Concession, Implicature and Alternative Sets

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Work In Progress

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Introduction

- Haliday (1970)

  (1) (In the London underground,) Dogs must be CARRIED.

  (2) (In the London underground,) DOGS must be carried.

- Rooth (1992)

  (3) I only introduced Bill to SUE.

  (4) I only introduced BILL to Sue.

Introduction

- Drestske (1972)

  Clyde has a relationship with Bertha, a confirmed bachelor(ette). They are both busy in their jobs, so they meet once week, unless either of them has to work. Clyde learns he stands to inherit a great deal of money at the age of thirty if he is married. Clyde would hate to abandon the congenial relationship with Bertha for a marriage of the conventional sort. Fortunately, Bertha agrees to go through the formalities of marriage, it being understood that their relationship will continue exactly as before.

(5) a. Clyde married BERTHA
    b. Clyde MARRIED Bertha

(6) a. because he wanted their relationship to continue as BEFORE.
    b. because he wanted to qualify for an INHERITANCE.

Introduction

- The information structure of a sentence reflects the speaker's (writer's) formulation of the "shared" attentional state

- Attention transcends the sentence

- **How does information structure (IS) relate to discourse semantics?**
  - How does IS **contribute to** and **make use of** discourse?
  - How does IS **project** in units larger than a sentence?

→ Current work:
How does IS contribute to discourse through the lexical semantics of discourse connectives expressing concession?

Outline

- IS and its formalization using alternative sets
- Lexical semantics of *although*: two kinds of concession
- IS projection through denial of expectation use of *although*
- IS projection through concessive opposition use of *although*
- Conclusions

Information Structure and Alternative Sets

Information Structure

- Our approach builds on
  - Prague School: Mathesius; Firbas; Sgall, Hajičová et al.
  - Halliday's notion of information structure (Given vs. New)
  - Steedman's work on IS in Combinatory Categorial Grammar

- Terminology and IS formalization based on Steedman (1991, 2000):

$$\begin{array}{ccc} \text{Theme}_{is}\ (\theta) & \text{vs.} & \text{Rheme}_{is}\ (\rho) \\ \text{Background}_{is}\ \text{vs. Focus}_{is} & & \text{Background}_{is}\ \text{vs. Focus}_{is} \end{array}$$

IS Partitioning: Examples

(7) Q. I know how David's doing. What about Clyde?
A. $(\textsc{Clyde})_\theta$ $(\underline{\text{married } \textsc{Bertha}})_\rho$.
θ(7): $\lambda Q.\ Q\ (\star c)$
ρ(7): $\lambda x.marry'(x, \star b)$

(8) Q. I know David married Aretha. Who married Bertha?
A. $(\underline{\textsc{Clyde}})_\rho$ $(\text{married } \textsc{Bertha})_\theta$.
θ(8): $\lambda x.marry'(x, \star b)$
ρ(8): $\lambda Q.\ Q\ (c)$

(9) Q. I know Clyde dates Aretha. What about his relationship with Bertha?
A. $(\text{Clyde})_\theta$ $(\underline{\textsc{married}})_\rho$ $(\textsc{Bertha})_\theta$.
θ(9): $\lambda Q.\ Q\ (c, \star b)$
ρ(9): $\lambda x.\lambda y. \star marry'(x, y)$

IS Semantics (Steedman 2000)

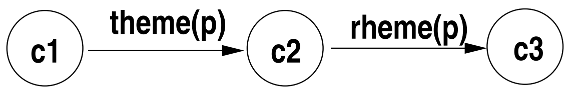
- based on alternative-set semantics (Rooth 1985, Rooth 1992, Kratzer 1991)
- Theme$_{is}$ presupposes a **Rheme$_{is}$-alternative set** (AS$_\rho$)
  Focus within Rheme$_{is}$ restricts the AS$_\rho$
- Theme$_{is}$ also presupposes a **Theme-alternative set** (AS$_\theta$)
  Focus within the Theme$_{is}$ restricts the AS$_\theta$

(9) (Clyde)$_\theta$ ($\underline{\text{MARRIED}}$)$_\rho$ (BERTHA)$_\theta$.
θ(9): $\lambda Q.\ Q\ (c, \star b)$
ρ(9): $\lambda x.\lambda y.\star marry'(x, y)$
AS$_\rho$(9): $\{date'(clyde', bertha'),\ marry'(clyde', bertha')\}$
AS$_\theta$(9): $\{\exists Q.\ Q(clyde', bertha'),\ \exists Q.\ Q(clyde', aretha')\}$

IS-sensitive Context Updating

- Krifka (1992), Kruijff-Korbayová (1998), Steedman (2000)

- Theme$_{is}$ update phase: $c_1[\theta(p)]c_2$,
  Rheme$_{is}$ update phase: $c_2[\rho(p)]c_3$



- $\theta(p)$ update: verify AS$_\theta(p)$ and AS$_\rho(p)$

- $\rho(p)$ update: verify Background of $\rho(p)$, restrict AS$_\rho(p)$

Concession and Conventional Implicatures

Concession Expressed by Discourse Connectives

- Denial of expectation

  (10) Although Greta Garbo was considered the yardstick of beauty, she never married. (Lagerwerf 1998)

- Concessive opposition

  (11) Q: Can I use Perl regular expressions to match balanced text?
  A: Although Perl regular expressions are more powerful than "mathematical" regular expressions, they still aren't powerful enough. You still need to use non-regexp techniques to parse balanced text, ...

- these two kinds of concession are related:
  they verbalize different parts of a concession logical schema for concession

The ABC-Scheme for Concession

- Grote et al. (1995): On the one hand, A holds, implying the expectation of C. On the other hand, B holds, which implies $Not - C$, contrary to the expectation induced by A.

  i. $A > C$
  —typically general world knowledge
  (rule of cause and effect or a customary expectation)

  ii. $B > not - C$
  —induced from context; considered stronger in the given situation

- denial of expectation: *although A, not-C*
- concessive opposition: *although A, B*

Lexical semantics of discourse connectives

- **Assertion**: relation between discourse units

- More can be conveyed than is asserted: Lakoff R. (1971), Lakoff G. (1971), Halliday (1985), (Lagerwerf 1998), etc.

→ **Presupposition(s)** triggered by a discourse connective

  – in the sense of pragmatic presuppositions (Karttunen 1971, 1973, 1974), or **conventional implicatures** (Grice 1975, Karttunen & Peters 1979), e.g., *because, although, however, nevertheless* conventionally implicate rules

Embedding Tests

- "survival" in a negation or modal context, or in different illocutionary acts

(12) It is not the case that Greta Garbo was never married although she was beautiful.

(13) It is possible that Greta Garbo was never married although she was beautiful.

(14) Is it the case that Greta Garbo was never married although she was beautiful?

- the tests are difficult to apply
  they have not been designed for complex clauses

Discourse Context Tests

- binding to an antecedent, accommodation in the absence of an antecedent

(15) Beautiful women always get married.
Greta Garbo never married although she was beautiful.

(16) Greta Garbo never married although she was beautiful.

(17) $\star$ Beautiful women always stay single.
Greta Garbo never married although she was beautiful.

- Discourse tests work fine.

$\rightarrow$ conventional implicature (Grice 1975, Karttunen & Peters 1979)

- What we are concerned with is the exact form rather than the status of the "expectations"

Denial of Expectation

- $although\ p\ q$ (denial of expectation interpretation)

  i. assertion: $p\&q$

  ii. conventional implicature: $gen(p) > gen(\neg q)$
  where p, q are propositions associated with the clauses,
  and $>$ is defeasible implication (Asher and Morreau 1991),
  and $gen(X)$ stands for a suitable generalization reachable from X

(10) Although Greta Garbo was considered the yardstick of beauty, she never married. (Lagerwerf 1998)

  i. assertion: $p : beauty(g)\ \&\ q : \neg married(g)$

  ii. conventional implicature: $gen(p) > gen(\neg q)$

(10′) Normally, if a woman is beautiful then she gets married.

Concessive Opposition

- relies on a contextually provided “open issue”, or “common topic” called **tertium comparationis** (TC) (Lagerwerf 1998)
- with explicit question: TC as the set of potential answers (Hamblin 1973)
- the relata support opposite conclusions w.r.t. the TC
- the conceded relatum has weaker argumentative force than the main one, so the conclusion drawn on the basis of the main one “wins”

(11) Q: Can I use Perl regular expressions to match balanced text?
A: Although Perl regular expressions are more powerful than “mathematical” regular expressions, they still aren’t powerful enough.

Concessive opposition (cont'd)

- $although\ p\ q$ (in concessive opposition interpretation)

  i. assertion: $p\&q$

  ii. conventional implicatures: $TC = \{r_1, r_2\}\ \&\ p > r_1\ \&\ q > r_2$
  where p, q are the propositions associated with the clauses,
  and $>$ is defeasible implication (Asher and Morreau 1991),
  and r_1 and r_2 are opposite conclusions wrt the TC

(11) Although Perl regular expressions are more powerful than "mathematical" regular expressions, they still aren't powerful enough.

  i. assertion: $p : more\_power(pre, mre)\ \&\ q : \neg enough\_power(pre)$

  ii. conventional implicatures:
  $\{r_1 : can\_use(pre), r_2 : \neg can\_use(pre)\}\ \&\ p > r_1\ \&\ q > r_2$

English: Intonation Affects Interpretation

- denial of expectation

(18) Although Clyde MARRIED Bertha, he did not inherit a PENNY.
(19) Although Clyde married BERTHA, he did not inherit a PENNY.

- concessive opposition

(20) Q: Is Clyde happy?
(21) A2: Although Clyde MARRIED Bertha, he did not inherit a PENNY.
(22) A1: Although Clyde married BERTHA, he did not inherit a PENNY.

Intuition: varying the IS of the relata (through intonation) results in differences in the expectations (we concentrate on the IS of the subordinate clause)

Czech: Word order Affects Interpretation

(23) Ačkoli si Clyde Bertu vzal, nezdědil ani groš.
Although Clyde Bertha married, not-inherited a penny.
Although Clyde MARRIED Bertha, he did not inherit a PENNY.

(24) Ačkoli si Clyde vzal Bertu, nezdědil ani groš.
Although Clyde married Bertha, not-inherited a penny.
Although Clyde married BERTHA, he did not inherit a PENNY.

Similar intuition: varying the IS of the relata (through word order) results in differences in the expectations

Conventional Implicatures in Concession and Alternative Sets

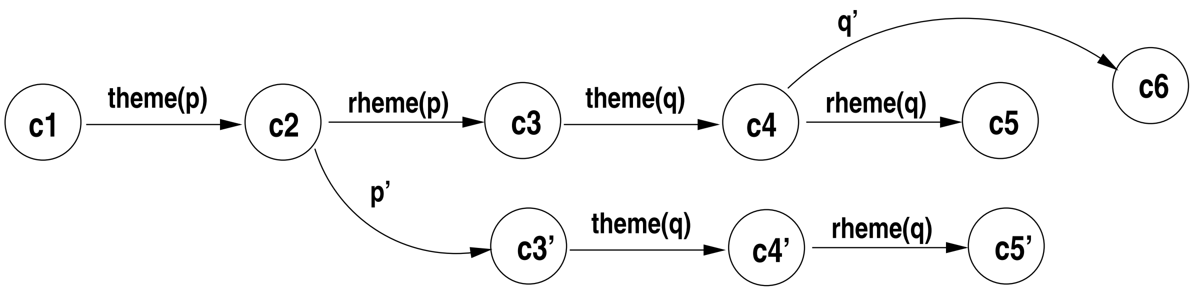
IS-Sensitive Denial of Expectation

(18) Although (Clyde)$_\theta$ ($\underline{\text{MARRIED}}$)$_\rho$ (Bertha)$_\theta$,
(he)$_\theta$ ($\underline{\text{did not inherit a PENNY}}$)$_\rho$.

(18′) In normal circumstances

i. If Clyde marries Bertha, he inherits money.

ii. If Clyde does with Bertha something else than marry her, he does not inherit money.



(For formal details of the IS-partitioning and alt-sets, see the Proceedings.)

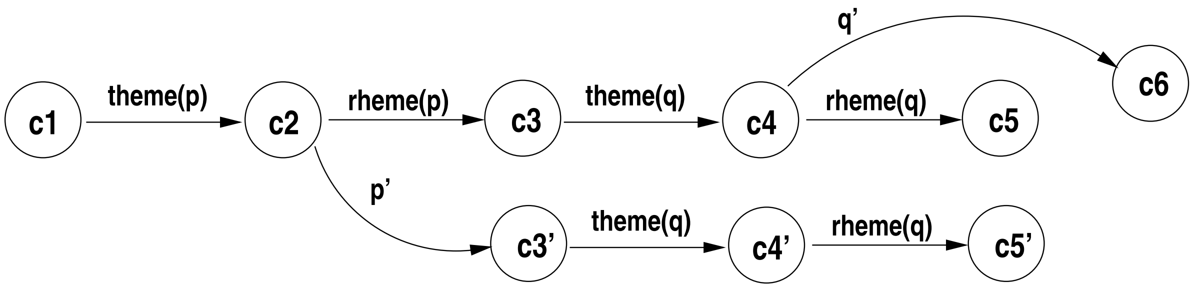
IS-Sensitive Denial of Expectation

(19) Although (Clyde married)$_\theta$ ($\underline{\textsc{Bertha}}$)$_\rho$,
(he)$_\theta$ ($\underline{\text{did not inherit a }\textsc{penny}}$)$_\rho$.

(19′) In normal circumstances

i. If Clyde marries Bertha, he inherits money.

ii. If Clyde marries someone else than Bertha, he does not inherit money.



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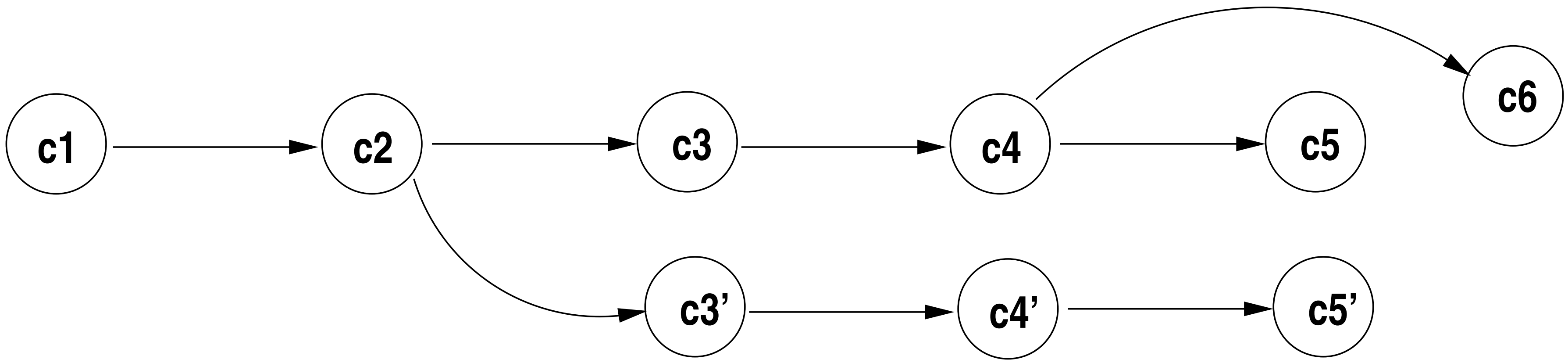
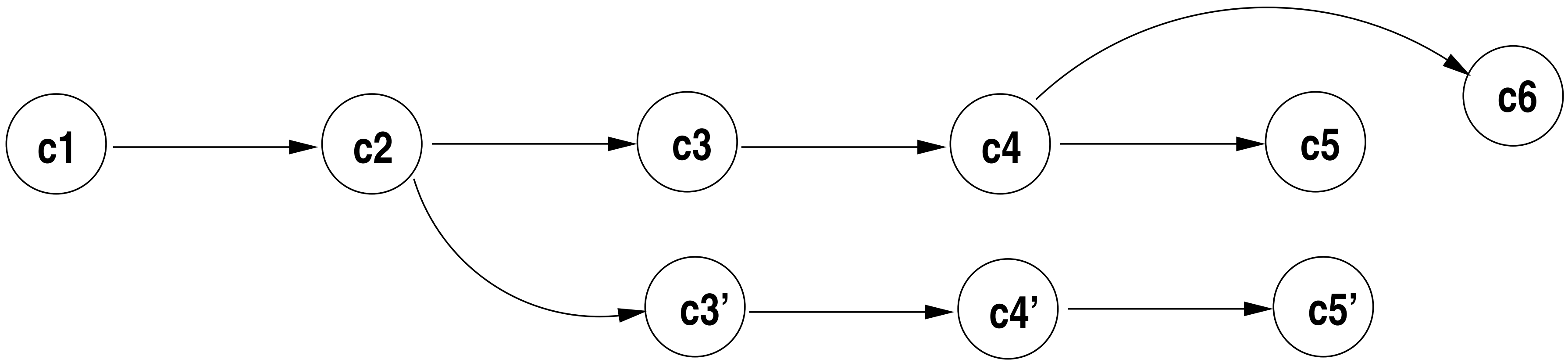
IS-Sensitive Denial of Expectation (18)



IS-Sensitive Denial of Expectation (19)



Denial of Expectation: Formalization

- c_1 admits $although\ p'\ q'$ iff
  - assertions:
    c_1 admits p: $c_1[\theta(p)]c_2[\rho(p)]c_3$
    c_3 admits q: $c_3[\theta(q)]c_4[\rho(q)]c_5$
  - pragmatic presuppositions (conventional implicatures):
    i. $\exists q'.\ q' \in \rho\text{-AS}(q) \ \wedge\ q' \neq q \wedge (c_1 \text{ admits } p > q')$:
    $c_1[\theta(p)]c_2[\rho(p)]c_3[\theta(q)]c_4[q']c_6 \ \wedge\ c_6 \neq \perp$
    ii. $\forall p'.\ p' \in \rho\text{-AS}(p) \ \wedge\ p' \neq p \wedge (c_1 \text{ admits } p' > q)$:
    $c_1[\theta(p)]c_2[p']c_3{}'[\theta(q)]c_4{}'[\rho(q)]c_5{}' \ \wedge\ c_5{}' \neq \perp$

- negation as a "suitable alternative", i.e. an alternative in the ρ-AS(q)
- "expectation perfection", i.e., implicatures for alternatives in ρ-AS(p)

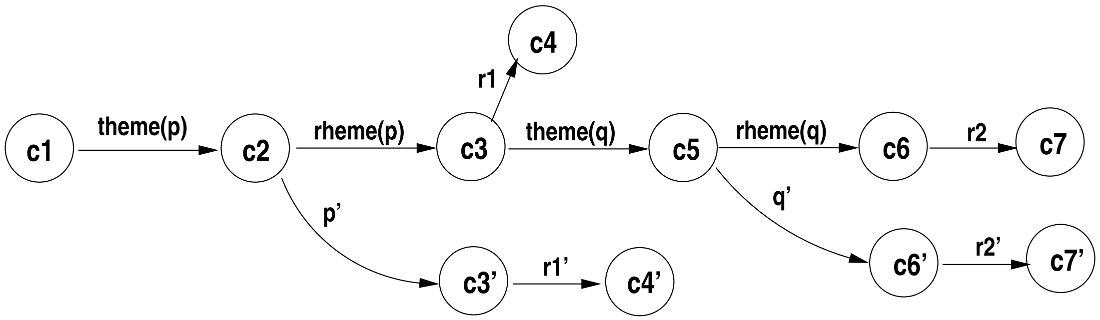
IS-Sensitive Concessive Opposition

(20) Q. Is Clyde happy?

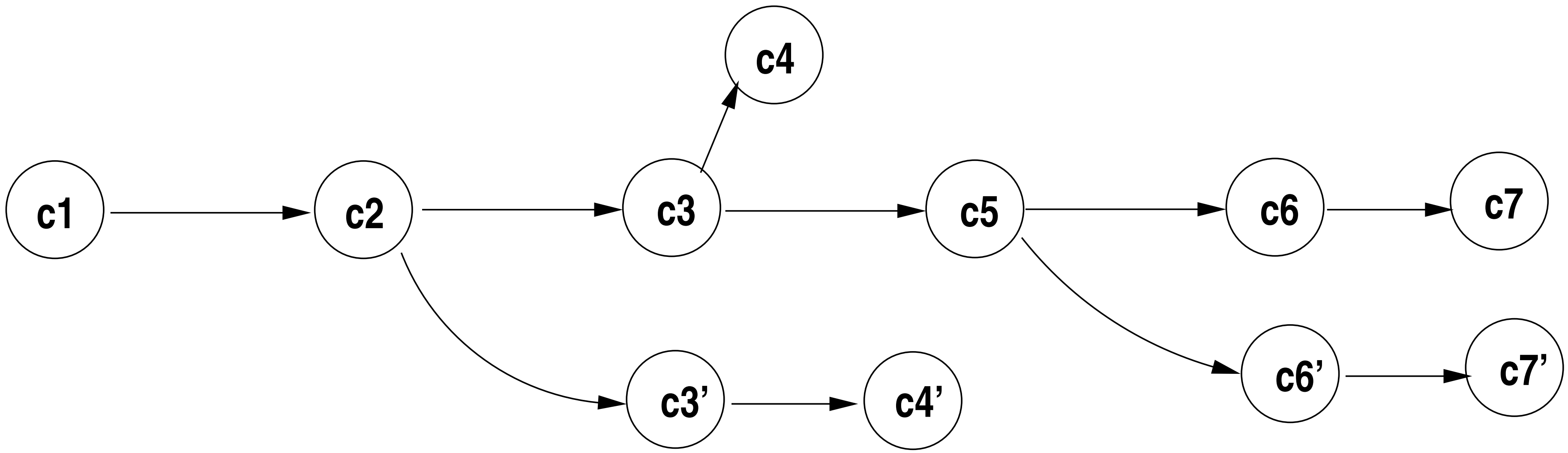
(22) A. Although (Clyde married)$_\theta$ (<u>BERTHA</u>)$_\rho$, (he)$_\theta$ (<u>did not inherit a PENNY</u>)$_\rho$.

(22′) In normal circumstances

i. If Clyde marries Bertha, he is happy.
ii. If Clyde marries someone else than Bertha, he is not happy.
iii. If Clyde does not inherit money, he is not happy.
iv. If Clyde inherits money, he is happy.



IS-Sensitive Concessive Opposition (22)



Concessive Opposition: Formalization

- c_1 admits $although\ p'\ q'$ iff
  - assertions:
    c_1 admits p: $c_1[\theta(p)]c_2[\rho(p)]c_3$
    c_3 admits q: $c_3[\theta(q)]c_4[\rho(q)]c_5$
  - pragmatic presuppositions (conventional implicatures):
    i. $\exists R.\ R\ is\ a\ contextual\ alternative\ set$
    $\exists r_1, r_2 \in R.\ r_1 \neq r_2 \wedge (c_1$ admits $p > r_1) \wedge (c_1$ admits $q > r_2)$:
    $c_1[\theta(p)]c_2[\rho(p)]c_3[r_1]c_4 \ \wedge\ c_4 \neq \perp \ \wedge c_1[\theta(q)]c_5[\rho(q)]c_6[r_2]c_7 \ \wedge\ c_7 \neq \perp$
    ii. $\exists r_1', r_2' \in R.\ r_1' \neq r_1 \ \wedge r_2' \neq r_2 \ \wedge\ r_1' \neq r_2' \ \wedge$
    $\forall p'.\forall q'.\ p' \in \rho - AS(p) \ \wedge\ p' \neq\ p \ \wedge\ q' \in \rho - AS(q) \ \wedge\ q' \neq\ q \wedge$
    $(c_1$ admits $p' > r_1') \wedge (c_1$ admits $q' > r_2')$:
    $c_1[\theta(p)]c_2[p']c_3'[r_1']c_4' \ \wedge\ c_4' \neq \perp \ \wedge c_1[\theta(q)]c_5[q']c_6'[r_2']c_7' \ \wedge\ c_7' \neq \perp$

Summary

- Although IS is expressed differently in different languages,

- IS affects the interpretation of discourse connectives all the same

- IS cannot be ignored when doing discourse semantics in general, and semantics of discourse connectives in particular

  – IS affects meaning (truth-conditions) as well as presuppositions
  – this holds also for discourse connectives

- A systematic discourse update procedure **needs** to and **can** be made IS-sensitive

Plenty of Further Work . . .

- Work out details, improve formalization, implement.

- Applicability to other concessive discourse connectives and beyond concession?
  - *however* β, *nevertheless* β, α *although* β
  - α *because* β and *otherwise* β in causal contexts
  - etc.

- Non-initial placement of discourse connectives with a clause/sentence as an indication of IS-partitioning?

- Computation of alternative sets as a discourse progresses?

- . . .