

# Contrastive Topicalization, and the relation between Information Structure and Discourse Structure

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## 1. Introduction

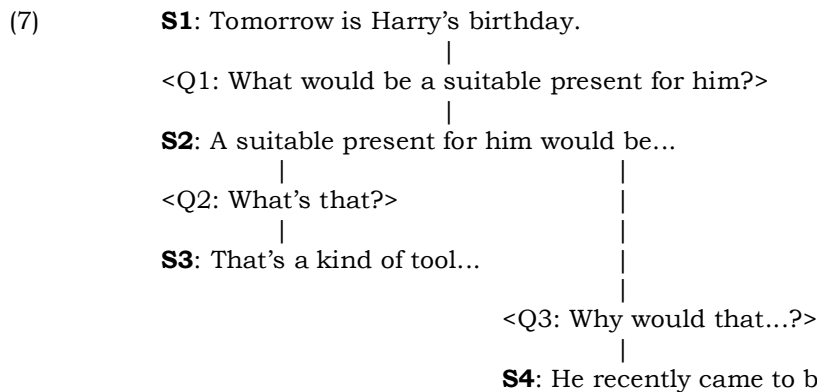
- The basic issue: how intimate is the relation between the structure of discourse [DS] and the information structure of clauses [IS]? Two truth-conditional approaches:
  - ♦ the *Questions-under-Discussion* [QUD] approach (van Kuppevelt 1995, Roberts 1996; for contrastive topics, Büring 2003; for “discourse contrast”, Umbach 2005): the hierarchical relation between text segments expressed by means of (implicit) “questions” (sets of propositions of which the “answer” is one member); relation between DS and IS is direct;
  - ♦ the *Segmented Discourse Representation Theory* [SDRT] approach (Asher 1993, Asher & Lascarides 2003, a.o.): the main hierarchical relations between text segments are expressed by means of a set of primitive discourse relations (*rhetorical relations*, or RR), such as *Elaboration*, *Contrast*, etc.; relation between DS and IS is not “direct”.
- Aims of this paper:
  - ♦ to discuss the DS and IS properties of (1) (from Lambrecht 1994’s (4.31), p.160; originally from Terkel 1974); *main observation*: the alternation between a contrastive topic IS and a focus-only IS is required for “discourse contrast”, in the absence of *but*.

(1) I graduated from high school as an average STUDENT, not more than that. *History* I found to be DRY. *Math courses* I was never GOOD at. (But) I was ok in SCIENCES and I sort of enjoyed WRITING.
  - ♦ theoretically: (a) to show that current QUD analyses of contrastive topics (Büring 2003) and of “discourse contrast” (Umbach 2005) are unable to predict the correlation between the IS’s and the DS in (1); (b) to suggest that the source of *discourse contrast* in (1) is not in the IS’s themselves (esp. contrastive topics), nor inherent to this discourse relation.

## 2. Two current views on the DS-IS relation

- *Discourse Structure* [DS]: As intuition tells, and many processes (such as anaphora) show, discourses possess a “hierarchical structure” of “thematic segments”.
- The QUD approach to DS-IS interaction:
  - ♦ DS arises as the result of the speaker’s attempt to satisfactorily answer a (implicit) “main topic-forming question”. To answer this question, the speaker may need to answer a number of *subquestions* satisfactorily. Example from van Kuppevelt (1995; (15), p.126):

(6) <Feeder:> [S1] Tomorrow is Harry’s birthday.  
<Q1:> <What would be a suitable present for him?>  
<A1:> [S2] A suitable present for him would be a monkey wrench.  
<Q2:> <What’s that?>  
<A2:> [S3] That’s a kind of tool with which one can loosen or tighten nuts and bolts of various sizes.  
<Q3:> <Why would that be a suitable present for him?>  
<A1:> [S4] <Because> He recently came to borrow one from me.



◆ Under this view, there is a direct connection between IS and its role in DS: the clause must have an IS that is congruent with the (implicit) question it answers; and its discourse role is the one this question has within the discourse’s hierarchy of questions.

• The SDRT approach:

- ◆ SDRT is an extension of standard DRT (Kamp & Reyle 1993); hence, its DS representations contain a hierarchy of propositionally-based “domains of reference”. In addition, SDRT incorporates domains defined by relations proper to the discourse level, called *rhetorical relations* (RRs): *Elaboration* , *Contrast*, *Counterevidence*, etc., cf. (9) below.
- ◆ The set of RRs is thought be limited, but not defined by general principles; so, the inventory of RRs must be determined empirically. Thus, unlike the QUD approach, SDRT cannot offer any principled connection between IS and discourse relations.
- ◆ Consider the RRs *Parallel* and *Contrast*: they join text segments in order to compare “structurally similar elements”; but *Parallel* treats these elements as “semantically similar”, whereas *Contrast* treats them as “dissimilar” (Asher & Lascarides 2003:152-155, 168-169). “Structural similarity” constrains the IS possibilities of the segments:

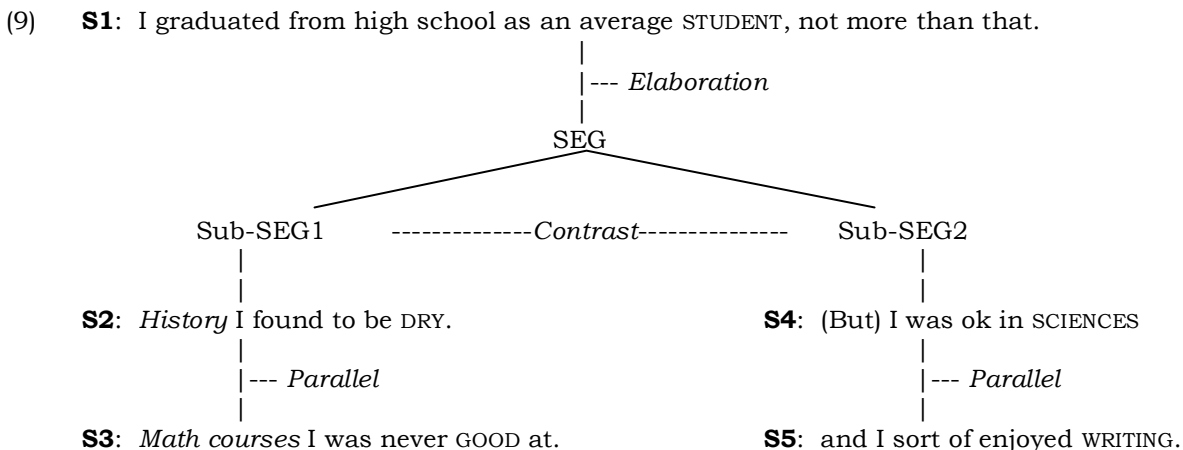
(8) What about your students? Who speaks which language?

- a) *John* speaks FRENCH; and *Bill* speaks GERMAN. [Parallel]  
 #*John* speaks FRENCH; and *German* is spoken by *BILL*.
- b) *John* speaks FRENCH and GERMAN; but *Bill* speaks only GERMAN. [Contrast]  
 #*John* speaks FRENCH and GERMAN; but *BILL* speaks only *German*.

- In sum: *a priori* the QUD approach looks more appealing than SDRT, since the IS of a clause follows from the role it has in DS – namely, answering a particular (implicit) topic-forming question. In SDRT, IS requirements can be imposed as part of the specific interpretation requirements of some RRs on a rather unconstrained way.

**3. The Problem: The CT/Focus-only alternation and Discourse Contrast**

- Coming back to the type of discourse of interest here: discourses such as (1) above, whose basic intuitive analysis, according to SDRT, would be sth like:



- Concerning the DS of discourses like (1):

- ◆ Sub-SEGs 1 and 2 (SS1 and SS2) satisfy the criteria for being in a *Discourse Contrast* relation wrt. each other and, internally, establish a *Discourse Parallel* relation:
  - a) they compare similar elements (school disciplines) with respect to similar predications (ways students can deal with or feel about school disciplines);
  - b) the compared elements are treated semantically in a dissimilar way: in SS1, they are assigned “negative” predications, and in SS2 they are assigned “positive” predications;
  - c) there is also a comparison of similar elements within each subsegment, but then they are assigned similar predications, satisfying the criteria for *Parallel*.
- ◆ VERY IMPORTANT: only the internal *Parallel* segments comply with the requirement for “structural similarity” as far as the IS’s of the sentences are concerned;
- ◆ The obvious argument for this analysis: the possible use of conjunctions in discourse (1):

(10) I graduated from high school as an average STUDENT, not more than that. *History* I found to be DRY. *Math courses* I was never GOOD at. But/??And I was ok in SCIENCES. I sort of enjoyed WRITING, too.

(11) I graduated from high school as an average STUDENT, not more than that. *History* I found to be DRY and/??but *Math courses* I was never GOOD at. I was ok in SCIENCES and/??but I sort of enjoyed WRITING, too.

- Concerning the interaction of DS and IS’s in discourses like (1):

- ◆ There is a correlation between the presence or absence of *but* in (1), and the requirements on the IS’s of the sentences in SS1 and SS2:
  - a) the “contrast” interpretation is unacceptable in case of CT-uniform IS pattern in the absence of *but*, cf. (12); idem for a Focus-only uniform IS pattern, cf. (13):

(12) I graduated from high school as an average STUDENT, not more than that. *History* I found to be DRY. *Math courses* I was never GOOD at. ??*In sciences* I was OK, and *writing* I sort of ENJOYED.

(13) I graduated from high school as an average STUDENT, not more than that. I found HISTORY to be dry, and I was never good at MATH. ??I was ok in SCIENCES and I sort of enjoyed WRITING, too.

b) **the “CT/Focus-only alternation”**: in absence of *but*, the “contrast” interpretation is acceptable only if: either sentences in SS1 are in a Focus-only IS and the sentences in SS2 in a CT IS, cf. (14), or the reverse, as originally in (1), repeated in (15) below;

(14) I graduated from high school as an average STUDENT, not more than that. I found HISTORY to be dry, and I was never good at MATH. \_\_ *In sciences* I was OK, and *writing* I sort of ENJOYED.

(15) I graduated from high school as an average STUDENT, not more than that. *History* I found to be DRY. *Math courses* I was never GOOD at. \_\_ I was ok in SCIENCES and I sort of enjoyed WRITING, too.

c) the “discourse contrast” can be expressed only by *but*, that is, the presence of *but* obviates the need for the CT/Focus-only alternation. cf. (16)-(17):

(16) I graduated from high school as an average STUDENT, not more than that. I found HISTORY to be dry, and I was never good at MATH. But I was ok in SCIENCES and I sort of enjoyed WRITING, too.

(17) I graduated from high school as an average STUDENT, not more than that. *History* I found to be DRY. *Math courses* I was never GOOD at. But *in sciences* I was OK, and *writing* I sort of ENJOYED.

• In short: there are four requirements for an analysis of discourse (1):

- a) to predict that the two segments SS1 and SS2 are sisters in a discourse relation, as SDRT does, cf. (9) above (leaving aside “structural similarity”, which is not to be met by (1));
- b) to predict that this relation corresponds to the one conventionally expressed by *but* – that is, *Contrast*, as opposed, say, to *Parallel*; this also seems to be met by the SDRT analysis;
- c) to predict the *optionality* of the CT/Focus-only alternation if *but* is present; this is not met by the SDRT analysis: the IS’s should all be the same because of “structural similarity”;
- d) to predict the *obligatoriness* of the CT/Focus-only alternation if *but* is not present; this is not met by the SDRT analysis either, again because of the “structural similarity”.

THAT IS: the SDRT analysis accounts for the DS of (1) as far as the content of RRs is concerned; but not for aspects related to the interaction between DS and IS.

#### 4. A QUD analysis of CTs

• Büring (2003) in a nutshell:

- ◆ Jackendoff’s observation: when a CT is used in a dialogue like (18B), “we presuppose (...) that there were a number of people and a number of different things to eat, and that various people ate various things. Speaker A is asking questions of the form *Who ate what?* And speaker B is answering” (Jackendoff 1972, p.261):

(18) A: Well, what about FRED? What did HE eat?  
B: *Fred* ate the BEANS.

Büring generalizes Jackendoff’s observation: (a) for any utterance containing a CT, the discourse issue addressed by the utterance can be expressed by a QUD corresponding to multiple question, such as ‘Who ate what?’ for (18); and (b) given that such QUD can be approached in two ways, the CT utterance signals which approach has been chosen:

(19) <Issue:>            <Who ate what?>  
  
    <Approach 1:>    <By people: What did Fred eat? And Mary? Etc.>  
    Utterance:        *Fred* ate the BEANS, and *Mary* ate THE TURKEY.  
  
    <Approach 2:>    <By food: Who ate the beans? And the turkey? Etc.>  
    Utterance:        FRED ate *the beans*, and MARY ate *the turkey*.

- ◆ Applying the idea to a more realistic discourse:

(20) <Q1:>            <What are the news?>  
    <A:>             Mr. Büring has finally closed his seminar.  
    <Q2:>            <How did the seminar end? >  
    <A:>             <With> Everyone of us got <getting> an old classic to read  
                          and to report to him.  
  
    <Q3:>            <Who got which book?>  
  
    a) <SQ1:>        <Who got Jackendoff’s book? Who got Selkirk’s?>  
    <A:>             *Jackendoff’s book* was assigned to MARY; and *Selkirk’s*  
                          (was assigned) to ME.  
  
    b) <SQ2:>        <Which book did Mary get? Which book did you get?>  
    <A:>             *Mary* got JACKENDOFF’S BOOK; and *I* got SELKIRK’S.

In short, the role of CTs is: (i) to signal the presence of a topic-forming question that can be answered by two or more “strategies”, as Q3 in (20); and (ii) to signal the “strategy” chosen – e.g., if (20) is continued as in (20b), the strategy is answering SQ2.

◆ More formally:

(a) Büring proposes that CTs trigger the formation of sets of questions called the **CT-value of S**, notated as  $[[S]]^{CT}$ . The algorithm of CT-value formation is:

(21) *CT-Value Formation:*

- (i) a WH-question is formed with the substitution of the focused constituent for a corresponding fronted WH-phrase;
- (ii) a set of questions is formed through the replacement of the contrastive topic for elements of a contextually given set of alternatives.

For instance, consider (21) applied to (18b) above:

(22) [*Mary*]<sub>CT</sub> got [JACKENDOFF’S BOOK]<sub>F</sub>.

STEP 1: Which book did [*Mary*]<sub>CT</sub> get?

STEP 2: {*Which book did Mary get? Which book did John get?...*}

(b) For a felicitous use of a CT utterance, there must be an (underlying) DS in the context that matches the set of questions triggered by the sentence – i.e., it should be possible to analyze the discourse context as composed of (at least) one of the elements of  $[[S]]^{CT}$  :

(23) *CT-Congruence:*

An utterance *U* containing a CT maps onto a move  $M_U$  within D-tree D if and only if *U* indicates a strategy around  $M_U$  in D.

(24) An utterance *U* indicates a strategy around  $M_U$  in D if and only if there is a non-singleton set  $Q'$  of questions such that, for each *Q* in  $Q'$ :

- (i) *Q* is identical to, or a sister of, the question that immediately dominates  $M_U$ ; and
- (ii)  $[[Q]]^O \in [[U]]^{CT}$  (where  $[[Q]]^O$  is the ordinary value of *Q*, i.e., a set of propositions).

◆ Ex.: (25) is odd because the strategy evoked by B’s utterance is not congruent with A’s question, according to the algorithm (21):

(25) A: Who got Jackendoff’s book?

B: #*Mary* got JACKENDOFF’S BOOK.

• Büring’s analysis applied to discourse (1):

◆ A DS analysis for (1) compatible with Büring’s idea: (a) It expresses the discourse relation between SS1 and SS2; and (b) it does so by means of a multiple-WH question:

(26) <Q1:> <How did you do in high school?>  
 <A:> I graduated from high school just as an average STUDENT.  
 <Q2:> <Why?>  
 <Q3:> < How did you feel about the classes?>

<SQ1:> <How did you feel about history, math, etc.?>  
 <A:> *History* I found to be DRY. *Math courses* I was never GOOD at.

<SQ2:> <Which classes did you feel good about: in which classes were you ok , which did you enjoy, etc.?>  
 <A:> I was ok in SCIENCES and I sort of enjoyed WRITING.

◆ Crucial observations:

- (a) SQ1 and SQ2 are DS related because they are “strategies”, i.e., sets of questions derived from the same multiple WH-question, Q3: SQ1 answers Q3 going by *disciplines*, and SQ2 by *ways students relate to disciplines*;
- (b) However, according to Buring’s analysis, the “answers” to SQ2 should be incongruent, since they do not have CT IS’s, but focus-only IS’s!!

◆ A way out: show that discourse (1) does not have the DS in (26)!

This, at first, seems to work out: (1) *may* be analyzed as *not* having the relevant discourse relation, cf. van Kuppevelt’s tests for topic-termination and topic-shift:

- (27) <Q1:> <How did you do in high school?>  
 <A:> I graduated from high school just as an average STUDENT.  
 <Q2:> <Why?>  
 <Q3:> <How did you feel about the classes?>
- <SQ1:> <How did you feel about history, math, etc.?>  
 <A:> *History* I found to be DRY. *Math courses* I was never GOOD at.  
 <A:> Now I think you UNDERSTAND WHY I was just an average student.
- <SQ2:> <Which classes did you like?/Wasn’t there any classes you like?>  
 <A:> (By the way) I was ok in SCIENCES and I sort of enjoyed WRITING.

◆ But this does not really solve the problem: *there must* an interpretation of discourse (1) in which the relation of discourse contrast connects the two segments, as shown by:

- (a) the possibility of inserting *but*, but not *and*, cf. (5)-(6) above;
- (b) the dependence of the IS’s in the two segments – i.e., “the CT/Focus-only alternation”;
- (c) and by the topic-termination test of van Kuppevelt as well, cf. (28) vs. (29):

(28) I graduated from high school just as an average STUDENT. *History* I found to be DRY. *Math courses* I was never GOOD at. I was ok in SCIENCES and I sort of enjoyed WRITING.  
**I think this shows how I felt about the classes.**

(29) I graduated from high school just as an average STUDENT. *History* I found to be DRY. *Math courses* I was never GOOD at. **I think this shows how I felt about the classes.**  
 ?? I was ok in SCIENCES and I sort of enjoyed WRITING.

(d) Moreover, the second segment of (1) can have CT-marking of the predicates; this shows that it can be interpreted as the strategy complementary to the first segment:

(30) I graduated from high school just as an average STUDENT. *History* I found to be DRY. *Math courses* I was never GOOD at. I was *ok* in SCIENCES and I sort of *enjoyed* WRITING.

◆ A final problem: all CT-Congruence requires is the presence of a “strategy”; it does not tell anything about the *content* of the SQs wrt. the main question, or wrt. each other; CT-Congruence applies equally to both *contrast* and *parallel*, which is correct for some cases:

(31) What about your students? Who speaks which language?

a) *John* speaks FRENCH; and *Bill* speaks GERMAN. [Parallel]  
 #*John* speaks FRENCH; and *German* is spoken by BILL.

b) *John* speaks FRENCH and GERMAN; but *Bill* speaks only GERMAN. [Contrast]  
 #*John* speaks FRENCH and GERMAN; but BILL speaks only *German*.

• Hence, wrt. the requirements for an analysis of discourse (1), Buring’s approach:

a) can predict that the two segments SS1 and SS2 are sisters in a discourse relation, but then it predicts that the sentences in SS2 should be incongruent;

- b) cannot predict that the DS relation between SS1 and SS2 is the same relation as the one conventionally expressed by *but*;
- c) cannot predict the *optionality* of the CT/Focus-only alternation if *but* is present;
- d) cannot predict the *obligatoriness* of the CT/Focus-only alternation if *but* is not present.

THAT IS: Büring's approach to CTs (and foci) can account neither for the DS properties of (1) as far as the content of RRs is concerned, nor for the aspects related to the interaction between the DS and the IS's in such discourses.

## 5. Conclusion: a QUD analysis of "discourse contrast"

- Umbach (2005) in a nutshell:

- ◆ Contrast between segments (i.e., "discourse contrast") results from the particular semantics of *but* and the questions triggered by the conjuncts – i.e., from the IS's of the sentences.
- ◆ Unlike Büring's analysis, the fact that CTs "presuppose a strategy for answering a main question" is not directly relevant. What matters is that CTs and Foci are "types of focus", i.e., both trigger contextually given sets of alternatives. The second major component in the analysis is that discourse contrast involves *two* underlying questions, one of which is denied.
- ◆ More specifically, the essential characteristics of CT constructions coordinated by *but* are:
  - (a) The elements "under focus" (CTs and Foci) from the first conjunct form *pairs* of contrasted elements with "appropriate items" of the second conjunct – items of the same semantic type and which belong to the same set of alternatives;
  - (b) VERY IMPORTANT: There is no requirement for "structural similarity"; in particular, no requirement that the contrasted elements have the same informational status. For ex.:

- (32) a) [*John*]<sub>CT1</sub> [cleaned up the ROOM]<sub>F1</sub> but [*Bill*]<sub>CT2</sub> [washed the DISHES]<sub>F2</sub>.  
 b) [*John*]<sub>CT1</sub> [cleaned up the ROOM]<sub>F1</sub> but it was [*BILL*]<sub>F2</sub> who [washed the *dishes*]<sub>CT2</sub>.  
 $\sigma_1 = \langle \text{John, Bill} \rangle$   
 $\sigma_2 = \langle \text{clean up the room, wash the dishes} \rangle$

(c) The predications that hold of the elements in the contrastive pairs must be mutually exclusive – that is, what is true for one element of a pair must not be true for the other. Contrast arises precisely because the context expectation is that of compatibility between the conjuncts. This is expressed by the compatibility of the underlying QUDs.

For example, consider possible DS's underlying (32a,b) above:

- (33) <Q:> <What did John do? And did Bill do that too?>  
 <A:> [*John*]<sub>CT1</sub> [cleaned up the ROOM]<sub>F1</sub> but [*Bill*]<sub>CT2</sub> [washed the DISHES]<sub>F2</sub>.

Context expectation: Bill cleaned up the room.

Contrast/But requirement:  $\neg \langle P_1: \text{John (also) washed the dishes} \rangle$   
 $\neg \langle P_2: \text{Bill (also) cleaned up the room} \rangle$

- (34) <Q:> <What did John do? And did he wash the dishes?>  
 <A:> [*John*]<sub>CT1</sub> [cleaned up the ROOM]<sub>F1</sub> but it was [*BILL*]<sub>CT2</sub> who [washed the *dishes*]<sub>F2</sub>.

Context expectation: John washed the dishes.

Contrast/But requirement:  $\neg \langle P_1: \text{John (also) washed the dishes} \rangle$   
 $\neg \langle P_2: \text{Bill (also) cleaned up the room} \rangle$

- Umbach's analysis applied to discourse (1): actually, there is a DS which would be compatible with Umbach's assumptions and coherent with discourse (1):

- (27) <Q1:> <How did you do in high school?>  
 <A:> I graduated from high school just as an average STUDENT.  
 <Q2:> <Why?>  
 <Q3:> <How did you feel about the classes?>
- <SQ1:> <How did you feel about history, math, etc.?>  
 <A:> *History* I found to be DRY. *Math* courses I was never GOOD at.
- <SQ2:> <Did you feel the same about the other disciplines?>  
 <A:> <No,> I was ok in SCIENCES and I sort of enjoyed WRITING.

This analysis has some positive features:

- (a) it does provide the means to express the discourse relation between the two segments of (1);
- (b) it does express the relation's content, namely, of "discourse contrast"; and
- (c) it does not predict the incongruence of the IS's in the second segment.

- Winding up: a few problems left and a few conclusions:

- ◆ Umbach's analysis of contrast *is* a matter of interaction between DS and IS: it is established by *but* must crucially refer to contrasted alternatives expressed by the IS's of the conjuncts;
- ◆ But Umbach's assumptions concerning the relation between contrast and the IS's of the conjuncts is weak, and it does not *require* any particular pattern of IS's in the conjuncts;
- ◆ Such weak assumptions do seem justified in the presence of *but*; however, they entail that the CT/Focus-only alternation can't be a *consequence* of there being an implicit "discourse contrast" between the two segments of discourse (1);
- ◆ Crucially, if this were true, it might actually be an argument *against* the SDRT approach, in which the IS requirements of the contrast relation might be taken as an explanation for the obligatoriness of the CT/Focus-only alternation in (1)!
- ◆ So, the situation is:
  - (a) we have now a way of characterizing the contrast relation in discourse (1), and this way of characterizing is compatible with the IS's in this discourse;
  - (b) we cannot predict yet that, in absence of *but*, the CT/Focus-only alternation is obligatory;
  - (c) moreover, we do not know yet the source of the meaning of "contrast" in discourse (1):
    - (i) it cannot be the discourse contrast relation by itself, since *but* do not impose the IS constraints found in (1);
    - (ii) and it cannot be the conventional meaning of CTs themselves (or foci, for that matter), since such IS's are compatible with structures that do not carry discourse contrast.
- ◆ CONCLUSION: It appears that it is the CT/Focus-only alternation itself that allows for the contrast relation to be established in (1), rather than the other way around. But how to express this idea? Of course, Umbach's analysis of discourse contrast does not account for this, as it was not devised to account for contrast in absence of *but*. To find an answer for this question is what we will try to do in the next steps of this study.

## References

Asher 1993 *Reference to Abstract Objects in Discourse*. | Asher & Lascarides 2003 *The Logics of Conversation*. | Büring 2003 On D-Trees, Beans, and B-Accents. | Kamp & Reyle 1993 *From Discourse to Logics*. | Lambrecht 1994 *Information Structure and Sentence Form*. | Roberts 1996 *Information Structure in Discourse*. | Umbach 2004 *Contrast in Information Structure and Discourse Structure*. | van Kuppevelt 1995 *Discourse Structure, Topicality and Questioning*.