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I discuss the relation between information structure and truth conditional semantics, concentrating on the question of whether there is any direct interaction between the various information structural dimensions and operators such as quantified DPs and quantificational adverbs. Concerning the focus-background dimension, we will see that in most cases truth conditional effects do not result from direct focus sensitivity of the involved

operators, but rather come about as indirect effects of the need to resolve a free variable

that is present in the denotation of these operators on the basis of contextual information –

with the notable exception of exclusives such as only. Concerning the topic-comment

30 *dimension, in cases where a quantificational DP functions as the aboutness topic of a*

sentence, the need to interpret the comment as a predicate that can be applied to the topic

has truth conditional effects in the presence of either another quantificational DP, a

quantificational adverb or generic tense. In cases where a quantificational DP is marked as

a contrastive topic, on the other hand, truth conditional effects come about indirectly.

35 *Finally, concerning the given-new dimension, there is also no evidence for a direct influence*

on the truth conditions of sentences, but only for indirect effects.

40 1.   Introduction

The term *information structure* is meant to capture the different dimensions at which

linguistic messages can be structured in accordance with requirements imposed by the

linguistic and extralinguistic context as well as the communicative intentions of the speaker.

At the first level, (the meanings of) sentences can be decomposed into *topic* and *comment*,

45 where the term *topic* according to the most widely held view (but see below) intuitively

stands for the entity about which the rest of the sentence – the comment – is felt to convey

information. At the second level, sentences can be decomposed into *focus* and *background*,

where the term *focus* intuitively stands for that part of the sentence that conveys the

information the speaker wishes to represent as most prominent and onto which s/he wants to

50 draw the hearer's attention. Finally, at the third level the distinction between *given* (i.e.

already mentioned explicitly or implicitly) and *new* information applies. It is important to

keep these levels apart, i.e. it is not necessarily the case that topics are given, while foci are

new, or that the topic coincides with the background, while the focus coincides with the comment, although simple examples like (1b) seem to suggest this:

55   (1) a. Tell me something about John.

           b. John married BERTHA.

In the case of (1b), the subject noun phrase *John* is given, and furthermore has been made the aboutness topic (see below) by the preceding utterance (1a). On the other hand, the verb phrase *married Bertha* is not only new, but also focal, which is indicated by the main stress

60 on the object noun phrase *Bertha* (see below). In addition to that, since *topic-comment* as well as *focus-background* are complementary notions, the background consists of the noun phrase *John*, while the comment consists of the verb phrase *married Bertha*. We thus have a perfect coincidence of topic, given information and background, on the one hand, and focus, new information and comment, on the other. However, one only needs to change the context

65 in which the sentence in (1b) is uttered as minimally as shown in (2a) to see that this coincidence does not hold necessarily:

    (2) a. Tell me something about John. Who did he marry?

           b. John married BERTHA.

Now, while *John* is still both given and topical, the focus does not coincide with the

70 comment anymore: the focus consists only of the object noun phrase *Bertha*, but the whole VP *married Bertha* makes up the comment. Similarly, the topic neither coincides with the background nor with the given information anymore, since both consist not only of the subject noun phrase *John*, but also contain the verb *married*. Below, we will even see cases where topics introduce novel information, and where given items are focussed. Traditionally,

75 truth conditional semantics is not concerned with differences of the kind exemplified by the contrast between (1) and (2): (1b)/(2b) denotes the same proposition, independently of whether it is uttered in a context like (1a) or (2a), and the same generally holds for sentences that (only) differ overtly with respect to which item has been marked as topical/focal/given

etc. Therefore, information structure is usually seen as belonging to the realm of pragmatics,

80 since it only seems to be concerned with the question of *how* something is said (cf. Chafe

1976, who coined the term *information packaging* to capture this fact), but not *what* is said.

We will see, however, that there are many cases where information structure and truth

conditional content cannot be separated so neatly, and where it actually makes a difference

to truth conditions whether an item is topical/focal or not. As we will see below, however,

85 this does not necessarily mean that there is a direct interaction between the semantic and the

pragmatic component of the language faculty. Rather, the observed truth conditional effects

may also be interpreted as resulting from the combination of the following facts: first, some

operators are semantically underspecified in the sense of containing free variables that need

to be resolved on the basis of contextual information. Second, the information structure of a

90 sentence encodes certain properties of the context in which the sentence is uttered. It is thus

only natural that information structural distinctions like the one between focus and

background or the one between topic and comment are made use of to resolve the respective

variables.

95 2.   Focus and background

At an intuitive, pre-theoretical level, the focus of a sentence is that part which represents the

information the speaker considers most important and to which s/he accordingly wants to

draw the hearer's attention. In languages such as English and German and many others,

focus is indicated by stress: the part of the sentence that is focussed must contain the syllable

100 onto which the main stress falls. The exact conditions governing the decision of which word

in a complex constituent must contain the syllable carrying the main accent are often

assumed to be taken care of by rules of *focus projection* (Selkirk 1984). Such rules account

for the fact that in many cases one and the same accent pattern can either indicate narrow

focus on the word containing the syllable that receives highest stress, or wide focus on some

105 larger constituent containing that word. The contrast between (1b) and (2b) above is a case in

point, where main stress on the first syllable of the proper name *Bertha* may either indicate

that it is just the object noun phrase that is focussed, or the whole VP. Note, however, that

phonological focus marking is by no means universal: there are languages such as Hungarian

where focus is marked by dedicated syntactic positions, and others (many African tone

110 languages such as Buli, Guruntum and Bole are cases in point) where morphological means

are chosen.

According to a very common and classical view, which goes back to Paul (1880) and was

taken up by Halliday (1967), and which we already employed in our discussion of (2) above,

the focus of a sentence is identified with that part of a sentence that replaces the *wh*-part of a

115 constituent question. Accordingly, the request in (1a) ensured that in (1b) the whole VP was

focussed, while the question in (2a) ensured that in (2b) only the object NP *Bertha* was

focussed.

In truth conditional semantics it is commonly assumed, following Hamblin (1973), that a

question denotes the set of its possible congruent answers, i.e. a question such as *What about*

120 *John*? denotes the set {[[John married Bertha]], [[John went to the movies yesterday]], [[John

won the Nobel prize in literature]], ... }, while a question such as *Who did John marry*?

denotes the set {[[John married Bertha]], [[John married Paula]], [[John married Jane]], ...}.

Rooth (1985, 1992) now developed a formal theory of focus interpretation that employs the

same formal object in order to model the denotation of focussed constituents. Simplifying

125 somewhat, Rooth assumes that the semantic effect of focus-marking is the introduction of a

(contextually restricted) set of alternatives to the (denotation of the) respective constituent,

where the alternative set always includes the original denotation of the focus-marked

constituent. These alternatives are then composed with the rest of the clause in pointwise

fashion, resulting in a set of propositions which only differ from each other with respect to

130 the chosen alternative. This set is called the *focus semantic value* (in addition to the *ordinary*

semantic value) of the respective sentence. Accordingly, the focus semantic value (indicated by the superscript *F*, while the subscript *F* indicated focus marking) of the focussed constituent in (1b) is the set in (3a), while the focus semantic value of the whole sentence is the set in (3b). (4a, b) gives the same two objects for (2b).

135   (3) a. $[[\text{married Bertha}]]^F = \{\lambda x.\lambda s.\ married(x, Bertha)(s),$

$\lambda x.\lambda s.\ went\_to\_the\_movies(x)(s),$

$\lambda x.\lambda s.\ won(x, Nobel\ prize)(s), ... \}$

   b. $[[\text{John } [_F \text{married Bertha}]]]^F = \{\lambda s.\ married(John, Bertha)(s),$

$\lambda s.\ went\_to\_the\_movies(John)(s),$

140                    $\lambda s.\ won(John, Nobel\ prize)(s), ... \}$

   (4) a. $[[\text{Bertha}]]^F = \{Bertha, Paula, Jane, ...\}$

   b. $[[\text{John married } [_F \text{Bertha}]]]^F = \{\lambda s.\ married(John, Bertha)(s),$

$\lambda s.\ married(John, Paula)(s),$

$\lambda s.\ married(John, Jane)(s), ... \}$

145 The set in (3b) is identical to the denotation of the question in (1a), while the set in (4b) is identical to the question denotation in (2a). The theory of Rooth (1985, 1992) can thus account for the observed correspondence between the *wh*-parts of questions and focus-marking in a natural and elegant way by requiring the focus semantic value of a sentence to be a superset of the respective question denotation. In cases such as (5a, b), where this

150 requirement is not met, infelicity ensues:

   (5) a. Who did John marry?

   b. #John MARRIED Bertha.

The problem with (5a, b) is that while the question in (5a) denotes the already familiar set {[[John married Bertha]], [[John married Paula]], [[John married Jane]], ...}, the answer in (5b)

155 denotes the set {[[John married Bertha]], [[John kissed Bertha]], [[John talked to Bertha]], ...},

which is clearly not a superset of the first set. Crucially for our purposes, however, while (5b) is pragmatically infelicitous as an answer to (5a), its truth conditions, which correspond to the ordinary semantic value of the sentence, do not differ from the truth conditions of the congruent answer *John married BERTHA*. In other words, the alternatives introduced by the

160 focus do not play any role at the level of truth conditions. Note that it is not even clear what pragmatic function they have in such cases since the plausible function of highlighting the part of the respective answer that provides the requested information does not seem to require the introduction of alternatives in any obvious way (but see Krifka 2008, who speculates that question-answer congruence might help the hearer to accommodate the

165 meaning of implicit questions). An alternative account, according to which focus does not introduce alternatives, but rather triggers the presupposition that there exists an entity of the same type as the focus-marked expression (Geurts & van der Sandt 2004), can explain the observed necessity of question-answer congruence in the following way: in the case of (2), for example, the presupposition triggered by the focus-marking in (2b) matches the

170 presupposition of the question in (2a), namely that John married somebody. In the case of (5), in contrast, this is not the case: while the question presupposes that John married somebody, the answer presupposes that John stands in some relation to Bertha. The problem with cases such as (5) would thus be that the immediate context does not satisfy the presupposition triggered by focus-marking.

175 In cases other than information focus, however, the pragmatic role of the alternatives introduced via focus-marking is more obvious, although they still do not influence the truth conditions: in both (6b) and (6c), the implicit introduction of the alternatives to the asserted proposition allows the speaker to express her conviction that among these alternatives the asserted proposition is the only one that is true. This leads to a *corrective* interpretation in

180 the first case, and to a *confirmative* interpretation in the second case:

    (6) a. John married Bertha.

b. (No,) John married [_F Jane].

c. (Yes,) John married [_F Bertha].

In section 5 we will discuss cases where the alternatives introduced via focus-marking play a

185 role at the level of the truth-conditions. But let us first turn to the second important

dimension, the one where sentences are decomposed into topic and comment.

3.   Topic and comment

Aboutness topics

190 As already said in the introduction, according to the most popular view today, which goes

back to ideas formulated in different terms by Gabelentz (1869) and Paul (1880), and was

brought to the fore in modern linguistic thinking by Reinhart (1982), the topic of a sentence

is the part about whose denotation the rest of the sentence – the comment – is intuitively felt

to convey information. In the case of (1b) above, for example, the topic status of the entity

195 referred to by the proper name *John* was made explicit by the preceding (1a). Often,

however, this is not the case, and there is nevertheless a clear intuition as to which part of a

given sentence is to be taken as the topic. As already noted by Hockett (1958), in the default

case the topic coincides with the grammatical subject. This, however, does not have to be the

case, as shown by the contrast between (7a) and (7b):

200   (7) a. Peter finished his new paper yesterday.

b. The telephone is ringing.

While (7a) is naturally understood as conveying information about Peter, (7b) is not felt to

convey information about some salient telephone, even though the DP *the telephone* is the

grammatical subject in (7b). Rather, (7b) is most naturally understood as describing a

205 particular spatiotemporal region or situation. The intuition that in sentences such as (7b)

neither the grammatical subject nor any other overt constituent is the topic can be accounted

for in two ways: either these sentences are analyzed as topicless or antitopical (Jacobs 2001),

or they are analyzed as being about the respective salient spatiotemporal region/situation (Cohen & Erteshik-Shir 2002).

210 Furthermore, in many languages such as German, Japanese, Hungarian and Korean there exist explicit morphological and syntactic means to unambiguously mark a constituent as the topic of a sentence, and there is no requirement for the constituent marked as the topic to be the grammatical subject. The sentence in (8), which exemplifies *German Left Dislocation* (henceforth:GLD), is a case in point:

215 (8) (Den) Peter, den hab ich lange nicht gesehen.

the-acc RP-SING.MASC.ACC have I long not seen

'I haven't seen Peter for a long time'.

GLD, whose first systematic description in modern terms is found in Altmann (1981), is characterized by the following configuration: a constituent that occupies the left-peripheral

220 position of the respective sentence co-occurs with a resumptive pronoun in clause-initial position with which it agrees in case-, number-, and gender-features. According to Frey (2004), German left-dislocated phrases which are not understood contrastively (see below) are necessarily interpreted as topics. This is evidenced by the fact that (8) is fine as an answer to a question like *What about Peter?* or a command like *Tell me something about*

225 *Peter*, while it is odd as an answer to a question like *Who haven't you seen for a long time?*, at least if it is not read with an intonational break after the fronted noun phrase and a strong accent on the resumptive pronoun. We can thus conclude that in (8), it is the left-dislocated object noun phrase *Peter* that is the aboutness topic of the sentence, not the subject noun phrase *ich*. Because of the prevalence of examples with proper names, definite descriptions

230 and pronouns in the literature on topics, many linguists subscribe to the view that topics are necessarily at least weakly familiar, i.e. the existence of the respective entity must at least be inferable from the context/general world knowledge (cf. Hockett 1958; Kuno 1972; Gundel 1988; Portner & Yabushita 1998). It has, however, been observed by Reinhart (1982; see

also Molnar 1993 and Frey 2000, 2004) that familiarity cannot be a defining property of

235 topics since not only individual-denoting noun phrases can be sentence topics, but also

indefinite DPs (while other quantificational DPs are excluded from topic positions; more on

this below), as shown by (9).

(9) Einem		Freund von	Peter, dem		hat
a/one-DAT.SING.MASC		friend of	RP-NOM.SING.MASC		has

240 Angela Merkel gestern die Hand gegeben.

                      yesterday the hand given.

'Angela Merkel yesterday shook the hand of a friend of Peter'.

Note that in all examples discussed so far, topic-marking only serves the pragmatic function

of structuring the information conveyed by the respective sentence in a certain way, while it

245 does not have any influence on the truth conditions: the variants given in (10), where np

special topic marking devices are employed and where (the entities denoted by) *his new*

paper, *I* and *Angela Merkel* therefore are the default topics because of subjecthood, are true

under exactly the same conditions as (7a), (8) and (9), respectively.

(10) a. His new paper was finished by Peter yesterday.

250   b. Ich habe (den) Peter lange nicht gesehen.

        'I haven't seen Peter for a long time'.

       c. Angela Merkel hat gestern einem Freund von Peter die Hand geschüttelt.

        'Angela Merkel yesterday shook the hand of a friend of Peter'.

In addition to that, there are cases such as (11) where (the denotation of) a constituent that

255 can plausibly be analysed as the topic stands only in a loose, underspecified relation to the

proposition denoted by the rest of the sentence, and which have accordingly been classified

as involving *hanging topics*:

(11)   Concerning Schoenberg, I like *Moses und Aron*.

In section 6, we will discuss examples where topichood clearly has an effect on the truth

260   conditions. But let us first go into a little more detail about the alleged pragmatic effect of

topicality in examples like the ones discussed so far. According to Reinhart's (1982) very

influential account – whose basic understanding of topichood goes back to Strawson (1964)

– the topic corresponds to the address where the proposition denoted by the respective

sentence is stored. Accordingly, Reinhart adopts a view of the *common ground* (CG), i.e. of

265   the mutually shared knowledge of speaker and hearer, that is slightly more articulated than

Stalnaker's (1974, 1979) in the following sense: According to Stalnaker, the CG just consists

of a set of propositions whose intersection gives the set of worlds that are compatible with

everything that both speaker and hearer(s) know. Reinhart (1982), in contrast, assumes that

these propositions are stored under particular addresses which she conceives of as mental

270   files, i.e. an assertion of (8) results in the proposition that the speaker has not seen Peter in a

long time being added to the address where information concerning the individual *Peter* is

stored. This basic idea has been developed in different directions by Vallduvi (1992),

Lambrecht (1994), and Portner & Yabushita (1998), who propose a model-theoretic re-

definition of the concept of a file where information is stored.

275

Frame-setting topics

The example in (12) is not easily captured by the notion of aboutness topicality introduced in

the last section: it does not make much sense to conceive of the proposition that Maria is

doing well as being added to a file where information about heath is stored. Rather, the

280   fronted adverb *gesundheitlich* ('healthwise') specifies the way in which the predicate *gut*

gehen (be fine) is to be understood.

    (12) Gesundheitlich geht es   Maria gut.

        healthwise   goes expl.   well.

        'Healthwise, Maria is fine'.

285 Nevertheless, researchers such as Chafe (1976) and many others have argued that the fronted

constituents in examples of this type should be analyzed as topics, which is further

confirmed by the observation that in languages such as Japanese where topics are marked

morphologically, the corresponding constituents are marked as such. Jacobs (2001) therefore

argues for a view according to which there is not one unified definition of topicality, but

290   rather a cluster of distinct, but nevertheless related properties that together define the field of

topic-comment structures: informational separation (of the topical constituent from the rest

of the sentence), predication (i.e. the comment is interpreted as a predicate that applies to the

topic), addressation (which corresponds to aboutness), and frame-setting. Crucially, a

constituent does not have to satisfy all of these properties to count as a topic, but only a

295   substantive subset thereof, and Jacobs accordingly analyses various topic-marking

constructions in German as being specified for different combinations. Jacobs defines frame-

setting in informal terms as in (13) (Jacobs 2001: 656):

(13)   In (X Y), X is the *frame* for Y iff X specifies a domain of (possible) reality to

which the proposition expressed by Y is restricted.

300   Jacobs claims that in contrast to aboutness topicality, frame-setting topicality always has a

direct influence on the truth conditions, since "the comment does not hold regardless of the

topic, but only within the domain specified by the topic" (Jacobs 2001: 656). Here, Jacobs in

my view confuses two different aspects, however: it is surely correct that marking a

constituent as the aboutness topic in many cases does not have an influence on the truth

305   conditions, either because the proposition denoted by the sentence remains the same

regardless of which constituent is marked as the aboutness topic (examples (7a) and (8-10)),

or because the aboutness topic stands only in an underspecified relevance relation to the

respective proposition (example (11)). Concentrating on the latter case, it may seem that

there is a general difference in the influence on truth conditions between frame-setting

310   topicality and aboutness topicality, because dropping the hanging topic would not alter the

truth conditions of the proposition functioning as the comment in examples like (11), while it

would in examples like (12). This, however, only shows that the denotation of the topical

adverb directly contributes to the meaning of the proposition – just as the meanings of the

respective topical constituents in (7a) and (8-10) do. Its topic status as such does not alter the

315   truth conditions, however. After all, the truth conditions of (14), where the adverb

gesundheitlich ('healthwise') remains in clause-internal position, do not differ from the truth

conditions of (12):

(14)   Maria geht es gesundheitlich gut.

'Healthwise, Maria is fine'.

320   There is, however, another aspect in which (12) and (14) differ, which we glossed over so

far: in contrast to (14), (12) is intuitively contrasted with alternative propositions where

gesundheitlich has been replaced with other framesetters like *finanziell* ('financially'), while

gut has been replaced with other evaluative adverbs like *schlecht* ('bad') (cf. Krifka 2008:

46). Furthermore, observe that examples such as (12) are most natural if they are read with a

325   rising accent on *gesundheitlich* in combination with a falling accent (which signals focus-

marking) on *gut*. As we will see in the following section, this combination is characteristic of

contrastive topics. We therefore have another option to analyse examples such as (14):

namely as not instantiating a special kind of topicality (namely frame-setting topicality), but

as exemplifying ordinary contrastive topicality, with a frame-setting adverb as the

330   contrastive topic. Consequently, frame-setting would be entirely independent of topicality.

Contrastive topics

As mentioned above, contrastive topics, which have been discussed extensively by Büring

(1997a, 1999) and Jacobs (1997), are marked by a characteristic intonation pattern in

335   German (cf. Jackendoff's 1972 discussion of the "B-accent" in English): a rising accent on

the fronted constituent, which functions as the contrastive topic, is combined with a falling

accent on some sentence-internal constituent, which is thus marked as focal. A typical

example is given in (15):

(15)   /SCHOENberg   MAG\ ich   (während ich Berg und Webern hasse).

340   like   I

’Schoenberg, I like (while I hate Berg and Webern)’.

(15) is automatically understood as being implicitly contrasted with sentences involving

alternatives to Schoenberg, and since the other two composers of the second Viennese

School, Alban Berg and Anton Webern, are natural choices, the continuation in brackets

345 would be entirely natural. Now, the introduction of alternatives via intonational prominence

is certainly reminiscent of focus marking, so one might ask why examples such as (15) are

not simply analysed as involving two instances of focus-marking. There are mainly two

reasons why this cannot be correct: first, in sentences like (16b), which clearly contain two

focussed items (see section 2 above), both are marked by a falling accent:

350   (16) a. Peter   hat   gestern   auf der Party Maria geküsst (habe ich gehört).

has   yesterday   at the party   kissed have I   heard

’Yesterday at the party, Peter kissed Maria (so I have heard)’.

b. Nein, PAUL\ hat ClauDINE\ geküsst.

no   has   kissed

355   ’No, Paul kissed Claudine’.

Second, in contrast to double focus, contrastive topicality in an answer to a question clearly

indicates non-completeness, as can be shown by the contrast between (17b) and (17c): (17b)

can only be understood as a partial answer, and therefore requires an interpretation of (17a)

as a pair-list question. (17c), on the other hand, is naturally understood as an exhaustive

360 answer, and thus requires (17a) to be understood as a single-pair question.

(17) a. Who kissed whom?

b. /PAUL hat ClauDINE\ geküsst.

c. PAUL\ hat ClauDINE\ geküsst.

'Paul kissed Claudine'.

365 From this we can conclude that the alternatives introduced via contrastive topic-marking differ from the ones introduced by focus-marking insofar as they indicate non-completeness, i.e. contrastive topic-marking is only appropriate if there are other relevant propositions that are true in the respective context, and that differ from the one asserted in both the constituent marked as the contrastive topic and the one marked as the focus. Consequently, (17b) would

370 not only be inappropriate if nobody kissed anyone else, but also if Paul kissed other people. According to the very influential theory of Büring (1997a, 1999), contrastive topic marking similarly to focus marking results in the introduction of a set of alternatives to the (denotation of the) respective constituent, the so-called *topic semantic value*. The crucial difference between focus and topic semantic value is that the respective alternatives are

375 structured in a different way: the double focus in (17c) introduces a set like the one in (18a), while the combination of contrastive topic- and focus marking in (17b) introduces a set (of sets) like the one in (18b):

(18) a. {[[Paul kissed Claudine]], [[Peter kissed Maria]], [[Eva kissed Maria]], ... }

b. {{[[Paul kissed Claudine]], [[Paul kissed Maria]], ...}, {[[Peter kissed Maria]],

380 [[Peter kissed Martina]], ...}, {[[Eva kissed Claudine]], [[Eva kissed Maria]], ...},

...}

Thus, while (18a) simply lists all possible kisser-kissee combinations, (18b) is structured in a more complex way: for each possible kisser, the set of all possible kissees is listed. In other words, (18a) contains the set of all possible answers to (17a), i.e. the denotation of the

385 question in (17a). (18b), in contrast, contains the set of all answers to a set of sub-questions of the form *Who did Paul kiss*?, *Who did Peter kiss*?, *Who did Maria kiss?*, i.e. the denotations of the respective sub-questions. Consequently, the above mentioned contrast between (17b) and (17c) can be interpreted as follows: (17b) is understood as picking out the unique true proposition from the set in (18a), while (17c) is only understood as picking out

390   the unique true proposition from the first sub-set in (18b), giving rise to the expectation that

the same will be done for the other sub-sets. The feeling of incompleteness that contrastive

topic- in contrast to focus-marking – triggers can thus be explained in pragmatic terms along

the following lines (Büring 2003: 9): since contrastive-topic marking generates a set of sub-

questions, and since one of these sub-questions is already answered by the ordinary semantic

395   value of the respective sentence, the principle of Informativity (Atlas & Levinson 1981)

ensures that the hearer can assume the answers to the other sub-questions to differ with

respect to the focus-marked constituent. Otherwise, i.e. if in a case like (17b) above someone

besides Paul (say Peter) had kissed Claudine as well, the speaker should have said *Paul and*

Peter kissed Claudine instead of (17b).

400   The theory just sketched informally, according to which contrastive topic marking generates

a set of sets of propositions (i.e. a set of questions), while focus marking simply generates a

set propositions (i.e. a question), gives us a plausible and elegant account of the discourse-

pragmatic effects of contrastive topicality, and in section 6 we will see that it can also

account for some observed truth-conditional effects. However, it leaves open the question of

405   what contrastive topicality has to do with other kinds of topicality, especially with aboutness

topicality (recall from section 3.2 that there are reasons to doubt the existence of frame

setting topicality as a distinct kind of topicality). Concerning the empirical basis of grouping

aboutness topics and contrastive topics together, the following observations speak in favour

of such a classification: first, languages like Japanese use the same device to mark

410   contrastive-topics and aboutness topic – namely the particle *wa*, and also in German

contrastive topicality is at least compatible with GLD (but see below for a qualification).

Second, just like aboutness topics, contrastive topics tend to be fronted (in German, for

example, this is almost obligatory, while English is more liberal in this respect and allows

foci to precede contrastive topics (see Jackendoff 1972). Third, we have seen above that

415   questions of the form *What about X?* serve to explicitly mark the constituent *X* as the

aboutness topic of the sentence answering the respective question. As shown in (19), sentences containing contrastive topics can be used as partial answers to such questions:

(19) a. Who did the girls talk to at the party yesterday?

    b. /MarIa hat mit PAUL\ geredet.

420   'Maria talked to Paul'.

Consequently, one could make the following assumption: the object created via contrastive topic marking – the topic semantic value – always consists of propositions each of which contains a partial aboutness topic, i.e. a part of the complex object denoted by the respective (complete) aboutness topic. The special accent pattern indicating contrastive topicality

425 would then simply result from the respective partial aboutness topic being contrasted with the other partial aboutness topics, which requires focus marking (cf. Krifka 1998). This proposal works well in many cases, since it is often plausible to assume that the required sub-questions can be accommodated easily (see Roberts 1996, van Kuppevelt 1995 and Büring 2003 for the view that the topic-focus-articulation of sentences is best captured

430 in terms of (answers to) explicit and implicit questions under discussion). Nevertheless it faces some serious problems. First, recall from section 3.1 that in GLD, which can plausibly be assumed to mark aboutness topicality, only a limited set of DPs is acceptable in left-dislocated position: the only quantifiers that are acceptable are indefinites with unmodified determiners, as shown by the unacceptability of examples like (20a). In contrast to this, even

435 downward entailing quantifiers like the one in (20b) are acceptable as contrastive topics (recall from above that while contrastive topicality is in principle compatible with GLD, contrastive topics do not need to be marked via GLD):

(20) a. [??]Weniger als   acht Jungen, die   haben Fußball   gespielt.

      less   than   eight boys RP-PL.NOM have   soccer   played

440   b. Weniger als /ACHT Jungen haben FUßball\ gespielt (und weniger als /NEUN

     Jungen HANDball\).

'Less than eight boys played soccer (and less than nine boys handball)'.

To make things worse, the sentence in (20b) is even acceptable as a (partial) answer to a question like the one in (21):

445 (21) How many boys played which game?

Now in this case, even if we assume sub-questions such as *Which game did less than eight boys play?* to be accommodated, these can not plausibly be considered as establishing the respective DP as aboutness topic, since a variant like *What about less than eight boys? Which game did they play?* is extremely odd. I therefore conclude that at least for the time

450 being we have to acknowledge the existence of at (least two) distinct kinds of topicality – aboutness topicality and contrastive topicality.

4. Givenness

The third information structural dimension that I will discuss in the present paper is the

455 distinction between given and new information. As already alluded to in section 1, the given-new distinction cannot be reduced to the focus-background distinction, since it is both possible that material which has been explicitly mentioned in the preceding discourse is focus-marked, and that focal material contains given sub-parts, as shown by (22) (see Schwarzschild 1999) and (23) (from Wagner 2006; see also Féry and Samek-Lodovici

460 2006):

(22) a. Who did John's mother praise?

b. She praised HIM/JOHN

(23) Mary sat at her desk. John walked in. What happened next?

a. # She kissed JOHN.

465 b. She KISSED John.

Now, as already discussed by Halliday (1967) and Chafe (1976), de-accentuation is a means that is very commonly employed by languages to indicate that (the denotation of) a

constituent has either been introduced explicitly or implicitly (in the sense of its existence being entailed by the common ground) into the discourse. Nevertheless, in (22b) the need to

470   ensure question-answer congruence via focus-marking the constituent that replaces the *wh-*term in the question in (22a) overrides the need to indicate the givenness of the individual referred to by *John* or *him* via de-accentuation. Alternatively, the elaborate account of givenness developed by Schwarschild (1999) can explain the accent pattern in (22b) along the following lines: first, constituents whose denotation is entailed by a salient antecedent in

475   the preceding context count as given. Since entailment is only defined for propositions, Schwarzschild assumes a mechanism of existential closure, "which raises expressions to type t, by existentially binding unfilled arguments" (Schwarzschild 1999: 147), and which applies after F-marked parts have been removed. For our limited expository purposes, F-marking, which corresponds to an additional abstract level of marking that is meant to

480   capture the above mentioned rules of focus projection, can be equated with focus-marking. Second, non-F-marked constituents are given (*Givenness*). Third, F-marking is to be minimized (*AvoidF*). Applying these principles to the case of (22), the accent pattern of (22b) is correctly predicted: *She praised HIM* is given, since the proposition that we get by removing *HIM* and applying existential closure, namely that there is someone that John's

485   mother praised, is entailed by the preceding question in (22a). *She praised him*, in contrast, is not given, since the context does not entail the proposition that John's mother praised John. *Him*, accordingly, has to be F-marked, while F-marking anything else would violate *AvoidF*. In the case of (23), question-answer congruence ensures that the whole sentence is focal (and the same is true of Schwarzschild's system: the question in (23a) neither entails that Mary

490   kissed somebody, nor that Mary did something to John, nor that Mary did something etc.). Nevertheless, the need to indicate the givenness of the individual referred to by *John* is strong enough to override the accentuation pattern that would normally be employed in such a case, and according to which the complement of the verb would receive the main accent

(as shown in (22b)). Note, however, that given constituents (even if they do not need to be

495 accented because of being focal for independent reasons, as in (22b)) are not always de-accented, as shown by Wagner (2006) for examples like the following one (Wagner 2006: 3):

(24) Mary's uncle, who produces high-end convertibles, is coming to her wedding. I wonder what he brought as a present.

500   a.   He brought [a CHEAP convertible].

     b. # He brought [a RED convertible].

     c.   He brought [a red CONVERTIBLE].

In the above context, the bracketed DP is always focal, and the noun *convertible* is always given. Nevertheless, it may only be de-accented in (24a), but not in (24b). Intuitively, the

505 relevant contrast between the two is that *cheap* can naturally be contrasted with *high-end*, while *red* can't. Based on these and similar observations, Wagner (2006) argues that in order for a constituent x to be marked as given via de-accentuation, it has to be given relative to its sister, i.e. the context has to make available an alternative $y´$ to its sister y such that $[y´ x]$ is given. Technically, this is accomplished by assuming that de-accentuation is regulated by an

510 operator presupposing relative givenness in the sense just sketched (cf Schwarzschild 1999 and Sauerland 2004 for earlier approaches that work with givenness operators).

Other means than de-accentuation to indicate givenness are deletion, pronominalization, the choice between the indefinite (for new discourse referents) and the definite (for given discourse referents) article (cf. Heim 1982) and word order. Concerning the latter aspect,

515 there is a strong tendency for given material to precede new material, which may be overwritten if canonical word order is employed, but has to be strictly respected if non-canonical word order is chosen (see [84], where this is shown in detail for English). The optional (re-)ordering of argument DPs in the German middle field which is known as *scrambling* is a case in point: while indefinite DPs may precede definite DPs as long as the

520 canonical argument order (subject before indirect object, indirect object before direct object)

is respected (as shown in (24a)), and while definite objects may be scrambled across

indefinite subjects (as shown in (24b)), indefinite objects (at least if they are not marked as

contrastive topics) may not be scrambled across definite subjects (as shown by (24c); see

Büring 2001):

525   (25) a. (weil)   ein   Student   den   Dekan   geohrfeigt   hat.

              (because) a-nom student   the-ACC dean   slapped-in-the-face   has

          '... (because) a student slapped the dean in the face'.

          b. (weil)   den   Dekan ein   Student geohrfeigt   hat.

              (because) the-ACC dean   a-NOM student slapped-in-the-face   has

530   c. [??](weil)   einen Studenten   der   Dekan geohrfeigt   hat.

              (because) a-ACC student-acc the-NOM dean   slapped-in-the-face has

          '... (because) the dean slapped a student in the face'.

We have seen that the distinction between given and new material is linguistically relevant

in the sense that languages employ a rich array of means to indicate givenness. It is also clear

535 that the conditions under which the respective marking strategies apply have to be stated in

semantic terms, since it is always identity of denotation that is relevant, not identity of form.

This, however, still leaves open the question of whether givenness affects truth-conditions,

i.e. whether there are, for example, any logical operators which associate exclusively with

given material, or whether the means employed to mark givenness may also be used to

540 achieve truth conditional effects.

5.   Truth conditional effects of focus marking

Ex situ focus in Hungarian and exhaustivity

One of the prime examples that is often cited to show that focus marking can have truth

545 conditional effects is the case of Hungarian ex situ focus, which is claimed to give rise to

exhaustivity effects (Szabolsci 1981) – in contrast to in situ focus, which behaves just like

(intonational) focus in English insofar as it implicates, but does not entail exhaustivity:

(25)   Nem PÉTER   aludt   a   padlón,   hanem PÉTER   ÉS   PÁL.

not   slept   the   floor.on   but   and

550   'It isn't Péter who slept on the floor; it's Péter and Pál'.

As argued for by Szabolsci, examples like the one in (25) would be contradictory if it was

not part of the truth conditions, but merely an implicature that the (denotation of the)

focussed constituent was the only one among the salient alternatives that had the property in

question. From the observation that they are perfectly coherent she thus concludes that the

555 position to the immediate left of the tensed verb is a special focus position in Hungarian that

is directly associated with exhaustivity. More concretely, she assumes that the focussed

constituent occupies the specifier position of an exhaustivity operator whose meaning is

given in (26):

(26) $\lambda x[\lambda P[P(x) \ \& \ \forall y[P(y) \rightarrow y = x]]]$

560 Applying the object in (26) to the focus-marked constituent to its left and to the rest of the

first sentence in (25) in turn gives us (27), whose negation is indeed coherent with the

continuation in (25). (Note that we have to assume that *Péter and Pál* denotes a sum

individual in the sense of Link 1983).

(27) $slept\_on\_floor(peter) \ \& \ \forall y[slept\_on\_floor(y) \rightarrow y = peter]$

565 There are, however, other facts which cast doubt on the assumption that the focus position in

Hungarian is directly associated with exhaustivity. Consider the two sentences in (28), which

were adapted by Wedgwood (2007) from an English example that Larry Horn (1981) used to

show that *it*-clefts do not encode exhaustivity ('VM' means *verbal modifier*).

(28)   a. # Azt   tudtam,   hogy Mari   megevett   egy   pizzát, de

570   that   knew.1SG   that   VM.ate.3SG   a   pizza but

most   vettem észre,   hogy egy   PIZZÀT   evett meg.

now   take   mind.to(VM)   that   a   pizza.ACC   ate   VM

'I knew that Mari ate a pizza, but now I know that it was a pizza that she ate'.

b. Azt   tudtam,   hogy   Mari   megevett   egy   pizzát, de   most

575   that   knew.1SG   that   VM.ate.3SG   a   pizza   but   now

vettem   észre,   hogy   csak   egy   pizzát   evett   meg.

take   mind.to(VM)   that   a   pizza.ACC   ate   VM

'I knew that Mari ate pizza, but now I know that it was only pizza that she ate'.

In contrast to (28b), which contains the Hungarian equivalent of *only*, (28a) is infelicitous,

580   which it should not be if *a pizza* in the second conjunct occupied the specifier position of the

exhaustivity operator discussed above, i.e. if an exhaustive interpretation of *a pizza* was

actually part of the asserted content. Now, Kenesei (1986) has argued for a modification of

Szabolsci's (1981) analysis according to which the operator into whose specifier the focus

marked constituent is moved denotes the object in (29):

585   (29) $\lambda x[\lambda P[x = \iota y [P(y)]]]$

The crucial difference between (26) and (29) is that while in (26) uniqueness of the

(denotation of the) focus marked constituent is part of the truth conditional content, it is

merely presupposed in (29), since the application of the iota operator only yields a defined

result if there is exactly one object that has the property denoted by the non-focal part of the

590   clause. (28a) would thus be infelicitous for the same reason that (30) is: since the object that

Mari ate has already been introduced under the description *pizza*, it is completely redundant

to identify it with an object that is characterized by satisfying the same predicate.

(30)   # I knew that Mary ate pizza, but now I know that the thing Mari ate a was

pizza.

595   Modifying the operator analysis in the way suggested by Kenesei (1986) thus captures the

empirical facts quite well. Wedgwood (2007) nevertheless claims that the position occupied

by the focus marked constituents in (25) and (27) cannot be a designated focus position,

since in sentences with broad focus (i.e. in cases where the whole sentence is in focus) it is occupied either by the verbal modifier (if the main verb is marked for tense) or by the main

600 verb. From this he concludes that the identificational interpretation sketched above comes about by inferential processes on the basis of an underspecified, incremental semantics. In a nutshell, he assumes that the position under discussion is reserved for the 'main predicate' of the respective clause, which in the default case is some verbal element. If it is a non-verbal element, however, this is only compatible with a situation where the (information provided

605 by the) rest of the clause is presupposed, which leads to an identificational interpretation. The data discussed in this section thus at least do not have to be interpreted as showing that ex situ focus in Hungarian is directly associated with an exhaustive interpretation.

Focus sensitive operators

610 As already mentioned in section 2, in English, too, there are cases where focus marking has an effect on the truth conditions of sentences:

(31) a. Peter only goes to the BEACH with Mary.

b. Peter only goes to the beach with MARY.

(32) a. Peter always goes to the BEACH with Mary.

615 b. Peter always goes to the beach with MARY.

(31a) and (32a), are both false in a situation where Peter on nine of ten occasions where he goes somewhere with Mary goes to the beach with her, but takes her to the park on every tenth occasion. (31b) and (32b), in contrast, are true in such a scenario, as long as Peter never goes to the beach with anyone but Mary. In light of these and similar observations,

620 which for the case of *only* and other degree particles such as *even*, *also* etc. have first been discussed by Dretske (1972), and for the case of adverbial quantifiers like *always*, *usually* etc. by Rooth (1985), it has been suggested by many researchers that the respective items are *focus sensitive operators*, i.e. operators whose denotations are directly sensitive to the

structuring of the clauses they occur in into focus and background (Jacobs 1983, Rooth

625 1985, von Stechow 1989, Krifka 1992, Herburger 2000). A second line of research attempts

to explain the observed truth conditional effects in a different way, namely as an optional

association of the (underspecified) interpretation of the respective operators with the

information provided by focus marking (von Fintel 1994, Roberts 1996, Geurts and von der

Sandt 1997, Schwarzschild 1997; Rooth 1992 argues for an intermediate position). Finally, a

630 third position is argued for by Beaver & Clark (2003, 2008): they present evidence for

treating *only* as a focus sensitive operator, and *always* as an operator whose association with

focus is only a pragmatically driven default option that can be overridden by other factors.

Concerning the first line of research, I will briefly sketch the analysis of Rooth (1985). He

assumes that operators such as *only* and *always* take the focus semantic value of a sentence

635 (minus the operator, that is) as their first argument, the *restrictor,* and the ordinary semantic

value as their second argument, the *nuclear scope*. In the case of (31a) and (32a), for

example, the focus semantic value (see section 3.2) is a set of proposition that only differ

from each other with respect to the place where Peter goes with Mary, i.e. a set such as

{[[Peter goes to the beach with Mary]], [[Peter goes to the park with Mary]], [[Peter goes to

640 the cinema with Mary]] ... }. Rooth (1985) now assumes that *only* is a propositional operator

which yields the following truth conditions when it is applied to the ordinary semantic value

p and the focus semantic value *R* of a sentence *S*:

(33) $\forall r\ [r \in R \wedge r \neq p \rightarrow false(r)]$

Both (31a) and (32a) are thus true if among the relevant alternatives no other proposition

645 than 'Peter went to the beach with Mary' is true, where the difference in truth conditions

comes about because the respective alternative sets *R* are different, due to focus marking: in

the first case the propositions vary with respect to the location where Peter goes with Mary,

while in the second case they vary with respect to the person that accompanies Peter to the

beach. Concerning *always*, in contrast, Rooth assumes that it is a quantifier over situations. It

650 can therefore not operate directly on the focus semantic value, which is a set of propositions. Rather, set union has to be applied, which in the case of (31b) for example gives us the proposition that Peter either went to the beach or to the park or to the cinema etc. with Mary, i.e. the proposition that Peter went somewhere with Mary. This proposition is now assumed to characterize the situations in the restrictor of *always*, while the ordinary semantic value is

655 assumed to characterize the nuclear scope. The truth conditions of (31b), for example, can thus be paraphrased as follows: all situations where Peter goes somewhere with Mary are situations where he goes to the beach with Mary. Since the respective focus semantic value determines the situations quantified over, the truth conditions are correctly predicted to depend on focus marking.

660 Concerning the second line of research, which assumes association with focus to be not directly encoded in the lexical entries of the operators, but to come about via indirect pragmatic processes in the default case, I will briefly sketch the theory of von Fintel (1994), which essentially differs from Rooth's only in the following respect: the restrictor of the respective operators is filled by a free variable ranging over sets of propositions (in the case

665 of *only*) or over situation predicates, i.e. propositions (in the case of *always* and other adverbs of quantification such as *usually*, *often* etc.). The respective variables now have to be resolved on the basis of contextually available information. Since the alternatives making up the focus semantic value have to be determined on the basis of contextual information, too, the value for the respective C-variable can in the default case be identified with the

670 focus semantic value/the object generated by applying set union to the focus semantic value. As already mentioned above, Beaver & Clark (2003, 2008) represent a third line of research insofar as they assume that a theory along the lines of Rooth (1985) is suitable for the case of *only*, while one along the lines of von Fintel (1994) is suitable for the case of *always* (and presumably other adverbs of quantification). This conclusion is based on a variety of tests

675 which show that while association with focus can be overwritten by other factors in the case

of *always*, it holds strictly and furthermore has to obey tighter constraints in the case of *only*. For reasons of space, I can only illustrate their case with a few examples. First, in contrast to *always*, *only* has to c-command the focus marked constituent it associates with:

(34)   a. PETER always goes to the beach with Mary.

680   b. *PETER only goes to the beach with Mary.

Second, while *always* can also associate with phonetically reduced (or extracted) material, this is impossible for *only*, as shown by the contrast between (34a) and (34b) (from Beaver & Clark 2003: 343), which are assumed to be uttered in a context where the speaker is asked how often the person he talked about with Sandy was Fred:

685   (34)   a. I [always]$_F$ discussed 'im with Sandy.

        b. # I [only]$_F$ discussed 'im with Sandy.

Third, in contrast to *only*, the restrictor of *always* can sometimes be determined on the basis of lexical presuppositions instead of the focus, as shown by the fact that the preferred interpretation of (35) (from Beaver & Clark 2003: 235) is the one in (a.), not the one in (b.),

690   while in the case of (36), the interpretation in (b.) is the only one available. The presupposition associated with *complete* thus overrides the effect of focus marking in the case of *always*, while it is unable to do so in the case of *only*:

(35)   Mary always managed to complete her [exams]$_F$.

          a. 'Whenever Mary took exams, she completed them.'

695   b. 'Whenever Mary completed something, it was invariably an exam.'

(36)   Mary only managed to complete her [exams]$_F$.

          a. * 'What Mary did when taking exams was complete them and nothing else.'

          b. 'What Mary completed was an exam and nothing else.'

Focus and determiner quantification

700   In the last section, we have discussed two operators whose arguments are not entirely determined by the syntax, and which therefore have to rely on other mechanisms to obtain

their restrictor: either by direct association with focus, or by searching a suitable value that

the free variable which initially makes up their restrictor can be resolved to, where the

information provided by focus marking is made use of by default. Let us now turn to

705   quantificational determiners such as *every*, *a*, *some*, *more than three* etc., which according to

the by-now standard view take two expressions denoting sets of individuals as arguments

and map them onto a proposition that is true if the respective sets stand in a certain lexically

specified relation to each other (see Barwise & Cooper 1981). Here, matters are different: the

first argument , i.e. the restrictor, is the denotation of the NP-complement of the

710   quantificational determiner. The second argument, i.e. the nuclear scope is the denotation of

the syntactic sister of the entire DP if the DP is in subject position. Since the subject

quantificational DP is the highest argument of the respective verbal predicate, its sister is

guaranteed to be of the right type – namely a one-place predicate, i.e. (the characteristic

function of) a set of individuals. Consider the examples in (37a, c):

715   (37)   a. [$_{TP}$ [$_{DP}$ Every [$_{NP}$ dolphin]] [$_{T'}$ is smart]].

b. $\{x: \text{dolphin}(x)\} \subseteq \{y: \text{smart}(y)\}$

c. [$_{TP}$ [$_{DP}$ A [$_{NP}$ dog]] [$_{T'}$ bit my sister]].

d. $\{x: \text{dog}(x)\} \cap \{y: \text{bit-my-sister}(y)\} \neq \varnothing$

In the case of (37a), the proposition is true if the set of dolphins is a subset of the set of smart

720   entities (as shown in (37b)), while in the case of (37c), the proposition is true if the

intersection between the set of dogs and the set of entities that bit my sister is non-empty (as

shown in (37d)). With quantificational DPs in object position, the syntax-semantics mapping

is less straightforward, since in these cases the sister of the respective DP is a transitive verb,

i.e. (the characteristic function of) a set of pairs of individuals. One very popular solution to

725   this problem is to assume that quantificational DPs can be moved away from their base

position at LF and adjoin to the TP-node via *Quantifier Raising* (QR) (cf. May 1985). Under

the additional assumptions that the trace left behind by the quantificational DP is interpreted

as a variable of type *e*, and that a lambda-operator binding this variable is inserted directly

beneath the moved DP, the sister of this DP is again of the right type for it to function as the

730 second argument of the D-quantifier (cf. Heim & Kratzer 1998 for discussion), as shown

below:

(38) a. Paul owns every book by John Updike.

b. LF: [$_{TP}$ [Every book by John Updike]$_i$ [$_{TP}$ λ$_i$ [$_{TP}$ Paul owns t$_i$]]]

c. {x: book-by-John-Updike(x)} ⊆ {y: owns(y)(Paul)}

735 The important point for our current purposes is that in general the arguments of

quantificational determiners are strictly determined by (LF-)syntax. While prosodic as well

as contextual information might have an influence on the truth conditions of sentences

containing two or more quantificational DPs (see below), there is no way for this kind of

information to alter the order in which a quantificational determiner such as *every* is

740 combined with its two arguments: the NP-complement of a quantificational determiner can

never be interpreted as its nuclear scope, while the sister of the entire DP is interpreted as the

restrictor. Consequently, even if we put a strong focal accent on *dolphin* in (37a) or on *book*

in (38a), the sentences still do not mean that every smart being is a dolphin or that

everything that John owns is a book by John Updike.

745 Nevertheless, there are two types of examples which at first sight seem to be problematic for

the view that determiner quantification is not influenced by information structural notion

such as focus marking. First, it has been observed by Krifka (1990) (see also Partee 1991,

1999) that in examples like (39a) the truth conditions are influenced by focus marking in the

sense that the restrictor consists not only of the NP-complement of the quantificational

750 determiner, but also of the non-focal material in the rest of the sentence, as shown by the

paraphrase in (39b):

(39) a. Most ships passed through the lock [at NIGHT]$_F$.

b. 'Most ships that passed through the lock passed through the lock at night.'

This, however, does not show that *most* is a focus-sensitive operator, since it can easily be

755 accounted for via assumptions about the influence of the context on the interpretation of

quantificational DPs that are by now rather standard (cf. Beaver & Clark 2008). It is well

known that the restrictor of quantificational determiners in many cases is not only

determined by overtly given material (i.e. the respective NP), but also by contextually salient

information: if I utter a sentence such as *Most students understood Lewis's theory of*

760 *counterfactuals* in the context of a discussion of a class on conditionals that took place

yesterday, it need not be the case that more than fifty percent of the students in the whole

world understood Lewis's theory for the sentence to be true. Rather, it suffices that more

than half of the students in my class got it. Observations such as these can easily be

explained if it is assumed that quantificational determiners come with a free variable ranging

765 over predicates that is intersected with the denotation of the NP they take as their first

argument, and which is resolved on the basis of contextually salient information (von Fintel

1994; see also Stanley 2000 and Martí 2003 for additional discussion). Now, in the case of

(39a), everything except the PP *at night* is de-accented, indicating its status as given

information. From this, the hearer can conclude that the existence of ships passing through

770 the lock is contextually salient information, and the free variable in the restrictor of *most* can

accordingly be resolved to the predicate $\lambda x.\ passed\_through\_the\_lock(x)$, which gives us the

desired result.

More problematic for the view that there is no direct influence of focus marking on the truth

conditions of sentences with quantificational DPs is the existence of examples such as (40a,

775 b) (from Herburger 1997, 2000; see Westerståhl 1985, Herburger 1992, Eckardt 1999 for

the initial observations):

(40)   a. Many SCANDINAVIANS won the Nobel prize in literature.

b. Few COOKs applied.

According to Herburger (1997, 2000), focussing *Scandinavians* and *cooks*, respectively,

780　makes available the readings paraphrased in (41a, b), where the argument order that is

normally obligatory for quantificational determiners has apparently been switched: the VPs

won the Nobel Prize in literature and *applied* are interpreted in the restrictor, while the NPs

Scandinavians and *cooks* are interpreted in the nuclear scope.

(41)　a. Many of the winners of the Nobel Prize in literature were Scandinavians.

785　　　　b. Few of the people that applied were cooks.

Crucially, such reversed readings are not available to strong quantifiers such as *all/most/all*

but four: the sentences in (42) cannot be interpreted as saying that all/most/all but four of the

people who won the Nobel Prize in literature are Scandinavians. Note that other than *many*

and *few*, weak quantifiers (i.e. ones that can occur in *there*-insertion contexts such as *there*

790　*were three/many/few/no Scandinavians*) cannot be tested this way, since they are all

symmetrical: *three/no philosophers arrived* has the same truth conditions as *three/no people*

who arrived were philosophers.

(42)　　　All/Most/All but four SCANDINAVIANS won the Nobel Prize in literature.

From these observations Herburger (1997, 2000) concludes that in contrast to strong

795　quantifiers, the arguments of weak quantifiers are determined on the basis of focus marking,

but that this effect is only visible in the case of the weak proportional quantifiers *many* and

few. Cohen (2001) argues for a different view, according to which it is not necessary to

reverse the order of the arguments that *many* and *few* combine with. Nevertheless, he still

assumes that the alternatives evoked by placing the main accent on some element within the

800　respective NP directly enter the process whereby the truth conditions of the sentences are

computed. He assumes that *many* and *few* both have *relative proportional readings* which

are computed in the following way: the proportion of the individuals satisfying both

restrictor and nuclear scope among those satisfying the restrictor is compared to the

proportion of individuals satisfying both any of the alternatives to the restrictor and the

805　nuclear scope among those satisfying any of the alternatives to the restrictor. In the case of

many, the respective sentence is true if the first proportion is greater than the second, while in the case of *few*, the first proportion needs to be smaller than the second. Applying this method to our example (40a), we get truth conditions that can be paraphrased as follows: among the Scandinavians, the proportion of Nobel Prize winners in literature is greater than

810 among people in general (i.e. among individuals who satisfy any of the relevant alternatives and are thus either Scandinavian or French or Chinese etc.).

According to Beaver & Clark (2008: 58 ff.; see also Büring 1996), the relevant truth conditions can also be obtained without having to assume *direct* focus sensitivity of *many* and *few*. They assume that in order for a sentence with *many* to be true, either the proportion

815 of people satisfying both restrictor and scope among those satisfying the restrictor or the number of people satisfying both restrictor and scope has to be higher than expected, while in the case of *few*, it has to be lower. What is expected is given in the form of either a proportion or an absolute number α that is determined by the context. Now, since focus on some part of the respective NP evokes a set of alternative propositions, it is natural for the

820 hearer to assume that at least some of these alternatives are false, while the proposition actually uttered is true (see above). The value for α thus has to be chosen accordingly, i.e. in the case of (40a), for example, it has to be chosen in such a way that it allows the proportion of Nobel Prize winners in literature among the Scandinavians to exceed it, while the proportions of winners among the French, Chinese, etc. are below it. This gives us the

825 desired result, since the alternatives evoked by focus marking play a decisive in determining the value for α, and this creates the impression of direct focus sensitivity.

In section 5 we have discussed some cases where focus marking has an influence on the truth conditions of sentences. It has turned out that in most cases (exhaustive focus in Hungarian, adverbial quantifiers, and determiner quantification in general) the observed

830 effects can be explained as indirect effects insofar as an underspecified element in the denotation of some operator is resolved on the basis of clues given by focus marking. On the

other hand, we have seen that there are operators like *only* which are most plausibly analysed

as directly focus sensitive (see Beaver & Clark 2008 for a thorough investigation of the class

of focus sensitive operators). In the next section we will discuss truth conditional effects of

835   topic marking.

6.   Truth conditional effects of topic marking

Aboutness topicality

As already mentioned in section 3, in most cases marking a constituent as an aboutness topic

does not have an observable truth conditional effect: first, there are no operators which seem

840   to be topic sensitive in a sense comparable to focus sensitive operators such as *only*. While it

has been claimed by Partee (1991, 1999) that adverbial quantifiers are sensitive to

information structure insofar as topical material is interpreted in their restrictor while focal

material is interpreted in their nuclear scope, we have already seen in section 5 that the

observed effects can also be explained without having to assume such a direct sensitivity.

845   Second, in most cases the constituent marked as the aboutness topic denotes an object of

type *e* and is therefore unable to take scope anyway. But as soon as we turn our attention to

indefinites headed by unmodified determiners – which are the only quantifiers that can

appear in constructions marking aboutness topicality overtly such as GLD – , the picture

changes: in contrast to the fronted indefinite in (43a), the left-dislocated one in (43b) can

850   only be interpreted with scope over *jeder* ('everyone'). This is shown by the fact that while

both the continuation in (43c) and the one in (43d) are possible for (43a), only the one in

(43c) is possible for (43b).

(43) a. Einen   Song   von Bob Dylan kennt   jeder.

           a/one-ACCsong by   knows   everybody

855   'Everybody knows a /one song by Bob Dylan.'

        b. Einen   Song von Bob Dylan, den   kennt   jeder.

           a/one-ACCsong by   RP-MASC.NOM.SING knows   everybody

'There is a /one song by Bob Dylan that everybody knows.'

c. Nämlich *Blowing in the Wind*.

860   Namely   *Blowing in the Wind*.

d. Maria kennt *Visions of Joanna*, Peter kennt *Everybody Must Get Stoned,* und

    knows   knows   and

Paula kennt *Blowing in the Wind*.

    knows

865 At first sight, examples such as (44a), where a pronoun contained within the left-dislocated

indefinite can be interpreted as bound by a quantifier from within the matrix clause, seem to

falsify the claim that left-dislocated indefinites have to be interpreted with widest scope.

Endriss (2009) shows, however, that the indefinites do not really receive narrow scope, but

rather functional wide scope. This is evidenced by the fact that the continuation in (44b),

870 which names a function (namely the function that maps pupils onto a picture of their first

day at school), is fine, while the one in (44c) is odd:

(44)   a. Ein Bild   von sich,   das   hat   jeder Schüler

       A   picture of   himself RP.NEUT.SING has   every   pupil

       mitgebracht.

875   brought-with-him

       'Every pupil has brought a (certain) picture of himself.'

   b. Nämlich sein   Einschulungsfoto.

     Namely   his   picture-of-his-first-day-at-school.

     'Namely a picture of his first day at school'.

880   c. #Paul   ein Bild   von   sich   mit   seiner Tante,

       Paul   a picture   of   himself   with   his   aunt,

       Peter   ein   Bild   von   sich   mit   seiner Katze, ...

       Peter   a   picture   of   himself   with   his   cat

Nevertheless, while being unable to be interpreted in the scope of other quantificational DPs,

885 left-dislocated indefinites nevertheless do not always have to be interpreted with widest

scope. As shown by (45a), they can be interpreted in the restrictor of adverbial quantifiers

(but not in the nuclear scope): the sentence is most naturally interpreted in a way that can be

paraphrased as "most dogs are smart". Finally, (45b) shows that left-dislocated indefinites

are also capable of receiving generic readings: the sentence cannot only be interpreted as a

890 statement about a particular dog, but also as a statement about dogs in general.

(45)   a. Ein Hund, der   ist   meistens   schlau.

         a   dog   RP-MASC.NOM.SING   is   usually   smart

       b. Ein Hund, der   ist   schlau.

         a   dog   RP-MASC.NOM.SING   is   smart

895 In order to capture all these interpretative possibilities, Endriss & Hinterwimmer (2009; see

also Endriss 2009) argue for a formal implementation of the aboutness concept of Reinhart

(1982) that can roughly be described as follows: first, the (denotation of the) left-dislocated

constituent is established as the topic in a separate speech act (cf. Searle 1969 and Jacobs

1984), which corresponds to the creation of an address. This first speech act is then

900 combined via speech act conjunction with a second speech act, in which it is asserted that the

comment holds of the topic, and which corresponds to the storage of the information

provided by the respective sentence under the address created for the topic. Now, in cases

such as (46a), where the topic is an object of type e, i.e. an individual, this is completely

unproblematic: assuming that the resumptive pronoun in the specifier of the matrix-clause

905 CP behaves like a relative pronoun in a relative clause insofar as it triggers lambda

abstraction (Heim & Kratzer 1998), the whole matrix clause can be interpreted as a predicate

that applies to the topic. The resulting interpretation is given schematically in (46b). Note

that with respect to the truth conditions, it does not differ from the interpretation of the

corresponding sentence in (46c) where Peter is not explicitly marked as the aboutness topic

910 receives, which is given in (46d):

(46) a. (Den) Peter, den mag ich.

(the-ACC) RP-MASC.ACC.SING like I

'Peter, I like.'

b. ∃α[α = Peter & ASSERT [λs. like(I, α)(s)]]

915 c. Ich mag (den) Peter.

I like (the-ACC)

d. like(I, peter)

In cases where an indefinite is marked as the aboutness topic, things are not so simple. First,

Endriss & Hinterwimmer (2009) assume the generalized quantifiers, i.e. sets of sets of

920 individuals, in contrast to individuals and sets are too complex objects to serve as addresses

for storing information. Second, the predicate denoted by the matrix-CP cannot be applied to

them, i.e. they cannot be interpreted as the logical subject of this predicate, which would

have to be of type $<<<e,t>t> t>$ for this to be possible. Therefore, the type of the

generalized quantifiers has to be lowered via typeshifting. Let us first consider the case of

925 (43a): in order to serve as an address for storing the information provided by the rest of the

sentence, the indefinite has to be lowered to the type of sets at least. This can be done in the

following way: a *representative* of the quantifier in the form of a *minimal witness set* (in the

sense of Barwise & Cooper 1981; see also Szabolcsi 1997) is created, where a minimal

witness set of a quantifier is an element of this quantifier that does not contain any

930 "unwanted" elements. The formal definition is given in (47):

(47)   Definition of a minimal (witness) set X of a generalized quantifier G :

$$min(X)(G) = [G(X) \land \forall Y [G(Y) \rightarrow \neg(\lambda x.Y(x)) \subset \lambda x.X(x))]]$$

In the case of a quantifier like *three dogs*, for instance, a minimal witness set of this

quantifier is a set that contains three dogs and nothing else. Such a minimal witness set can

935 function as the address where the information conveyed by the comment is stored. In order

for this to be possible, however, the denotation of the topic – which now is an object of type

<e,t> – has to be combined with the denotation of the comment, which is of the same type.

Furthermore, the intuition has to be respected that the topic is the logical subject of the

predicate denoted by the comment. This can be achieved in the following way: an operator

940 ⊓, which collects the elements of the minimal witness set and turns them into a into a (sum)

individual is applied to the respective minimal witness set. Taking all this together, the

sentence in (43a) is interpreted as shown in (48):

(48) $\exists\alpha[\min(\alpha)([[a \text{ song by Bob Dylan}]]) \ \& \ \text{ASSERT}[\lambda s.\forall y[\text{human}(y) \rightarrow$

$$\rightarrow \text{know}(y, \sqcap\{x: \alpha(x)\}(s)]]]$$

945 This is the correct result. It reflects the wide scope reading for the indefinite and at the same

time respects the principle underlying the formalization proposed by Endriss &

Hinterwimmer (2009): it allows the creation of an address corresponding to the minimal

witness set where the information conveyed by the comment can be stored. Endriss (2009)

argues that the need to create a representative in the form of a minimal witness set excludes

950 all generalized quantifiers except indefinites headed by unmodified articles from functioning

as aboutness topics, since it leads to unwanted results in all other cases. Furthermore, she

argues that exceptional wide scope readings of these indefinites (Fodor & Sag 1982), i.e.

readings where they take scope out of islands that generally cannot be crossed by quantifiers,

also come about because the respective indefinite is interpreted as the (not overtly marked)

955 aboutness topic.

Let us now turn to the case exemplified by (45a), where an indefinite marked as aboutness

topic is interpreted in the restrictor of an adverbial quantifier. In a nutshell, Endriss &

Hinterwimmer (2009) argue that the existence of such readings, where the quantificational

force of the indefinite seems to vary with the force of the quantificational adverb and which

960 accordingly exemplify a phenomenon dubbed *Quantificational Variability Effect* (QVE)

(Berman 1987), can be reconciled with the need for the indefinite to function as the aboutness topic in the following way: first, the indefinite is applied to the dummy predicate *λxλs. in(x)(s)*, which turns it into a situation predicate – in the case of (45a), into the situation predicate $λs. \exists x[dog(x) \wedge in(x)(s)]$. Second, quantificational adverbs are

965 systematically ambiguous between a variant whose restrictor is given in the form of a free variable (see section 5) and one that combines with its arguments in reverse order (from the perspective of determiner quantification), i.e. with the nuclear scope first and then with the restrictor. Note that something like this second variant is needed anyway in order to allow for a compositional derivation in cases where a left-adjoined *when-* or *if-*clause is interpreted

970 in the restrictor of the Q-adverb (cf. Chierchia 1995). Third, the resumptive pronoun, which occupies the specifier of the matrix-CP at the surface, can optionally be reconstructed into its clause-internal base position, where it no longer triggers lambda-abstraction, but rather is interpreted as a free variable. As a free variable, it can be bound dynamically (Groenendijk & Stokhof 1991) by the indefinite ending up in the restrictor of the quantificational adverb.

975 Taking all this together, we arrive at the following result: in a first step, the left-dislocated indefinite is shifted to a situation predicate which can function as an address for storing the information provided by the rest of the sentence. In a second step, it is asserted that the result of applying the Q-adverb to the situation predicate denoted by the matrix clause (i.e. its nuclear scope) is applied to the situation predicate denoted by the left-dislocated indefinite.

980 This is shown schematically for (45a) in (49):

(49) $\exists\alpha[\alpha = λs. \exists x [dog(x) \wedge in(x)(s)]$ &

      & ASSERT $[λP.λs. \text{Most } s' [s' \leq s \wedge P(s')]$

                    $[\exists s''[s' \leq s'' \wedge smart(x)(s'')]](\alpha)]] =$

$\exists\alpha[\alpha = λs. \exists x [dog(x) \wedge in(x)(s)]$ &

985   & ASSERT $[λs. \text{Most } s' [s' \leq s \wedge \alpha(s')]$

                    $[\exists s''[s' \leq s'' \wedge smart(x)(s')]]]]$

The result of combining the Q-adverb with its nuclear scope can be seen as a higher order predicate that specifies the degree to which the nuclear scope applies to its logical subject (the restrictor), i.e. the degree to which the set denoted by the restrictor is included in the set

990   denoted by the nuclear scope. In our example, it is asserted that most elements of the set of situations containing a dog x is included in the set of situations where x is smart. By enforcing the situations quantified over to be minimal in the sense of containing nothing beyond what is necessary to make them a situation satisfying the respective predicate (the minimality conditions have been suppressed for ease of exposition), we get the desired

995   result: since the situations vary with the dogs they contain, the illusion of direct quantification over dogs is created (Berman 1987; von Fintel 1994; Herburger 2000). Concerning the generic reading exemplified by (44b), Endriss & Hinterwimmer (2009) assume that it is nothing but a special case of the reading exemplified by (45a), where the overt quantificational adverb has been replaced by a covert generic operator with quasi-

1000 universal force (see Krifka et al. 1995 and the references cited therein for discussion). The analysis just sketched can also be applied to sentences with left-dislocated temporal clauses and conditional antecedents (see Iatridou 1994 and Bhatt & Pancheva 2001 for an analysis of *if-then*-sentences as instances of left-dislocation), since the set of situations/the closest world (Stalnaker 1968 & Schlenker 2004) characterized by the respective clause can

1005 be viewed as the aboutness topic in such cases (see Haiman 1978 and Bittner 2001 for the general idea that conditionals are topics). Based on the idea that the establishment of (aboutness) topicality involves a separate speech act, Ebert, Endriss and Hinterwimmer (2009) argue that the difference in truth conditions between regular conditionals such as (50a) and relevance conditionals such as (50b) can be phrased in terms of the difference

1010 between two kinds of aboutness topicality: the one discussed in this section, which in German is marked via GLD, and the one exemplified by the so-called *hanging topic* in (50c):

(50) a. If you are thirsty, (*then) there is beer in the refrigerator.

b. If Kim was at the party, (then) it was fun.

1015   c. As for the pastor, the marriage sermon was wonderful.

Ebert, Endriss and Hinterwimmer (2009) show that what both types of aboutness topicality

have in common is the relation of relevance: the information provided by the comment is

presented as relevant with respect to the topic, which corresponds to the storage of this

information under the address created for the topic. Now, while in the case exemplified by

1020   GLD relevance is trivially ensured via the relation of predication, an appropriate relation has

to be inferred on the basis of contextual information, world knowledge, etc. in the second

case. This accounts for the observed truth conditional difference between (50a) and (50b):

while (50b) is automatically understood as conveying that the party's having been fun

depends on the presence of Kim, the beer's being in the refrigerator is not understood as

1025   depending on the addressee's being thirsty in the case of (50a). Rather, the sentence is

understood as conveying that the information that there is beer in the refrigerator is only

relevant for the hearer in case s/he is thirsty. In other words, an address is created for the

closest world where the addressee is thirsty (which might, or might not be the actual world),

and the information that there is beer in the refrigerator in the actual world is stored under

1030   this address. In the case of (50a), in contrast, the information that the party was fun in the

closest world where Kim was present is stored under the address created for the closest

world where Kim was present.

Summarizing the main results of this section, aboutness topicality can have truth conditional

effects if the aboutness topic is an indefinite since two requirements have to be met that

1035   necessitate typeshifting: first, an object has to be created from the original denotation of the

indefinite as a generalized quantifier that can serve as an address for storing the information

provided by the rest of the sentence. Furthermore, the rest of the sentence has to function as

a (first- or higher-order predicate) that applies to this object. This either leads to an

interpretation that is equivalent to one where the indefinite receives widest scope or (in the

1040   case of adverbially quantified and generic sentences) to an interpretation that is equivalent to

one where the indefinite is interpreted in the restrictor of the quantificational adverb/the

covert generic operator. Furthermore, we have seen that the truth-conditional difference

between regular conditionals and relevance conditionals can be traced back to the difference

between two types of aboutness-topicality only one of which involves predication, while the

1045   other involves an (under-specified) relation of relevance. In the next section, I will deal with

truth conditional effects of contrastive topicality. Concerning frame setting topics, we have

already seen in section 3 that the alleged truth conditional effects does not have anything to

do with the marking of the respective constituents as topics, since leaving them in sentence-

internal position results in exactly the same truth conditions.

1050

Contrastive topicality

In section 3, we saw that the restrictions that keep quantificational DPs other than indefinites

headed by unmodified determiners from functioning as aboutness topics do not apply to

contrastive topics. It is therefore not surprising that we find no evidence for the typeshifting

1055   operations discussed in the last section in sentences where quantificational DPs are marked

as contrastive topics – they do not have to take widest scope in the presence of other

quantificational DPs, and neither do they have to be interpreted in the restrictor of overt or

covert quantificational adverbs. Nevertheless, there is evidence that contrastive topic

marking has an influence on the interpretation of quantificational DPs. It has been observed

1060   that the rise-fall contour indicating contrastive topicality makes available scope-inversion in

configurations where it would normally (i.e. without this contour) be excluded in German

(Jacobs 1982, 1983, 1984; Höhle 1992; Büring 1997a, b; Krifka 1998), as evidenced by the

examples in (51) (from Krifka 1998: 80, ex. (16a, b))

(51)   a. /JEDER   Student hat mindestens EINEN\   Roman   gelesen. $\exists (\forall), \forall (\exists)$

1065   every-NOM student has at-least   one-ACC   novel   read

        b. Mindestens /EIN   Student hat JEDEN\   Roman gelesen. $\exists\,(\forall), \forall\,(\exists)$

        at-least   one-NOM student has every-ACC novel read

As indicated, both sentences are ambiguous: (51b), for example, may either be true if there is one student that read every book, or if every book was read by a different student. This is

1070 exceptional for German, where the word order is freer than in English, and where accordingly only sentences where the canonical word order has been altered are scope-ambiguous. Frey (1993) accounts for this fact by assuming that in German (and other languages with relatively free word order such as Hungarian) an operator α may only be interpreted with scope over an operator β if α either c-commands β or a trace of β. Now, in

1075 (51a, b) the subject c-commands the object on the surface, which is the canonical word order. There should thus be no reading where the object has wider scope, contrary to fact. Krifka (1998) now assumes that the additional scope options brought into play by contrastive topic marking of the higher operator result from complex derivations involving several invisible movement operations. Consequently, the higher operator leaves behind traces that

1080 are c-commanded by the surface position of the lower operator, which allows the latter to take scope over the former, in accordance with Frey's assumptions. Let us have a closer look at the derivation Krifka assumes for (52b) (Krifka 1998: 11). The crucial steps are given in (52): first, after the finite auxiliary verb has moved to C^0 (as shown in (52b)), the direct object DP is scrambled across the subject DP (as shown in (52c)). Then, the subject DP

1085 receives focus marking in its derived verb adjacent position (as shown in (52d)) and is moved to the specifier of CP (as shown in (52e)). According to Krifka, the latter movement operation "has a specific discourse pragmatic function, contrastive topicalization" (Krifka 1998: 11). Finally, the object DP receives focus marking in its derived verb adjacent position (as shown in (52f)).

1090   (52)   a. [CP e [C' e [mindestens ein Student [jeden Roman [gelesen]] hat]]

b. $[_{CP}$ e $[_{C'}$ hat$_1$ [mindestens ein Student [jeden Roman [gelesen]] t$_1$]]

c. $[_{CP}$ e $[_{C'}$ hat$_1$ [jeden Roman$_2$ [mindestens ein Student [t$_2$ [gelesen]]] t$_1$]]

d. $[_{CP}$ e $[_{C'}$ hat$_1$ [jeden Roman$_2$ [[mindestens ein Student]$_F$ [t$_2$ [gelesen]]] t$_1$]]

e. $[_{CP}$ [mindestens ein Student]$_{F,3}$ $[_{C'}$ hat$_1$ [jeden Roman$_2$ [t$_3$ [t$_2$ [gelesen]]] t$_1$]]

f. $[_{CP}$ [mindestens ein Student]$_{F,3}$ $[_{C'}$ hat$_1$ [[jeden Roman]$_{2,F}$ [t$_3$ [t$_2$ [gelesen]]]

t$_1$]]

g. $[_{CP}$ Mindestens /EIN   Student $[_{C'}$ hat [\JEDen   Roman [gelesen]]]

at least   one-NOM   student   has   every-ACC novel   read

Now, the crucial movement operation is the one shown in (52c), which brings the object DP

into a position from where it c-commands a trace left behind by the subject DP and thus

allows it to take scope over the subject DP. According to Krifka, it is motivated as follows:

first, as already mentioned in section 3, contrastive topicality is a combination of aboutness

topicality and focus marking. Second, focus is preferably assigned to preverbal constituents

in German. This forces the object DP to move across the subject DP, since otherwise the

subject DP would not be in the right position for focus marking.

While we have seen that there are good reasons to doubt Krifka's assumption that

contrastive topicality involves aboutness topicality, it is nevertheless reasonable to assume

that it involves focus marking, since both contrastive topic marking and focus marking can

fruitfully be analysed in terms of the introduction of alternatives, as we have seen above.

Furthermore, Krifka (1998: 87-97) discusses a whole battery of empirical observations

which support the assumption that focus is preferably assigned to constituents in preverbal

position in German. His account of how contrastive topicality makes available scope options

that otherwise would not exist in German is thus by and large well motivated, leaving only

the "altruistic" scrambling of the object DP shown in (52c) as an assumption that is

problematic from the point of view of the highly influential Minimalist Program inaugurated

by Chomsky (1995), according to which all movement operations are feature-driven. Note,

however, that the existence of scrambling is problematic for this view, anyway, since there

does not seem to be any independent motivation for postulating a feature that all scrambled

elements share and that needs to be checked. It is thus more promising to analyse scrambling

1120 as an option that is in principle freely available, but which is only employed if it has any

payoffs at either of the interfaces (cf. Reinhart 2006), which is compatible with Krifka's

account.

A related pattern, where contrastive topicality has an influence on the truth conditions of

sentences containing scope taking elements, is discussed by Büring (1997b): as has been

1125 observed by Jacobs (1984) and Löbner (1990), the two sentences in (53) only have a reading

according to which the lower higher operator takes scope over the higher one – i.e. (53a) can

only be interpreted as saying that it is not the case that all politicians are corrupt, and (53b)

as saying that the addressee does not have to smoke so much.

(53)	a. /ALLE	Politiker	sind	NICHT\		korrupt.
1130	All	politicians	are	not		corrupt
	b. Du	/MUSST	NICHT\	so	viel	rauchen
	you	must	not	so	much	smoke

Based on the theory of contrastive topicality proposed by Büring (1997a), Büring (1997b)

offers a pragmatic account of this pattern. He starts from the assumption that the two

1135 sentences in (53) are structurally ambiguous at LF at latest, which is compatible with Frey's

(1993) assumptions discussed above, since negation may in both cases have been base

generated in a position where it c-commands the base position of the other operator. Now

recall from section 3 that contrastive topic marking introduces a set of set of propositions

where both the denotation of the constituent marked as the contrastive topic and the one

1140 marked as the focus have been replaced by alternatives. If in the case of (53a), for example,

the universally quantified DP is interpreted with scope above negation, we get the set shown

in (54a), and if it is interpreted with scope beneath negation, we get the set in (54b):

(54) a. { {all(politicians)(λx. $\neg$corrupt(x)), all(politicians)(λx. corrupt(x))},

{most(politicians)(λx. $\neg$corrupt(x)), most(politicians)(λx. corrupt(x))},

1145   {some(politicians)(λx. $\neg$corrupt(x)), some(politicians)(λx. corrupt(x))},

{one(politician)(λx. $\neg$corrupt(x)), one(politicians)(λx. corrupt(x))},

{no(politician)(λx. $\neg$corrupt(x)), no(politicians)(λx. corrupt(x))} }

b. { {$\neg$all(politicians)(λx. corrupt(x)), all(politicians)(λx. corrupt(x))},

{$\neg$most(politicians)(λx. corrupt(x)), most(politicians)(λx. corrupt(x))},

1150   {$\neg$some(politicians)(λx. corrupt(x)), some(politicians)(λx. corrupt(x))},

{$\neg$one(politician)(λx. corrupt(x)), one(politicians)(λx. corrupt(x))},

{$\neg$no(politician)(λx. corrupt(x)), no(politicians)(λx. corrupt(x))} }

Now observe that there is a crucial contrast between the two sets. In the case of (54b), asserting the proposition corresponding to the first element of the first set only eliminates the

1155 second element of the first set as an option that is still open: while it cannot possibly be the case that all politicians are corrupt and that not all politicians are corrupt, we can neither conclude that it is the case that most politicians are corrupt nor that it is not the case that most politicians are corrupt from the fact that not all politicians are corrupt, and the same holds for all the other quantifiers listed above. In the case of (54a), in contrast, asserting the

1160 proposition corresponding to the first element of the first set automatically decides the question of which of the two elements in each set is true for all the other sets: as soon as we know that all politicians are not corrupt, we automatically know that most politicians are not corrupt, that some politicians are not corrupt and that it is not the case that no politician is not corrupt, i.e. that no politician is corrupt. As the reader can easily check for herself, the

1165 same reasoning applies to (53b). Büring (1997b) now assumes that contrastive topic marking is subject to the following pragmatic constraint: after a sentence *A* has been uttered, there must at least be one disputable element in the set corresponding to the topic semantic value

of *A*, where a set of propositions *P* is disputable with respect to the Common Ground if it contains at least one element *p* such that both *p* and ¬*p* could informatively and coherently

1170 be added to the Common Ground. Since in the case of (53a) as well as (53b) the reading where the higher operator has scope above negation violates this constraint, it is correctly predicted that only the reading where negation takes higher scope is available.

This account is very attractive insofar as it comes at practically no cost at all: apart from the independently well-supported assumption that contrastive topic marking introduces a set of

1175 sets of alternative propositions, Büring only needs the disputability constraint. This constraint is extremely natural, however, since it simply formalizes the idea that there has to be a point in introducing such a complex semantic object as the topic semantic value of a sentence: if the truth value of all alternatives to the ordinary semantic value of the respective sentence is already decided on via entailments of the ordinary semantic value, there simply is

1180 no point in introducing these alternatives in the first place. Note, however, that in spite of its attractiveness Büring's account can not replace the one of Krifka (1998), since it only works for a limited set of data. We thus need both to account for the full range of facts.

In this section we have seen that while contrastive topic marking can have an influence on the truth conditions of sentences containing multiple scope taking elements, these effects do

1185 not show that truth conditional semantics is directly sensitive to contrastive topicality. Rather, they can naturally be explained as indirect effects of either formal requirements that contrastive topic marking is subject to, or of a pragmatic principle that requires the introduction of the topic semantic value of a sentence to fulfil some communicative purpose. In the next section we will briefly discuss the question of whether there is any interaction

1190 between givenness marking and truth conditional semantics.

7. Givenness and truth conditions

In section 3 we have seen that there are good reasons to reject the idea that adverbial quantifiers like *always* and quantificational determiners like *most*, *many* and *few* are directly

focus sensitive. Rather, the observed effects can be better explained by assuming that all of

1195 these operators introduce a free variable as part of their denotation which needs to be

resolved on the basis of contextually available information. Focus marking, which allows the

reconstruction of implicit questions under discussion, is important in the task of finding

suitable values for these variables insofar as it often gives a clue as to which part of the

respective sentence counts as contextually available information. This does not show,

1200 however, that the operators which have been analysed as focus sensitive should be analysed

as directly sensitive to givenness instead, since there is no reason to assume a

grammaticalized dependency on constituents marked as given (by phonological,

morphological, or syntactic means), as shown by the fact that in some instances (such as

example (35) discussed in section 5) even focal material can be interpreted in the restrictor

1205 of an adverbial quantifier.

Apart from the operators just mentioned there is a whole class of expressions which depend

on (directly or indirectly) given information insofar as they only yield a defined value if the

context in which they are uttered satisfies certain conditions: namely all so-called

presupposition triggers such as the definite article, factive verbs like *realize* and *regret*,

1210 implicative verbs like *manage* etc. (see [] for detailed discussion). However, in these cases,

too, there is no grammaticalized sensitivity to constituents that are explicitly marked as

given: it does not matter whether the required information is given explicitly or implicitly in

the discourse, is part of the shared background knowledge of the discourse participants, or

can be accommodated. There is thus no evidence for a direct influence of givenness marking

1215 on the truth conditions of sentences.

8.   Conclusion

In this paper I have discussed the relation between information structure and truth

conditional semantics, concentrating on the question of whether there is any direct

1220 interaction between the various information structural dimensions and operators such as quantified DPs and quantificational adverbs. Concerning the focus-background dimension, we have seen that in most cases truth conditional effects do not result from direct focus sensitivity of the involved operators, but rather come about as indirect effects of the need to resolve a free variable that is present in the denotation of these operators on the basis of

1225 contextual information – with the notable exception of exclusives such as *only* (cf. Beaver and Clark 2008).

Concerning the topic-comment dimension, I have argued that in cases where a quantificational DP functions as the aboutness topic of a sentence, the need to interpret the comment as a predicate that can be applied to the topic has truth conditional effects in the

1230 presence of either another quantificational DP, a quantificational adverb or generic tense (Endriss & Hinterwimmer 2009). In cases where a quantificational DP is marked as a contrastive topic, on the other hand, truth conditional effects come about indirectly – either because the alternatives thus introduced could not be put to use otherwise (Büring 1997b), or because contrastive topic marking results in a more complicated syntactic derivation that

1235 opens up additional scope possibilities (Krifka 1998).

Finally, concerning the given-new dimension, there is no evidence for a direct influence on the truth conditions of sentences, but only for indirect effects that come about in basically the same way as the above mentioned indirect effects of focus marking.

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