Coherence and the Coordinate Structure Constraint

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1 The Coordinate Structure Constraint

The Coordinate Structure Constraint [Ross, 1967]:

> In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct.

(1) a. * What book did John buy and read the magazine?
(Parallel ∈ *Resemblance*)

b. What book did John buy and read?

Counterexamples to the CSC [Lakoff, 1986]:

(2) a. How much can you drink and still stay sober? [Goldsmith, 1985]
(Violated Expectation ∈ *Cause-Effect*)

b. That's the stuff that the guys in the Caucasus drink and live to be a hundred. [Lakoff [1986], attributed to Farley]
(Result ∈ *Cause-Effect*)

(3) a. What did Harry buy, come home, and devour in thirty seconds? [Adapted from Ross [1967]] (Narration ∈ *Contiguity*)

b. * What did Harry buy and come home?

2 VP Ellipsis

(4) Ross likes his mother, and Bill does too.

- Much debate in literature about whether resolution reconstructs a syntactic or a semantic representation in the target

Kehler [1993; 1994a; 1995]:

- Resemblance Relations: *Syntactic* representation reconstructed
- Cause-Effect Relations: *Semantic* representation reconstructed

2.1 Passive/Active Voice Mismatches

Cause-Effect:

(5) In March, four fireworks manufacturers asked that the decision be reversed, and on Monday the ICC did. [reverse the decision] (cited in Dalrymple [1991])

(6) This problem was to have been looked into, but obviously nobody did. [look into the problem] (Vincent Della Pietra, in conversation)

(7) Actually I have implemented it with a manager, but it doesn't have to be. [implemented with a manager] (Steven Ketchpel, in conversation)

Resemblance:

(8) # This problem was looked into by John, and Bob did too.

(9) # John implemented the indexing program with a manager, and the retrieval program was too.

2.2 Non-VP Antecedents

Cause-Effect:

(10) This letter deserves a response, but before you do, ... [respond] (Gregory Ward, p.c.)

(11) First person pronouns aren't very shiftable, although the plural ones can be. [shifted] (Barbara Partee, in conversation)

Resemblance:

(12) # This letter provoked a response from Bush, and Clinton did too.

(13) # First person pronouns aren't very shiftable, and the plural ones also don't.

2.3 Binding Theory Constraints

2.3.1 Condition A Violations

Resemblance:

(14) ?? John$_i$ defended himself$_i$, and Bob$_j$ did too. [defended John$_i$]

(15) ?? Fred$_i$ voted for himself$_i$, and Gary$_j$ did too. [voted for Fred$_i$]

Cause-Effect:

(16) Bill$_i$ defended himself$_i$ against the accusations because his lawyer$_j$ wouldn't.

(17) John$_i$ voted for himself$_i$ even though no one else$_j$ did.

2.3.2 Condition B Violations

Resemblance:

(18) # John's$_j$ mother introduced him$_j$ to everyone, and he$_j$ did too. [introduced himself$_j$]

(19) # John$_i$'s lawyer defended him$_i$, and he$_i$ did too. [defended himself$_i$]

Cause-Effect:

(20) John's$_j$ mother introduced him$_j$ to everyone because he$_j$ wouldn't.

(21) John$_i$'s lawyer defended him$_i$ because he$_i$ wouldn't.

2.3.3 Condition C Violations

Resemblance:

(22) # I hit Bill$_i$, and he$_i$ did too. [hit Bill$_i$]

(23) # Mary introduced John$_j$ to everyone, and he$_j$ did too. [introduce John$_j$ to everyone]

Cause-Effect:

(24) I expected Bill$_i$ to win even when he$_i$ didn't.

(25) The lawyer defended Bill$_j$ against the accusations because he$_j$ wouldn't.

2.4 Subjacency Violations

Antecedent Contained Deletion:

(26) John read everything which Bill believes he did.

Resemblance:

(27) # John read everything which Bill believes the claim that he did. [Haïk, 1987]

(28) # John read everything which Bill wonders why he did. [Haïk, 1987]

Cause-Effect:

(29) Which problem did you think John would solve because of the fact that Susan did? [Rooth, 1981]

Unelided form with gap:

(30) * Which problem did you think John would solve because of the fact that Susan solved?

3 Gapping

(31) John drank the beer and Bill the wine.

Gapping only felicitous with 'symmetric' (i.e., Resemblance) *and*, and not 'asymmetric' (i.e., Cause-Effect) *and* [Levin and Prince, 1982]:

(32) a. Sue became upset and Nan became downright angry.

b. Sue became upset and Nan ∅ downright angry.

(33) Sue and Nan had worked long and hard for Carter. When Reagan was declared the winner, Sue became upset and Nan became/∅ downright angry. (Resemblance)

(34) Susan's histrionics in public have always gotten on Nan's nerves, but it's getting worse. Yesterday, when she couldn't have her daily Egg McMuffin because they were all out, Sue became upset and Nan became/#∅ downright angry. (Cause-Effect)

Correlation with Resemblance vs. Cause-Effect [Kehler, 1994b]:

(35) a. John will vote for Clinton or Tom ∅ for Bush.

b. John voted for Clinton but Tom ∅ for Bush.

(36) # John voted for Clinton $\left\{ \begin{array}{c} \text{because} \\ \text{even though} \\ \text{despite the fact that} \\ \text{although} \end{array} \right\}$ Tom ∅ for Bush.

4 The Pattern

Relation Type	Across-the-Board Extraction Required?	VPE Requires Syntactic Parallelism?	Gapping Felicitous?
Resemblance	yes	yes	yes
Cause-Effect	no	no	no
Contiguity	no*	no*	no*

Table 1: The Pattern

5 Hume's Three Types of Coherence

Hume [1748]:

> To me there appear to be only three principles of connection among ideas, namely *Resemblance*, *Contiguity* in time or place, and *Cause* or *Effect*."

The coherence resolution procedure as a two-step process:

1. *Identify* and *retrieve* the arguments to the coherence relation
   ⇒ utilizes syntactic structure
2. *Apply* the constraints of the relation to those arguments.

5.1 Resemblance

Parallel: Infer $p(a_1, a_2, ...)$ from the assertion of S_0 and $p(b_1, b_2, ...)$ from the assertion of S_1, where for some property vector q, $q_i(a_i)$ and $q_i(b_i)$

(37) John bought the book and Bill read the magazine.

Relation	Constraints	Conjunctions
Parallel	$p_0 = p_1$, $q_i(a_i)$ and $q_i(b_i)$	and
Contrast	(1) $p_0 = \neg p_1$, $q_i(a_i)$ and $q_i(b_i)$ (2) $p_0 = p_1$, $q_i(a_i)$ and $\neg q_i(b_i)$	but
Exemplification	$p_0 = p_1$; $b_i \in a_i$ or $b_i \subset a_i$	for example
Generalization	$p_0 = p_1$; $a_i \in b_i$ or $a_i \subset b_i$	in general
Elaboration	$p_0 = p_1$, $a_i = b_i$	in other words

Table 2: Resemblance Relations

5.2 Cause-Effect

Result: Infer P from the assertion of S_0 and Q from the assertion of S_1, where normally $P \rightarrow Q$.

(38) The guys in the Caucasus drink that stuff and live to be a hundred.

Relation	Presuppose	Conjunctions
Result	$P \rightarrow Q$	and (as a result) therefore
Explanation	$Q \rightarrow P$	because
Violated Expectation	$P \rightarrow \neg Q$	but and still
Denial of Preventer	$Q \rightarrow \neg P$	even though despite

Table 3: Cause-Effect Relations

5.3 Contiguity

Narration: Infer a change of state for a system of entities from S_1, inferring the initial state for this system from S_0.

(39) Harry bought a box of cookies and came home.

6 Synopsis of The Analysis

- VP-ellipsis and gapping: missing syntax is recovered so that the arguments to the Resemblance coherence relation can be identified
  - VP-ellipsis is referential, so a semantic antecedent is recovered without regard to syntactic parallelism in Cause-Effect relations
  - Gapping is not referential, so it is infelicitous in Cause-Effect relations because its meaning can not be recovered without reconstruction of the missing syntax
- For extraction, the topic of a Resemblance construction must be common to each of the conjuncts (i.e., *Common Topic* [Lakoff, 1971])
- In each case, the process of coherence establishment for Resemblance relations is sensitive to choice of syntactic structure

7 Conclusions

- There is no purely syntactic Coordinate Structure Constraint. Unacceptable cases of extraction out of coordinate structures appear to result from constraints at the syntax/discourse interface.
- The data for VP-ellipsis, gapping, and extraction suggest that constraints on these processes cannot be explained solely at the level of syntax. In particular, the type of coherence relation that is operative between clauses must be taken into account.

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