Intermediate Scope Readings as Embedded Speech Acts [*]

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Abstract

In this paper we explain the variation in availability of (exceptionally wide) *intermediate scope readings* (ISRs). We argue that ISRs have to be kept apart from functional readings and provide a formal analysis of ISRs. Our approach is based on the assumption that exceptional wide scope readings are the effect of interpreting the involved indefinite as aboutness topic, where the introduction of an aboutness topic is analyzed as a distinct speech act, similar to an act of referring. We adopt this view and show that intermediate scope readings only occur in the presence of certain topic-comment embedding operators.

1 Introduction

Nowadays the observation that indefinites can take exceptional wide scope out of scope islands is well-known. In example (1) from (Ruys, 1999) the indefinite *three relatives of mine* can take *exceptionally wide* scope outside the *if*-clause-island, yielding a reading roughly paraphrasable as *there are three relatives of mine and if all of them die, I will inherit a fortune.*

(1) *If three relatives of mine die I will inherit a fortune.*   [IF $\succ$ 3] [3 $\succ$ IF]

If indefinites can escape scope-islands and take scope wherever they please, one would expect to see them take *intermediate scope*, i.e. scope outside a scope-island but yet below other scope-taking operators. However, this does not seem to be the case, as

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(Fodor and Sag, 1982) argue. They provide (2) as an example where the indefinite *a student* cannot take exceptional wide scope outside the *if*-clause-island but below *every professor* (b) , although it can take (exceptional) widest scope (c).

(2) *If a student in the syntax class cheats on the exam, every professor will be fired.*

    a. [∀ professor ≻ IF ≻ ∃ student] narrow scope   available
    b. [∀ professor ≻ ∃ student ≻ IF] (exceptional) intermediate scope   unavailable
    c. [∃ student ≻ ∀ professor ≻ IF] (exceptional) widest scope   available

This observation led Fodor and Sag (1982) to propose that indefinites are ambiguous between a quantificational and a referential reading, thus accounting for the observed narrow scope and widest scope reading, respectively. This proposal also makes the prediction that intermediate scope readings are unavailable in general, a view to which Fodor and Sag (1982) subscribe.

However, sometimes intermediate scope readings (ISRs) *are* available. In the following example from (Ruys, 1992) the indefinite contains a bound pronoun such that a widest scope reading is unavailable for binding reasons. But more crucially, this bound pronoun seems to make an intermediate scope reading available.

(3) *Every professor$_i$ will rejoice if a student of his$_i$ cheats on the exam.*

Indeed this observation has led some researchers to conclude that the presence of an overt or covert bound pronoun is the decisive indicator for an intermediate scope reading (cf. Matthewson, 1999; Schwarzschild, 2002). But there are yet examples which show that intermediate scope readings are also available in cases where the indefinite does not contain such a bound pronoun. The following is a case in point from (Kratzer, 1998). (4) also has an intermediate scope (*de re*) reading stating that for everyone of them there is a doctor from the hospital such that he suspected that this doctor is a quack.

(4) *Everyone of them suspected that some (actual) doctor from the hospital was a quack.*

In conclusion, Fodor & Sag's claim that intermediate scope readings do not exist in general has to be dimissed (cf. e.g. Farkas, 1981; Ruys, 1992; Abusch, 1994; Kratzer, 1998, and many others). But then again, it is not the case that ISRs do exist in general as Fodor & Sag's seminal (2) shows. Even if the intermediate scope reading is contextually preferred it seems to be unavailable in certain cases, rendering sentences pragmatically odd:

(5) *(Last week, I went to a horse-race every day. It was curious:)*
    $^{\#}$*All horses won all races that took place on some day.*

    [∀ horse ≻ ∀ race ≻ ∃ day]   narrow scope   contextually excluded
    [∀ horse ≻ ∃ day ≻ ∀ race]   intermediate scope   unavailable
    [∃ day ≻ ∀ horse ≻ ∀ race]   widest scope   contextually excluded

In (5), the narrow scope and the widest scope reading of the indefinite *some day* is contextually excluded. As every competition usually yields only one winner it is implausible that all horses won all races, whether they happen on some day or other (narrow scope

reading) or at some specific day (widest scope reading). The only sensible reading would be the ISR, paraphrasable as *for each horse there was one day such that this horse won all races on that day*. However, this reading does not seem to be available in the case of (5) resulting in the observed oddity.

The most pressing question raised by these data is obviously: what exactly is it, that is responsible for the (un)availability of ISRs? In this paper we provide an answer to this question that recurs to the information structural notion of *topicality*. We follow Ebert and Endriss (2004) and Endriss (to appear) who propose a formal interpretation of the notion of *aboutness topicality* (Reinhart, 1981) for clauses structured into topic-comment which separates the establishment of the topic from the predication of the comment. Crucially, topic establishment is prior to the predication of the comment thus resulting in a (possibly exceptional) wide scope reading of the topical constituent w.r.t. all operators included in the comment. We extend this approach and show that ISRs may arise if such a topic-comment structured clause occurs embedded within some operator. Hence ISRs are predicted to be unavailable if no such embedding operator is present, which we will show to be borne out.

We start with a careful inspection of the data in Section 2 and argue that it is crucial to keep genuine ISR apart from wide scope *functional* readings. After a brief exposition of the approach of Ebert and Endriss (2004) and Endriss (to appear) our own formal approach follows in Section 3. We conclude with a brief discussion on the nature of speech act embedding operators in Section 4.

2   Intermediate Scope vs. Functional Wide Scope

We will first take a closer look at data that illustrate important differences between genuine intermediate scope readings and functional wide scope readings. In order to elucidate the respective readings, we will investigate possible continuations of a given scope-ambiguous sentence.

The inspection of continuation possibilities has been used in various other contexts in order to elucidate and differentiate functional and pair-list readings, for instance with questions (Groenendijk and Stokhof, 1984; Krifka, 2001) and functional relative clauses (Sharvit, 1997). The following example is taken from (Krifka, 2001).

(6) *Which dish did every guest make?*
    a. *Pasta.*
    b. *His favourite dish.*
    c. *Al, the pasta; Bill, the salad; . . .*

(7) *Which dish did most/few guests make?*
    a. *Pasta.*
    b. *Their favourite dish.*
    c. *# Al, the pasta; Bill, the salad; . . .*

In (6) both a functional (b) as well as a pair-list answer (c) are possible (in addition to an individual answer). This is different from (7), where a pair-list answer is inappropriate, while a functional (and individual) answer is still fine. Hence pair-list answers are more restricted than functional answers and must be distinguished from the latter.

The proposal to use this method to distinguish different readings induced by quantifier scope variation has first been proposed by (Groenendijk and Stokhof, 1984) and employed in (Endriss, to appear; Ebert and Endriss, 2006). We will use this method in the following to tease apart functional readings and genuine intermediate scope readings.

Each sentence in the following pair contains the same three DPs with the indefinite *some lecturer* occurring in an *if*-clause-island. The decisive difference is the presence of the CP-embedding verb *announce* in (8b).

(8) a. *Every student will leave the party if some lecturer shows up.*
     b. *Every student <u>announced</u> that she will leave the party if some lecturer shows up.*

Accordingly, we observe differences concerning the acceptability of different continuations. Whereas the statement of an individual and the statement of a functional dependence yields a felicitous discourse in both cases, an enumeration of student-lecturer pairs is acceptable only subsequent to (8b).

(9) Continuation	OK after (8a)?	OK after (8b)?
Namely, Prof. Humpty (statement of individual)	yes	yes
Namely, her supervisor (statement of functional dependence)	yes	yes
For Ann its Prof. Hob, for Mary Prof. Nob, … (pair list)	**no**	yes

We take it that these three different types of continuations correspond to different scope readings of the indefinite *some student*. The statement of an individual helps to elucidate the widest scope reading, the statement of a functional dependence a *functional wide scope reading*, and the enumeration of pairs a genuine intermediate scope reading. Hence we conclude from (9) that both sentences in (8) allow for a widest scope/functional wide scope reading, while only (8b) allows for a genuine ISR.

That functional wide scope readings and genuine ISRs are truth-conditionally independent can be illustrated with examples including non-monotonic quantifiers like the following variant of (8b) (cf. Chierchia, 2001; Schwarz, 2001; Endriss, to appear)

(10) *Exactly two students announced that they will leave the party if some lecturer shows up.*

Both a function statement as well as a pair-list enumeration are acceptable continuations for (10). The functional wide scope reading and the genuine intermediate scope reading are given schematically in (a) and (b), respectively.

(11) a. $\exists f_{\rightarrow \text{lecturer}}[|\lambda x[\text{student}(x) \wedge \text{announce}(x, \text{shows\_up}(f(x)) \rightarrow \text{leave}(x)]| = 2]$

There is a function into lecturers such that the number of students who announced that they leave if the functionally corresponding lecturer shows up is 2.

b. $|\lambda x[\text{student}(x) \wedge \exists y[\text{lecturer}(y) \wedge \text{announce}(x, \text{shows\_up}(y) \rightarrow \text{leave}(x)]]| = 2$

The number of students such that there is a lecturer such that the students announced that they leave if this lecturer shows up is 2.

These two readings differ in truth conditions. Suppose Ann, Bob, and Chris are students who announced to leave the party if Mr. Annson, Mr. Bobson, and Mr. Chrisson shows up, respectively. Furthermore, Mr. Annson and Mr. Bobson happen to be the respective supervisors of Ann and Bob, but Mr. Chrisson is just some lecturer Chris despises. In this situation the functional wide scope reading in (11a) is true: there is a function of the required kind, namely the one assigning the supervisor to each student. However, the ISR in (11b) is false: the overall number of students who made announcements with regards to respective lecturers is not two, but three.

We conclude that functional wide scope readings and ISRs must be kept apart and hence must be analyzed differently. While in the case of the former an indefinite is interpreted as a function that takes widest scope, an ISR must be analyzed such that the indefinite genuinely takes intermediate scope between two other scope operators. We argue in (Ebert and Endriss, 2006) that functional wide scope readings exist whenever an ordinary wide scope reading exists and the indefinite can plausibly be reinterpreted as a function, for instance due to the presence of a pronoun or some inherent relational meaning as in the case of nouns like *relative*, *teacher*. Genuine ISRs on the other hand are much more restricted as examples like (8a) illustrate.

In the following we will not go into any more detail on functional wide scope readings, but refer the reader to (Ebert and Endriss, 2006) where they are discussed in depth. Instead we will focus on intermediate scope readings and the aspects that restrict their occurrence.

3   Intermediate Scope Readings via Embedded Topics

We base our proposal for the derivation of intermediate scope readings on (Ebert and Endriss, 2004; Endriss, to appear), where the information structural notion of *aboutness topicality* is the decisive aspect for the existence of *exceptional* wide scope readings, i.e. scope readings where it seems that scope islands are not respected.

3.1   Embedded Topics

In fact, the observation that topical indefinites receive a wide scope/specific/referential interpretation has been made at various places before (cf. Firbas, 1966; Cresti, 1995, and many others). (Ebert and Endriss, 2004; Endriss, to appear) understand topics as sentence topics in the *aboutness* sense of (Reinhart, 1981). According to Reinhart's view (which goes back to Hockett 1958), topics constitute what the sentence is about. They refer to an *individual/'storage address'* associated with the information conveyed by the sentence.

Topic-marking, i.e. designation of a constituent as topic subdivides a clause into topic and

comment. This division is captured formally with a *structured meaning* representation (cf. Dahl, 1974; Krifka, 1992), i.e. a pair of semantic representations such that the first and second component reflect the semantic contributions of the topic and the comment, respectively. The rules for the compositional derivation of these structures are defined in a way such that the semantics of the comment can be applied to the semantics of the topic at any stage, resulting in the 'standard' compositional semantics of the respective constituent. We note topic-comment structures in the following form (see (Krifka, 1992) for details on the formal definition and compositional derivation of such structures).

(12) $\qquad\qquad\qquad\qquad [\varphi]_{\text{Topic}} \; [\lambda x[\psi(x)]]_{\text{Comment}}$

(Endriss, to appear) assumes that topic-comment structured clauses are always embedded under some operator. In the 'standard' case, where the topic-comment structure exhausts the entire matrix clause, this embedding operator is a silent speech act operator such as ASSERT (Jacobs, 1984) for instance. Crucially, topics can also occur embedded. This case can occur if the sentence contains subordinate clauses that are themselves structured into topic and comment. Take for instance a CP complement verb such as *announce* in

(13) *Peter announced that John will marry Sue.*

If we take the three DPs as candidates for topic marking, there are various possibilities. First, in the 'standard' case, either DP might be the topic of the entire utterance or, more precisely, the speech act. For instance if *John* constitutes the topical constituent in this way, the entire speech act would be an assertion about John, about whom it is asserted that Peter announced that he will marry Sue. This is reflected in the structured meaning representation that we derive for the assertion of (13).

(14) $\qquad$ $\text{ASSERT}\big([\text{john}]_{\text{Topic}}[\lambda x[\text{announce}(\text{peter}, \text{marry}(x, \text{sue}))]]_{\text{Comment}}\big)$

Second, each DP of the embedded CP (i.e. *John* and *Sue*) might be the topic of the embedded clause. If *John* constitutes the topical constituent in this way, the 'aboutness' of John would not concern the speech act but the announcement. The entire utterance is then interpreted as an assertion stating that Peter makes an *announcement about John*, namely that he will marry Sue.

(15) $\qquad$ $\text{ASSERT}\big(\text{announce}(\text{peter}, [\text{john}]_{\text{Topic}}[\lambda x[\text{marry}(x, \text{sue})]]_{\text{Comment}})\big)$

Obviously, not every CP complement verb allows for such an aboutness interpretation and hence for topic-comment structured complements. We will discuss the class of verbs that do allow such structured complements in Section 4. But in the presence of a suitable CP embedding semantic operator (such as *announce*) we are confronted with one of the following situations, depending on the exact form of the topic-comment structure.

(16)   a. $\text{SpeechActOperator}([\ldots]_{\text{Topic}}[\ldots \text{SemanticOperator}(\ldots)\ldots]_{\text{Comment}})$

    b. $\text{SpeechActOperator}(\ldots \text{SemanticOperator}([\ldots]_{\text{Topic}}[\ldots]_{\text{Comment}})\ldots)$

The schema in (16a) corresponds to (14), where the topic-marked constituent contributes the 'outermost' topic of the entire speech act, i.e. the object the speech act is about. The schema in (16b) on the other hand corresponds to (15), where the topic-marked constituent contributes the 'embedded' topic of a clausal argument of some semantic operator, i.e. the object the semantic contribution of this operator is about.

In the following section we formalize the notion of aboutness topicality and put forth a general topic interpretation scheme that details how topic-comment structures are interpreted w.r.t. their embedding operators. Crucially, this general scheme will eventually derive widest scope readings of the topical constituent for structures of the form (16a) and intermediate scope readings for structures of the form (16b). Hence, we predict that the presence of a suitable topic-comment structure embedding semantic operator such as *announce* is crucial for the derivation of intermediate scope readings.

This approach is similar in spirit to the proposal of Kratzer (1998). In her view, genuine intermediate scope readings (which need to be distinguished from functional wide scope readings, as Kratzer also concedes) constitute *de re* readings in the context of attitude verbs (such as *suspect*), which come with an additional *res* argument. Furthermore she assumes that some indefinites come with existence presuppositions, which can be accommodated into the res argument of the attitude verb if the indefinite occurs in the scope of such a verb. Hence, the availability of ISRs hinges on the presence of a corresponding attitude verb.

3.2   Topic Interpretation

(Ebert and Endriss, 2004; Endriss, to appear) propose to formalize the concept of *'storage address'* in Reinhart's aboutness metaphor by a *discourse referent* in the semantic representation which is used further in predication of the information in the comment. They assume that all DPs (including indefinites) denote generalized quantifiers following Kadmon (1985) w.r.t. to the lexical quantifier semantics. For instance, the semantic contribution of the indefinite DP *three lecturers* would be the following.

(17) $[\![three\ lecturers]\!] = \lambda Q.\exists X[\,|X| = 3 \land X \subseteq \mathsf{lecturer} \cap Q\,]$

As a generalized quantifier does not *per se* provide a reasonable storage address, i.e. a discourse referent, such a discourse referent must be created for a suitable representative of the generalized quantifier, if the respective quantified DP is marked for topicality. A *minimal witness set* of the quantifier is such a suitable representative (cf. Szabolcsi, 1997). Minimal witness sets as defined in (Barwise and Cooper, 1981) are those sets of a GQ that, roughly speaking, contain no 'unnecessary' elements. The set of such minimal witness sets of a GQ G can be defined as follows:

(18) $\mathsf{MinWit}(G) =_{\mathrm{def}} \{\,X : G(X) \land \forall Y[G(Y) \to \neg(Y \subset X)]\,\}$

For instance, $\mathsf{MinWit}([\![three\ lecturers]\!])$ comprises all sets that consist of exactly three lecturers.

(19) $\mathsf{MinWit}([\![three\ lecturers]\!]) = \{\,X \subseteq \mathsf{lecturer} : |X| = 3\}$

According to this view of the aboutness concept, the basic interpretation scheme for a topic-comment structure $[G]_{\text{Topic}} [\lambda\mathcal{G}[\psi(\mathcal{G})]]_{\text{Comment}}$ is formally spelled out in two steps, where we make crucial use of a *dynamic* construal of the involved quantifiers and logical connectives along the lines of e.g. (Groenendijk and Stokhof, 1991).

1. A new discourse referent (i.e. 'storage address') for a minimal witness set representative of the topic G is introduced.

   (20) $\exists X[X \in \mathsf{MinWit}(G)]$

2. This representative stands proxy for G in the application of the comment. Hence the comment is interpreted as a predicate that applies to (the representative of) the topic:

   (21) $\psi(X)$

   where the type mismatch of X (of set type) with the argument $\mathcal{G}$ of ψ (of generalized quantifier type) is resolved by a distributive type lift of X to $\lambda P[X \subseteq P]$.

The *Topic Interpretation Scheme* relates these two steps to the operator which embeds the topic-comment structure as explained above. It reflects the natural order that is suggested by the aboutness concept: first, the object which the sentence is about is established, and *then* the sentence conveys further information about this object. That is to say that the establishment of the topic is assumed to happen *before* the predication of the comment. In formal terms, the introduction of the discourse referent (20) happens *outside* of the topic-comment structure embedding operator, while the predication of the comment (21) stays inside.

(22) **Topic Interpretation Scheme:**

   If $[G]_{\text{Topic}}[\lambda\mathcal{G}[\psi(\mathcal{G})]]_{\text{Comment}}$ is a topic-comment structure and $\mathcal{O}$ is the embedding operator, then
   $$\mathcal{O}\big([G]_{\text{Topic}}[\lambda\mathcal{G}[\psi(\mathcal{G})]]_{\text{Comment}}\big)$$
   is interpreted as
   $$\exists X[X \in \mathsf{MinWit}(G)] \wedge \mathcal{O}\big(\psi(X)\big)$$

In cases the topic is the 'outermost' topic of the matrix clause (as exemplified by the schema in (16) and instantiated by (14)), a speech act operator plays the role of $\mathcal{O}$ in the Topic Interpretation Scheme (22). Applying the interpretation scheme straightforwardly would yield the following result

(23) $\exists X[X \in \mathsf{MinWit}(G)] \wedge \mathsf{SpeechActOperator}\big(\psi(X)\big)$

This representation is not very sensible as such, as it consists of a conjunction of semantic material (the existential quantification of a new discourse referent for the witness representative) with material on the speech act level. Therefore we re-interpret the first part as a separate *speech act of topic establishment* very similar to an act of *referring* (cf. Searle, 1969) or *frame setting* (cf. Jacobs, 1984) (with the additional introduction of a

new discourse referent). We write $\mathsf{REF}_X(G)$ for this speech act and take it to mean that the speaker establishes an aboutness topic for a subsequent speech act by introducing a new discourse referent X for a minimal witness set of G. With this re-interpretation (23) becomes

$$(24) \qquad\qquad \mathsf{REF}_X(G) \quad \& \quad \mathsf{SpeechActOperator}\big(\psi(X)\big)$$

where we write $\&$ for speech act conjunction, i.e. consecutive performance of speech acts. Performance of these two consecutive acts leads to the following consecutive update of the common ground, where $c + \varphi$ indicates the update of the common ground c with φ.

$$(25) \qquad c \quad + \quad \exists X[X \in \mathsf{MinWit}(G)] \quad + \quad \text{effects of } \mathsf{SpeechActOperator}\big(\psi(X)\big)$$

Note that due to the initial topic establishment, the topic G in effect takes scope over any other scope-taking element in the comment ψ. This is the crucial feature that allows for the derivation of exceptional wide scope readings of indefinites. Consider (1) again, repeated here as (26), where the indefinite occurs in a scope island.

(26) *If [three relatives of mine]$_T$ die I will inherit a fortune.*

If this assertion is about the *three relatives of mine* mentioned in the antecedent (i.e. if the topic is marked as indicated) the structured meaning representation would be as follows (where we simplify exposition by not fully spelling out the formal representation here and in the following).

(27) $\mathsf{ASSERT}\big(\big[\, [\![\textit{three relatives of mine}]\!]\,\big]_{\text{Topic}}\big[\,\lambda\mathcal{G}.\mathcal{G}[\lambda y.\mathsf{die}(y)] \to \mathsf{inherit}(I)\,\big]_{\text{Comment}}\big)$

According to the Topic Interpretation Scheme (22) this representation would be interpreted by the two consecutive acts in (29).

$$(28) \qquad \mathsf{REF}_X([\![\textit{three relatives of mine}]\!]) \quad \& \quad \mathsf{ASSERT}(X \subseteq \mathsf{die} \to \mathsf{inherit}(I))$$

If we simplify matters somewhat and assume that the common ground update effect of an assertion is simply the addition of the asserted proposition to the common ground, the final common ground update of these two acts is as follows:

$$(29) \qquad c \quad + \quad \exists X[|X| = 3 \wedge X \subseteq \mathsf{rel\_of\_mine}] \quad + \quad (X \subseteq \mathsf{die} \to \mathsf{inherit}(\mathsf{speaker}))$$

This corresponds to the exceptional wide scope reading of the indefinite *three relatives of mine* in (26). The common ground is updated with the information that there is a set of three relatives of the speaker such that she inherits a fortune if they die altogether. Note that in order for this reading to emerge, it is crucial that the indefinite constitutes the aboutness topic of the sentence. If it was not, the approach would predict only local scope variation confined to scope-islands as usual. Exceptional wide scope emerges if and only if the respective indefinite is interpreted as topic in the way detailed above.

3.3   Intermediate Scope Readings

In order to show the semantic effect of interpretation of embedded topic-comment structures, we recur to (8) again.

(30)   a. *Every student will leave the party if some lecturer shows up.*

      b. *Every student <u>announced</u> that she will leave the party if some lecturer shows up.*

Both sentences contain the indefinite *some lecturer* as part of an *if*-clause-island, but only (30b) contains the CP embedding verb *announce*.

Consider an assertion of (30b). As mentioned before, the only possibility for an exceptional wide scope interpretation of *some lecturer* lies in its status as aboutness topic and hence we assume that it is marked as such. Depending on whether the corresponding topic-comment structure exhausts the entire sentence or only the embedded CP, a representation of an assertion of (30b) patterns with the schemata (16a) and (16b), respectively.

Suppose first that the indefinite is the matrix level topic and hence the topic-comment structure exhausts the entire sentence (illustrated as follows where the comment is underlined for clarity):

(31) *<u>Every student announced that she will leave the party if</u> [some lecturer]$_T$ <u>shows up</u>.*

In this case, the topic-comment structure representation is an instance of the schema in (16a).

(32) $\mathsf{ASSERT}\Big(\big[\, [\![\textit{some lecturer}]\!] \,\big]_{\text{Topic}}$

$\qquad\qquad \big[\lambda \mathcal{G}[\forall x[\mathsf{student}(x) \to \mathsf{announce}(x, \mathcal{G}(\mathsf{show\_up}) \to \mathsf{leave}(x))]]\big]_{\text{Comment}}\Big)$

The Topic Interpretation Scheme derives the following interpretation.

(33) $\mathsf{REF}_X\big([\![\textit{some lecturer}]\!]\big)$

$\qquad\qquad \&\ \mathsf{ASSERT}\big(\forall x[\mathsf{student}(x) \to \mathsf{announce}(x, X \subseteq \mathsf{show\_up} \to \mathsf{leave}(x))]\big)$

The eventual common ground update illustrates that this is the exceptional widest scope reading for the indefinite: there is a certain lecturer such that every student announced that he leaves if this lecturer shows up.

(34) c $+$ $\exists X[|X| = 1\ \wedge\ X \subseteq \mathsf{lecturer}]$

$\qquad\quad + \quad \forall x\big[\mathsf{student}(x) \to \mathsf{announced}\big(x, X \subseteq \mathsf{show\_up} \to \mathsf{leave}(x)\big)\big]$

The derivation of this widest scope reading is not any different from the derivation illustrated in (26) – the indefinite functions as the 'outermost' topic of a matrix level topic-comment structure.

The more interesting case of (30b) occurs when the topic-comment structure is 'embedded' under the CP complement verb *announce*.

(35) *Every student* $\boxed{\textit{announced}}$ *<u>that she will leave the party if</u> [some lecturer]$_T$ <u>shows up</u>.*

In this case, the structured representation instantiates (16b): the topic-comment structure is embedded under the semantic operator announce.

(36) $\mathsf{ASSERT}\big(\forall x\big[\mathsf{student}(x) \rightarrow$
$\mathsf{announced}\big(x, \big[\,[\![\textit{some lecturer}]\!]\,\big]_{\mathrm{Topic}} \big[\,\lambda\mathcal{G}[\mathcal{G}(\mathsf{show\_up}) \rightarrow \mathsf{leave}(x)]\,\big]_{\mathrm{Comment}}\big)\big]\big)$

The Topic Interpretation Scheme in (22) applies again in the same way as before, but now the crucial operator $\mathcal{O}$ is the semantic operator announce instead of the speech act operator ASSERT as in the former cases. Hence, the establishment of the topic, i.e. the introduction of the discourse referent for a witness set representative, is not reinterpreted as a separate speech act but enters into the semantics proper.

(37) $\mathsf{ASSERT}\big(\forall x\big[\mathsf{student}(x) \rightarrow$
$\exists X[X \in \mathsf{MinWit}([\![\textit{some lecturer}]\!])] \wedge \mathsf{announced}\big(x, X \subseteq \mathsf{show\_up} \rightarrow \mathsf{leave}(x))\big]\big)$

In the final common ground update the asserted information is added to the common ground yielding

$c + \forall x\big[\mathsf{student}(x) \rightarrow \exists X[|X| = 1 \wedge X \subseteq \mathsf{lecturer}] \wedge \mathsf{announced}\big(x, X \subseteq \mathsf{show\_up} \rightarrow \mathsf{leave}(x))\big]$

This is the genuine intermediate scope reading for the indefinite in (30b): for every student there is a (potentially different) lecturer such that this student has announced that she will leave the party if that lecturer shows up.

In contrast, consider (30a) and assume again that the indefinite *some lecturer* is marked for topicality. In this case, there is no choice as to how exactly the sentence may be structured into topic and comment. As it does not contain any CP complement verb and hence no topic-comment structure embedding operator, the only option is for the topic-comment structure to exhaust the entire sentence. Hence the topic interpretation runs entirely parallel to the corresponding interpretation (32)–(34) of matrix level topic for (30b). The eventual common ground update again amounts to an exceptional widest scope reading for the indefinite: there is a certain lecturer such that every student will leave if this lecturer shows up.

(38) $c + \exists X[|X| = 1 \wedge X \subseteq \mathsf{lecturer}] + \forall x\big[\mathsf{student}(x) \rightarrow X \subseteq \mathsf{show\_up} \rightarrow \mathsf{leave}(x)\big]$

Crucially, this is the only exceptional/island-free scope reading of the indefinite. In particular, there is no way to derive an intermediate scope reading due to the lack of any topic-comment embedding operator. This explains the contrast we observed in (9), where an intermediate scope reading was elicited by a viable pair-list continuation for (30a) but not for (30b).

The absence of a topic-comment embedding operator also accounts for the oddity of (5)

(39) #*All horses won all races that took place on a some day.*

As discussed in (5), this sentence lacks an intermediate scope readings despite its pragmatic preference for such a reading.

An ISR does become available in the presence of a topic-comment embedding operator such as *reported*:

(40) *Of all horses it was* $\boxed{\text{reported}}$ *that they (had) won all races that took place on some day.*

Again, the availability of the ISR can be elicited by a pair list continuation of (40), which is impossible subsequent to (5).

(41) *Fury was the winner on Monday, Seabiscuit on Tuesday, ...*

Assuming that the indefinite *some day* is topic-marked, our approach derives a genuine intermediate scope reading if the corresponding topic-comment structure occurs embedded under *reported*: For each horse, there was some day such that it was reported that it had won all races that happened on that day.

In conclusion, genuine intermediate scope readings are only available in the presence of a topic-comment embedding operator. Hence we predict the following scope patterns:

no topic marking	→	local scope variation
topic marking at matrix level	→	(exceptional) wide scope
	→	(exceptional) functional wide scope (cf. Ebert and Endriss, 2006)
embedded topic marking	→	genuine intermediate scope

The data we presented in Section 1 confirm these predictions. The seminal example (2) of Fodor & Sag lacks an ISR due to the absence of any topic-comment embedding operator. For the same reason, (3) lacks a genuine ISR but has a very prominent *functional* wide scope reading due to the presence of the overt pronoun that could be easily mistaken for an ISR. And finally, (4) has a genuine ISR because of the presence of the topic-comment embedding operator *suspect*. Currently Cieschinger et al. (in preparation) are undertaking experimental studies which aim at further empirical verification of these predictions.

4   Topic-Comment Structure Embedding Operators

At this point, it is of obvious interest to know what kind of operators allow for embedding of topic-comment structures and what they have in common. We will only briefly discuss data from Japanese and German here and refer the reader to (Ebert et al., to appear) for more detail on these issues.

In Japanese some verbs allow for overt topical *wa*-marked *within their CP complements* (Kuroda, 2005).

(42)   a. John wa Mori-san wa Toyota no syain   de aru to   omotte-iru.
          John WA Mori-san WA Toyota of employee be   that think-be

          'John believes that Mori-san is an employee of Toyota.'

       b. John wa Mori-san wa Toyota no hira-syain   de aru koto o zannen ni
          John WA Mori-san WA Toyota of flat-employee be   that   regret

              omotte-iru.
              think-be

              'John regrets that Mori-san is a mere employee of Toyota.'

As is known, *wa*-marking may indicate topicality or contrastivity. Kuroda (2005) observes that (42b) only has a contrastive interpretation whereas in (42a) no such contrastive interpretation is enforced and concludes that (42a) but not (42b) constitutes a case of embedded topic-marking.

In German, *dass* complement clauses standardly occur in verb final word order.

(43)   Mia glaubt/vermutet/kündigt an/berichtet/bedauert, dass Pit nach Hause **geht**.
       Mia believes/suspects/announces/reports/regrets   that Pit to   home goes.

      'Mia believes/suspects/announces/reports/regrets that Pit is going home.'

However, some verbs allow for V2 clauses in the same position, while others do not (see Truckenbrodt, 2006, and citations therein).

(44)   Mia glaubt/vermutet/kündigt an/berichtet/*bedauert, Pit **geht** nach Hause.
       Mia believes/suspects/announces/reports/regrets   Pit goes to   home.

      'Mia believes/suspects/announces/reports/regrets that Pit is going home.'

Comparing the two verbs *believe* vs. *regret*, we see that the former allows for both embedded topical *wa*-marking and V2 embedding while the latter allows for neither. Preliminary questionnaire studies show that also other verbs such as *say* and *want* pattern with *believe* and *regret*, respectively[1]. Interestingly, the difference between *believe/regret* is also observable w.r.t. intermediate scope readings.

(45) a.   *Every pupil believes that the outing will be called off if one teacher falls ill.*
     b.   *Every pupil regrets that the outing will be called off if one teacher falls ill.*

While a pair list continuation is possible for (45a) it is impossible for (45b). Hence, a genuine ISR is available for (45a), but not for (45b). Our conjecture at this point is that verbs that allow for embedded topical *wa*-marking in Japanese, verbs that allow for V2 complement clauses, and verbs that allow for intermediate scope readings form the same class.

It has been noted at several places that predicates that embed V2 show some resemblance to *assertions*. For instance, Gärtner (2002) argues that embedded V2 clauses have *assertive proto-force*. We conclude tentatively that the assertive character is the decisive feature for ISRs to arise. Assertions can be structured into topic (the object the assertion is about) and comment. Since V2 complements are assertive in character, they are likely candidates for embedded topic-comment structures and hence the verbs allowing for V2 complements are likely candidates for topic-comment embedding operators. The possible underlying generalization for topic interpretation could then be as follows.

        Topics take scope over the (proto-)assertion they are embedded in.

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[1]We are grateful to Yurie Hara, Shinichiro Ishihara, and Kimiko Nakanishi for their help.

If this assertion is the outermost speech act operator, a widest scope reading of the topic arises. If the assertion is embedded, a genuine ISR arises. And if the sentence contains no V2-complement verb that could possibly embed an assertion, an ISR is unavailable.

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