Hurford disjunctions: embedded exhaustification and structural economy[1]

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Abstract. Hurford's Constraint, which bans disjunctions in which one disjunct entails the other, has been central to the debate between the pragmatic and the grammatical view on Scalar Implicatures. We provide evidence that Hurford's Constraint should be derived from more basic principles, and we propose such a derivation using a pragmatic prohibition against redundant constituents. In a first, more conservative version, the redundancy is specific to disjunctions. In a second, more general version, redundancy is banned regardless of constituent type. Both versions make new predictions about the emergence of oddness in cases that are not covered by Hurford's Constraint. The first version is too restricted. The second one is incorrect. We explore a revised architecture in which the relevant redundancy principle applies locally in the semantic computation. This perspective makes different predictions about oddness than the first two and has a potentially interesting extension to oddness in quantificational constructions, which we discuss. All our attempts to generalize Hurford's Constraint require the grammatical theory of Scalar Implicatures.

Keywords: Hurford's constraint; scalar implicature; exhaustivity; redundancy; economy; presupposition; domain restriction.

1. Introduction

1.1. Scalar implicatures and exhaustification

Scalar implicatures (SIs) are computations in which an assertion S gives rise to inferences of the form $\neg S'$, where S' is an alternative of S. Descriptively, SIs can be thought of as being computed by a function, f, which takes a sentence, S, and a set of alternatives, $A(S)$, and negates some members of $A(S)$.

(1) S = John gave some of his students an A (= $\exists$)
  a. $f(A(\exists))(\exists) = \exists \wedge \neg\forall$
  b. $A(\exists) = \{\exists, \forall\}$
  c. f negates alternatives

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Broadly speaking, there are two distinct views on how SIs come about. On what is often called the 'pragmatic' view, f is the output of global, domain general processes of rational thought (e.g., Grice (1975), Horn (1972), and many others). On the so-called 'grammatical' view, f is the output of domain-specific mechanisms (e.g., Chierchia (2004), Fox (2007), among others), and it is sometimes considered to be a syntactically-realized operator, exh, which can be thought of as a silent variant of *only*.

1.2. Hurford's constraint

At the center of much recent work on choosing between the pragmatic and the grammatical view stands an observation by Hurford (1974), who noted that disjunctive sentences are odd if one of the disjuncts entails the other. This observation is stated in (2) and illustrated in (3).

(2) Hurford's Constraint (HC): A disjunction of the form $X_1 \vee X_2$ is odd if X_1 entails X_2 or vice versa

(3) a. # John was born in France or he was born in Paris
  b. # John was born in Paris or he was born in France

Hurford further noted that HC has an apparent counterexample in sentences like (4).

(4) John ate (cake or ice-cream) or he ate both

The first disjunct, *cake or ice-cream*, is entailed by the second, *both* (= *cake and ice-cream*), in apparent violation of HC. And yet (4) is a perfectly acceptable sentence. Hurford concluded from such examples that *or* is lexically ambiguous between inclusive and exclusive disjunction: inclusive disjunction would cause a violation of HC in (4), but with exclusive disjunction neither disjunct would entail the other and HC would not be violated. It is thanks to the availability of exclusive disjunction, on Hurford's analysis, that (4) is acceptable.

Hurford's conclusion was challenged by Gazdar (1979), who noted that the pattern of apparent violations of HC in acceptable sentences is not specific to the use of *or* within one of the disjuncts and that a similar state of affairs obtains across scalar items. In (5), for example, the first disjunct appears to be entailed by the second, without giving rise to oddness:

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

Gazdar concluded that HC is obviated whenever one of the disjuncts is a scalar alternative of the other. Not wishing to resort to systematic lexical ambiguity across scalar items, he took his refinement of Hurford's pattern to imply a complication of HC so as to make room for the exemption of disjuncts that are scalar alternatives of one another.

1.3. The argument from HC

In recent work, Chierchia, Fox, and Spector (2011) point out that the apparent exceptions to HC noted by Hurford and Gazdar are predicted by the original formulation of HC–and without resorting to lexical ambiguities for scalar items–on the grammatical view on SIs. We illustrate using exh as a grammatical device.

(6) Explaining (4) using *exh*:
  a. # $\exists \vee \forall$ (ruled out by HC)
  b. $exh(\exists) \vee \forall$ (okay under HC)

(7) Explaining (5) using *exh*:
  a. # $(A \vee B) \vee (A \wedge B)$ (ruled out by HC)
  b. $exh(A \vee B) \vee (A \wedge B)$ (okay under HC)

Contrasting with the straightforward explanation of the apparent exceptions to HC under the grammatical view, under the pragmatic view such cases are puzzling: from a globalist, pragmatic perspective, there seems to be no clear way to distinguish the bad (3) from the acceptable (4) and (5). Chierchia et al. use this preliminary challenge for the pragmatic view to construct a much more direct one. All disjunctions violating HC in its original form are equivalent to their weaker disjunct. In (4) and (5), which appear to obviate HC, the disjunction is still equivalent to the (unexhaustified version of what under the pragmatic view is) the weaker disjunct: for (5), $(\exists \wedge \neg\forall) \vee \forall \equiv \exists$, and similarly for (4). But the grammatical view predicts that this will not always be the case. Specifically, following Fox and Spector (2008), suppose $p \subset q \subset r$, and suppose p, q, and r are scalar variants of one another. Then $r \vee p$, parsed as $exh(r) \vee p$, will be equivalent to $(r \wedge \neg q) \vee p \neq r$. As the following shows, this reading is indeed available:

(8) Peter either solved the first and the second problem or he solved all of the problems
Reading: Peter either solved only the first and second problems, or he solved them all

We are not aware of attempts within the pragmatic view to address this challenge.

2. Concerns

Due to the centrality of HC to the debate between the pragmatic and the grammatical views, we would like to give HC a closer look. In particular, the statement of HC in (2) treats it as an unanalyzed condition of oddness, and in this section, we will discuss two concerns with HC that suggest that it should be derived rather than stipulated as a primitive. This does not directly damage Chierchia et al.'s argument from HC, but it does leave one wondering whether the argument will still hold under a better understanding of what derives HC. If our attempt to derive HC in the following section is on the right track, it does.

2.1. Naturalness and embedding

HC regulates only disjunctive sentences, which makes it an unlikely candidate for a general condition on speech acts: pragmatic constraints are more naturally formulated at the level of the entire sentence and the information contained within it, rather than with the particular form it happens to take. In particular, as a constraint on speech acts, it is not clear whether HC applies to embedded occurrences. However, applying disjunction to smaller constituents within (3) and various forms of embedding continue to lead to oddness:

(9) a. # John was born in France or in Paris
b. # John was born in France or Paris
c. # It is likely that John was born in France or (that he was born) in Paris
d. # John wasn't born in France or in Paris
e. # Every man was born in France or in Paris

2.2. Context

As noted earlier (5) (= *John gave some or all of his students an A*) is generally felicitous, an observation that led Gazdar (1979) to propose a complication of HC and that has been argued by Chierchia et al. (2011) to support the grammatical view of SIs. (5) was presented within a null context. Surprisingly from the perspective of both Gazdar and Chierchia et al., the same sentence becomes infelicitous when uttered within the context provided in (10).

(10) John gave the same grade to all his students...# he gave some or all of them an A.

In (10) we follow Magri (2009) by creating a context in which $\exists$ (= *John gave some of his students an A*) and $\forall$ (= *John gave all of his students an A*) are equivalent. But why should this manipulation be relevant? Magri explained the oddness of $\exists$ in similar contexts by appealing to a contradiction between $\exists$'s strengthened meaning $\exists \wedge \neg\forall$ and the contextual equivalence between $\exists$ and $\forall$; cf. the contrast in (11).

(11) John gave the same grade to all his students...
  a. # ...he gave some of them an A.
  b. ...he gave all of them an A

This line of explanation is unavailable in (10), however, because (5) does not generate an SI $\neg\forall$.

3. Generalizing HC

3.1. First attempt: penalizing redundant disjuncts

A common intuition regarding HC is that it relates to a dispreference for redundancy: the disjunction in a Hurford disjunction is equivalent to the weaker disjunct, so the speaker uttering the disjunction could have conveyed the same information by using that weaker disjunct alone. If we can make this informal sense more precise, we might have a handle on the naturalness concern. Moreover, non-redundancy offers a potentially helpful perspective on the effects of context: in (5), the use of disjunction is not generally redundant, but in the context provided in (10), it is (the same information could have been provided by $\exists$ or by $\forall$). Our first step, then, is to make the non-redundancy intuition precise.

What we need is a condition that blocks a structure Z containing disjunction that conveys the same information as a variant of Z with just one of the disjuncts instead of the entire disjunction. As it turns out, a very similar condition has been proposed – but for conjunctions rather than disjunctions – by Schlenker (2008) (see also Horn (1972), van der Sandt (1992), and Fox (2008)):

(12) `Avoid Incrementally Redundant Conjuncts`: # $X \wedge Y$ if the same information could have been conveyed by X.

Condition (12) was proposed by Schlenker to account for presupposition projection. As Schlenker points out, however, it makes the correct prediction also for non-presuppositional cases. For example, it correctly predicts that (13a) below, the conjunctive counterpart of a Hurford disjunction, will be odd. Note that the formulation of (12) is asymmetric: a sentence containing a conjunction is odd if the conjunction can be replaced with the first conjunct; replaceability with the second conjunct does not lead to oddness. This asymmetry is motivated by the well-known asymmetry in presupposition projection, but Schlenker also notes that it makes the correct prediction that reversing the order of the conjuncts in (13a), as in (13b), will improve the sentence.

(13) a. # John resides in Paris and lives in France
b. John lives in France and resides in Paris

In section 3.4 we will take a closer look at the question of linear order, both in conjunctions and in disjunctions. For now, because (3a) and (3b) are both odd, let us take HC to be a symmetric, conjunctive variant of (12):[2]

(14) a. `Avoid redundant disjuncts` (replaces HC): If X contains a disjunction $Y_1 \vee Y_2$, $X[Y_1 \vee Y_2]$, and X is contextually equivalent in context c to either $X[Y_1]$ or $X[Y_2]$ then use of X is inappropriate in c.
b. `Contextual Equivalence` ψ and ξ are *contextually equivalent* in context c, $\psi \equiv_c \xi$, iff $\{w \in c : [[\psi]](w) = 1\} = \{w \in c : [[\xi]](w) = 1\}$ (cf. Schlenker (2012)).

By comparing the meanings of sentences and penalizing the representation of constituents that contribute nothing to content, (14) provides a more natural pragmatic statement than HC. More importantly it has desirable empirical consequences. In particular, it captures the fact that both unembedded and embedded Hurford Disjunctions should be odd. To see this, note that $X[Y_1 \vee Y_2]$, where Y_1 contextually entails Y_2 (say), is contextually equivalent to $X[Y_2]$ (this is because $\forall w \in c$, $[[Y_1 \vee Y_2]](w) = [[Y_2]](w)$; $Y_1 \vee Y_2$ and Y_2 will thus project meaning in the same way). Taking the France-or-Paris case (schematized as $F \vee P$) as an example, note that for the unembedded case, as in (3), $F \vee P \equiv_c F$ and for the embedded case, as in (9d), $\neg(F \vee P) \equiv_c \neg F$. In this way, the statement in (14) is readily shown to rule out both (3) and (9d).

We should add that the constraint is local: it penalizes redundant disjuncts but it does not penalize undue complexity in some global sense. For example, the sentence in (15) is perfectly acceptable, even though it is more verbose than but equivalent to (3b) (= *John was born in Paris or in France*) and the even simpler *John was born in France*. Under the statement in (14), (15) manages to escape oddness because neither of its disjuncts is equivalent to the disjunction itself.[3]

(15) John was born in Paris or somewhere else in France

[2]Some informants report that (3b) is easier to rescue than (3a) when interpreted as 'John was born in Paris, or at least in France.' As noted in Schlenker (2009, p. 35), adding an overt *at least* at the second disjunct does improve (13a). We think the strategy of introducing an 'at least,' overtly or covertly, eliminates the disjunctive force of the sentence, though we do not attempt to develop a theory of where 'at least' can be inserted.

[3]We thank Ida Toivonen for this observation and helpful discussion.

3.2. Exh persists

We can also see that (14) allows us to derive the re-emergence of oddness in the relevant contexts in cases in which HC was obviated using SIs. Consider again (5) above, repeated here.

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

Without exh, (16) is semantically equivalent (and hence always contextually equivalent) to its first disjunct $\exists$. This incorrectly predicts that (16) should be unusable in any context. But if exh exists, (16) can be parsed as $exh(\exists) \vee \forall$. This parse breaks the semantic equivalence between (16) and its disjuncts, thus rescuing (16) from (14) unless context imposes an equivalence between (16) and its disjuncts. Unlike HC, we *predict* that (5) will be odd in a context that does impose such an equivalence, as in (10), repeated here as (17).

(17) John gave the same grade to all his students...# he gave some or all of them an A.

On our account, (17) (= $(exh(\exists) \vee \forall) \equiv \exists \equiv_c \forall$) is odd because the same information could have been conveyed by either of the simpler disjuncts, $\exists$ or $\forall$.[4]

3.3. Second attempt: general economy

Condition (14) still makes reference to disjunctions, and hence is not fully general. One possible solution would be to replace it with a general ban against redundant material (modeled after Fox, 2008):

(18) `Avoid redundant material`: Do not use $X[Y]$ in context c if Y contains Z, and $X[Z] \equiv_c X[Y]$.

Condition (18) is a general ban against redundant material. It subsumes (14), which in turn replaces HC. Like (14), (18) does not allow us to eliminate exh: to account for the lack of oddness in sentences such as (16), exhaustification must still apply disjunct-internally.

The data so far thus support the following conclusions: (i) SIs are computed by exh; and (ii) the pragmatic system encodes a (restricted) preference for simpler expressions (either (14) or (18)).

[4]As mentioned earlier, Magri (2009) derives the oddness of $\exists$ in such contexts. The present account, then, can be seen as complementing – rather than replacing – Magri's account.

As we will shortly see, the relative generality of (18) gives rise to wrong predictions, leading us to adopt a more local conception of non-redundancy. For now, though, let us use (18) to explore certain oddness effects beyond disjunction.

3.4. Generalizing to conjunction

Up until the introduction of (18), our entire discussion was framed in terms of disjunctive sentences. (18) prohibits redundant material more generally, and thus extends to non-disjunctive sentences. Sticking to conjunction for the moment, substituting the second conjunct in each of the following (*it's upstairs* in (19) and *a smoker* in (20)) for the entire conjunction would result in an equivalent sentence in each case; consequently, both are ruled out by (18).

(19) # If there is a bathroom in this house, then there is a bathroom in this house and it's upstairs.

(20) # Every boy is a boy and a smoker

(18) also predicts that redundancy in conjunctive sentences will be bad symmetrically. In certain cases, this prediction seems to be borne out:

(21) a. # John walks and moves
b. # John moves and walks

This symmetry is at odds with Schlenker's pattern in (13) above, where, as predicted by (12), a stronger initial conjunct (as in (13a) = *# John resides in Paris and lives in France)* leads to oddness, while a stronger final conjunct (as in (13b) = *John lives in France and resides in Paris*) does not.

We believe that the representative pattern is the one in (21) and that redundancy in conjunction is prohibited in both directions.[5] To account for (13), we tentatively propose that it is possible to reanalyze *lives* and *resides* such that entailment between the conjuncts can be broken. For example, one verb might be read as signifying the space that John actually occupies, while the other signifies a perhaps more abstract notion relevant for legal purposes such as taxes, citizenship, etc. Note for example that when there is only one verb present (say 'lives in'), the oddness appears in both directions (Chemla, 2009):

(22) a. # John lives in Paris and in France

[5] An alternative would be to argue for a left-to-right asymmetry in Hurford disjunctions. In fact, such an asymmetry has been pointed out and discussed in Singh (2008), but for those disjunctions in which a scalar item allows for an obviation of HC. For actual Hurford disjunctions, oddness holds in both orders, as we have discussed.

b. # John lives in France and in Paris

Moreover, when we turn to entailments that are due to logical operators, rather than content words that in principle allow some flexibility in interpretation, the oddness is there in both directions:

(23) a. # John ate some of the cookies and he ate all of them
b. # John ate all of the cookies and he ate some of them

We are thus left with a puzzle: some conjunctions are bad in both orders, such as (22) and (23), while others, such as (13), are not (nothing we have said speaks to why (13b) is less odd than (13a)).[6] A particularly important case of the latter kind concerns the classic observation (Karttunen, 1973) that conjunctions with one conjunct S_p presupposing the content of the other conjunct p are felicitous only in the order $p \wedge S_p$:

(24) a. John has children and he loves his children
b. # John loves his children and he has children

Given (18) we might expect the redundancy of p to be penalized in both cases (note that S_p doesn't merely presuppose p, but it also entails it). A possible explanation for this asymmetry – assuming that presupposition projection is asymmetric – comes from the observation that the sentence $p \wedge S_p$ has no presuppositions while S_p does; hence, p is not redundant here. In the reverse direction, $S_p \wedge p$ and S_p both presuppose p; hence p is redundant, and the sentence is thus ruled out by (18).

Needless to say, much more needs to be said about presupposition projection and its interaction with linear order, but at this point let us set this matter aside. We now turn to a different and perhaps more severe challenge for (18), brought to our attention by Gennaro Chierchia.

3.5. Chierchia's challenge

Condition (18), which penalizes redundancy by considering the substitution of every constituent for every containing constituent, is probably too strong. As pointed out to us by Gennaro Chierchia

[6]It has sometimes been suggested that the pragmatic system employs both symmetric and incremental redundancy evaluations, which raises questions of how these strategies might interact (Schlenker, 2008, 2009; Chemla and Schlenker, 2012). With both symmetric and incremental evaluations of redundancy, it is natural to think that oddness would be greater if a sentence is both incrementally and symmetrically redundant than if it is only symmetrically redundant. We do not consider extensions to incremental strategies here (note again that the oddness of (21), (22), and (23) is mysterious if incremental strategies are available).

(p.c.), a pattern noted by Mayr and Romoli (2013) argues against any ban on redundancy that is as general as (18). Here are some examples:

(25) a. Either there is no bathroom, or (there is one, and) it is upstairs
b. Either Mary isn't pregnant, or (she is, and) John is happy

The observation is that these sentences are appropriate, even though the bracketed phrases could be deleted without any change in information ($\phi \vee \psi \iff \phi \vee (\neg\phi \wedge \psi)$). The problem is a general one, stemming from the fact that our generalization of (14) in (18) is no longer local: whereas (14) compared the meaning of a disjunction to its immediate constituent disjuncts, (18) makes it possible to compare the meaning of a sentence with the meanings of other sentences derivable by *arbitrary* substitutions of nodes in the sentence by their constituents. Thus, the following sentences – which were not ruled out by (14) (cf. (16), (15)) – are now incorrectly predicted to be banned:

(26) a. John ate some or all of the cookies (= $exh(\exists) \vee \forall$; blocked under (18) by $\exists$)
b. John is from Paris or somewhere else in France (blocked under (18) by *John is from France*)

Our attempt to eliminate the stipulative restriction to disjunctive sentences has also eliminated the locality that seems to be needed to correctly describe the data.

3.6. Third attempt: local redundancy checking

We believe that Chierchia's challenge can be addressed, at least in part, by reassigning the redundancy checking from the pragmatics to points in the structure-building process where the grammar interfaces with the context. Specifically, we propose that the semantic computation evaluates, at certain nodes, whether the semantic composition principle that applies there is non-vacuous. Focusing here on nodes γ that dominate binary operators O taking arguments α and β:

(27) `Local Redundancy Check:` S is deviant if S contains γ and $[[\gamma]] = [[O(\alpha, \beta)]] \equiv_c [[\zeta]], \zeta \in \{\alpha, \beta\}$.

This principle bans sentences if there is a node in the sentence whose meaning is derived by applying an operator O to a pair of arguments α and β, and the result of this application is contextually equivalent to the meaning of one of the arguments α or β. The statement in (27) maintains the locality of (14) (note that (27) accesses only that information needed to compute the denotation of the node under consideration), as well as some of the generality of (18) (no reference is made to any particular operator or constituent type). For now, we will assume that when S is asserted in context c, for each node in S where (27) is evaluated the context relevant to the evaluation is the global context c.[7]

The revised architecture provides a handle on Chierchia's challenge. In particular, (27) does not penalize $\phi \vee (\neg\phi \wedge \psi)$ (e.g., (25b) = *either Mary isn't happy or she is and John is happy*) even though it contains material that could be deleted without any change in meaning (the sentence is equivalent to $\phi \vee \psi$). To see why this is true, note that at node $\alpha = \neg\phi \wedge \psi$ the conjunction is not equivalent to either of its conjuncts (e.g., *Mary is pregnant and John is happy* is not equivalent to either constituent). Thus α passes the redundancy check and $[[\alpha]]$ gets passed on up to the root node, $\phi \vee \alpha$. Here, the redundancy check finds that neither of the disjuncts is equivalent to the disjunction itself. In other words, the local composition in $\phi \vee (\neg\phi \wedge \psi)$ is always meaningful.

The constraint in (27) further predicts that redundant conjuncts and disjuncts will be banned, symmetrically: $\phi \vee \psi$ and $\phi \wedge \psi$ are banned if they end up contextually equivalent to either ϕ or ψ. This prediction holds for matrix and embedded coordinated structures; the principle in (27) applies locally, and thus does not distinguish between embedded and matrix clauses. Thus, not only will embedded Hurford disjunctions like (9) above be ruled out, so will variants of Mayr and Romoli (2013)'s disjunctions (29) $\phi \vee (\neg\phi \wedge \psi)$, central to Chierchia's puzzle, when the second disjunct is equivalent to one of its constituent conjuncts (symmetrically):

(28) a. # Either John ate none of the cookies or he ate some of them and he ate all of them
b. Either John ate none of the cookies or he ate all of them
c. # Either John doesn't live in France or he lives in France and Paris
d. Either John doesn't live in France or he lives in Paris

Note that exh is still needed to account for the appropriateness of disjunctions like (16) = *John gave some or all of his students an A*. The parse $\exists \vee \forall$ is banned by (27) because the whole disjunction is equivalent in any context to $\exists$. However, the parse $exh(\exists) \vee \forall$ is not banned by (27): the whole disjunction is equivalent to $\exists$, which is not generally equivalent to either $exh(\exists)$ or to $\forall$.[8] However, in contexts that do impose such an equivalence, such as (17), (27) is violated and oddness re-emerges. Interestingly, exh has remained stable under our various attempts to replace HC with more descriptively and empirically adequate bans on redundancy.

[7] Opening the door to interactions between context and embedded constituents invites a 'dynamic' view on interpretation but does not necessitate it. In section 3.7 we will build on Schlenker's (2009) demonstration that such interactions are also compatible with a classical semantics, but we will develop an alternative perspective for reasons we discuss more carefully there.

[8] Note that the disjunct with exh will also satisfy (27): exh takes two arguments, $\exists$ and the alternatives of $\exists$, and the meaning of the whole, $\exists \wedge \neg\forall$, is not equivalent to $\exists$.

Unfortunately, Chierchia's challenge re-emerges in a slightly different form: the oddness of (19), repeated below as (29c), is now left unexplained. Under a material implication analysis of conditionals, for example, the sentence should behave exactly like (25a) ($\phi \rightarrow \psi \iff \neg\phi \vee \psi \iff \neg\phi \vee (\phi \wedge \psi)$). At the consequent neither conjunct is vacuous, and at the root the entire conditional is equivalent to neither its antecedent nor its consequent. Assuming that redundancy is the relevant source of oddness in (19), the challenge we face is:

(29) Chierchia's Challenge, Again: Why is *there is a bathroom in this house* redundant in (29c) but not in (29a)?

a. Either there is no bathroom in this house or there is a bathroom in this house and it's upstairs
b. Either there is no bathroom in this house or it's upstairs
c. # If there is a bathroom in this house, there is a bathroom in this house and it's upstairs
d. If there is a bathroom in this house, it's upstairs

We will not be able to derive the asymmetry between disjunction and conditionals and will therefore have to stipulate it. In the next section we will explore ways in which the relevant stipulation can be stated.

3.7. Domain Restriction

One way to state the difference between $A \vee B$ and *if* A, *then* B is by restricting the evaluation of B in the conditional to those worlds where A is true, which makes the representation of A in such a position entirely redundant; in disjunction, on the other hand, B will be evaluated with respect to the context of the entire disjunction. This comes close to adopting the standard dynamic semantic denotation for the conditional: $\phi \rightarrow \psi$ will now be analyzed as $\neg\phi \vee (\phi \wedge \psi)$ instead of its truth-conditionally equivalent $\neg\phi \vee \psi$. In a dynamic semantics, where $\wedge$ is defined in the usual way as sequential composition, the equivalence between $\neg\phi \vee \psi$ and $\neg\phi \vee (\phi \wedge \psi)$ is lost: indefinites in ϕ can bind pronouns in ψ in $\neg\phi \vee (\phi \wedge \psi)$ but not in $\neg\phi \vee \psi$. This is what allows for donkey anaphora: *If John has a donkey*$_i$, *he beats it*$_i$.

As pointed out by Schlenker (2009), the dynamic perspective is not required for the use of local contexts. Schlenker offers a general statement which, in conjunction with a classical semantics, predicts the context of evaluation for any embedded constituents. Specifically, he argues that such an assignment can be made by assuming: (i) that embedded constituents are evaluated with respect to subsets of the global context c (i.e., worlds in $\mathcal{W} \setminus c$ are ignored), and (ii) the interpretive system employs strategies that sometimes restrict attention to proper subsets of c when the result is guaranteed to not affect the truth-conditions of the sentence. Schlenker (2009) shows that the statement predicts the following assignment of local contexts, which agree with the dynamic treatments of e.g., Chierchia, 1995; Beaver, 2001:

(30) Local Contexts Predicted by Schlenker (2009):
  a. The local context of ψ when $\phi \vee \psi$ is uttered in context c is $c \cap [[\neg\phi]]$
  b. The local context of ψ when *if* ϕ, ψ is uttered in context c is $c \cap [[\phi]]$

This assignment of local contexts, together with assumptions demanding that each constituent be locally consistent and informative (Schlenker, 2009), would suffice to capture the oddness of (29c). However, important problems remain. First, these assumptions leave the appropriateness of (29a) unexplained (*there is a bathroom in the house* is redundant in the local context of the second disjunct). Moreover, as noted by Schlenker (2009, p. 35), the oddness of *John was born in France or (John was born) in Paris* is predicted (since *John was born in Paris* is contradictory in its local context), but the oddness of *John was born in Paris or in France* is left unexplained because *John was born in France* is neither inconsistent nor redundant in a context which entails that he was not born in Paris.

Let us consider a variant of Schlenker (2009)'s proposal that applies only in specific cases rather than as a general strategy. Specifically, we will assume that the evaluation of local contexts applies in the case of restricted quantification:[9]

(31) `Restricted Evaluation`: For sentences $Op_E(A)(B)$, where Op is a generalized quantifier in natural language and E is the domain of $[[A]]$ and $[[B]]$, evaluation of $[[B]]$ is restricted to $c \cap [[A]]$, where c is the global context of utterance.

All restricted operators, such as determiners (e.g., Barwise and Cooper, 1981; van Benthem, 1983) and adverbs of quantification (e.g., von Fintel, 1994), will be odd in the same way as (29c) if the restrictor is repeated as a conjunct in the scope:

(32) a. # Every man is a man who is tall
  b. # When a cat falls, usually it falls and lands on its feet

Assuming this, if we treat *if* as a generalized quantifier over propositions (van Benthem, 1984a), for example, the oddness of (19) follows from (27) and (31). In a conditional *If p, then p and*

[9]This restriction poses no risk because of the following result: $Op_E(A)(B) \iff Op_A(A)(B)$ (van Benthem, 1983, 1984b; Westerståhl, 1984). This property, called 'restrictedness' in the literature, ensures that in evaluating the meaning of the sentence nothing outside of A need be considered. On the conservative strategy outlined here, the interpretive system exploits this possibility and does in fact restrict the domain of evaluation to A.

q, the consequent *p and q* selects that subset of p in which *p and q* are true, and of course, the conjunct p here serves no role. Disjunctions, on the other hand, need to be prevented from using local contexts in this way (so as not to lose the account of the contrast in (29)) and presumably keep their truth-functional analysis, with each disjunct evaluated independently of the other.

4. Discussion

We tried to replace Hurford's Constraint with a general pragmatic ban against redundancy and we were led to a view in which redundancy is evaluated locally. The principle bans the representation of locally vacuous constituents, where alternatives are derived only via replacements of functors by their arguments and the evaluation of redundancy is made with respect to the global context, sometimes restricted by the fact that natural language operators are restricted. The appeal to exh was needed in all redundancy statements that we considered, which further supports Chierchia et al. (2011)'s contention that the Hurford paradigm, and its obviation by scalar items, provides strong evidence that exh computes scalar implicatures.

We should reiterate that our proposed constraint in (27) is restricted to local semantic composition. It is not a general ban against redundancy, and thus leaves open the extent to which redundancies not captured by (27) will be tolerated. For example, tautologies like *either it's raining or it's not* are not banned by (27).

Many questions remain, and it is not clear to us how much of our proposal will remain intact once these questions are seriously addressed. First, we have assumed a classical semantics and our local redundancy check bans redundancy irrespective of linear order. We saw evidence that conjunctions are banned symmetrically, an observation that goes against what is commonly assumed in the literature (Horn, 1972; van der Sandt, 1992; Schlenker, 2008). More work will be needed to resolve this discrepancy.

Second, we need to clarify how our system relates to left-right asymmetries in presupposition and anaphora. In a system like Schlenker (2008), incremental evaluations of redundancy are responsible for presupposition projection. How a symmetric ban on redundancy would affect patterns of projection in such a system, and related ones (e.g., Fox, 2008), needs to be worked out.

Finally, we have so far been concerned with bans on redundancy, and we have argued that incorporating such bans into the derivation itself provides a natural solution to patterns of oddness. We believe the principle in (27) should be extended to a more general principle of optimality. Discussing this move would take us too far afield, but as motivation, consider the following paradigm (we repeat (11) from Magri (2009) and section 2.2 as (33a), and we repeat (10) from section 2.2 as (33b)):

(33) Context: Sam gave the same grade to all the boys …
   a. … # he gave some of them an A.

b. ... # he gave some or all of them an A.
c. ... #he gave at least some of them an A.
d. ... he gave all of them an A.

Recall that Magri (2009) accounts for the oddness of (33a) by appealing to a contradiction between its strengthened meaning, $\exists \wedge \neg\forall$, and the contextual equivalence between $\exists$ and $\forall$. As we noted in section 2.2 this explanation does not extend to (33b), because it does not have the strengthened meaning $\exists \wedge \neg\forall$, and hence there can be no appeal to a contradiction between its strengthened meaning and the context. We suggested that (33b) is banned because of redundancy, and our local redundancy principle in (27) indeed rules it out because the whole disjunction is equivalent to one of its disjuncts, $\forall$. However, neither of these principles extends to (33c). This sentence, like (33b), does not have a strengthened meaning $\exists \wedge \neg\forall$, but unlike (33b) it is not equivalent to any of its sub-constituents. What we should ideally like – but do not have at present – is a single principle that would block each of (33a), (33b), and (33c) by the better alternative in (33d).

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