attitude verb

wonder. This would give rise to an analysis whose simplified form is given in (35), where  $w^*$  is a free variable denoting the actual world:

(35) conceivable<sub>w\*</sub>  $\lambda w$  nobody wondered<sub>w</sub> whether  $\lambda w'$  necessary<sub>w</sub>  $\lambda w''$  [someone notify<sub>w'</sub> [the director] [who be-shocked<sub>w''</sub>]]

On this analysis, the NRR is in fact interpreted in the scope of *wonder*, but it is not indexed to it; technically, *be-shocked*<sub>w</sub> takes a world argument  $w$  bound by (a  $\lambda$ -operator introduced by) the modal *conceivable*. With the assumption that NRRs contribute a conjunctive meaning (or something close to it), we *still* get an undesirable result, as can be seen by considering the schematic representation in (36):

(36) conceivable<sub>w\*</sub>  $\lambda w$  nobody wondered<sub>w</sub> whether  $\lambda w'$  necessary<sub>w</sub>  $\lambda w''$  p<sub>w'</sub> & q<sub>w''</sub>

To make (36) true, it is enough to find a world  $w$  in which the proposition  $q$  is false – for in such a world, the underlined clause denotes a proposition which is false in *every* possible world; and certainly nobody wonders whether a contradiction is necessarily true! In other words, this analysis wrongly predicts that (32)a should be true as soon as there is a conceivable situation in which the directly was *not* shocked – which is definitely not the intended reading.

#### □ Intermediate scope with the English present tense under *if*

The same logic is applied to (37)a:

–the underlined pluperfect NRR is interpreted with a non-realis meaning, which requires embedding under *if* (this interpretation fails with a clausal parenthetical, as in (37)b);

–still, the meaning forces the NRR to scope above *each of the faculty*: the condition is that [each of the faculty mentions the fact that he doesn't like the Chair] *and* the latter gets fired as a result of this unanimous opinion; attachment under *each of the faculty* yields implausible readings on which for each faculty  $f$ , the Chair could be fired on the strength of  $f$ 's particular opinion.

(37) *Context*: there is discontent with the current Chair, but many people didn't say anything to the Dean for fear that he would take excessive action. I justify this course of action:

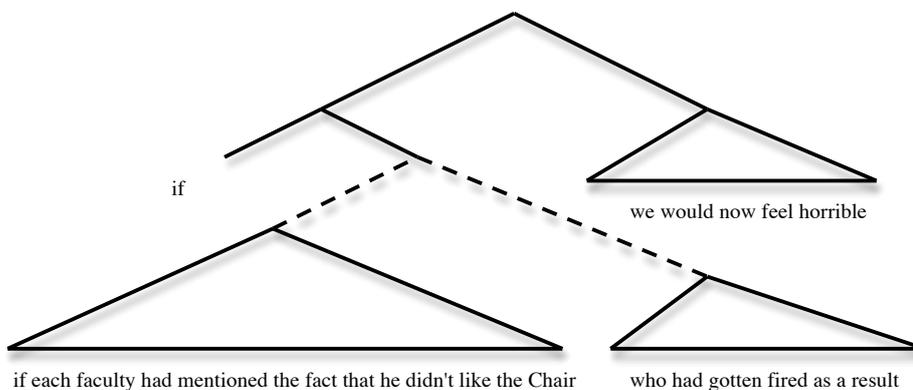
a. ok? If [each of the faculty had mentioned the fact that he didn't like the Chair], who had gotten fired as a result, we would now feel terrible.

≠> If each of the faculty had mentioned the fact that he didn't like the Chair, the Chair would have gotten fired.

b. If [each of the faculty had mentioned the fact that he didn't like the Chair] (he #had gotten fired / ok would have gotten fired as a result), we would now feel terrible

The correct results are predicted if the NRR is attached with intermediate scope, as shown in (38).

(38)



We conclude that NRRs can be attached with narrow, wide and intermediate scope. Given the evidence we have, it would appear that they can in principle attach to any propositional node that dominates the position of their antecedent DP (in Section 4.2.1, we will see that the node in question should dominate the LF position of the DP).

## Part II. Core Theory

We now develop in greater detail our positive theory: it involves an enriched syntax in which NRRs can in principle be attached to any propositional node that dominates the (LF position of the) DP they are dependent on; a 'bare bones' semantics in which NRRs have a conjunctive semantics; and an enriched pragmatics in which, in essence, the content of NRRs should be non-trivial but easy to accommodate. Consequences of the proposal will be discussed in Part III, and various refinements will be sketched in Part IV.

### 4 Basic Theory I: Syntax and Semantics

#### 4.1 *Basic Syntax*

Following McCawley 1988, we posit that an NRR can be merged within a clause, i.e. a fully saturated constituent of propositional type, which we label *IP*, as shown in (39). Since we allow an NRR to be attached at a variety of propositional sites, we encode the point of attachment by subscripting the NRR with the name of the IP node it attaches to (e.g. *IP1*, *IP2*, *IP3*; in the general case: *IP<sub>i</sub>*).<sup>10</sup>

#### (39) **External Syntax of NRRs**

$$[_{IP_i \dots} DP \dots] \rightarrow [_{IP_i \dots} DP NRR_{IP_i} \dots]$$

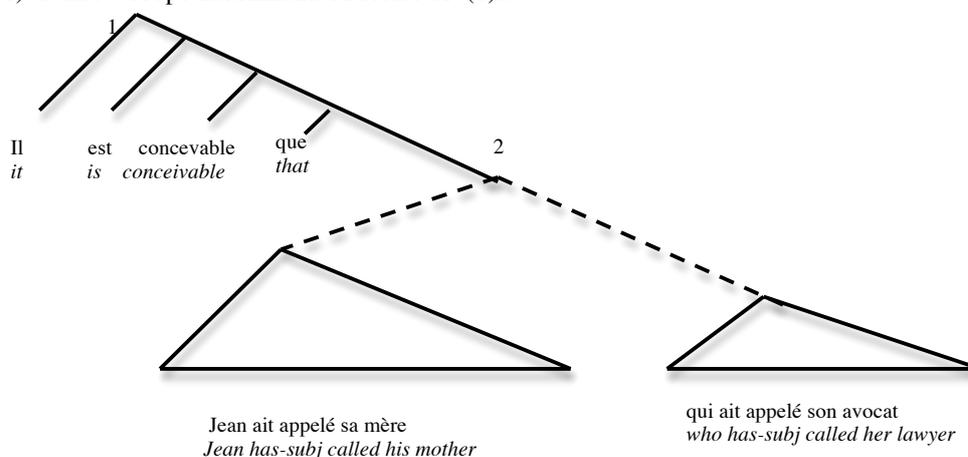
Here we take the noun phrase ('DP') which is affected by the NRR to be one that contains an index of its own – a point that will matter when we set up the semantics. We further assume that NRRs are relative clauses (and thus 'CPs') of a distinguished type – which is motivated by the observation that (a) the distribution of non-restrictive relative pronouns isn't exactly that of restrictive relative pronouns (e.g. French *lequel* can be a non-restrictive but not a restrictive relative pronoun when in subject position); and that (b) they have a special phonological realization, with a pause at the beginning, for instance. For the rest, we will just need to assume, along standard lines (e.g. Heim and Kratzer 1998), that relative clauses start with a *wh*-pronoun (written as *wh*) which introduces an abstraction index (*k*), as is shown in (40):

#### (40) **Internal Syntax of NRRs**

$$NRR \rightarrow [_{NRR} wh_k IP_k], \text{ where } IP \text{ is an IP with a trace with index } k$$

With these tools in hand, we can represent the attachment ambiguities found with NRRs. In (41), we provide the representation of example (8)a, which included a subjunctive NRR licensed by the modal *conceivable*:

(41) Narrow scope attachment: structure of (8)a

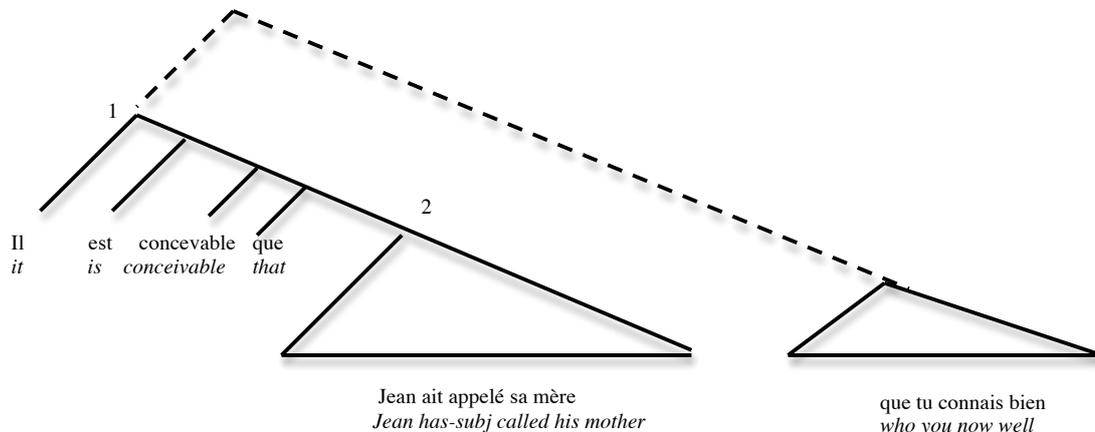


'It is conceivable that Jean called his mother, and that she (lit. who) called her lawyer.'

<sup>10</sup> This information is fully recoverable from a derivation tree. We encode it by way of subscripts because we wish to use bracket-based representation of derivation trees.

In this case, rule (39) is applied to the lower IP. With an indicative NRR, we can obtain high attachment by applying rule (39) to the matrix IP, as shown in (42).

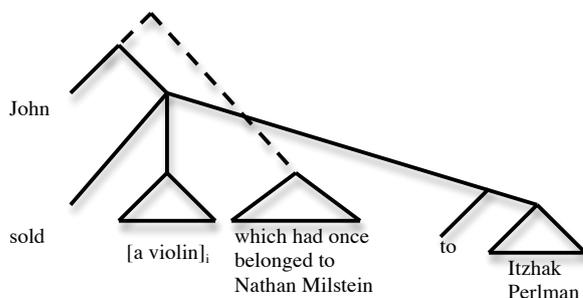
(42) Variant of (8)a with high attachment and an indicative NRR



'It is conceivable that Jean called his mother, who you know well.'

In (42), no discontinuous constituent appears because the NRR is attached at the end of the sentence. In McCawley's sentence quoted in (24), by contrast, a discontinuous constituent does arise: rule (39) is applied to the IP *John sold [a violin]<sub>i</sub> to Itzhak Perlman*, and it inserts the NRR within the constituent VP, next to the DP *[a violin]<sub>i</sub>* (which we take to carry an index *i*).

(43)



We noted in our discussion of embedding under *will* (in Section 2.4.2) that a present tense NRR can be licensed by a future tense, but only if the latter is present in a superordinate clause – which suggests that attachment within a given clause is in a position higher than tense. This is exactly what is encoded by rule (39), since an NRR attaches to a full IP, which includes tense projections within it.

Throughout our discussions, we noted that NRRs differ from parentheticals in that the latter *always* attach at the matrix level. As a first approximation, we can posit a rule which, like (39), allows parentheticals to be merged within fully-formed constituents.

(44) **Syntax of Clausal Parentheticals**

We write  $IP^*i$  for a root IP with index *i*, and  $(IP)$  for a clausal parenthetical.

$[IP^*i \dots \dots] \rightarrow [IP^*i \dots [IP^*k(IP)] \dots]$

Since the left-hand side of the rewrite rule must be a root IP, clausal parentheticals that are attached to embedded constituents are prohibited by this analysis. On the other hand, since the inserted

parenthetical itself counts as a root IP, recursive embedding of clausal parentheticals is in principle allowed.<sup>11</sup>

## 4.2 Basic Semantics

### 4.2.1 NRRs

#### □ 'Official' analysis

The syntactic rule in (39), repeated as (45)a, will be interpreted with the semantic rule in (45)b; it serves a dual role: first, it provides a conjunctive semantics for the NRR; second, it ensures (on pain of a presupposition failure) that the *wh*-relativizer has an antecedent that is linearly adjacent to it.

#### (45) NRRs

##### a. Syntax of NRRs

$[_{IP_i \dots} DP \dots] \rightarrow [_{IP_i \dots} DP NRR_{IP_i} \dots]$

where node  $IP_i$  dominate the LF position of  $DP$ .

##### b. Semantics of NRRs

Let  $s$  be assignment function ( $\#$  represents presupposition failure).

(i)  $\llbracket [_{IP_i \dots} DP NRR_{IP_i} \dots] \rrbracket^s = \#$  unless for some  $DP$   $d$  and some index  $k$ ,  $DP = d_k$ .

If  $\neq \#$ ,  $\llbracket [_{IP_i \dots} DP NRR_{IP_i} \dots] \rrbracket^s = \llbracket [_{IP_i \dots} DP \dots] \rrbracket^s \bullet \llbracket [NRR_{IP_i}] \rrbracket^s(s(i))$

where  $\bullet$  is the operation by parataxis in discourse is evaluated.<sup>12</sup> As a first approximation,

$\llbracket [_{IP_i \dots} DP \dots] \rrbracket^s \bullet \llbracket [NRR_{IP_i}] \rrbracket^s(s(i)) = 1$  iff  $\llbracket [_{IP_i \dots} DP \dots] \rrbracket^s = 1$  and  $\llbracket [NRR_{IP_i}] \rrbracket^s(s(i)) = 1$ .

For completeness, we add:

(ii)  $\llbracket [NRR_{IP_i}] \rrbracket^s = \llbracket [NRR] \rrbracket^s$

(iii) Let  $IP_k$  be an IP with a trace with index  $k$ .

$\llbracket [_{NRR} wh_k IP_k] \rrbracket^s = \lambda x. \llbracket [IP] \rrbracket^{s[k \rightarrow x]}$

Let us discuss the various ingredients in turn.

–As can be seen, we posit a presupposition failure in case the  $DP$  which the NRR appears next to fails to carry an index; and when no failure arises, the denotation of this index plays a role in the semantic rule we posited. This requires a departure from strong compositionality: since the sister of  $CP_{NRR}$  is the discontinuous constituent  $[_{IP_i \dots} DP \dots]$ , strong compositionality would lead one to expect that the meaning of  $[_{IP_i \dots} DP NRR_{IP_i} \dots]$  is a function of the meaning of  $NRR_{IP_i}$  and the meaning of  $[_{IP_i \dots} DP \dots]$ . This is not so, since we need to have access to the value of the index carried by  $DP$ .

<sup>11</sup> One can find naturalistic examples, as in (i), although they do occasionally raise suspicions, as suggested by (ii) [unrelated context].

(i) "Okay, so Boston. Why did I go to Boston? I was invited to attend the tail end of the American Association of Museums conference, help host a workshop (**read: be tech support in case anything bad went wrong (and it did (what's up with the nested parentheticals?!)) but I fixed it) or to answer stupid questions**), and meet with folks from the museum world (...)." [From <http://philosophicalmusings.com/2006/05/18/>, accessed on 01/29/2013]

(ii) "Are you sure you're not a coder? Your nested parentheticals say otherwise..." [From <http://hcs64.com/mboard/forum.php?showthread=48&showpage=3>, accessed on 01/29/2013]

<sup>12</sup> It is only typographically that  $\bullet$  is reminiscent of Potts's operation to interpret NRRs: the operation we use doesn't involve bidimensional semantics.

There are alternatives to this analysis, discussed below;<sup>13</sup> but this one has the advantage of summarizing in one definition the requirement that the relative pronoun should have an adjacent antecedent, as well as further constraints on the ordering of NRRs (to be discussed in Section 7). (Note that non-restrictive relative clauses can sometimes be subject to an extraposition rule; the adjacency requirement must be checked before the application of this rule, though this point ought to be investigated in future research)<sup>14</sup>

–One initial advantage of this analysis is that it makes it possible to give to NRRs the same denotation as to restrictive relative clauses: in both cases, we can take the *wh*-pronoun to trigger a process of abstraction, as is standardly assumed (e.g. Heim and Kratzer 1998). What is non-standard, on the other hand, is the fact that the resulting  $\lambda$ -abstract takes as argument the denotation of the index of the modified DP.

–When the NRR modifies a proper name, this mechanism has the same effect as 'feeding' the value of the proper name to the relative clause. Specifically, a simple sentence such as (46)a receives the semantic analysis in (46)b:

- (46) a. John, who smokes, is sick.  
 a'.  $\text{John}_i, \text{who}_k t_k \text{ smokes, is-sick.}$   
 b.  $\llbracket (a') \rrbracket^s \neq \#$  since *John* carries an index *i*. Furthermore,  $\llbracket (a) \rrbracket^s = \llbracket \text{John}_i \text{ is-sick} \rrbracket^s \bullet \llbracket \text{who}_k t_k \text{ smokes} \rrbracket^s(s(i))$

For this analysis to be feasible, we must assume that proper names can carry referential indices; a standard procedure is to posit a presupposition that the index they carry does in fact denote the value of the proper name:

- (47) Proper names  
 If *p* is a proper name carrying an index *i*,  
 $\llbracket p_i \rrbracket^s = \#$  unless  $s(i) = \llbracket p \rrbracket^s$ . If  $\neq \#$ ,  $\llbracket p_i \rrbracket^s = \llbracket p \rrbracket^s = s(i)$

With the rule in (47), we can complete the derivation of (46)b (we write as *john'* the denotation of *John*, and similarly for other expressions):

- (48)  $\llbracket (46)a \rrbracket^s = \llbracket \text{John}_i \text{ is-sick} \rrbracket^s \bullet \llbracket \text{who}_k t_k \text{ smokes} \rrbracket^s(s(i)) = \llbracket \text{John}_i \text{ is-sick} \rrbracket^s \bullet \llbracket \text{who}_k t_k \text{ smokes} \rrbracket^s(\text{john}')$   
 $= \text{is-sick}'(\text{john}') \bullet [\lambda x. \text{smoke}'(x)](\text{john}')$   
 $= \text{is-sick}'(\text{john}') \bullet \text{smoke}'(\text{john}')$

–When it comes to quantificational expressions, it is well established that in NRRs relative pronouns can have the readings of 'donkey' pronouns (Del Gobbo 2003). In order to capture this fact in the present framework, we make the assumption, common in dynamic semantics, that generalized

<sup>13</sup> While keeping the spirit of (45)b, one could develop a strictly compositional analysis within a syntax with multidominance, namely one in which an NRR has two simultaneous attachment points, at a propositional node (as assumed here), and as a sister of the antecedent DP. We leave this alternative for future research.

<sup>14</sup> Cinque 2008 notes that "*che/cui*-nonrestrictives (and restrictives) (...) must be adjacent to the Head"... although there are exceptions as in (i); while "*il quale*-nonrestrictives can be separated from it within the sentence (...) or across discourse", as in (ii).

(i) a. Se hanno portato Carletto al mare, che comunque non c'era mai stato, una ragione c'è.  
*If they took C. to the seaside, who in any case had never been there, there is a motive.*

b. Ho incontrato il dott. Setti ieri, che mi ha detto che non potrà intervenire.  
*I met dr. S. yesterday, who told me that he will not be able to come.* (Cinque 2008 fn. 8)

(ii) a. Da quando i russi se ne sono andati, i quali non si erano mai veramente integrati con la popolazione, la pace è finita.

*Since the Russians left, who had never really mixed with the population, there is no more peace.* (Cinque 2008 p. 103)

b. Ha difeso la sua tesi quasi contro tutti. La quale sosteneva la necessità del non intervento.  
*He defended his thesis against almost everyone. Which asserted the need of non intervention.* (Cinque 2008 p. 104)

quantifiers carry indices that denote the 'maximal set' that satisfies both the restrictor and the nuclear scope. We will not be concerned here with how this is achieved (see for instance Nouwen 2003 for a recent presentation); for present purposes, we can assume that the assignment function under which the sentence is evaluated guarantees that the index carried by the DP denotes a plurality that denotes the intersection of the restrictor set and the nuclear scope set.

(49) Assumption (to be derived from a proper semantic analysis)

In a clause  $[D NP]_i VP$  evaluated under an assignment function  $s$ ,  $s(i)$  = the mereological intersection of the objects that satisfy  $\llbracket NP \rrbracket^s$  and the objects that satisfy  $\llbracket VP \rrbracket^s$ .

With this assumption, we can provide a derivation of the truth conditions of a sentence such as (50)a, where the DP is quantificational.

(50) a.  $[A \text{ few students}]_i$ , who were rich, did without loans.

a'.  $[a\text{-few students}]_i$ , who<sub>k</sub> t<sub>k</sub> were-rich, did-without-loans.

b.  $\llbracket (a') \rrbracket^s \neq \#$  since  $[a \text{ few students}]$  carries an index. Furthermore,

$\llbracket (a') \rrbracket^s = \llbracket [a\text{-few-students}]_i \text{ did-without-loans} \rrbracket^s \bullet \llbracket [\text{who}_k t_k \text{ were-rich}] \rrbracket^s(s(i))$

=  $a\text{-few}'(\text{students}')(\text{did-without-loans}') \bullet [\lambda x \text{ were-rich}'(x)](S \wedge D)$ , with  $s(i) = S \wedge D$  = the students who did without loans

=  $\text{few}'(\text{students}')(\text{did-without-loans}') \bullet \text{are-rich}'(S \wedge D)$

Importantly, the conjunct contributed by the NRR – here:  $\text{are-rich}'(S \wedge D)$  – gets an 'exhaustive' reading, in the sense that its content is that *all students who did without loans were rich*. This is as is desired: the final result is analogous to the sentence in (51), where *they* is a 'donkey' pronoun referring to the students who don't need loans.

(51) a. A few students did without loans. They were rich.

b.  $[\text{Few students}]_i$  did-without-loans. They<sub>i</sub> were-rich.

–Our analysis in (45)a stipulates that an NRR must be attached to a node that dominates the LF position of its antecedent DP. This provision is intended to explain why examples such as (50)a do not allow for a reading on which the NRR is attached to the *trace* of the quantifier, as in (52)a; this would incorrectly allow the NRR to be attached to the lower IP (as indicated in the boxed part index), and thus to restrict the nuclear scope of the quantifier, which doesn't seem possible. Instead, the NRR must be attached to a node that dominates the LF position of the antecedent quantifier, and hence to the matrix IP, as in (52)b (where we have assumed that the NRR is linearly adjacent to *few students*).<sup>15</sup>

(52) a.  $[\text{IP}_1[\text{few students}]] \lambda i [\text{IP}_2 t_i [ , \text{who were rich} ]_{\text{IP}_2} ] \text{, did without loans} ] ]$

b.  $[\text{IP}_1[\text{few students}]] [ , \text{who were rich} ]_{\text{IP}_1} \lambda i [\text{IP}_2 t_i , \text{, did without loans} ] ]$

This analysis is useful to explain why NRRs cannot be interpreted in the immediate scope of *no*, as in (53)b. The kind of low attachment illustrated in (52)a is blocked by the condition that the NRR be attached to a node that dominates the LF position of the DP antecedent. High attachment yields a reading on which the NRR denotes a property that needs to take an argument provided by the antecedent DP. Depending on one's theory of *no*, either *no student* introduces no discourse referent at all, or it introduces one whose value is asserted to be empty. Either way, it is plausible that (53)b fails for the very same reason that makes (53)b' deviant.<sup>16</sup>

<sup>15</sup> We use the labels *IP1* and *IP2* in the Logical Forms in (52) to refer to propositional nodes, without an implication that these are IPs (= Inflection Phrases) in the syntactician's technical sense. What matters for us is solely the *logical type* of the relevant constituents.

<sup>16</sup> Note that this analysis is neutral about further types of attachment under negative operators, as exemplified in (i)b:

(i) *Context*: There was incident at school.

a.  $[\text{IP}_1 \text{Il est possible que } [\text{IP}_2 \text{Jean ait appelé sa mère, qui ait appelé son avocat} ] ]$ .

*It's possible that Jean has-sub called his mother, who has-subj called her lawyer.*

b.  $\langle ?? \rangle [\text{IP}_1 \text{Il est impossible que } [\text{IP}_2 \text{Jean ait appelé sa mère, qui ait appelé son avocat} ] ]$ .

*It's impossible that Jean has-sub called his mother, who has-subj called her lawyer.*

- (53) a.  $\langle \rangle$ Few students, who didn't work enough, flunked the exam.  
 b.  $\langle \# \rangle$ No student(s), who didn't work enough, flunked the exam.  
 a'.  $\langle \rangle$ Few students flunked the exam. They didn't work enough.  
 b.  $\langle \# \rangle$ No student(s) flunked the exam. They/He didn't work enough.

□ *Alternative*

It must be granted that the presuppositional component of the rule in (45)b(i) is idiosyncratic; one of its virtues will become clearer when we discuss ordering restrictions on NRRs. An alternative would be to endow the *wh*-pronoun with a referential index of its own (call it *i*) so as to forego the non-standard presupposition we had to posit in (45)b(i). But we also need to keep our earlier assumption that the *wh*-pronoun introduces an *abstraction* index – call it *k*. Both indices appear in the syntax in (54)b and semantics in (55)a, where *k* is interpreted as a  $\lambda$ -operator binding index *k*, as in Heim and Kratzer 1998; and unlike in our 'official' treatment, *wh<sub>i</sub>* is just interpreted as pronoun denoting *s(i)*, as stated in (55)b.

(54) **Internal Syntax of NRRs**

- a. Official: NRR  $\rightarrow$   $[_{NRR} wh_k IP_k]$ , where IP is an IP with a trace with index *k*.  
 b. Alternative: NRR  $\rightarrow$   $[_{NRR} wh_i k IP_k]$ , where  $IP_k$  is an IP with a trace with index *k* and *i* is a referential index.

(55) **Alternative semantics**

- a.  $\llbracket k IP_k \rrbracket^s = \lambda x. \llbracket IP_k \rrbracket^{s[k..x]}$   
 b.  $\llbracket wh_i \rrbracket^s = s(i)$

While this analysis initially appears simpler than the one we adopted, it must be constrained so as to guarantee that the index *i* denotes whatever the DP modified by the NRR refers to; by contrast, this property is a design feature of our 'official' account, since the NRR directly recovers the appropriate index from the DP it sits next to on the surface.

#### 4.2.2 Clausal Parentheticals

It is straightforward to extend our analysis to clausal parentheticals: they behave like NRRs, with two provisos: (i) they may only be attached to root IPs; (ii) they have a standard propositional semantics, and thus they do not have to 'steal' the referential index of the element that's left-adjacent to them.

(56) **Parentheticals**

- a. Syntax of Clausal Parentheticals  
 We write  $IP^*i$  for a root IP with index *i*, and (*IP*) for a clausal parenthetical.  
 $[_{IP^*i} \dots ] \rightarrow [_{IP^*i} \dots [_{IP^*k} (IP)] \dots ]$

In the negative (i)b as in the positive (i)a, the underlined NRR can attach to the lower *IP*<sub>2</sub> (boxed) as well as to the matrix node *IP*<sub>1</sub>, since both dominate the LF position of the DP antecedent *his mother*. Furthermore, the subjunctive in the underlined NRR forces the low attachment.

To my ear, the negative example in (i)b is less felicitous than the positive one in (ia), but I do not have systematic data on this point. One possibility is that for NRRs embedded in negative environments there is a clash between the effects of supplement projection (roughly, the content of the NRR should be close to trivial in its local context) and an implicature of manner. Schematically, *impossible* [*IP*^NRR] triggers an implicature that *it's not impossible that IP*, for reasons discussed in fn. 18. If the content of the NRR is trivial in its local context, we should have something like:  $IP \Rightarrow NRR$ . But under the latter assumption, it is hard to see how it can both be the case that *impossible* [*IP*^NRR] but *not impossible IP*. A similar point is raised in fn. 18 in connection to *if*-clauses (and some acceptable cases of NRRs attached under a negative operator are discussed in Appendix III). We leave this issue for future research.

## b. Semantics of Clausal Parentheticals

Let  $s$  be an assignment function.

(i)  $\llbracket \llbracket_{IP^*i} \dots \llbracket_{IP^*k}(IP) \dots \rrbracket \rrbracket^s = \llbracket \llbracket_{IP^*i} \dots \rrbracket \rrbracket^s \bullet \llbracket \llbracket_{IP^*k}(IP) \rrbracket \rrbracket^s$ , where  $\bullet$  is the operation by parataxis in discourse is evaluated.

(ii)  $\llbracket \llbracket_{IP^*k}(IP) \rrbracket \rrbracket^s = \llbracket IP \rrbracket^s$

## 5 Basic Theory II: Pragmatics

At this point, our theory is incomplete: even in case an NRR is attached with wide scope, the simple-minded semantics we posited does not do justice to the complexity of the data that the bidimensional analysis sought to derive. We list some of these properties and add a pragmatic module to our theory in order to derive it.

### 5.1 Main Properties

An adequate theory of NRRs should derive at least four properties: (i) their contribution is not at issue (Potts 2005), (ii) it is generally non-trivial (Potts 2005), (iii) it should also be relatively uncontroversial, and (iv) it gives rise to non-trivial patterns of 'supplement projection'.

#### 5.1.1 The contribution of an NRR is not at issue (Potts 2005)

Potts 2005 shows that the contribution of an NRR is 'not at issue', in the sense that it cannot easily be targeted by a negation in discourse. In this respect, supplements behave like presuppositions and unlike mere conjuncts, as shown in (57).

- (57) a. Mary knows that Lance is a cancer survivor. –No!  
 => Lance is a cancer survivor.  
 b. Lance, who is a cancer survivor, won the Tour de France. –No!  
 => Lance is a cancer survivor.  
 c. Lance is a cancer survivor and won the Tour de France. –No!  
 ≠> Lance is a cancer survivor.

(This observation is refined by Koev 2012, who suggests that it only holds for non-clause-final NRRs; we come back to this point in Section 8.2.)

#### 5.1.2 The contribution of an NRR is non-trivial (Potts 2005)

Potts 2005 argues that the content of NRRs must be non-trivial, unlike the content of presuppositions. The contrast in (58), which can be replicated in French, establishes this point.

- (58) a. Armstrong survived cancer. #Lance, who is a cancer survivor, won the Tour de France. (after Potts 2005)  
 b. Armstrong survived cancer. Mary knows he did. (after Potts 2005)

#### 5.1.3 The contribution of an NRR is non-controversial

Still, not any content can appear in an NRR. Given appropriate (and unlikely!) circumstances, (59)a would be a natural thing to say: that Obama is the commander in chief follows from the fact that he is the President, so the content of the NRR is not controversial; by contrast the information that he murdered his wife would be quite surprising. (59)b distributes the information in the opposite way, and is correspondingly odd – unless the news is already out that Obama murdered his wife, in which case the sentence becomes fine again.

- (59) *Context:* The news isn't out yet that Obama has committed a crime.  
 One expects the Commander-in-chief to have an exemplary behavior. However  
 a. Obama, who is the Commander-in-chief, has just murdered his wife.  
 b. (#) Obama, who has just murdered his wife, is the commander in Commander-in-chief.

#### 5.1.4 NRRs give rise to non-trivial patterns of 'supplement projection'

In (60)b, the content of the supplement appears seen to 'project out' of the scope of a question:

- (60) a. Obama, who is to be indicted, is about to resign.  
 => Obama is to be indicted  
 b. Is it true that Obama, who is to be indicted, is about to resign?  
 => Obama is to be indicted  
 c. Is it true that Obama is to be indicted and is about to resign?  
 ≠> Obama is to be indicted

There are two ways to account for this observation. The first possibility is that the NRR is attached with matrix scope – which makes it unsurprising that the content of the NRR escapes the scope of the question operator or the word *if*. The second possibility is that we are dealing with a semantic/pragmatic pattern of projection pattern, possibly reminiscent of presupposition projection. If all attachment possibilities were equally available, we could argue that the sole fact that (60)b yields a quasi-obligatory inference is evidence for the existence of a projection mechanism (without one, the narrow scope reading should be available, and it wouldn't yield the observed inference). But since matrix attachment is usual the preferred option, these data are not conclusive.

We can provide evidence of projection by blocking the possibility of matrix attachment. The data turn out to be subtle, for reasons we'll get to shortly. But an example will clarify the logic of the argument:

- (61) *Context*: DSK will stand in a civil trial next week.

Next Tuesday it will definitely not turn out that DSK's lawyers

- a. , who bungled his plea bargain the day before,  
 => Next Monday there will be a plea bargain and DSK's lawyers will bungle it  
 b. ? (they bungled his plea bargain the day before)  
 c. bungled his plea bargain the day before and  
 ≠> Next Monday there will be a plea bargain and DSK's lawyers will bungle it

are dropping their fees.

In (61)a, the underlined past tense is evaluated relative to the matrix future tense, which shows that the NRR must be read as embedded. (61)b is deviant because parentheticals do not such a possibility, and this creates a clash between the past tense, which forces the underlined verb to refer to an event in the speaker's past, and the anaphoric expression *the day before*, which forces the same event to occur on the Monday following the speech time. Importantly, although the NRR in (61)a is in the scope of negation and must be read as embedded, it gives rise to an inference that on that Monday DSK's lawyers will bungle his plea bargain. Unsurprisingly, such an inference fails when the NRR is replaced with a garden-variety conjunct, as in (61)c.

Projection out of questions and out of the scope of negation is of course reminiscent of the behavior of presuppositions, as illustrated in (62).

- (62) a. Does John know that he can apply for this job?  
 => John can apply for this job  
 b. John doesn't know that he can apply for this job.  
 => John can apply for this job

Sometimes the similarities between supplement projection and presupposition projection are more subtle and more striking. To take an extreme example, it was observed in the literature on presuppositions that sometimes presuppositions give rise to complex conditional inferences whereby part of an antecedent is taken into account while another part is disregarded, as in (63). (We will not be concerned with the *explanation* of this phenomenon, which intuitively has to do with the fact that irrelevant conditions are somehow ignored in the computation of presupposition projection; see for instance Schlenker 2011a,b and Lassiter 2012 for recent discussion.)

(63) If John is 64 years old and he knows our hiring practices, he is aware that he {can | cannot} apply for this job.

≠> John {can | cannot} apply for this job.

=> If John is 64 years old, he {can | cannot} apply for this job. (Schlenker 2011b)

We believe that similar facts can be found with supplements, as is shown in (64), where (i) the supplement triggers an inference despite the fact that it is in the scope of a question, (ii) this inference is conditional in nature, but (iii) it seems to 'ignore' one part of the *if*-clause (= DSK being potentially broke) while taking into account another (= DSK being found guilty next week).

(64) *Context*: DSK will stand in a civil trial next week.

? If DSK turns out to be broke and is found guilty next week, will it turn out that his lawyers, who are responsible for his condemnation, are willing to give up their fees?

≠> DSK was condemned and his lawyers are responsible for the fact the was found guilty

=> if DSK is found guilty next week, his lawyers will be responsible the fact that he was found guilty

We take these similarities to argue for a treatment in which embedded NRRs trigger inferences that share some of the properties of presuppositions. Of course the non-triviality condition on NRRs suggests that they cannot be fully assimilated to presupposition triggers, hence a more sophisticated theory must be developed (we will study projection patterns in greater detail when we investigate consequences of the proposed theory in Section 6.3).

## 5.2 Proposal: Translucency

According to dynamic semantics (e.g. Heim 1983), a sentence *S* is felicitous in a context set *C*, its presuppositions are what we can call 'transparent', in the sense that they are entailed by their local contexts – they are thus locally trivial (i.e. their contribution can be disregarded without affecting the truth conditions).<sup>17</sup> As was mentioned above, supplements should *not* be locally trivial. But we will suggest that they should be 'translucent', in the sense that there should be a 'close enough' context in which they are transparent. More specifically, the requirement for an NRR uttered in a global context set *C* is that one could add some unsurprising assumptions to *C* to obtain a context set *C*<sup>+</sup> in which the NRR *is* locally trivial. This idea is stated in a preliminary fashion in (65) (we will sketch a more principled treatment as well as some refinements in Section 9).

(65) Translucency (initial formulation)

If an NRR is uttered in a global context set *C*,

a. the content of NRR should not be locally trivial given *C*, but

b. it should be possible to add to *C* unsurprising assumptions to obtain a context *C*<sup>+</sup> in which the NRR is 'locally trivial', i.e. entailed by its local context given *C*<sup>+</sup>.

Let us see how Translucency can explain the main pragmatic properties of NRRs.

(i) It immediately follows from part (a) of Translucency that the content of an unembedded NRR should be non-trivial.

(ii) If *C*<sup>+</sup> can only be obtained from *C* by adding relatively uncontroversial assumptions to it, we also get a handle on the contrast between (59)a and (59)b above. To determine whether Translucency is satisfied by (59)a in *C*, we ask whether we can find a strengthening *C*<sup>+</sup> of *C* in which the content of the NRR, namely that Obama is the commander in chief, is trivial in its local context. Now the NRR is attached at the matrix level, and furthermore it appears linearly before (most of) the main clause. So it is safe to assume that its local context is just the global context. Therefore, we need only ask whether we can find a strengthening of *C*<sup>+</sup> from which it follows that Obama is the

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<sup>17</sup> One can attempt to develop a theory of presupposition projection on the basis of the sole assumption that the context should be such as to guarantee that a presupposition is 'transparent'. See for instance Schlenker 2008, 2009 for two versions of such an attempt. The present analysis is consistent with this analysis ('translucency' and 'transparency' are closely related notions), but it is independent from it, which is why we use the more standard terminology of dynamic semantics to introduce our proposal.

commander in chief. This is clearly the case if Obama is the President. By contrast, in (59)b a non-trivial assumption must be added to C to obtain a C<sup>+</sup> which entails that Obama murdered his wife.

(iii) Translucency immediately predicts that embedded NRRs should give rise to the same *kinds* of projection patterns as presupposition triggers. However two provisos must be borne in mind.

–Due to their non-standard syntax, NRRs can attach much higher than their surface position. Hence the more precise prediction is that NRRs should give rise to the same patterns of projection as presupposition triggers *which appear in the position in which the NRR is attached*.

–In addition, we predict *very weak inferences in such cases*: Translucency only predicts that the NRR should be transparent relative to the strengthened context C<sup>+</sup>, which on its own does not even imply that the speaker's belief state entails C<sup>+</sup> (though this is a possibility). In this respect, the inference we observed in (60)b is a bit stronger than what the theory licenses (though the theory doesn't preclude the possibility that such inferences are strengthened – a fact pervasive in presupposition theory). In other cases, the effects of the inference are hard to detect, as was the case in (11)a, repeated as (66).

(66) If tomorrow I call the Chair, who in turn calls the Dean, then we will be in deep trouble.  
 ≠> If I call the Chair, he will call the Dean

Presuppositional sentences of the form *if p and qq', r* (with a presupposition *q* triggered in the second conjunction the *if*-clause) are predicted by standard theories of presupposition projection to yield an inference that *if p, q* (e.g. Heim 1983). But it is clear that in (66) we do not get this inference: in the case at hand, this would imply that C entails that *if I call the Chair, he will call the Dean*. But the theory only predicts that this inference should hold with respect to C<sup>+</sup>, not C; this presumably accounts for the fact that a conditional inference isn't detected in this case (in Section 6.4, we will argue that *even* in such cases the presence of a weak inference can be detected by considering the licensing conditions on Negative Polarity Items (NPIs)). Future research will have to determine why some cases, such as (60)b, lead to relatively strong inferences, while others, such as (66), lead to imperceptible ones. In the present framework, we have no choice but to start from weak modal inferences, and argue that under some ill-understood conditions they get strengthened into non-modal ones.<sup>18</sup>

(iv) Finally, we must account for the fact that some supplements, like presuppositions, are not at issue, as was shown in (57), repeated as (67):

(67) a. Mary knows that Lance is a cancer survivor. –No!  
 => Lance is a cancer survivor.  
 b. Lance, who is a cancer survivor, won the Tour de France. –No!  
 => Lance is a cancer survivor.  
 c. Lance is a cancer survivor and won the Tour de France. –No!  
 ≠> Lance is a cancer survivor.

In the case of presuppositions, this property is not hard to derive. Take (67)a. If the presupposition that Lance is a cancer survivor is entailed by the common ground, then it is part of the shared assumptions of the conversation, and thus what is denied by *No!* couldn't be something that the addressee believes. If the presupposition is not initially entailed by the common ground, it must usually be globally accommodated. Within the theory developed in Heim 1983, this follows because a sentence whose presupposition is not met has an undefined semantic value. Thus in a context in which it is not initially taken for granted that Lance is a cancer survivor, this assumption must be added to the common ground if the conversation in (67)a is to go forward. (Heim 1983 also discusses the mechanism of *local accommodation*, which is severely restricted and essentially turns

<sup>18</sup> The difference between (60)b and (66) might conceivably be explained by monotonicity considerations. For a sentence such as *If IP^NRR, IP'*, where *NRR* corresponds to a non-restrictive relative clause, recent theories of alternatives and implicatures (notably Katzir 2007) predict an inference that *it isn't known that if IP, IP'*. If Translucency produced a strong inference for *If IP^NRR, IP'*, it would be of the form *if IP, NRR*. But *If IP^NRR, IP'* together with *If IP, N* yields the inference that *If IP, IP'*, which contradicts the implicatures that *it isn't known that if IP, IP'*. See also Appendix III for examples of NRRs attached under negative operators.

a presupposition into part of the assertive component – in which case it could in principle become 'at issue'.)

What about supplements? In Schlenker 2010, to appear, the mechanism of global accommodation was essentially built into the semantics of supplements; the idea was that the content of an NRR is not at issue because 'the addressee must first find a global context set  $C^+$  that makes the NRR (locally) trivial before processing further material'. However this might be pushing too far the similarity between NRRs and presupposition triggers. As we just saw, a presupposition must sometimes be globally accommodated because this is the best way to make the sentence interpretable (local accommodation is usually taken to be more costly than global accommodation). But no such motivation offers itself in the case of NRRs: to the contrary, the semantics we posited predicts an NRR to be interpretable when the initial context does *not* entail its content.

We now believe that the main facts can be explained without adding such an assumption.<sup>19</sup> Consider again (67)b. Translucency on its own requires that it should be possible to add some relatively uncontroversial assumption  $A$  (whose meaning we write as  $\mathbf{A}$ ) to the context  $C$  to obtain a context  $C^+$  from which it follows that Lance is a cancer survivor. This means that relative to  $C$ , a relatively uncontroversial assumption entails that Lance is a cancer survivor; and hence the negative proposition that Lance *isn't* a cancer survivor entails the negation of an uncontroversial assumption, which implies that the negative proposition in question should be unlikely. This reasoning is summarized in probabilistic terms in (68).

- (68) a. By Translucency, for  $C^+ = C \cap \mathbf{A}$ ,  $C^+ \models$  Lance is a cancer survivor.  
 b. By a.,  $C \models \mathbf{A} \Rightarrow$  Lance is a cancer survivor, and hence  $C \models \text{not (Lance is a cancer survivor)} \Rightarrow \text{not } \mathbf{A}$   
 c. Let  $\epsilon$  be such that the conditional probability of  $\mathbf{A}$  relative to  $C$  is above  $1-\epsilon$ :  
 $\text{Prob}(\mathbf{A} / C) > 1-\epsilon$   
 Since  $C \models \mathbf{A} \Rightarrow$  Lance is a cancer survivor,  $\text{Proba}(\text{Lance is a cancer survivor} / C) \geq \text{Proba}(\mathbf{A} / C) > 1-\epsilon$ ,  
 and thus  $\text{Proba}(\text{not } \mathbf{A} / C) \leq \epsilon$ .

In many cases, then, it will simply be *unlikely* that a sentence such as (67)b is denied because the NRR is false. This might explain the impression that the contribution of the NRR is not at issue. We come back in Section 8.2 to the fact that some supplements do in fact appear to be at issue.

Having laid out our core theory (which will be refined in Part IV), we turn to some of its immediate predictions: one concerns predictions we make about patterns of supplement projection; the other pertains to constraints on stacked NRRs.

### **Part III. Main Consequences**

#### **6 Semantic Consequence: Supplement Projection**

The analysis we have put forth predicts that NRRs should give rise to 'projection patterns' similar to (but weaker than) those found with presupposition projection. The difference is that 'standard' presuppositions yield the inference that a certain proposition  $p$  is part of the common ground. An NRR with the same content, by contrast, should yield the inference that *modulo certain uncontroversial assumptions* the meaning of the NRR can be made to follow from the common ground. We already discussed in Section 5.1.4 the case of presupposition and supplement projection under negation. We now discuss further cases, leaving a systematic study for future research.

##### **6.1 Three challenges**

Three difficulties will have to be borne in mind as we study supplement projection.

- (i) First, it is essential to distinguish pragmatic inferences from inferences that follow from the semantics alone. This issue already arose in (60), repeated in an English version as (69):

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<sup>19</sup> Thanks to Daniel Rothschild for discussion of this point.

- (69) a. Obama, who is to be indicted, is about to resign.  
 => Obama is to be indicted  
 b. Is it true that Obama, who is to be indicted, is about to resign?  
 => Obama is to be indicted  
 c. Is it true that Obama is to be indicted and is about to resign?  
 ≠> Obama is to be indicted

While (69)a gives rise to an inference that President will be put on trial, this inference could be due to the conjunctive semantics we posited for NRRs rather to a phenomenon of supplement projection. On the assumption that the NRR is attached with narrow scope, the analogous inference we obtain in (69)b does make the desired point, since the question environment would not yield such an inference if the supplement were just part of the assertive content.

(ii) But another difficulty immediately presents itself: how do we know that in (69)b the NRR is not attached so high that it finds itself in a positive environment after all? Since high attachment is usually preferred, the fact that we get the inference we do in (69)b isn't an argument for a pragmatic mechanism of supplement projection. Worse, there are cases in which one gets by way of modal or quantificational subordination inferences that are reminiscent of presupposition projection.<sup>20</sup> Consider for instance (70):

- (70) a. John might hire Mary, who would be ecstatic.  
 => If John were to hire Mary, she would be ecstatic  
 b. John might hire Mary (she would be ecstatic) / . She would be ecstatic.  
 => If John were to hire Mary, she would be ecstatic

(70)a has the form *might p<sup>n</sup>*, where *n* is the NRR; it triggers a rather strong conditional inference of the form *if p, n*. This is also the inference predicted by dynamic theories for sentences of the form *might [p and pn']*, where this time *n* is a presupposition rather than a supplement. Does this similarity show that supplements give rise to patterns of projection similar to presuppositions? No. The reason is that the control in (70)b, which involves an independent clause, gives rise to the very same inference – one that can easily be explained in terms of matrix attachment combined with modal subordination (see Brasoveanu 2010 for a recent account).

(iii) Finally, don't we obtain in (69)b an inference which is *too strong* for the theory's own good? We predict that the sentence should be acceptable in a context *C* if *C* can be strengthened into a context *C*<sup>+</sup> in which the NRR is transparent. But from this it doesn't follow that the NRR actually is or ought to be accepted by the speech act participants – unless one adds an assumption that *C*<sup>+</sup> needs to be believed by the speaker, and the addressee is willing to accommodate that part of the speaker's beliefs.

We will address Problem (i) by considering non-assertive environments. To solve Problem (ii), we will systematically contrast NRRs with clausal parentheticals, and we will use some of the tests we developed to force narrow attachment of the NRR (notably: forward shifted past or present tenses, and presence of a presupposition trigger that couldn't be interpreted with matrix attachment); this was the logic we already followed in our discussion of projection out of the scope of negation in (61). Finally, we will begin to address Problem (iii) by displaying one case in which the weak presupposition-like inference triggered by NRRs has indirect consequences on the licensing of NPIs.

## 6.2 *Reminder: Presupposition Projection*

We briefly discussed the case of presupposition projection in questions and under negation in Section 5.1.4. Let us add two cases; if we underline the presupposition of an elementary clause or predicate, *possible pp'* presupposes that *p*; and *if p, qq'* presupposes that *if p, q*

<sup>20</sup> We now believe that some examples of projection we used in Schlenker 2010, to appear could be analyzed instead in terms of matrix attachment and modal subordination.

(though this inference is often strengthened to  $p$ , a point we come back to in Section 6.5). Both cases are illustrated below.

- (71) *possible pp'* usually presupposes that  $p$   
 Your family might know that you are working for a thug  
 => you are working for a thug
- (72) *if p, qq'* usually presupposes that *if p, q*  
 If you accept this job, will you let your family know that you're going to be working for a thug?  
 => If you accept this job, you're going to be working for a thug.  
 ≠> You're going to be working for a thug.

### 6.3 Supplement Projection

We turn to examples in which we force an NRR to be interpreted with narrow scope. Importantly, our analysis predicts that the inferences we get should be weaker than presuppositions (because supplements constrain  $C^+$ , not (directly)  $C$ , to put it sloppily); for this reason, some of the contrasts are particularly subtle and will require more work (eventual, experimental work).

We should emphasize that this part of the discussion is *not* intended to show that low attachment is possible; doing so was the goal of Section 2. Rather, we attempt to show that in some cases in which NRRs are clearly attached low, they give rise to non-trivial patterns of projection. For reasons we come back to in Section 9.3, some speakers have a very strong preference for matrix attachment, and some of them reject our test sentences. Here we provide fine-grained grammatical and inferential judgment of one native English speaker who accepts low attachment in the relevant sentences.

We will consider complex paradigms such as (73). We will explain its main ingredients before we generalize it to other types embedding verbs and other logical environments.

- (73) *Context*: DSK is thought to be in discussions to settle the civil lawsuit against him. The speaker is talking to a journalist who has information about how the procedure will unfold.

Will it turn out next Wednesday that DSK

- |  |    |   |
|--|----|---|
| a. , who met with the judge the day before,          | ok | 2 |
| b. (he met with the judge the day before)            | ?  |   |
| b'. (he will have met with the judge the day before) | ok | 5 |
| c. met with the judge the day before and             | ok | 1 |

agreed to a settlement?

*Inferential question*: Do these sentences imply/suggest<sup>21</sup> that DSK will meet with the judge next Tuesday?

We provide one informant's judgments, using a 5-point scale for acceptability (the linguist's standard scale *ok, ok?, ?, ??, \**), and a 5-point scale for inferential strength (1 = no inference; 5 = strongest inference; this can be taken to measure how certain the informant is that the inference holds). To understand the crucial ingredients of the paradigm, consider (73).

–In (a), the simultaneous presence of *met* and of *the day before*, which is evaluated with respect to *next Wednesday*, forces the NRR to be attached under the matrix tense (or to be unacceptable – for other speakers); it yields weak inferences reminiscent of presupposition projection.<sup>22</sup>

–In (b), an NRR with the same properties is deviant because it cannot be embedded.

–In (b'), a future anterior *will have met* replaces the past tense *met*, and as a result high attachment of the parenthetical is acceptable – and yields strong inferences.

<sup>21</sup> The term 'suggest' is intended to show to informants that we are not just looking for logical inferences. This is admittedly overkill when the informant happens to be another semanticist.

<sup>22</sup> We consider biclausal structures because, as was noted in our discussion of (21), in a monoclausal structure the NRR would be attached 'too high' to take scope under the future tense.

–In (c), the NRR is replaced with a conjunct, which yields no inference because it is embedded under a question operator.

A preliminary statement of our generalization is as follows; it is just a more abstract version of what we saw in (73), except for (74)d, which restates the expected behavior of presuppositions.

(74) **Generalization**

When properties of tense force a clause *IP* to be attached under an operator *Op*,

a. if *IP* is a non-restrictive relative clause *wh IP*, two cases arise:

(i) speakers that display a very strong preference for matrix attachment may find the sentence unacceptable;

(ii) for speakers that accept low attachment of *wh IP*, it usually yields weak inferences that accord with rules of presupposition projection;

b. if *IP* is in a clausal parenthetical (*IP*), it is ungrammatical;

b'. however, if the tense of *IP* is changed to allow for matrix attachment, the sentence becomes grammatical, and gives rise to a strong inference that *IP* holds true;

c. if *IP* is only triggers an entailment, it yields inferences only to the extent that the logical environment in which it is embedded is non-negative;

d. if *IP* is in the immediate scope of an element that triggers a presupposition that *IP*, it yields strong inferences in accordance with rules of presupposition projection.

We start a more systematic investigation of the paradigm in (73). The verb *turn out* has the advantage of having something close to a non-intensional meaning – but the inferences it gives rise to with NRRs are weak.

(75) **Embedding under *turn out*: supplements**

*Context*: DSK is thought to be in discussions to settle the civil lawsuit against him. The speaker is talking to a journalist who has information about how the procedure will unfold.

**1. Projection out of questions:** see (73)

**2. Projection out of the scope of negation**

I don't think it'll turn out next Wednesday that DSK

a. , who met with the judge the day before,	ok	2
b. (he met with the judge the day before)	?	
b'. (he will have met with the judge the day before)	ok	5
c. met with the judge the day before and	ok	1

agreed to a settlement.

*Inferential question*: Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?

**3. Projection out of the scope of modals**

It might turn out next Wednesday that DSK

a. , who met with the judge the day before,	ok	3
b. (he met with the judge the day before)	?	
b'. (he will have met with the judge the day before)	ok	5
c. met with the judge the day before and	ok	1

agreed to a settlement.

*Inferential question*: Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?(74)

**4. Projection out of the consequent of conditionals**

If the big event takes place on Tuesday, will it turn out next Wednesday that DSK



result is in (77) (for the negative case, we used *I doubt that we'll be wondering...* in (77)2 rather than *we won't be wondering*, which triggers unwanted implicatures).

(77) **Embedding under *wonder*: supplements**

**0. Projection out of the scope of *wonder* alone**

I will be wondering next Wednesday whether DSK

- |  |    |   |
|--|----|---|
| a. , who met with the judge the day before,          | ok | 4 |
| b. (he met with the judge the day before)            | ?  |   |
| b'. (he will have met with the judge the day before) | ok | 5 |
| c. met with the judge the day before and             | ok | 1 |

agreed to a settlement.

*Inferential question:* Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?

**1. Projection out of questions**

Will we be wondering next Wednesday whether DSK

- |  |    |   |
|--|----|---|
| a. , who met with the judge the day before,          | ok | 4 |
| b. (he met with the judge the day before)            | ?  |   |
| b'. (he will have met with the judge the day before) | ok | 5 |
| c. met with the judge the day before and             | ok | 1 |

agreed to a settlement?

*Inferential question:* Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?

**2. Projection out of scope of negative expressions**

I doubt we'll be wondering next Wednesday whether DSK

- |  |    |   |
|--|----|---|
| a. , who met with the judge the day before,          | ok | 4 |
| b. (he met with the judge the day before)            | ?  |   |
| b'. (he will have met with the judge the day before) | ok | 5 |
| c. met with the judge the day before and             | ok | 1 |

agreed to a settlement.

*Inferential question:* Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?

**3. Projection out of the scope of modals**

We might be wondering next Wednesday whether DSK

- |  |    |   |
|--|----|---|
| a. , who met with the judge the day before,          | ok | 4 |
| b. (he met with the judge the day before)            | ?  |   |
| b'. (he will have met with the judge the day before) | ok | 5 |
| c. met with the judge the day before and             | ok | 1 |

agreed to a settlement.

*Inferential question:* Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?

**4. Projection out of the consequent of conditionals**

If the big event takes place on Tuesday, will we be wondering next Wednesday whether DSK

		(i)	(ii)
a. , who met with the judge the day before,	ok	2	4
b. (he met with the judge the day before)	?		
b'. (he will have met with the judge the day before)	ok	3	5
c. met with the judge the day before and	ok	1	1

agreed to a settlement?

*Inferential question:* Do these sentences imply/suggest that:

(i) DSK will meet with the judge next Tuesday?

(ii) if the big event takes place on Tuesday, DSK will meet with the judge on that same day?

A paradigm with embedding under *deny* is discussed in Appendix III.

#### 6.4 Intervention on NPI Licensing

As was mentioned, our analysis predicts that supplement projection gives rise to weaker inferences than presupposition projection; and as we saw in the case of embedding under *turn out*, some projective patterns are very weak indeed, much weaker than for presuppositions. From the present perspective, the reason is that a presupposition comes with a requirement that it should be transparent in the context of speech *C*, whereas a supplement only comes with the requirement that it should be 'translucent' in *C* – and hence 'transparent' in some other context *C*<sup>+</sup> obtained by strengthening *C* with some relatively uncontroversial assumptions. It is only on the basis of additional hypotheses – for instance that the speaker *believes* these uncontroversial assumptions – that clear projection phenomena are obtained. In some cases, the inferences triggered by embedded NRRs are hard to distinguish from those of standard conjuncts, as was noted in our discussion of (66). This is also shown by the example in (78)a, whose truth conditions seem to be rather close to those of (78)b: the punching event is predicted to occur if *both* the student gets examined by Smith and the latter makes a derogatory comment.

(78) Uttered by an angry student on the eve of an important exam:

a. ok/ok? If tomorrow I get examined by Smith, who makes a derogatory comment, I'll punch him in the face.

b. If tomorrow I get examined by Smith and he makes a derogatory comment, I'll punch him in the face.

c. \* If tomorrow I get examined by Smith (he makes a derogatory comment) I'll punch him in the face.

Upon closer inspection, however, a difference can be found between the two cases: NPIs are degraded in an NRR, but not in a conjunction (we provide the judgments of two informants, 1 and 2):

(79) a. 1? 2? If tomorrow I get examined by Smith, who makes any derogatory comment, I'll punch him in the face.

a'. 1ok? 2?? If tomorrow I get examined by Smith, who makes the slightest derogatory comment, I'll punch him in the face.

b. 1ok 2ok If tomorrow I get examined by Smith and he makes any derogatory comment, I'll punch him in the face.

b'. 1ok 2ok If tomorrow I get examined by Smith and he makes the slightest derogatory comment, I'll punch him in the face.

Since for purposes of NPI licensing *if*-clauses count as downward-monotonic environments, the acceptability of (79)b,b' is unsurprising. On the other hand, the deviance of (80)a,a' is quite informative; it is exactly as is predicted if we compute an inference that *there is some context C<sup>+</sup> accessible from C such that the NRR is transparent in C<sup>+</sup>*. Taking into account rules of presupposition projection *relative to C<sup>+</sup>*, we compute – very roughly – an inference that *it is possible that if I get examined by Smith, he will make a derogatory comment*. Crucially, in this latter proposition *a derogatory comment* is *not* in a downward-monotonic environment, and as a result, when this inference is conjoined with the literal meaning of the sentence, downward-monotonic inferences are blocked – which explains why the NPI isn't acceptable.

Since the judgments are subtle, it is worth expanding the investigation to French. As in the English example we just discussed, (80)a, which involves an embedded NRR, initially seems to be a close paraphrase of (80)b, which involves a simple conjunction; but as soon as NPIs are introduced, the two constructions display different behaviors: the NPI *la moindre insulte* ('the slightest insult') is licensed in a conjunction, but not an NRR, embedded in an *if*-clause.

(80) *Context:* Pierre has a history of bad behavior at work. The speaker is his boss.

Si dans deux mois je convoque Pierre  
*if in two months I summon Pierre*  
 'If in two months I summon Pierre

a. ok , qui me répond (alors) par une insulte,  
*who to-me reply (then) with an insult*  
 who replies with an insult,

b. ok et qu'il me répond (alors) par une insulte,  
*and that he to-me reply (then) with an insult*  
 and he replies with an insult,

a'. ?? , qui me répond (alors) par la moindre insulte  
*who to-me reply (then) with any insult*  
 who replies with any insult,

b'. ok? et qu'il me répond (alors) par la moindre insulte,  
*and that he to-me reply (then) with an insult*  
 and he replies with any insult,

je le licencierai sans hésiter.  
*I him will-fire without hesitating*  
 I will fire him without hesitation.'

The same logic can account for the contrast in (81), which involves the French NPI *quiconque* ('anybody'):

(81) *Context:* someone made a big mistake at the Department.

Si demain j'appelais le directeur  
*if tomorrow I called the director*  
 'If tomorrow I called the director,

a. , qui en informait quelqu'un au niveau supérieur,  
*, who of-it informed somebody at-the level superior*  
 , who informed somebody at a higher level,

b. et qu'il en informait quelqu'un au niveau supérieur,  
*and that he of-it informed somebody at-the level superior*  
 and he informed somebody at a higher level,

a'. ??/?, qui en informait quiconque au niveau supérieur,  
*, who of-it informed anybody at-the level superior*  
 , who informed anybody at a higher level,

b'. ok? et qu'il en informait quiconque au niveau supérieur,  
*and that he of-it informed anybody at-the level superior*  
 and he informed anybody at a higher level,

nous aurions à coup sûr de sérieux problèmes.  
*we would-have without-doubt of serious problems*  
 we would definitely have serious problems.'

We conclude that even when the inferential effects of supplement projection are hard to detect directly, they can be diagnosed indirectly by way of their effect on NPI licensing.<sup>25</sup>

### 6.5 *Proviso Problem with Supplements*<sup>26</sup>

Dynamic semantics (Heim 1983, Beaver 2001) and several other theories (e.g. Schlenker 2008, 2009, George 2008a, b, Fox 2008, Chemla 2008) predict that certain sentences that intuitively yield unconditional presuppositions should have weaker, conditional ones. This problem has been dubbed by Geurts (1996, 1999) the ‘Proviso Problem’. The problem arises in some environments but not others, as shown by the *contrast* between (82)a, which displays the conditional presupposition predicted by dynamic semantics, and (82)b, which typically yields a stronger (unconditional) inference.

- (82) a. Peter knows that if the problem was easy / difficult, someone solved it. (Geurts 1999)  
 ≠> Someone solved the problem.  
 b. If the problem was easy / difficult, then it isn’t John who solved it. (Geurts 1999)  
 => Someone solved the problem.

Several theories have been entertained to explain this contrast (see Schlenker 2011b for some references). We will not review them here; our sole goal is to show that the same phenomena arise with NRRs.

A simple instance of a strengthening is given in (83):

- (83) *Context*: DSK is being sued.

If DSK is broke, it could conceivably turn out next Tuesday that his lawyers

- a. ok , who bungled his plea bargain the day before,  
 => DSK's lawyers will bungle his plea bargain next Monday  
 b. ? (they bungled his plea bargain the day before)  
 c. ok bungled his plea bargain the day before and  
 ≠> DSK's lawyers will bungle his plea bargain next Monday

---

<sup>25</sup> This analysis is entirely modeled after the one Homer 2011 developed to account for the observation that presupposition triggers can intervene on the licensing of some NPIs. For instance, *quiconque* is deviant if a presupposition trigger blocks downward-monotonic inferences needed to license NPIs, as shown in 0b (judgments are for the – natural – reading on which *anybody* has scope over the embedded negation):

- (i) Si tu invites Marie  
 if you invite Marie  
 'If you invite Marie
- a. ? et qu'elle croit que quiconque n'a pas été invité,  
 and that she believes that anybody NE has not been invited,  
 and she believes that anyone wasn't invited,
- b. \*? et qu'elle sait que quiconque n'a pas été invité,  
 and that she knows that anybody NE has not been invited,  
 and she knows that anyone wasn't invited,
- elle sera malheureuse.  
 she will-be un happy  
 she will be unhappy.'

Briefly, when presupposition projection is taken into account, if you invite Mary and she knows that someone hasn't be invited, she'll be unhappy has roughly the semantics of: someone hasn't been invited and if you invite Mary and she believes that somone hasn't been invited, she'll be unhappy. The underlined occurrence of someone is in a positive environment, which explains why downward-monotonic inferences are blocked in this case.

<sup>26</sup> The discussion of presuppositions in this subsection borrows material from Schlenker 2011b.

are dropping their fees.

For the NRR to be transparent in an accessible context  $C^+$ , it is enough that  $C^+$  should guarantee that *if DSK is broke*, his lawyers will bungle his plea bargain next Monday. But an unconditional inference is obtained, presumably because one usually assumes (maybe wrongly) that DSK's financial situation is independent from his lawyer's performance during a plea bargain.

As will be recalled, when we argued that there is a striking parallel between presupposition projection and supplement projection, we displayed a more sophisticated version strengthening, one that yields 'semi-conditional' inferences, as in (64), repeated as (84):

(84) *Context*: DSK will stand in a civil trial next week.

ok? If DSK turns out to be broke and is found guilty next week, will it turn out that his lawyers, who are responsible for his condemnation, are willing to give up their fees?

=> if DSK is found guilty next week, his lawyers will be responsible the fact that he was found guilty

A full investigation of these strengthening phenomena is left for future research. But we hope to have shown that there is a strong *similarity* between the strengthening problem for supplements and for presuppositions, which suggests that both phenomena share a mechanism of projection.

## 7 Syntactic Consequence: Ordering Restrictions

### 7.1 *A Prediction*

Consider again the syntax and semantics we posited in (45), whose main components are repeated for convenience in (85):

(85) **NRRs**

a. Syntax of NRRs

$[_{IP_i \dots} DP \dots] \rightarrow [_{IP_i \dots} DP NRR_{IP_i} \dots]$

where node  $IP_i$  dominate the LF position of  $DP$ .

b. Semantics of NRRs

Let  $s$  be assignment function ( $\#$  represents presupposition failure)

(i)  $\llbracket [_{IP_i \dots} DP NRR_{IP_i} \dots] \rrbracket^s = \#$  unless for some  $DP$   $d$  and some index  $k$ ,  $DP = d_k$ .

If  $\neq \#$ ,  $\llbracket [_{IP_i \dots} DP NRR_{IP_i} \dots] \rrbracket^s = \llbracket [_{IP_i \dots} DP \dots] \rrbracket^s \bullet \llbracket NRR_{IP_i} \rrbracket^s(s(i))$

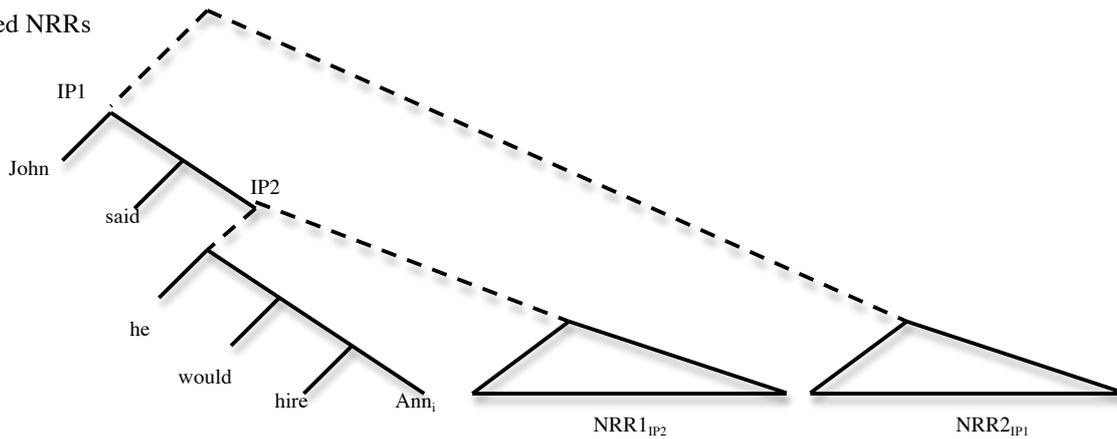
where  $\bullet$  is the operation by parataxis in discourse is evaluated.<sup>27</sup> As a first approximation,

$\llbracket [_{IP_i \dots} DP \dots] \rrbracket^s \bullet \llbracket NRR_{IP_i} \rrbracket^s(s(i)) = 1$  iff  $\llbracket [_{IP_i \dots} DP \dots] \rrbracket^s = 1$  and  $\llbracket NRR_{IP_i} \rrbracket^s(s(i)) = 1$ .

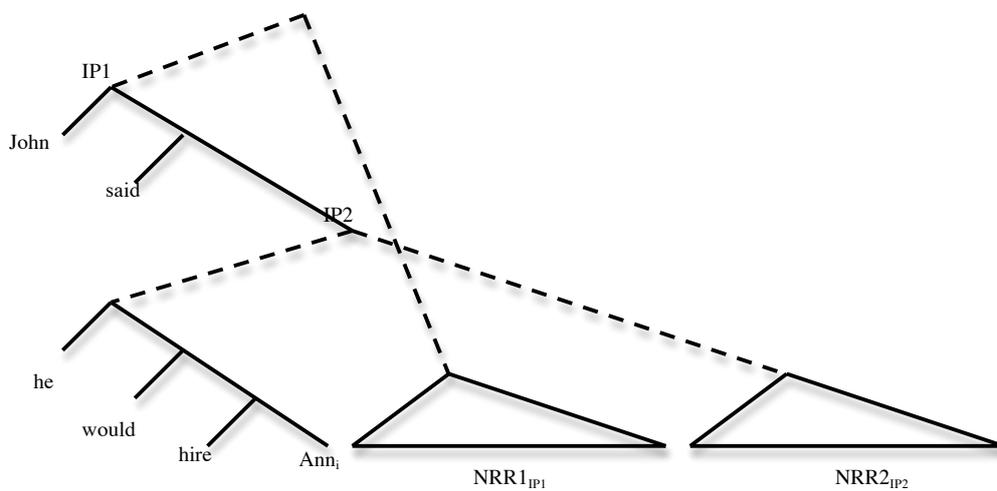
The semantic component of this analysis predicts a failure if an NRR cannot 'steal' the referential index of the DP that appears to its immediate left (in linear terms) at the relevant point of interpretation. Now consider what happens when two NRRs appear next to each other while being attached at different syntactic levels, as sketched in (86).

<sup>27</sup> It is only typographically that  $\bullet$  is reminiscent of Potts's operation to interpret NRRs: the operation we use doesn't involve bidimensional semantics.

(86) a. Nested NRRs



b. Crossing NRRs



Let us start by assuming a top-down interpretation procedure.

–An immediate problem is predicted for (86)a: NRR2 needs to 'steal' the referential index of the element that appears immediately to its left. But that element is NRR1, which does not carry a referential index.<sup>28</sup> Hence a failure is predicted at the very first step of the interpretive process: by (85)b, we have:

(87)  $\llbracket [_{IP_1} \text{John said } [_{IP_2} \text{he would hire Ann}_i \text{ NRR1}_{IP_2}] \text{ NRR2}_{IP_1} ] \rrbracket^s = \#$   
because the element left-adjacent to NRR2 isn't a DP with a referential index.

–While this might be surprising at first glance, the problem is solved in (86)b. First, NRR1 can just 'steal' the index of the DP that's left-adjacent to it, as desired. What about NRR2? Well, the compositional procedure ensures that NRR1 gets 'out of the way' as soon as it is interpreted. Specifically, since no failure is predicted when NRR1 is interpreted, we apply (88)b to obtain the interpretive step in (88):

(88)  $\llbracket [_{IP_1} \text{John said } [_{IP_2} \text{he would hire Ann}_i \text{ NRR1}_{IP_1}] \text{ NRR2}_{IP_2} ] \rrbracket^s = \llbracket [_{IP_1} \text{John said } [_{IP_2} \text{he would hire Ann}_i] \text{ NRR2}_{IP_2} ] \rrbracket^s \bullet \llbracket [ \text{NRR1}_{IP_1} ] \rrbracket^f(s(i))$

Now the computation of the meaning of  $[_{IP_1} \text{John said } [_{IP_2} \text{he would hire Ann}_i] \text{ NRR2}_{IP_2}]$  can proceed as normal. Crucially, however, NRR1 has now gotten out of the way, so that NRR2 can 'steal' the index of the element that's left-adjacent to it, as is desired. (Needless to say, to give a full formal account of such examples, we would need a semantic account of verbs like *say*, which in turn would require an intensional component in our semantics. For simplicity we do not provide a full derivation of such examples.)

Consider now a bottom-up interpretive procedure. As in a top-down procedure, (86)a gives rise to a failure when the top-most constituent is evaluated because NRR2 is not adjacent to its antecedent *Ann*. What about (86)b? If we take there to be an interpretive step that evaluates  $\llbracket [_{IP_1} \text{John said } [_{IP_2} \text{he would hire Ann}_i \text{ NRR1}_{IP_2}] \text{ NRR2}_{IP_1} ] \rrbracket^s$ , we will predict a failure in this case as well, since here *NRR1* has not been able to get 'out of way' to ensure that *NRR2* is adjacent to *Ann*. But I believe there is no reason to assume that there exists such an interpretive step; rather, in a bottom-up procedure constituents are shipped to the semantics in the order in which they are put together by the syntax, and thus exactly as in the top-down procedure we should have an interpretive step that evaluates  $\llbracket [_{IP_1} \text{John said } [_{IP_2} \text{he would hire Ann}_i] \text{ NRR2}_{IP_1} ] \rrbracket^s$ , because when *IP1* is put together by the syntax, *NRR1* hasn't been inserted within that constituent yet (since it is merged at a later derivational step).

One further point is worth noting: since parentheticals are always attached at the matrix level (as specified in (44)), they should pattern like 'high' NRRs and thus not count for the computation of adjacency conditions for NRRs that are attached lower.

## 7.2 Testing the Prediction

Are these predictions borne out? Consider the paradigm in (89):

(89) *Context*: John and his girlfriend Ann are currently in New York. They are planning to marry in Vegas tomorrow.

a. After the wedding, John will announce to his parents that he has married Ann, who you know well, who became his wife a few minutes before.

b. \*After the wedding, John will announce to his parents that he has married Ann, who became his wife a few minutes before, who you know well.

c. After the wedding, John will announce to his parents that he has married Ann (you know her well), who became his wife a few minutes before.

<sup>28</sup> NRR1 carries an unrelated index which encodes the syntactic node to which it attaches. As noted in fn. 10, this is purely a notational convenience, since the derivation tree fully encodes this information.

The underlined past tense verb *became* refers to a future event, which suggests that the underlined NRR must have scope under *will* (and possibly under *announce* as well). By contrast, the non-underlined NRR can without difficulty be attached with matrix scope. The data are clear: the matrix NRR can intervene between *Ann* and the narrow scope NRR, but the opposite pattern is impossible. As is also predicted, the parenthetical in (89)c patterns with high NRRs.

Importantly, the ordering restrictions we found in NRRs are explained by the interaction between two mechanisms: (i) an adjacency requirement between the NRR and the DP it depends on; and (ii) the standard compositional mechanism by which the semantics evaluates constituents rather than strings: as a result, an NRR which is attached high gets 'out of the way' of an NRR that is attached low, and this makes it possible for the adjacency requirement to be satisfied at the point at which the lower NRR is interpreted. For this analysis to work, however, it is crucial that the adjacency requirement be computed as part of the semantics rather than the syntax; this was enforced in the semantics we posited in (45)b.

### 7.3 *Alternative: Cyclicity*

Adam Szczegielniak (p.c.) has suggested an alternative explanation in terms of syntactic cyclicity. On this view, we don't need the non-strictly compositional semantic rule in (45) and can make do with the more conservative one in (55). The reason is that the condition requiring linear adjacency between the NRR and the DP it modifies is computed cyclically in the syntax, rather than in the semantics. To see how the proposal works, consider again (86)b. There are two cyclic domains in which the adjacency condition will be checked: the lower IP, namely *IP2*, and the higher IP, namely *IP1*.

–When adjacency is checked within *IP2*, *IP1* hasn't been constructed yet, and for this reason *NRR2* is adjacent to the DP it modifies, namely *Ann* (because *NRR1* is only added in the course of the construction of *IP1*).

–When adjacency is checked within *IP1*, we only need to worry about *NRR1*, since the adjacency between *NRR2* and *Ann* was checked in the earlier cyclic domain. And it is immediate that *NRR1* is adjacent to *Ann*.

By contrast, in (86)a *NRR2* fails to be adjacent to *Ann* in the higher cyclic domain, and for this reason the sentence is unacceptable.

Szczegielniak originally stated his proposal (in discussion) with reference to the late merge of adjuncts, a proposal that was argued for repeatedly in the syntactic literature (for instance in Lebeaux 1988 and Fox and Nissenbaum 2006). Part of the motivation had to do with Condition C of the binding theory, which arguably target differently complements – e.g. *about John<sub>i</sub>'s library* in (90)a – and adjuncts – e.g. *from John<sub>i</sub>'s library* in (90)b:

- (90) a. ??/\*[Which book about John<sub>i</sub>'s library] did he<sub>i</sub> read?  
 b. [Which book from John<sub>i</sub>'s library] did he<sub>i</sub> read?

The idea was that adjuncts but not complements allowed for a 'late merge' sketched in (91) (from Fox and Nissenbaum 2006):

- (91) i. he<sub>i</sub> read [Which book]  
 ii. *wh-movement* --> [**Which book**] did he<sub>i</sub> read [Which book]  
 iii. *adjunct merger* --> [Which book **from John<sub>i</sub>'s library**] did he<sub>i</sub> read [Which book]

Importantly, however, the cyclicity-based analysis of the adjacency condition on NRRs will *not* be very easy to reconcile with the view that other adjuncts can also be merged late. For while NRRs attached high as well as clausal parentheticals are 'ignored' by the adjacency condition on low NRRs, other adjuncts appear to intervene, as illustrated in (92).

- (92) a. ok My mother told me that she's just printed an article about Chomsky, who she greatly admires.  
 b. \* My mother told me that she's just printed the article about Chomsky **that I like best**, who she greatly admires.

While (92)a is acceptable, I don't think that (92)b is. But without special constraints on the late merge of adjuncts, it should have a good derivation, namely one in which the underlined NRR is attached to the clause embedded under *told*, while the restrictive relative clause in bold is merged

late. In this derivation, the adjacency between the NRR and *Chomsky* should be satisfied within the lower IP domain – which makes it a mystery why the sentence is unacceptable.

Still, thanks to Szczegielniak's suggestion we now have two ways to derive our generalization about iterated NRRs. On our original view, it follows from a semantics in which high NRRs are not present at the interpretive step at which lower NRRs – and the attending adjacency conditions – are evaluated; this requires a semantics that is not strictly compositional. On the cyclic syntactic view, high NRRs haven't been merged yet when adjacency conditions on low NRRs are checked.

The debate between these two options is currently open.<sup>29</sup>

## Part IV. Extensions and Refinements

### 8 Discourse Relations and Linear Restrictions

#### *8.1 Discourse relations*

In our definition of the semantics of NRRs in (45), we introduced an operation • by which their content is conjoined to that of the clause they attach to. As a first approximation, we took • to have the semantics of conjunction, but we now want to suggest that • must denote a discourse relation which is either explicit in the NRR, or is provided by the context. And we will make the assumption that matrix attachment involves whatever implicit discourse relations are available for parataxis in

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<sup>29</sup> Let us mention one additional fact of some relevance. Some non-restrictive relative clauses may appear as independent sentences – but they are still subject to an adjacency condition to a DP that appears in the preceding sentence, as is illustrated below. This need not create any problems for a semantic analysis, which must definitely have ways to evaluate the truth conditions of discourses rather than just sentences. But the cyclicity-based syntactic analysis would have to posit that cyclic conditions apply to bigger syntactic chunks than just sentences – presumably entire discourses.

To see an example of a full sentence NRR which is still subject to an adjacency condition, one can compare standard *lequel* NRRs as in (ia-b) with variants in which a full NP follows *lequel*, as in (iia-b); (iib) is a simplified version of (iii), found on the internet.

- (i) Il faut se demander quel candidat peut gagner face à Sarkozy.  
*It must SE ask which candidate can now win in-front at Sarkozy.*  
 'One must ask which candidate can win over Sarkozy –

(a) Lequel / (b) [Lequel Sarkozy] disserte désormais sur l'insignifiance de Hollande.  
 (a) LEQUEL / (b) LEQUEL Sarkozy pontificates now on the insignificance of Hollande.  
 who now pontificates on Hollande's insignificance.'

- (ii) Il faut se demander quel candidat peut gagner face à Sarkozy et ensuite présider.  
*It must SE ask which candidate can now win in-front at Sarkozy and then presider.*  
 'One must ask which candidate can win over Sarkozy and then govern.

(a) #Lequel / (b) [Lequel Sarkozy] disserte désormais sur l'insignifiance de Hollande.  
 (a) LEQUEL / (b) LEQUEL Sarkozy pontificates now on the insignificance of Hollande.  
 Which Sarkozy now pontificates on Hollande's insignificance.'

(iii) Dans la matinée, sur BFMTV, il avait expliqué que le sens de la primaire socialiste devait être de se demander quel candidat pouvait « gagner au second tour face à Nicolas Sarkozy » et ensuite présider. Lequel Sarkozy, après avoir fait mine de le craindre pour installer sa candidature à l'époque où il redoutait celle de DSK, disserte désormais sur son insignifiance :

« Hollande ? Prenez un sucre. Et mettez-le dans un verre d'eau... »

<http://www.lcp.fr/webstern-socialiste/2011/06/29/16944-aubry-candidate-a-la-primaire-ps-pour-le-jour-le-plus-rose>

One point is left open, however: while the orthography and probably the intonation suggest that the underlined clauses are indeed independent sentences, it has not been proven on independent grounds that this indeed so – and our point about the existence of large cyclic domains in the syntax crucially depends on it.

discourse, while implicit discourse relations for embedded NRRs are more constrained; this is summarized in (93).

(93) Implicit discourse relations

- a. Implicit discourse relations by which NRRs can be attached at the discourse level are all those that are available for parataxis in discourse.
- b. Implicit discourse relations by which NRRs can be attached at embedded sites are more constrained.

The reason for this stipulation is that (i) there appear to some severe constraints on the possible discourse implicit discourse relations that connect an embedded NRR to the clause it attaches to; and (ii) sometimes the addition of explicit connectives improves the status of NRRs that are otherwise degraded.

We will make use of the French subjunctive to ensure that an NRR is indeed interpreted with narrow scope. To start with a manageable list of discourse relations, we base our discussion on Lascarides and Asher 1991. It becomes quickly apparent that all implicit discourse relations they illustrate with parataxis in discourse are available for matrix NRRs. By contrast, embedded NRRs have access to fewer implicit discourse relations than matrix NRRs. As a first approximation, the relations of Narration and Result seem to be readily available for embedded NRRs; in both cases, the content of the NRR is presented as being a consequence of the content of the NRR. The relation of Background is somewhat less available, and the relations Elaboration and Explanation appear to be still less available.

Lascarides and Asher's original examples are defined and illustrated in (94).

- (94) a. **Narration( $\alpha$ ,  $\beta$ ):** "The event described in  $\beta$  is consequence of (but not necessarily *caused by*) the event described in  $\alpha$ ."  
 Max stood up. John greeted him.
- b. **Result( $\alpha$ ,  $\beta$ ):** "The event described in  $\alpha$  caused the event or state described in  $\beta$ ."  
 Max switched off the light. The room was pitch dark.
- c. **Background( $\alpha$ ,  $\beta$ ):** "For example, the state described in  $\beta$  is the 'backdrop' or circumstances under which the event described in  $\alpha$  occurred."  
 Max opened the door. The room was pitch dark.
- d. **Elaboration( $\alpha$ ,  $\beta$ ):** "The event described in  $\beta$  contributes to the culmination of the occurrence of the event described in  $\alpha$ , i.e.  $\beta$ 's event is part of the preparatory phase of  $\alpha$ 's event."  
 The council built the bridge. The architect drew up the plans.
- e. **Explanation( $\alpha$ ,  $\beta$ ):** "For example, the event described in clause  $\beta$  caused the event described in clause  $\alpha$ ."  
 Max fell. John pushed him.

On the basis of these observations, we can account for some surprising contrasts among the availability of narrow scope NRRs: in (95), only the NRRs that are naturally interpreted as connected to the main clause by the relations of Narration, Result or (to some extent) Background are acceptable, and possibly Elaboration. But connection by the implicit relation of Explanation seems to be difficult (the version of the sentence with 'aunt' makes it particularly natural that the *reason* Jean called her aunt was that she is a lawyer – whereas there might be many other reasons Jean called his mother).

(95) *Context:* Jean was involved in an incident at school.

a. **Narration**

1. Imagine que Jean ait appelé sa mère  
*Imagine that Jean have-subj called his mother*

- (i), qui ait appelé son avocat.  
*, who have-subj called her lawyer.*
- (ii) et qu'elle ait appelé son avocat.  
*and that she have-subj called her lawyer.*

2. Jean a appelé sa mère  
*Jean has called his mother*

(i) , qui a appelé son avocat  
*, who has called her lawyer*

(ii). Elle a appelé son avocat.  
*. She has called her lawyer.*

#### **b. Result**

1. Imagine que Jean ait appelé sa mère,  
*Imagine that Jean have-subj called his mother*

(i) , qui ait pris peur  
*who have-sub taken fear*  
 (ii) et qu'elle ait pris peur.  
*and that she have-subj taken fear*

2. Jean a appelé sa mère  
*Jean has called his mother*

(i) , qui a pris peur.  
*, who has taken fear*

(ii) . Elle a pris peur.  
*. she has taken fear*

#### **c. Background**

1. Imagine que Jean ait appelé sa mère  
*Imagine that Jean have-subj called his mother*

(i) ok? , qui ait été en réunion avec le Ministre  
*, who have-subj been in meeting with the Minister*

(ii) et qu'elle ait été en réunion avec le Ministre.  
*and that have-subj been in meeting with the Minister*

2. Jean a appelé sa mère,  
*Jean has called his mother*

(i) , qui était en réunion avec le Ministre.  
*, who was in meeting with the Minister*

(ii) . Elle était en réunion avec le Ministre.  
*. she was in meeting with the Minister*

#### **d. Elaboration**

1. Imagine que Jean ait fait intervenir son avocat  
*Imagine that Jean have-subj made intervene his lawyer*

(i) ?, à qui sa mère ait donné l'ordre de déposer plainte  
*, to whom his mother have-subj given the order of filing a-complaint*

(ii) et que sa mère lui ait donné l'ordre de déposer plainte.  
*and that his mother have-subj given the order of filing a-complaint*

2. Jean a fait intervenir son avocat  
*Jean has made intervene his lawyer*

(i) , à qui sa mère a donné l'ordre de déposer plainte.  
*to whom his mother has given the order of filing a-complaint*

(ii) . Sa mère lui a donné l'ordre de déposer plainte.  
*his mother to-him has given the order of filing a-complaint*

#### e. Explanation

1. Imagine que Jean ait appelé sa tante  
*Imagine that Jean have-subj called his aunt*

(i) , #qui soit avocate  
*, who be-subj lawyer*  
 (ii) et qu'elle soit avocate.  
*and that she be-subj lawyer*

2. Jean a appelé sa tante  
*Jean has called his aunt*

(i) , qui est avocate.  
*, who is lawyer*

(ii) . Elle est avocate.  
*. She is lawyer*

In other cases, the addition of explicit connectives in narrow scope NRRs can markedly improve their acceptability, as in (96):

- (96) *Context:* The speaker laments that his seminar, due to being shortly, might attract very few students.
- ??Il se peut que j'aie moins de 5 étudiants, qui soient incompétents.  
*It is possible that I have-subj less than 5 students, who be-subj incompetent*
  - Il se peut que j'aie moins de 5 étudiants, qui **en outre** soient incompétents.  
*It is possible that I have-subj less than 5 students, who **in addition** be-subj incompetent*
  - Il se peut que j'aie moins de 5 étudiants, et qu'ils soient incompétents.  
*It is possible that I have-subj less than 5 students, and that they be-subj incompetent*

In (96), the relevant discourse relation does not fall under any of the labels we took over from Lascarides and Asher 1991; here it seems that the main clause and the NRR are connected in virtue of being two justification for the speaker's unhappiness. But in any event providing an explicit connection makes the sentence significantly more acceptable. A similar contrast (though a subtle one) can apparently be found in English:

- (97) *Context:* The speaker laments that his seminar is attracting fewer students every year.

If at some point I have fewer than five students

- ?, who are incompetent,
- , who in addition are incompetent, I'll retire right away.
- and they are incompetent, I'll retire right away.  
 I'll retire right away.

We conclude that the paucity of available implicit relations between embedded NRRs and clauses they attach to is one reason why narrow scope attachment is sometimes difficult (there might be others, as we discuss below). We leave a full investigation of the discourse relations available for NRR for future research.

## 8.2 Linear Restrictions

We will now argue that the necessary presence of a discourse relation between the NRR and the rest of the discourse is responsible for another quirk of NRRs, most recently discussed in a very interesting piece by Koev (2012). In a nutshell, Koev 2012 shows that clause-final NRRs differ from clause-internal ones in having the ability to be 'at issue'. We argue (i) that this property is correlated

with the greater ease with which clause-final NRRs can be interpreted with narrow scope; and (ii) that both properties follow from the necessity to connect an NRR to the rest of the sentence with an implicit or explicit discourse connective, which must be anaphorically linked to the clause the NRR attaches to, or to the earlier discourse. Due to independent (and 'soft') constraints on anaphora resolution, it is easier to resolve anaphora when the pronominal element follows its antecedent. This is precisely what happens when an NRR is clause-final. When it is not, two things happen:

–anaphoric discourse connection to the clause within which it appears on the surface is harder, which makes narrow scope readings more difficult;  
 –connection to the *earlier* discourse is preferred, with the result that denials in discourse are typically understood not to target the NRR (because it is structurally part of the earlier discourse). Importantly, we will see that the linear role of the NRR is only a 'soft' constraint, not the categorical one that Koev makes it out to be.

### 8.2.1 Koev's Analysis

Koev 2012 displays several examples in which a clause-final NRR can be interpreted as being 'at issue', whereas clause-medial cannot be. He takes this fact to provide a hint as to the correct semantics of NRRs. In his analysis (in which he calls NRRs 'ARCs', for 'Appositive Relative Clauses'),

both main clauses and ARCs introduce proposals. Proposals are introduced/ accepted at the left/right clause boundary, respectively. Since the right boundary of clause-medial ARCs falls inside the main clause, proposals associated with such ARCs are never at-issue. The right boundary of clause-final ARCs can be construed as either inside or outside the main clause. When the latter is the case, proposals introduced by such ARCs become at-issue.

An example of the at-issue contrast between clause-final and non-clause final NRRs is given in (98):

- (98) a. A: Edna, who is a fearless leader, started the descent.  
       B: #No, she isn't. She is a coward. (Koev 2012 – with a reference to Amaral et al. 2007)  
       b. A: Jack invited Edna, who is a fearless leader.  
       B: No, she isn't. She is a coward. (Koev 2012)

Koev 2012 provides a further argument to buttress his conclusion, the 'answerability test'. As he observes, given the right question a clause-final NRR can be construed as being part of the answer, but this isn't possible with clause-medial NRRs:

- (99) Answerability Test: Only at-issue content can be employed by interlocutors to answer questions. (Koev 2012)
- (100)a. A: What did Paula bring and when did she leave the party?  
       B: ??Paula, who brought cookies, left after midnight. (Koev 2012)
- b. A: Who did you meet at the party and what did they bring?  
       B: I met Paula, who brought cookies.

To account for these data, Koev makes the following assumptions within a dynamic framework:

- (i) Propositions do not get directly incorporated into the context set. Rather, they constitute *proposals* which are incorporated into the context set (represented as distinguished variable  $p_{cp}$ ) in case the addressee doesn't object.
- (ii) Proposals are introduced at the left edge of clauses, and accepted at the right edge of clauses.
- (iii) For this reason, non-clause final NRRs can only be taken to constrain the context, and not to make a new proposal.
- (iv) But clause-final NRRs can either be construed as being within the main clause, in which case they behave like clause-internal NRRs; or as lying outside of the clause, in which case they introduce a new proposal.

Koev's proposal can be interpreted in two ways: on one interpretation, only *sentence-final* NRRs can have at-issue status; on another interpretation, all *clause-final* NRRs can. I believe the

author means the former, but in view of the arguments developed in Section 2 to show that NRRs can take narrow scope, the second interpretation seems to us to be preferable.

### 8.2.2 *Clause-final NRRs take narrow scope more easily*

While Koev focuses on at-issue status rather than scope, we suggest – following the spirit of his analysis – that clause-final NRRs take narrow scope more easily than clause-medial one. This can be established by considering our old subjunctive example, which simply becomes less acceptable when the NRR is clause-medial, as shown by the contrast between (101)b and (101)a:

(101) *Context*: There was an incident at school.

a. Imagine que Jean ait appelé ta mère, qui ait [alors] appelé son avocat.

*it's conceivable that Jean has-sub called his mother, who has-subj [then] called her lawyer.*

b. ??Imagine que ta mère, qui ait [alors] appelé son avocat, ait été appelée par Jean.

*imagine that your mother, who have-subj [then] called her lawyer, have-subj been called by Jean*

Importantly, similar (though possibly weaker) contrasts can be found when an anaphoric element (here: *then*) is included in a clausal parenthetical:

(102)a'. Jean a appelé ta mère (elle a alors appelé son avocat).

*Jean has called your mother (she has then called her lawyer)*

b'. ? Ta mère (elle a alors appelé son avocat) a été appelée par Jean.

*your mother (she has then called her lawyer) has been called by Jean*

A natural explanation for this similarity is that the supplement in (101) (with or without *alors* ['then']) must be anaphoric to the rest of the sentence. In the case of embedded NRRs, we claim that this is so because a discourse relation must be established between the NRR and the clause it attaches to. In the case of our parentheticals, this is forced by the presence of *alors*.

### 8.2.3 *The effect is gradient*

We believe that the facts are more subtle than Koev allows for: some NRRs can have at-issue status and/or be embedded without being clause-final. We saw numerous cases of embedded NRRs above. Here we want to add that the effect is gradient: clause-initial NRRs are harder to embed than clause-medial ones, and clause-final ones are usually easiest to embed (here we use clausal parentheticals with modals that require modal subordination as anaphoric elements; other anaphoric elements should be investigated in the future).

(103) *Context*: John has been courting Ann for some time now, but with only moderate success.

#### a. **Clause-final**

(i) If tomorrow John sent a 2 carat diamond to Ann, who got all excited as a result, he would have a better chance of marrying her.

(ii) \*If tomorrow John sent a 2 carat diamond to Ann (she got all excited as a result), he would have a better chance of marrying her.

(iii) If tomorrow John sent a 2 carat diamond to Ann (she would get all excited as a result), he would have a better chance of marrying her.

#### b. **Clause-medial**

(i) ok? If tomorrow John sent to Ann, who got all excited as a result, a 2 carat diamond, he would have a better chance of marrying her.

(ii) \*If tomorrow John sent to Ann (she got all excited as a result) a 2 carat diamond, he would have a better chance of marrying her.

(iii) ok? If tomorrow John sent to Ann (she would get all excited as a result) a 2 carat diamond, he would have a better chance of marrying her.

#### c. **Clause-initial**

(i) ?? If tomorrow Ann, who got all excited as a result, received a 2 carat diamond from John, he would have a better chance of marrying her.

(ii) ?? If tomorrow Ann (she got all excited as a result) received a 2 carat diamond from John, he would have a better chance of marrying her.

(iii) ok? If tomorrow Ann (she would get all excited as a result) received a 2 carat diamond from John, he would have a better chance of marrying her.

#### 8.2.4 *The availability of at-issue status is also gradient*

Koev didn't discuss embeddability, but was concerned with at-issue status. Here we believe that the same generalization holds: there is a gradient effect, and that clause-medial NRRs are intermediate in at-issue status between clause-initial and clause-final ones (we provide judgments for the A sentence alone, and for the B sentence as a response to A).

##### (104)a. **Clause-final**

A: ok John will send a 2 carat diamond to Ann, who is all excited about the prospect.

B: ok No she isn't – she hates John's diamonds!

Judgment about A alone:

##### b. **Clause-medial**

A: ok? John will send to Ann, who is all excited about the prospect, a 2 carat diamond.

B: ? No she isn't – she hates John's diamonds!

##### c. **Clause-initial**

A: ok Ann, who is all excited about the prospect, will receive a 2 carat diamond from John.

B: ?? No she isn't – she hates John's diamonds!

The same conclusion can be reached on the basis of the paradigm in (105) (here we just have judgments concerning the B sentences).

##### (105)a. **Clause-final**

A: The First Lady got introduced to Lance, who was at the White House.

B: ok No he wasn't; they met in a restaurant.

##### b. **Clause-medial**

A: Ann introduced Lance, who was at the White House, to the First Lady.

B: ? No he wasn't; they met in a restaurant.

##### c. **Clause-initial**

A: Lance, who was at the White House, got introduced to the First Lady.

B: ?? No he wasn't; they met in a restaurant.<sup>30</sup>

#### 8.2.5 *The role of linear order*

We conclude that Koev 2012 is right that linear order plays a role in the ability of NRRs to have at-issue status, and we believe that his insights extend to embedded NRRs. But the phenomenon seems to be gradient rather than categorical, and it seems to correlate with propositional anaphora resolution, as is expected if a condition for at-issue status and narrow scope is that the NRR can be linked by explicit or implicit discourse connectives to the clause it attaches to. This is a point we already argued for in the analysis of embedded NRRs, but it can be extended to at issue status as well. Specifically, we make the following assumptions:

–When a matrix NRR cannot be discourse-linked to the main clause, it is linked to the earlier discourse. It thus is semantically composed with the earlier discourse *before* the main clause is linked to the result. It is thus natural that the NRR should in this case pattern with the earlier

<sup>30</sup> Our informant disregarded an irrelevant reading on which *he wasn't* is interpreted as *he wasn't introduced to the First Lady*. On the intended reading, it means: *he wasn't at the White House*.

discourse rather than with the main clause. This is in a way a syntactic rendition of Koev's idea that NRRs that come 'early enough' modify the context set and are not at issue.

–When a matrix NRR can be connected to the main clause, at issue-status is a gradient matter, as we argued above.

## 9 Epistemic Status and Structural Iconicity

At this point, we have stipulated the principle of Translucency, which requires that it should be easy to accommodate a global context that makes the content of the NRR locally trivial, i.e. entailed by its local context. Can we derive this principle from more elementary assumptions? We would like to explore the idea that the special semantic/pragmatic status of NRRs is directly related to their special syntactic status: they are *syntactically parasitic* in the sense that they are added within fully fledged syntactic constituents that would be perfectly well-formed without them; and they are *semantically parasitic* in the sense that they constitute an add-on to meanings that would serve their main function without them. We will explore the view that this is a case in which an aspect of the semantics of an expression is understood to resemble (in a sense to be made precise) its form. This is an instance of what is traditionally called 'iconicity' – in the case at hand, structural iconicity. Iconic-like conditions have occasionally been posited for spoken language, for instance to explain why sequences of eventive sentences in discourse are often understood to make reference to successive events. But it is fair to say that such conditions have hardly played any role in the formal literature. However, when one investigates the semantics of sign languages, iconic conditions are ubiquitous, and it is thus of some interest to see whether they could be made to play a role in the analysis of spoken languages as well (see Schlenker et al. 2012 for a recent example).

We will attempt to make concrete the informal intuition that NRRs are construed as semantically parasitic because they are syntactically parasitic. This will lead to a refinement of our pragmatic analysis, which we will use to compare supplements to informative presuppositions.

### 9.1 *Eliminability Principle*

We will start with the intuition that parentheticals and NRRs have a form that suggests that there is a possibility that the speaker could have omitted without loss.

(106) 'x might have been syntactically eliminable'

If a speaker utters in a context C a sentence  $a x b$ , where  $x$  is an NRR or a parenthetical, he suggests that  $x$  might have been eliminated, in the sense that there is a context C' accessible from C in which  $a b$  produces the same (relevant) effect as  $a x b$ .

At this point we have just stated in a more complicated way the intuition that a sentence with an NRR or a parenthetical somehow evokes another sentence, namely the version obtained by removing the NRR or the parenthetical. Now we will take a semantic step and say under what conditions it is also that some material might have been semantically eliminated. Here we build on the notion of 'local triviality' as developed in various ways in Stalnaker 1978, in the tradition of dynamic semantics, and in recent reconstructions of it (Schlenker 2009, 2010): we take material to be semantically eliminable just in case it is entailed by its local context.

(107) 'x is semantically eliminable'

If a speaker utters a sentence  $a x b$  in a context C, and if  $x$  is of propositional or predicative type,  $x$  is semantically eliminable just in case the content of  $x$  is entailed by the local context in  $a x b$  given C.

Now we certainly don't want to suggest that parentheticals and NRRs are presented as being as semantically eliminable: this would make them pragmatically indistinguishable from presuppositions, which in standard dynamic accounts must follow from the local context in which they are triggered. On the otherhand, it does make sense to suggest that an NRR or parenthetical *might* have been eliminable, in the sense that there is an accessible context in which it is. So we need to modalize the notion in (107) as in (108):

(108) 'x might have been semantically eliminable'

If a speaker utters a sentence  $a x b$  in a context C, and if  $x$  is of propositional or predicative type,  $x$  might

have been semantically eliminable just in case there is a context  $C'$  accessible from  $C$  such that the content of  $x$  is entailed by the local context in  $a x b$  given  $C'$ .

Now we will propose a kind of iconic principle according to which material presented as being syntactically eliminable is semantically eliminable:

(109) If a speaker utters a sentence  $a x b$  in a context  $C$ , and if  $x$  is of propositional or predicative type, then if  $x$  might have been syntactically eliminable,  $x$  might have been semantically eliminable.

We thus predict the following pragmatic condition on NRRs and parentheticals:

(110) **Eliminability Principle**

If a speaker utters in a context  $C$  a sentence  $a x b$ , where  $x$  is an NRR or a parenthetical, he suggests that  $x$  might have been semantically eliminable, and hence that there is a context  $C'$  accessible from  $C$  such that the content of  $x$  is entailed by the local context in  $a x b$  given  $C'$ .

Importantly, in this analysis the notion of 'accommodation' does not play a direct role. We will now suggest that (a) context that can be accommodated count as accessible, but (b) there are contexts that count as accessible but are not easily accommodated.

## 9.2 Comparison with Informative Presuppositions

We assume that if in a context  $C$  a hypothesis  $p$  can be accommodated to satisfy a presupposition, then  $C^+ = C \cap p$  counts as an accessible context from  $C$ , which can justify the use of an NRR with content  $p$ . But sometimes a context  $C^+$  is accessible from a context  $C$  although there is no hypothesis  $p$  which can be easily accommodated to guarantee that  $C^+ = C \cap p$ .

It remains to say what a presupposition that can 'easily be accommodated' is. We will use the following definition:

(111) A presupposition is easy to accommodated if it can appear in an environment in which it must be informative to be acceptable.

Clearly, we cannot hope to show that *all* presuppositions can be transformed into good supplements, because the latter must obey a non-triviality condition, as was discussed in Section 5.1.2. But some presuppositions are systematically informative, and we will now suggest that they can always be turned into good supplements.

□ *An informative presupposition is a good supplement*

There are well-studied cases in which presuppositions are in fact informative (Stalnaker 2002, Fintel 2006). These turn out to have very much the same effect as NRRs, but for different reasons. Consider the following examples, where the presupposition is triggered by a possessive or definite description.<sup>31</sup>

- (112) a. Alfredo Emilio Koch started his 1,300-acre vineyard and winery in the 1950's and named it "La Juanita," honoring his New Yorker wife, Mary Jane Bergen.<sup>32</sup>  
 b. The stupid President will cause a disaster.  
 c. The fantastic President will take us out of this quagmire.

The surprising thing is that the descriptions (*New Yorker wife*, *stupid President*, *fantastic President*) contain adjectives that are redundant, in the sense that they do not affect the denotation of the descriptions (on the assumption that Koch has only one wife, and that there is only one salient president in the domain of discourse). It can be ascertained that in other cases such redundancy leads to some amount of deviance: (113)a and (114)a-b are all odd; (113)b is acceptable *if* it is not assumed that John may have two brothers (one blond, one not) – so that in this case the adjective *blond* does do semantic work after all.

<sup>31</sup> See Schlenker 2004, 2007 for discussion. Note that (112)b-c are felicitous even if there is only one salient President – say that of the US

<sup>32</sup><http://www.southernwines.com/vineyard.cfm?preview=162>

- (113) a. #John's blond father has arrived  
 b. John's blond brother has arrived (Ok if John has several brothers).
- (114) a. #The brown-haired president will cause a disaster.  
 (Ok if there are several presidents in the context, one of whom is brown-haired).  
 b. #The president from Texas will cause a disaster.  
 (Ok if there are several presidents in the context, one of whom is from Texas).

The reason for the deviance is not hard to find: a maxim of manner - *Be Brief* - usually enjoins one not to use words that could be eliminated without changing the semantic contribution of the sentence. In these cases, the denotation of the definite description is not affected by the presence of the modifier, and thus neither are the truth conditions.

So why are the examples in (112) acceptable? Presumably because the adjectives trigger an informative presupposition, i.e. a presupposition that can easily be accommodated – and is of interest to the conversation. In these very special cases, the mechanism of context update is similar to our analysis of supplements: starting from a context *C*, we modify it to *C*<sup>+</sup> (e.g. in the case of (112)a, the fact that the speaker presents himself as presupposing that his wife is a New Yorker is enough to add this proposition to *C*, yielding *C*<sup>+</sup>). As a result, these informative presuppositions are also ‘not at issue’: if the addressee said *No!* after one the examples in (112), we would typically understand him *not* to be denying the information contributed by the informative presupposition.

The first part our claim (‘if *C*<sup>+</sup> can be obtained from *C* via accommodation, *C*<sup>+</sup> is accessible from *C*’) predicts that informative presuppositions can always be transformed into good supplements. In (112), the transformation can indeed be effected:

- (115) a. Alfredo Emilio Koch started his 1,300-acre vineyard and winery in the 1950’s and named it “La Juanita,” honoring his wife, Mary Jane Bergen, who is from New York / a New Yorker.  
 b. The President, who is stupid, will cause a disaster.  
 c. The President, who is fantastic, will take us out of this quagmire.

More generally, we can test the claim by comparing complex demonstratives in which a modifier appears within the DP, or within an NRR that modifies it, as in (116):

- (116)a. Yesterday I met Mary. That wonderful lady told me that she would invite Peter.  
 b. Yesterday I met Mary. That lady, who is wonderful, told me that she would invite Peter.  
 a'. I invited Mary, and that wonderful lady came to my party.  
 b'. I invited Mary, and that lady, who is wonderful, came to my party.

In fact, the similarity between informative presuppositions and supplements is such that some authors have tried to treat the former in the terms of the latter (Umbach 2006). This caused some immediate difficulties for a compositional analysis, since the syntax of these modifiers seems to be that of simple adjectives that happen to be embedded within definite descriptions or complex demonstratives.

□ *Some good supplements do not make good presuppositions*

To illustrate the second part of our claim (‘some good supplements do not make good informative presuppositions’), we consider the paradigm in (117):

- (117) Uttered by someone close to the President:  
 a. I invited Obama to my party, and our President, who speaks Farsi, greatly impressed his interlocutors with his knowledge of foreign languages.  
 b. #?I invited Obama to my party, and our Farsi-speaking President greatly impressed his interlocutors with his knowledge of foreign languages.  
 a'. I invited Obama to my party, and our President, who speaks Indonesian, greatly impressed his interlocutors with his knowledge of foreign languages.  
 b'. I invited Obama to my party, and our Indonesian-speaking President greatly impressed his interlocutors with his knowledge of foreign languages.

Given world-knowledge, Obama's ability to speak Indonesian can easily be presupposed or accommodated, as shown by (117)b' (the information is unsurprising because it is generally known that he spent years in Indonesia as a child). By contrast, it would be news if Obama spoke Farsi; this

seems to be the kind of information that can be the object of a supplement, but not of a presupposition, even with the mechanism of accommodation.

Similar facts can be found in French; in (118), we rely on intonational breaks to distinguish between restrictive and non-restrictive relative clauses; the properties *who came with her husband* and *who is so nice* make good supplements, but only the latter also makes a good presupposition, as shown by the contrast between (118)b and (118)b'.

- (118)a. J'ai appelé Anne, et j'ai invité cette dame, qui est venue avec son mari.  
*I have called Anne, and I have invited this woman, who is come with her husband.*  
 'I called Anne, and I invited that lady, who came with her husband.'  
 b. #J'ai appelé Anne, et j'ai invité cette dame qui est venue avec son mari.  
*I have called Anne, and I have invited this woman who is come with her husband.*  
 'I called Anne, and I invited that lady that came with her husband.'  
 a'. J'ai appelé Anne, et j'ai invité cette dame, qui est si sympathique.  
*I have called Anne, and I have invited this woman, who is so nice*  
 'I called Anne, and I invited that lady, who is so nice.'  
 b'. ok? J'ai appelé Anne, et j'ai invité cette dame qui est si sympathique.  
*I have called Anne, and I have invited this woman who is so nice*  
 'I called Anne, and I invited that lady that is so nice.'

### 9.3 Asher's Recoverability Principle

We noted several times that NRRs are preferably attached to the matrix node. This does not follow from the present theory. Asher 2000 makes a proposal:

A fundamental principle seems to be that while the addition of parenthetical information can change the discourse context and even the veridical status of the attachment point, it cannot make the information in the attachment point unrecoverable.

In effect, one can think of Asher's principle as a rule of structural iconicity that applies to the main clause rather than to the supplement. Simply put, if the supplement is taken to be secondary, the content of the main clause shouldn't be affected too much when the NRR is disregarded. When the NRR is attached with matrix scope, the NRR can be assimilated to a separate sentence in discourse and for this reason the content of the main clause can be recovered without change when the NRR is disregarded. When the NRR has embedded scope, things are different: disregarding the NRR may radically change the truth conditions of the matrix clause. This intuition leads to the following preference principle:

#### (119) Recoverability Principle [1st version]

If possible, an NRR added to a sentence S should be attached in such a way that the meaning of the highest node of S is not affected when the NRR is disregarded (i.e. erased).

Concretely: consider again the trees in (41) and (42) above. In (41), the (embedded) NRR is attached to the embedded node 2, and as a result the meaning of the top node 1 is completely modified when the NRR is erased. By contrast, in (42) the (matrix) NRR is attached to the top node 1 itself, with the result that the meaning of that node is unaffected when the NRR is disregarded. Obviously this is just another way of stating a preference for matrix attachment over embedded attachment, but in terms that are related to those that we used in the analysis of the pragmatics of supplements: the contribution of the latter should easily be eliminable, as we saw before; and Asher's suggestion is that the content of the main clause should be recoverable.

As things stand, the Recoverability Principle in (119) fails to capture the three-way contrast we had announced in (3), since it only allows for matrix attachment, which has no provision for lower attachment under attitudinal operators.

(120) Preferences: highest attachment >> lower attachment – attitudinal >> lower attachment – non attitudinal

The revised principle in (121) encodes the intuition that the content of *some* speech or thought act should be recoverable when the NRR is deleted; but it leaves open whether this must necessarily be the actual speech act, and hence it leaves room for the special status of NRRs attached under attitude operators.

(121) **Recoverability Principle [2nd version]**

–If possible, an NRR added to a sentence S should be attached in such a way that the meaning of **some node S' corresponding to the content of an attitude** is not affected when the NRR is disregarded (it is preferable for the attitude in question to be the actual speech act).

Speakers that strongly apply the Recoverability Principle will have difficulty allowing for low attachment except in the immediate scope of attitude operators (we leave it open which attitudes count as appropriate). An example is given in (122). To our ear, both examples are rather acceptable; but for other speakers, (122)b (embedding under the speech act verb *write*) is far more acceptable than (122)a (embedding under *appear*). Different degrees of strength of the Recoverability Principle might conceivably account for these differences across speakers.

(122) *Context*: DSK is thought to be in discussions to settle the civil lawsuit against him. The speaker is talking to a journalist who claims to know how the procedure will unfold.

a. ok/# Est-ce qu'il apparaîtra mercredi prochain  
*Is-it that it will-appear Wednesday next*  
 'Will it appear next Wednesday

b. ok Est ce que tu écriras mercredi prochain  
*Is-it that it will-appear Wednesday next*  
 'Will you write next Wednesday

que DSK, qui a rencontré le juge la veille, a accepté de payer des dédommagements?  
*that DSK, who has met the judge the previous-day, has accepted to pay some damages?*  
 that DSK, who met with the judge the day before, agreed to pay damages?'

## 10 **Conclusion**

In his study of supplements and expressives, Potts 2005 uncovered an empirical domain of considerable subtlety and theoretical importance. His contention that NRRs (and expressives) motivate a multidimensional semantics was both important and exciting. We hope to have shown that the alternative picture we sketched here has both empirical and theoretical appeal.

–On an empirical level, it accounts for numerous cases of narrow and intermediate scope interpretation of NRRs, a phenomenon which is not properly handled by the multidimensional analysis as it stands; our analysis also makes predictions correlating various aspects of the syntax and semantics depending on the precise point of attachment of NRRs.

–On a theoretical level, we have kept the semantics simple and 'lean', but we have admittedly complicated the syntax. However we have done so with tools – the non-local attachment of NRRs – which seem to us to be hard to avoid when one considers the independent behavior of clausal parentheticals (NRRs differ from parentheticals in being able to be attached to any propositional node that dominates their surface position, not just to the matrix node; but the mechanism of non-local attachment seems to be needed in both cases). As for the peculiar pragmatic contribution of NRRs, we have sought to derive it from the idea that NRRs are syntactically parasitic and therefore semantically parasitic as well – an intuition we have implemented within an extension of the theory of presupposition theory. Since the latter was recently been argued to be derivable from a relatively simple – classical and non-dynamic – semantics (e.g. Schlenker 2008, 2009, 2010), the present analysis also contributes to the more general program of analyzing within a 'lean' semantics several phenomena that have been taken in recent years to argue for significant enrichments of the semanticist's toolbox.

While several points have been left open, the most pressing issue concerns the psycholinguistic investigation of the predictions we have made. Our analysis predicts subtle contrasts and correlations, but the means with which we have tested them are only appropriate as a first and very crude approximation; rigorous experimental methods are definitely called for to confirm or refute the main insights, in particular when it comes to (i) the point of attachment of various NRRs, and (ii) the projection patterns they give rise to.

### *Appendix I. Non-restrictive Relative Clauses vs. Nominal Appositives*

Nouwen 2010 seeks to explain two facts about nominal appositives (= NAs) (we assume the judgments Nouwen provides in his paper):

(i) They allow for narrow scope readings in cases in which NRRs don't, as in (123)-(124):

(123)a. If a professor, a famous one, publishes a book, he will make a lot of money.

≈ If a professor is famous and publishes a book, he will make a lot of money.

b. If a professor, who is famous, publishes a book, he will make a lot of money.

≠ If a professor is famous publishes a book, he will make a lot of money.

(124)It is not the case that a boxer, a famous one, lives in this street.

≈ It is not the case that any boxer is famous and lives in this street.

(ii) Still, nominal appositives don't allow for narrow scope readings when they attach to proper names (in this case there is no contrast between nominal appositives and NRRs).

(125)If Jake, a famous boxer, writes a book, he will make a lot of money.

≠ If Jake is a famous boxer and writes a book, he will make a lot of money.

(126)It is not the case that Jake, a famous boxer, lives in Utrecht.

≠ It is not the case that Jake is a famous boxer and lives in Utrecht.

His theory has the following structure:

1. As argued in the present piece for NRRs, nominal appositives (a) can attach to any propositional node that dominates them, and (b) they have a conjunctive semantics.
2. NRRs cannot attach at embedded levels.
3. There is a competition between matrix and embedded attachment:

(127)**Nouwen's NA attachment generalization**

A logical form in which an NA is attached in a high position blocks competing logical forms in which the NA is attached in a lower position.

Nouwen's theory has several virtues.

–First, it accounts for the contrast between nominal NRRs and nominal appositives in his narrow scope examples (since NRRs are taken not to give rise to narrow scope behavior).

–Second, it explains why narrow scope is possible when a nominal attaches to an indefinite but not when it attaches to a proper name: in the former case, if the indefinite has narrow scope, high attachment is semantically impossible, and hence by the competition principle narrow scope is *ipso facto* possible. When a nominal appositive attaches to a proper name, high attachment is always possible – and by the competition principle narrow scope attachment is predicted to be impossible.

–Third, Nouwen's analysis makes fine-grained predictions about the attachment of nominal appositives to definite descriptions: a narrow scope reading should be possible just in case the definite description has a non-referential reading. He argues that this prediction is correct: in (128)a, *this son* is not referential, and thus high attachment of the nominal appositive is impossible; we get the entailments in (128)b-c.

(128)a. If I ever get another son, I will call this son, my 5th one, Horatio.

b. If I ever get another son, I will call this son Horatio.

c. If I ever get another son, this son will be my 5th one.

Nouwen argues that because the nominal appositive has a presupposition-like semantics, its contribution projects in (129)a in the same way as in the presupposition example in (129)b:

(129)a. It is not the case that if I ever get another son, I will call this son, my 5th one, Horatio.

b. It is not the case that if I ever get another son, I will call this fifth son of mine Horatio.

We have a different take on these examples. In agreement with AnderBois et al. 2012, we believe that something quite special is going on with some nominal appositives whose NP-component entails the NP-component of the DP they attach to. This phenomenon, which we term

'corrective specification', exists in a variety of contexts besides apposition (AnderBois et al. 2012 explicitly analyze these as 'corrections' and mention partly similar data). Consider first the examples in (130), which do not involve any standard apposition.

- (130) Uttered by the person in charge of internships at a company (interns are usually high school students, undergraduates and graduate students).
- ok If I get a student – if I get a GOOD student – I'll be delighted.
  - ok? If I get a student – if I get an UNDERGRADUATE – I'll be delighted.
  - (#) If I get an undergraduate – if I get a GOOD student – I'll be delighted.
  - (#) If I get an undergraduate – if I get a NICE student – I'll be delighted.

The initial *if*-clause is repeated, but with a further specification, as in (130)a-b – hence the second *if*-clause entails the initial one: both *I have a good student* and *I have a graduate student* entail *I have a student*. By contrast, when this entailment fails, as in (130)c-d, the result is deviant – presumably because the speaker cannot be construed as further specifying the content of an earlier proposition.<sup>33</sup>

The paradigm in (130) can be replicated in French:

- (131) a. Si j'ai un étudiant – si j'ai un BON étudiant – je serai ravi.  
*If I have a student – if I have a GOOD student – I will-be delighted*  
 b. Si j'ai un étudiant – si j'ai un THESARD – je serai ravi.  
*If I have a student – if I have a PHD-STUDENT – I will-be delighted*  
 c. #Si j'ai un thésard – si j'ai un BON étudiant – je serai ravi.  
*If I have a PhD-student – if I have a GOOD student – I will-be delighted*  
 d. #Si j'ai un thésard – si j'ai un étudiant SYMPATHIQUE – je serai ravi.  
*If I have a PhD-student – if I have a student NICE – I will-be delighted*

The same generalization is at work in French in (132), where the clause starting with *and* can be interpreted as corrective only in case it entails the immediately preceding clause. The condition is satisfied in (132)a, b, c and violated in (132)d, e – which accounts for the contrast between them. Here <#> indicates that (132)c, d cannot be given a corrective reading; they can get a standard (additive) reading, on which one infers that the speakers works with at least two students.

- (132) Je travaille avec un thésard,  
*I work with a PhD-student*  
 a. et un BON.  
*and a GOOD*  
 b. ok? et un BON thésard  
*and a GOOD PhD-student*  
 c. ? et je travaille avec un BON thésard  
*and I work with a GOOD PhD-student*  
 d. <#> et un BON étudiant.  
*and a GOOD student*  
 e. <#> et je travaille avec un BON étudiant.  
*and I work with a GOOD student*

Without seeking to *analyze* corrective specification, we can describe it with the following generalization:

(133) **Interpretation of corrections**

If constituent *C'* is a correction of constituent *C*, interpret the string *a C C' b* as *a C' b*.

Importantly, the general availability of this mechanism immediately implies that some constructions that look very much like nominal appositives should be read as corrective specifications. Hence the examples in (134) could in principle be read as standard nominal appositives, or as corrective specifications:

<sup>33</sup> One informant marks (130)c-d as #; another notes that to the extent that they are accepted, they come with a special inference, namely that all undergraduates are good / nice students. Just as is the case in (130)a-b, when this inference is taken into account the original *if*-clause can be replaced with the parenthetical one; but the mechanism appears to be more complex than the one we discuss in the text.

- (134) J'ai un thésard,  
*I have a PhD-student*  
 a. un BON.  
*a GOOD*  
 b. ok? un BON thésard.  
*a GOOD PhD-student*  
 c. ?? un BON étudiant.  
*a GOOD student*

Now something is striking about Nouwen's examples: they all involve NPs that could be construed as corrective, since in each the NP component of the appositive entails that of the DP it attaches to. And when they are replaced with appositives that fail the entailment condition, the examples seem to become worse:

- (135) a. If a professor, a famous one, publishes a book, he will make a lot of money.  
 ≈ If a professor is famous and publishes a book, he will make a lot of money.  
 b. ?? If a professor, a famous writer, publishes a book, he will make a lot of money.  
 b'. ?? If a professor, a famous person, publishes a book, he will make a lot of money.

Finally, we believe that (128)a can be analyzed in terms of matrix attachment and modal subordination rather than in terms of embedded attachment. This is because (128), repeated as (136)a, has a good paraphrase in terms of a clausal parenthetical, as in (136)b.

- (136) a. If I ever get another son, I will call this son, my 5th one, Horatio.  
 b. If ever get another son, I will call this son (he will be my 5th one) Horatio.

As we argued before, clausal parentheticals only allow for matrix attachment. It is thus plausible that matrix attachment of the nominal appositive in (136)a yields the desired truth conditions once the mechanism of modal subordination is taken into account. We cannot exclude that low attachment is possible as well, but (136)a does not show it.

*Appendix II. Subject vs. Object Subjunctive NRRs in French*

There is a potential objection to our analysis of subjunctive NRRs in Section 2.2. Our argument was based on French subject relative clauses, which have well-known peculiarities.<sup>34</sup> In particular, they have ‘pseudo-relative uses’ when they appear under perception verbs, as in (137)a; the meaning obtained is one on which *him that left from the cinema* is interpreted as an English-style gerund with an eventive denotation (from Cinque 1995; see also Côté 1998).

- (137)a. Je l' ai vu qui sortait du cinema.  
*I him have seen that left from-the cinema*  
 ‘I saw him leaving the cinema.’
- b. \*Je l' ai vu que Marie embrassait.  
*I him have seen that Marie was-kissing*

While there is no reason to assume that the NRRs discussed in the text in (8) involve a similar construction, which is restricted to the scope of perception verbs, it is still useful to consider object relative clauses, as these do not display the same idiosyncracies as subject relative clauses, as shown in (137)b. Importantly, some object NRRs give rise to the very same pattern we saw with subject NRRs, as seen in (138).

- (138)a. Suppose que Jean ait épousé Anne  
*Suppose that Jean has-subj married Anne,*
- a. à qui il ait fait des enfants.  
*, to whom he has-subj given some children*  
 ≠> If Jean had married Anne, he would have fathered children with her.
- b. \* (il lui ait fait des enfants).  
*(he to-her has-subj given some children)*
- a'. qui lui aurait fait des enfants.  
*to-whom he would-have given some children.*  
 'who would have fathered children with her.'  
 => If Jean had married Anne, he would have fathered children with her.
- b'. (il lui aurait fait des enfants).  
*(he to-her would-have given some children*  
 '(he would have fathered children with her)'  
 => If Jean had married Anne, he would have fathered children with her.

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<sup>34</sup> A peculiarity we will not discuss involves the existential construction, which is of no relevance for our own examples. (i) gives an example from colloquium continental French; Côté 1998 discusses examples from Quebec French.

(i) Il y Jean qui est venu. (see Côté 1998)  
*It there Jean who is come*  
 ‘Jean came.’

### *Appendix III. Supplement projection under 'deny'*

In this Appendix, we replicate with *deny* the judgments obtained in Section 6.3 (with the same informant). Note that the context includes a line to the effect that 'all sorts of unfounded rumors are being spread all the time'; this is to block a potentially factive reading of *deny that* \_\_, one on which its complement is presupposed to be true. That this reading was successfully set aside is shown by the inferential judgments we obtained with simple conjunctions. The data concerning supplement projection are in (139)<sup>35</sup>, and presuppositional controls are in (140).

#### (139) **Embedding under *deny*: supplements**

*Context:* DSK is thought to be in discussions to settle the civil lawsuit against him. The speaker is talking to a journalist who has information about how the procedure will unfold. The journalist complains that all sorts of unfounded rumors are being spread all the time.

0. [Reversed context: the journalist is talking]

All sorts of unfounded rumors are being spread all the time. In fact, I will deny next Wednesday that DSK

- |  |    |   |
|--|----|---|
| a. , who met with the judge the day before,          | ok | 4 |
| b. (he met with the judge the day before)            | ?  |   |
| b'. (he will have met with the judge the day before) | ok | 5 |
| c. met with the judge the day before and             | ok | 1 |

agreed to a settlement.

*Inferential question:* Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?

1. All sorts of unfounded rumors are being spread all the time. Will you deny next Wednesday that DSK

- |  |    |   |
|--|----|---|
| a. , who met with the judge the day before,          | ok | 3 |
| b. (he met with the judge the day before)            | ?  |   |
| b'. (he will have met with the judge the day before) | ok | 5 |
| c. met with the judge the day before and             | ok | 2 |

agreed to a settlement?

*Inferential question:* Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?

2. [Reversed context: the journalist is talking]

All sorts of unfounded rumors are being spread all the time. I might be in a position to deny next Wednesday that DSK

- |  |    |   |
|--|----|---|
| a. , who met with the judge the day before,          | ok | 4 |
| b. (he met with the judge the day before)            | ?  |   |
| b'. (he will have met with the judge the day before) | ok | 5 |
| c. met with the judge the day before and             | ok | 1 |

agreed to a settlement.

Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?

3. All sorts of unfounded rumors are being spread all the time. If the big event takes place on Tuesday, will you deny next Wednesday that DSK

- |   |    |          |           |
|---|----|----------|-----------|
| a. , who met with the judge the day before, | ok | (i)<br>1 | (ii)<br>4 |
|---|----|----------|-----------|

---

<sup>35</sup> Note that we omitted to test embedding under negation because *deny* is itself negative, which would have lead to complications.

b. (he met with the judge the day before)	?		
b'. (he will have met with the judge the day before)	ok	3	5
c. met with the judge the day before and	ok?	1	1

agreed to a settlement?

*Inferential questions:* Do these sentences imply/suggest that:

(i) DSK will meet with the judge next Tuesday?

(ii) if the big event takes place on Tuesday, DSK will meet with the judge on that same day?

**(140) Embedding under *deny*: presuppositions**

0. [Reversed context: the journalist is talking]

All sorts of unfounded rumors are being spread all the time. In fact, I will deny next Wednesday that during DSK's meeting with the judge the day before, he agreed to a settlement. ok 5

*Inferential question:* Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?

1. All sorts of unfounded rumors are being spread all the time. Will you deny next Wednesday that during DSK's meeting with the judge the day before, he agreed to a settlement? ok 5

*Inferential question:* Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?

2. [Reversed context: the journalist is talking]

All sorts of unfounded rumors are being spread all the time. I might be in a position to deny next Wednesday<sup>36</sup> that during DSK's meeting with the judge the day before, he agreed to a settlement. ok 4

*Inferential question:* Do these sentences imply/suggest that DSK will meet with the judge next Tuesday?

3. All sorts of unfounded rumors are being spread all the time. If the big event takes place on Tuesday, will you deny next Wednesday that during DSK's meeting with the judge the day before, he agreed to a settlement?

	(i)	(ii)
ok	2	5

*Inferential question:* Do these sentences imply/suggest that:

(i) DSK will meet with the judge next Tuesday?

(ii) if the big event takes place on Tuesday, DSK will meet with the judge on that same day?

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<sup>36</sup> The informant found the position of 'next Wednesday' a little suboptimal.

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