Economy of structure and information

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Summary: We formulate an economy condition that bans the use of linguistic objects that are needlessly inferior than other linguistic objects that could have been used to effect the intended context change. The empirical focus is on utterances whose inappropriateness cannot be due to quantity considerations, given the availability of appropriate alternatives that convey the same information in context. Such cases have motivated the formulation of three independent principles: (i) A principle stating that sentences must be parsed with a covert exhaustive operator *exh* (Magri, 2009); (ii) *Maximize Presupposition!* (Heim, 1991); (iii) Hurford's constraint on disjunctive sentences (Hurford, 1974). We argue that our proposed economy condition, stated in (1) below (cf. Blutner, 1998; Zeevat, 2000; a.o.), not only unifies the principles (i)-(iii) but also overcomes difficulties we identify with each of them. However, in section 5 below we point out a new challenge that arises for this perspective.

(1a) Use the best alternative! Use of sentence S in context c is inappropriate if there is a better alternative $S' \in ALT(S)$ such that $c \cap [[S]] = c \cap [[S']]$.

(1b) Goodness: A is 'as good as' B if A semantically entails B and A is structurally no more complex than B. A is 'better than' B if A is as good as B and B is not as good as A.

(1c) ALT and Structure: ALT(S) is the set of sentences derivable by replacing nodes in the parse of S with their subconstituents or with lexical items (simplification of Katzir, 2007). S' is 'no more complex than' S if $S' \in ALT(S)$.

1. Mandatory Exh? Magri (2009) observed that it is odd to use the semantically weaker of two scalar alternatives if they happen to provide the same new information in the context:

(2) Sam gave all his students the same grade. He gave $\{\#\text{some / all}\}$ of them an A.

Magri (2009) argues that the oddness of \exists in (2) is evidence that: (A1) scalar implicatures (SIs) are computed with a covert exhaustive operator exh (e.g., Chierchia et al., 2008) and (A2) exh must be appended to sentences. Under these assumptions the existential sentence in (2) will be parsed $exh(\exists)$, and oddness follows from a contradiction between $[[exh(\exists)]] = \exists \land \neg \forall$ and the contextual equivalence between \exists and \forall established by the first sentence of (2). Without A1 and A2, the oddness of \exists in (2) remains puzzling from a neo-Gricean perspective: Why not just cancel the SI, or not compute it in the first place? (Similar remarks apply to ignorance inferences which in any event are not available in (2) under Magri's assumptions.)

1.1 Difficulty: A1 and A2 do not explain cases of oddness in which exhaustification does not yield the required contradiction. For example, *John ate some or all of the cookies* and *John ate at least*

some of the cookies do not have an SI that John did not eat all of the cookies. Nevertheless, these sentences are as odd as *John ate some of the cookies* when \exists and \forall are contextually equivalent:

(3) Sam gave all his students the same grade. He gave {#some or all/#at least some} of them an A. **1.2 Our proposal:** We suggest that the oddness in (2) and (3) can be explained with the principle in (1). Under (1) the utterances are sub-optimal given the availability of a better alternative that can effect the same context-change: *John ate all of the cookies* (\forall is no more complex than any of the existential sentences in (2) and (3), and it semantically entails them all). Note that we nowhere appeal to *exh* in the explanation. Thus, we can give up A2 as well as A1. The challenge, however, is to explain why there should be a preference for a *semantically* stronger alternative when it adds no additional information to the context than the semantically weaker alternative.

2. Brief remark on motivation: A preference for a semantically stronger alternative can be motivated by communicative considerations other than the amount of increment to the current context. Specifically, use of \forall in (2) and (3) would save the conversational participants from having to reason with information in the context, reasoning that could in principle go wrong (e.g., Stalnaker, 1978; Beaver, 2001; Schlenker, 2012). Use of a semantically weaker expression like \exists forces the interlocutors to reason with contextual assumptions to get the context to entail \forall ; this reasoning can be avoided at no additional cost to anyone if the speaker uses \forall instead.

3. *Maximize Presupposition!* Heim (1991) observed that when there are equally simple sentences that can increment a context c to a context c', and one has presuppositions that are satisfied in c and the other carries less presuppositions, the speaker must use the alternative that encodes stronger presuppositions (see also e.g., Sauerland, 2003, 2008; Percus, 2006; Chemla, 2008).

(4) $\{\# A / the\}$ sun is shining

3.1 Difficulty: *Maximize Presupposition!* (MP) has no obvious motivation, and in particular does not derive from Gricean quantity considerations (Heim, 1991; Percus, 2006; Schlenker, 2012).

3.2 Our proposal: The contrast in (4) is a special case of the principle in (1). Thus, there is no need to stipulate **MP**. The definite variant in (4) semantically entails the indefinite variant, and since the context satisfies its presupposition (by assumption), update is defined and the sentences will thus be contextually equivalent. In general, when there are alternatives some of which encode a partial/trivalent proposition, the principle in (1) will be operative only in those contexts in which the presuppositions of all alternatives are satisfied.

4. Hurford's Constraint: Hurford (1974) observed that disjunctions are infelicitous if one of the disjuncts entails the other.

(5) # John was born in France or in Paris

Call such sentences 'Hurford Disjunctions,' and call whatever is behind the oddness of Hurford Disjunctions 'Hurford's Constraint' (henceforth HC). In light of HC, the observation that (6) is felicitous (Gazdar, 1979) has been used to argue that a covert exhaustive operator exh exists and applies at the first disjunct to break the entailment (Chierchia et al., 2008):

(6) John gave some or all of his students an A

Without exh, the parse $\exists \lor \forall$ violates HC. With exh the parse $exh(\exists) \lor \forall$ becomes available and obviates HC.

4.1. Difficulties: First, HC is not a good candidate for a general condition on speech acts as such: it regulates only disjunctive sentences, and it is not obvious why pragmatics should be concerned with entailment relations between disjuncts. Second, HC does not explain why the sentence in (6) becomes odd in a context like (3). Third, HC does not straightforwardly extend to embedded disjunctions. However, embedding (5) under negation and quantifiers continues to lead to oddness:

(7) # John wasn't born in France or in Paris / # Every man was born in France or in Paris

4.2 Our proposal: Under (1) the sentence in (5) is blocked by the alternative *John was born in France*, since it is contextually equivalent to (5) but is structurally simpler than it. For similar reasons, the embeddings in (7) are blocked by *John wasn't born in France* and *Every man in that room was born in France*. Turning to (6), without *exh* the sentence would be blocked by \exists . To capture the appropriateness of (6), then, we must accept that there is an *exh* at the first disjunct. With this assumption, the sentence $exh(\exists) \lor \forall$ is no longer contextually equivalent to either of its alternatives $exh(\exists)$ or \forall . It is contextually equivalent to \forall in (4), however, and hence the oddness. **5. A Challenge:** The principle in (1) predicts that disjunctions $\phi \lor (\neg \phi \land \psi)$ should be blocked by the semantically equivalent but structurally simpler $\phi \lor \psi$. However, no such blocking occurs:

(8) Either there is no bathroom in this house or (there is and) it's upstairs

Solutions to this challenge typically employ local contexts (e.g., Schlenker, 2009; Mayr & Romoli, 2013; Katzir & Singh, 2013); a challenge (for us) is to address (8) without local contexts.