A pragmatic approach to Hurford disjunctions

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Abstract. Hurford disjunctions are disjunctions where one disjunct entails another. Some of these are fine while others seem infelicitous. The predominant approach to this phenomenon relies on Hurford's Constraint, which states that such disjunctions are generally bad, together with grammatical exhaustification, which can rescue some of them by exhaustifying the weaker disjunct to break the entailment. This paper explores an alternative, based on a non-grammatical, pragmatic approach to exhaustivity. Instead of adopting Hurford's Constraint it takes the felicitous examples as basic, and aims to explain the infelicitous ones by means of a frequently made assumption about the pragmatics of disjunction. A detailed comparison shows that the two approaches divide the empirical landscape in sometimes surprisingly different ways. Moreover, it shows that several theoretical choices in the field are deeply connected: whether or not to assume the general validity of Hurford's constraint, whether to adopt a pragmatic or grammatical approach to exhaustivity, and which type of semantics to use as the backbone.

Keywords: disjunction, Hurford's Constraint, exhaustivity, relevance, redundancy, Alternative Semantics

1   Introduction

Some so-called *Hurford disjunctions* are fine while others are strange, at least out of context:

(1) a. Mary read most or all of the books on this shelf.
     b. John and Mary have three or four kids.
     c. Mary is having dinner with John, with Bill, or with both.

(2) a. (?) John is from France or Paris.
     b. (?) The painting is of a man or a bachelor.
     c. (?) The value of x is different from 6 or greater than 6.

The awkwardness of the cases in (2) prompted Hurford (1974) to postulate the following:

- **Hurford's Constraint:** disjunctions are infelicitous if one disjunct entails the other.

Pre-theoretically Hurford's Constraint appears to be refuted by examples like (1). But Hurford pointed out that there is a way to reconcile felicitous Hurford disjunctions (1) with Hurford's Constraint, namely if a case can be made that, for some reason, these disjunctions (but not those in (2)) have an "exclusive" reading. After all, then we can read, e.g., (1c) as

meaning "*only* John or *only* Bill or both", of which neither disjunct entails another. Gazdar (1979) suggests that this exclusive reading is possible only if the two disjuncts are members of the same semantic "scale" (in the sense of Horn 1972), like, supposedly, "most" and "all" but not "France" and "Paris". In this way the contrast between (1) and (2) can potentially be explained. Hurford's (1974) proposal, with Gazdar's (1979) refinement, is frequently built upon in more recent work, especially in the grammatical approach to exhaustivity, where the exclusive reading is achieved by assuming that the weaker disjunct is interpreted *exhaustively* (Chierchia et al. 2009; see also, e.g., Singh 2008; Chierchia et al. 2012; Gajewski and Sharvit 2012; Sauerland 2012; Katzir and Singh 2013; Mayr and Romoli 2016) – this approach will be presented in more detail in due course.

Important empirical motivation for the foregoing approach, based on Hurford's Constraint and exhaustive interpretation of the weaker disjunct, is that a correlation exists between the (in)felicity of Hurford disjunctions and the presence/absence of an exhaustive interpretation of the weaker disjunct when it appears in isolation (e.g., Chierchia et al. 2009). That is, the utterances in (3), which are simply the weaker disjuncts of (1), have an exhaustive interpretation implying the negation of what is the stronger disjunct in (1):

(3) a. Mary read most of the books on this shelf. $\rightsquigarrow$ not all

b. John and Mary have three kids. $\rightsquigarrow$ not four

c. Mary is having dinner with John or with Bill. $\rightsquigarrow$ not both

By contrast, the utterances in (4), which are the weaker disjuncts of the infelicitous Hurford disjunctions in (2), do not normally imply the negations of the stronger disjunct:

(4) a. John is from France. $\not\rightsquigarrow$ not from Paris

b. The painting is of a man. $\not\rightsquigarrow$ not of a bachelor

c. The value of x is different from 6. $\not\rightsquigarrow$ not greater than 6

This shows that the presence/absence of exhaustivity in (3)/(4) correlates with the felicity/infelicity of their disjunctive counterparts in (1)/(2), which is exactly what the foregoing, predominant explanation would predict: the Hurford disjunctions in (1) are felicitous precisely because the weaker disjunct permits exhaustive interpretation, as evidenced independently by (3), which enables them to comply with Hurford's Constraint, whereas the Hurford disjunctions in (2) are bad because an exhaustive interpretation of the weaker disjunct is unavailable there, as evidenced by (4). This correlation between the presence/absence of an exhaustive interpretation in (3)/(4) and the felicity/infelicity of their disjunctive counterparts in (1)/(2) is what makes the account based on Hurford's Constraint and exhaustive interpretation of the weaker disjunct particularly appealing.

The foregoing approach to Hurford disjunctions, embedded in the grammatical approach to exhaustivity, is the predominant one in the literature: adopting Hurford's Constraint to account for the infelicity of (2), and then explaining the felicity of (1) in terms of exhaustive interpretation of the weaker disjunct. The opposite approach has not, to my awareness, been seriously pursued: to take the felicity of (1) as a given (hence not necessarily adopt Hurford's Constraint) and, rather, try to predict the infelicity of (2) by other means. The aim of this paper is to pursue this alternative approach, and compare it in detail to the predominant approach. That is, this paper offers an account of Hurford Disjunctions that relies neither on Hurford's Constraint nor on local exhaustification of the weaker disjunct. Instead it is based on the pragmatic (non-grammatical) approach to exhaustivity in Westera

2017a, which builds on earlier pragmatic approaches to Hurford disjunctions in Gazdar 1979; Schulz and Van Rooij 2006. Pragmatic accounts have thus far concentrated on deriving the right (non-)exhaustivity effects for felicitous Hurford disjunctions like (1), but as we will see nothing new is required for in addition predicting the infelicity of Hurford disjunctions like (2) – just an assumption about relevance on which also the grammatical approach relies.

The grammatical approach will be presented in more detail in section 2; the pragmatic approach in section 3. In subsequent sections I concentrate on two issues faced by both approaches alike:

(i) Explaining why the variation in (in)felicity in (1)/(2) *correlates* with variation in (non-)exhaustivity in (3)/(4) is one thing; what *causes* such variation in the first place?

(ii) Can Hurford's Constaint be independently motivated, in particular, as a derivative of considerations of semantic redundancy?

Sections 4, 5, and 6 discuss how these two issues can be (and, within the grammatical approach, have been) addressed, concentrating on a comparison between the two approaches. Section 6, on issue (ii), will cover a range of examples from the literature that go beyond the basic examples given above, including conjuctions, conditionals and embedded disjunctions.

There will be three main conclusions to this comparison. One is that a pragmatic alternative to the predominant, grammatical approach to Hurford's Constraint is available, and feasible as far as this single paper is able to assess. The second is that the choice between the grammatical and the pragmatic approach to Hurford disjunctions is, at the same time, a choice between semantic foundations: pragmatic approaches require something like Alternative Semantics for disjunction (e.g., Alonso-Ovalle 2006) whereas Hurford's Constraint is available as a derivative of considerations of redundancy only in a more coarse-grained semantics like classical (information-only) or inquisitive semantics (the latter as noted in Ciardelli and Roelofsen 2016). The third main conclusion is that the two approaches end up dividing the empirical landscape very differently, and sometimes in surprising ways: e.g., for certain *embedded* Hurford disjunctions a straightforward account in terms of Hurford's Constraint is available – paradoxically perhaps – only within the pragmatic approach.

2   The grammatical approach to Hurford disjunctions

As mentioned, Hurford (1974) proposed that Hurford disjunctions can be fine if they are interpreted as exclusive disjunctions. The grammatical approach makes the way in which disjunctions would obtain an exclusive reading more precise, in terms of covert exhaustivity operators that can be inserted locally within a sentence. In the grammatical approach, Hurford's Constraint is understood as one of the principles that can mandate the insertion of local exhaustivity operators (Chierchia et al. 2009; see also, e.g., Singh 2008; Chierchia et al. 2012; Gajewski and Sharvit 2012; Sauerland 2012; Katzir and Singh 2013; Mayr and Romoli 2016). For (1c) this looks roughly as follows:[1]

(5)   B: Mary is having dinner with John, with Bill or with both.
    a. LF: * Mary is having dinner with John, with Bill or with both.
    b. LF: Mary is having dinner with O(John), with O(Bill) or with both.

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[1]The precise placement of the operators O will depend on one's assumptions about, e.g., the scope-taking behavior of disjunction. We can set these details aside for present purposes.

The logical form (LF) in (5a) violates Hurford's Constraint because one disjunct entails the other, whereas the LF in (5b), which contains exhaustivity operators (or "silent only") O on the disjuncts, does not violate Hurford's Constraint. This is because the operators O render the disjuncts mutually exclusive: only-John, only-Bill, both-John-and-Bill. One way to frame what is going on is that local exhaustification can save certain disjunctions from violating Hurford's Constraint, i.e., it explains why Hurford disjunctions can in principle be felicitous. Another way to frame it is that Hurford's Constraint essentially enforces local exhaustification (Chierchia et al. 2009; see also, e.g., Singh 2008; Chierchia et al. 2012; Gajewski and Sharvit 2012; Sauerland 2012; Katzir and Singh 2013; Mayr and Romoli 2016).

Thinking of Hurford's Constraint as enforcing local exhaustification also helps explain why the stronger disjunct of Hurford disjunctions makes a difference to the overall interpretation at all, compared to a disjunction that lacks the stronger disjunct, i.e., (6):

(6) B: Mary is having dinner with John, or with Bill.
    a. LF: Mary is having dinner with John, or with Bill.
    b. LF: Mary is having dinner O(with John), or O(with Bill).

The LFs given here suggest that (6) has both an inclusive and an exclusive ('not both") interpretation, whereas in (5) both LFs are inclusive: even the one with exhaustivity operators still permits the "both" possibility. Morever, the predicted interpretive contrast between (6) and (5) holds up even if we consider the possibility of having an additional, wide-scope exhaustivity operator, resulting in the following LFs:

(5) c. LF: * O(Mary is having dinner with John, with Bill, or with both.)
    d. LF: O(Mary is having dinner O(with John), O(with Bill), or with both.)
(6) c. LF: O(Mary is having dinner with John, or with Bill.)
    d. LF: O(Mary is having dinner O(with John), or O(with Bill).)

It is normally assumed that O obtains its alternatives compositionally, including the effects of any local operators in its scope (e.g., Fox 2007). Moreover, O is vacuous if its set of alternatives is mutually exclusive, because (glossing over some details) excluding all such alternatives would result in a contradiction, and excluding any subset of them would be arbitrary (see Fox 2007 for discussion). Accordingly, even if the wide-scope operator in (5) is assumed to result in a felicitous LF for (5), it still won't predict the "not both" implication that is present in (6). Rephrasing, in a nutshell: adding "or both" as in (5) prevents the "not both" implication present in (6), because (via Hurford's constraint) it enforces local exhaustification of the disjuncts, making them mutually exclusive, and rendering any additional wide-scope O vacuous in the relevant respect.

These are just the basic phenomena, i.e., the felicity of certain Hurford disjunctions and the exhaustivity-canceling effect of the stronger disjunct therein. In recent works the approach based on Hurford's Constraint has been applied to more sophisticated cases, involving disjunctions in embedded positions (e.g., embedded under verbs like "believe"; e.g., Gajewski and Sharvit 2012), and the approach generalized to conjunctions and conditionals (e.g., Katzir and Singh 2013; Mayr and Romoli 2016). Some of these extended applications will be reviewed towards the end of this paper, in section 6.

For a proper evaluation of the grammatical approach we need to understand where the alternatives come from on which the exhaustivity operators operate. It is not always clear

what an author's stance on this matter is. For a clear discussion we need some footing, so I will commit to what seems to be the most common assumption on this matter, framed so as to be neutral between the grammatical and pragmatic approach:

- **Assumption 1:** Alternatives excluded in exhaustification (whether pragmatic or by an operator O) must be relevant to the same question under discussion (or goal, or topic, or some other model of relevance) as the explicit (i.e., non-exhaustified) proposition (in the grammatical approach: the proposition that is the argument of O).

An assumption along these lines seems to be shared by all pragmatic accounts of exhaustivity including those framed in terms of *scales* (like Gazdar 1979; as noted also by Singh 2008; see below), and also by most or all grammatical accounts (e.g., Fox 2007; Singh 2008; Magri 2009; Fox and Katzir 2011; Chierchia et al. 2012).

Moreover, it has been supported empirically (e.g., Zondervan 2010). To clarify, note that assumption 1 is perfectly compatible with the additional assumption, also often made in both pragmatic and grammatical approaches, that the set of relevant alternatives would be additionally filtered, prior to the computation of exhaustivity, by, say, brevity considerations and/or grammatical constraints. That is, assumption 1 states that any alternative excluded by exhaustification is relevant, not that any relevant alternative is necessarily excluded.[2]

A clarifying remark on so-called *scales*. It is often said that the proposition that is asserted and the proposition that is excluded by exhaustivity must be elements of (or be expressed by means of lexical entries that are elements of) the same *scale* (e.g., Gazdar 1979, following Horn 1972, and many since). As Geurts (2011) notes there is only little explicit reflection on what scales are supposed to represent. Russell (2006) notes that scales are primarily empirical generalizations, and that scales don't really explain the differences in exhaustivity they describe unless one explains why scales are the way they are. One option (following Lassiter 2010; Geurts 2011) is to conceive of scales as representations of what are *typically* the alternatives that matter for exhaustivity, given that a certain lexical expression is used. Another option is to conceive of scales as representations not of what are typically the alternatives (across contexts) but of the *actual* alternatives in a given context (following, e.g., Hirschberg (1985) and Levinson (1983); in this role scales are also called "Hirschberg scales" or "ad hoc scales", Huang 2014). In the terms set out by Assumption 1, then, scales may represent either what is *typically* relevant (when a certain expression is uttered), or what is *actually* relevant in a given context. Naturally, when a sentence is presented without an explicit context, lacking information about what is actually relevant, one's judgments regarding, e.g., exhaustivity will be based on the most typical scenario (e.g., Kadmon and Roberts 1986; Schwarz 1996; Westera and Brasoveanu 2014), i.e., on what is typically relevant. In any case, my reason for using the term "relevance" in Assumption 1 as opposed to "scale" is that, as Geurts (2011) argues, relying on the notion of "scale" has led to much oversimplification in our understanding of exhaustivity; it has made us prone to forget for instance the kinds of lexical and world knowledge that can interfere with exhaustivity (see also Degen 2015). Using "relevance" poses no such risks, although of course the notion must (just like "scale") be defined in sufficient detail so as to yield predictions and be explanatory.

Let me highlight two important open ends to the grammatical approach as I have summarized it thus far:

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[2]Note furthermore that assumption 1 does not purport to cover *all* cases of exhaustivity. In some cases exhaustivity may be part of a lexical entry's conventional meaning, it may arise as an implic-i-ture (Bach 1994; or "explicature" of Recanati 2004), and it may arise as an implicature through (say) the maxim of Relation – and at least some of these other routes do not require that the excluded proposition be relevant.

(i) Explaining the varying felicity of Hurford disjunctions in terms of the varying presence of exhaustivity is one thing; what causes the varying presence of exhaustivity to begin with?

(ii) What is the nature of Hurford's Constraint? Under which conditions should it be expected to be true of language? Such questions require an answer lest the constraint is non-explanatory/ad-hoc.

Issue (i) has received some attention in the literature, but no explanation currently seems to command general agreement. Issue (ii) has received more attention, and the predominant view is that Hurford's Constraint can be explained as a derivative of a criterion against semantic redundancy. I will return to both issues (i) and (ii) in due course; first I will discuss the pragmatic approach to Hurford disjunctions. The reason for this order is that both issues bear on the pragmatic approach as well.

3 The pragmatic approach to Hurford disjunctions

The pragmatic approach to Hurford disjunctions has concentrated on felicitous Hurford disjunctions, in particular on the exhaustivity-canceling effect of the stronger disjunct, as illustrated above by (5) vs. (6). Infelicitous Hurford disjunctions seem to have been deemed less interesting – perhaps because from a pragmatic standpoint the explanation is intuitively obvious but very hard to formalize, see below – and in fact Hurford's Constraint is rarely even mentioned. (In the grammatical approach, by contrast, the exhaustivity-canceling effect has played a more secondary role; taking Hurford's Constraint for granted, the grammatical approach focused more on explaining why certain Hurford disjunctions are fine despite it.)

Exhaustivity has long been explained in terms of the Gricean (1975) maxim of Quantity – this became the core of what is known as the "neo-Gricean" approach to exhaustivity. The maxim of Quantity states that rational, cooperative speakers normally intend to *share all relevant information they take to be true*. To illustrate, consider again (6), repeated here (without the LFs):

(6)   B: Mary is having dinner with John, or with Bill.

The speaker didn't say that Mary is having dinner with *both* John and Bill, whereas this information is presumably relevant. Accordingly, the maxim of Quantity tells us that the reason must be that the speaker does not take this information to be true, i.e., the speaker does not possess knowledge to the effect that Mary had dinner with both John and Bill. This Quantity implication is almost like exhaustivity, but not quite: from the absence of knowledge that both were there, we cannot conclude the presence of knowledge that not both were there – the speaker could simply be ignorant, after all. That the Quantity implication falls short of exhaustivity was already pointed out by Soames (1982: p.534), in a discussion of Gazdar's (1979) account. More recently, Sauerland (2004) called the gap between Quantity and exhaustivity, i.e., between not knowing and knowing that not, the *epistemic step*. To explain how participants in a conversation take the epistemic step, Soames proposed that they assume, normally or in the relevant situations, each other's *opinionatedness* (Horn (2001) notes that this proposal can be found already in Mill 1867). Indeed, if the speaker in (6) knows *whether* Mary is having dinner with both John and Bill or not (opinionatedness), but the speaker doesn't know *that* both were there (Quantity implication), then the speaker must know the contrary, i.e., that not both were there. This

approach to exhaustivity, based on Quantity plus opinionatedness, has been adopted by many (e.g., Horn 1972; Gazdar 1979; Schulz and Van Rooij 2006; Spector 2007; Geurts 2011).

Now, the foregoing, common pragmatic recipe for exhaustivity cannot easily distinguish (6) above and example (5), repeated here:

(5)   B: Mary is having dinner with John, with Bill or with both.

Note that prior to computing any exhaustivity implications, the disjunctions in (5) and (6) have the same classical, informational content – a disjunct like "or both" does not logically add anything to the non-exhaustified meaning. Since the maxim of Quantity operates on this classical informational content, it is blind to the disjunct "or both". Hence, the only way for a Quantity-based approach to handle Hurford disjunctions would be to tinker with the opinionatedness assumption: it must be made sensitive somehow to the disjuncts of the utterance, such that the speaker is not considered opinionated about disjuncts like "or both". Indeed, two approaches exist that try something along these lines: Gazdar's (1979) approach based on "clausal implicatures", and Schulz and Van Rooij's (2006) approach based on dynamic semantics. Westera (2017a) pursues an alternative pragmatic route to exhaustivity altogether, not based on the information-governing maxim of Quantity (plus opinionatedness) but based on a separate pragmatics of attention-drawing. I will review these three approaches, though in the rest of the paper I will adopt the most recent installment, Westera 2017a.

Gazdar tries to curb the opinionatedness assumption by assuming that utterances have *clausal implicatures* to the effect that a speaker should be uncertain about any embedded clause of an uttered sentence, e.g., the disjuncts of a disjunction. The speaker would then be assumed to be only as opinionated as these clausal implicatures allow. Gazdar seeks to derive these clausal implicatures from the maxim of Quantity, combined with the assumption that both the embedded clause and its negation are relevant: the speaker's uncertainty about the truth of the embedded clause then follows from the fact that the speaker asserted neither the embedded clause nor its negation. Thus, for (5) Gazdar would assume that both John and Bill's joint attendance and its negation are relevant, in order to derive an ignorance implication from Quantity that then blocks the exhaustivity implication that the speaker thinks they weren't both there. Now, I do not think that embedded clauses and their negations are always relevant – e.g., it is conceivable to me that one would utter "John believes that φ" when one doesn't care about the truth of φ, or when one already knows that φ is true (or false) – but for the disjuncts of a disjunction Gazdar's assumption may not seem unreasonable. (Another complexity is that it should be restricted to disjuncts stronger than what is asserted; e.g., in "John, or both John and Bill", the speaker should be uncertain only about both John and Bill attending.) But a serious challenge for this idea is that the assumption of a *symmetrical* notion of relevance – i.e., that the negation of any relevant proposition is also relevant – when generalized, is known to be problematic for pragmatic accounts of exhaustivity (aside from such symmetry being implausible in its own right; Leech 1983; Horn 1989). In a nutshell, this so-called *symmetry problem* (e.g., Kroch 1972; Chierchia et al. 2012; Westera 2017c) is that, if relevance is symmetrical, it isn't clear how to predict that the right alternatives are excluded to yield exhaustivity, and not their negations.

Schulz and Van Rooij (2006) pursue a more technical solution, the pragmatic underpinnings of which aren't entirely transparent (as argued in Westera 2017a). But because of its technical

precision it is worth a quick review. First of all, Schulz and Van Rooij (2006) (and in parallel Spector (2007)) show that the outcome of the traditional recipe for exhaustivity, based on Quantity and opinionatedness, can be captured in a shorthand "exhaustivity operator". Let me denote this so-called *minimal worlds* operator by Exh_{mw}, which operates on the asserted proposition p and a set of alternative propositions or question under discussion Q:[3]

$$\text{Exh}_{\text{mw}}(p, Q) \stackrel{\text{def}}{=} \{w \in p \mid \text{there is no } w'' \in p \text{ such that:}$$
$$\{q \mid q \in Q, w'' \in q\} \subset \{q \mid q \in Q, w \in q\}\}$$

That is, the proposition p must be true in the relevant worlds w, together with a set of other relevant propositions that is *minimal* compared to the sets of true relevant propositions in other worlds w' in which the proposition denoted by p is true.[4] Now, since the minimal worlds operator Exh_{mw}, like the maxim of Quantity, operates on a piece of information, it is blind to disjuncts which do not affect it, hence it cannot explain the exhaustivity-canceling effect of Hurford disjunctions. To remedy this, Schulz and Van Rooij (2006) reformulate their operator in *dynamic semantics* so as to render it sensitive to the discourse referents introduced by an utterance – assuming that a disjunction introduces its disjuncts as discourse referents (following, e.g., Aloni 2001). The relevant part of this new operator Exh_{dyn} is defined as follows, for the set of propositional discourse referents A (say, to which *attention* is drawn) – in their case the disjuncts of a disjunction – and a set of relevant alternatives Q:

$$\text{Exh}_{\text{dyn}}(A, Q) = \{w \mid \text{for some } a \in A: w \in a \text{ and there is no } w'' \in a$$
$$\text{s.t. } \{b \mid b \in Q, w'' \in b\} \subset \{b \mid b \in Q, w \in b\}\}$$

This operator Exh_{dyn} is similar to the minimal worlds operator Exh_{mw}, the difference being that Exh_{dyn} does not minimize the set of true relevant propositions among *all* worlds (or all worlds compatible with the asserted proposition), but only within each disjunct (each $a \in A$) separately. As a consequence the operator Exh_{dyn} can distinguish between examples like (5) and (6).

Unfortunately Schulz and Van Rooij (2006) offer only a partial pragmatic explanation for their operator – they do not motivate its sensitivity to discourse referents, which is precisely what gives it an edge over Exh_{mw}.[5] This is overcome in Westera 2017a, where a pragmatic explanation is given for an operator that is formally equivalent to Exh_{dyn}. Unlike the (partial) motivations given in Gazdar 1979 and Schulz and Van Rooij 2006, which rely on the traditional combination of Quantity and opinionatedness, this new approach is based on an altogether different set of maxims.[6] The basic idea is that, besides intending to provide information, speakers also intentionally draw each other's *attention* to certain possibilities.

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[3]Formally, Schulz and Van Rooij (2006) derive the set of alternative propositions from a predicate P, with different possible extensions for P corresponding to the alternative propositions in Q used here.

[4]See Spector 2016 for a close correspondence between the operator Exh_{mw} and other existing operators from the literature, namely, from Krifka 1993 and Fox 2007.

[5] A somewhat similar but likewise not pragmatically derived operator is defined in Alonso-Ovalle 2008. In a nutshell, that operator negates propositions that are "innocently excludable", a notion adopted from Fox 2007 but made sensitive to the set of disjuncts of an utterance. Unlike Exh_{dyn}, Alonso-Ovalle's operator doesn't work for more sophisticated examples like the following ((7) from Chierchia et al. 2009):

(1)   Peter either solved both the first and the second problem or all of the problems.

The reason is that Alonso-Ovalle's operator never excludes only *part* of a proposition, which is what is needed there. The operator Exh_{dyn}, by contrast, does yield the right predictions. See Schulz and Van Rooij 2006; Westera 2017a for discussion.

[6]Westera (2017a) argues that, by replacing rather than trying to refine the traditional recipe of (informational) Quantity plus opinionatedness, this new account offers some advantages: it correctly predicts

Like information-sharing, attention-drawing is governed by a set of conversational maxims. To that end Westera (2017a) formulates "Attentional Pragmatics". In a nutshell, and omitting the formalization, the maxims of Attentional Pragmatics require that a speaker draws attention *only* to propositions that are considered individually possible (A(ttentional)-Quality) and relevant (A-Relation), and to *all* such propositions (A-Quantity). Exhaustivity in this account derives not from the traditional, informational maxim of Quantity, but from its attentional counterpart, i.e., A-Quantity. For instance, in (6), because the speaker didn't draw attention to the (relevant) proposition of John and Bill both attending dinner, this proposition must not be considered possible. By contrast, in (5) this proposition is mentioned, so it need not be considered impossible – in fact, by virtue of A-Quality, it must be considered possible.As mentioned, the exhaustivity effects derived from A-Quantity in this way are formally equivalent (in a relevant subset of circumstances, see Westera 2017a for formal proofs) to the dynamic operator Exh_{dyn} formalized above, dealing adequately with Hurford disjunctions.

Anticipating section 6, on conceiving of Hurford's Constraint as a derivative of considerations of semantic redundancy, let me note that Attentional Pragmatics can be thought of as relying on something like Alternative Semantics for disjunction (Alonso-Ovalle, 2006), according to which disjunction introduces its disjuncts as alternatives, thereby, say, drawing attention to them. Alternative Semantics is strictly richer than classical, information-only semantics, and accordingly the notion of semantic redundancy will be more restricted (see section 6). Although I will simplifyingly assume that Alternative Semantics and Attentional Pragmatics (and the pragmatic approach to Hurford disjunctions more generally) go together in this way, in fact Attentional Pragmatics does not require special assumptions about the semantics of disjunctions and what they serve to draw attention to. The reason is that the attention-governing maxims, together with the traditional, information-governing maxims, can in fact predict the attention-drawing use of disjunction, rather than requiring this to be presupposed (see Westera 2017b:Ch.6 for details and formalization). This may matter to the extent that Alternative Semantics can be considered an appeal to grammar, thereby making the labels "pragmatic" vs. "grammatical" somewhat murky, but it will not play a role in what follows.

The operator Exh_{dyn}, by virtue of its definition, achieves the same as applying a minimal worlds operator Exh_{mw} to each individual disjunct, which is basically what the grammatical approach seeks to do by applying exhaustivity operators O to each disjunct (Chierchia et al., 2009). To clarify, despite this superficial correspondence (which, given the empirical facts, is inevitable) there is a crucial difference – the difference on which much of the pragmatics vs. grammar debate has focused: whereas the grammatical approach predicts that individual disjuncts are genuinely interpreted exhaustively as part of the primary meaning or speech act, in the pragmatic approach exhaustivity effects are derived *on top of*, rather than *as part of*, the primary meaning. The following paraphrases explicate this difference (using a slightly more sophisticated Hurford disjunction, chosen for exposition; cf. footnote 5):

(7)   B: John was there, or John, Mary and Bill were all there.

    a. **Grammatical approach:**
       John *and no one else* was there, or John, Mary and Bill were all there.
       $(Pj \land \neg Pm \land \neg Pb) \lor Pjmb$

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exhaustivity also in cases where opinionatedness is not assumed (but not of course where *un*opinionatedness is assumed), it can predict exhaustivity for assertions and questions alike (because questions, though not providing information, do serve to draw attention to possibilities; cf. Biezma and Rawlins 2012), and it applies to circumstances where the informational maxim of Quantity arguably does not apply (such as a quiz setting, see Fox 2014).

b. **Pragmatic approach:**
John was there, or John, Mary and Bill (*and not only two individuals*).
$(Pj \lor Pjmb)$ and $\neg((Pjm \land \neg Pb) \lor (Pjb \land \neg Pm))$

Although the formula in (7a) and a conjunction of the two formulae in (7b) are logically, informationally equivalent, only (7a) really involves the exhaustive interpretation of an individual disjunct. What this highlights is that a "globalist" (utterance-level) pragmatic theory can explain the appearance, at the level of overall truth conditions of the assertion plus the implicature, of a local exhaustivity effect. This important possibility was highlighted by Simons (2011), because it has sometimes been overlooked in the pragmatics vs. grammar debate. Of course a prerequisite is the existence of global, utterance-level intentions that to some extent reflect the internal structure of the uttered sentence, in this case the disjuncts.

In any case, the pragmatic approaches to Hurford disjunctions align in their focus on the exhaustivity-canceling effect of Hurford disjunctions, and in the general intuition that what matters is not just the information provided (to which the maxim of Quantity is sensitive), but also (as in Gazdar 1979; Schulz and Van Rooij 2006), or even solely (as in Westera 2017a), which other possibilities are mentioned, like the stronger disjunct in a Hurford disjunction. In what follows I will adopt the approach in Westera 2017a, which pursues this intuition the furthest, and take it as a representative of the pragmatic approach more generally. This approach (as do Gazdar 1979 and Schulz and Van Rooij 2006) raise two core issues:

(i) What causes the varying felicity of Hurford disjunctions, and the varying presence of exhaustivity with which it correlates?

(ii) If some independent motivation can be given for Hurford's Constraint (as required by the grammatical approach), then what ensures that it doesn't apply to the felicitous Hurford disjunctions (which, in the pragmatic approach, i.e., without local exhaustification, would inevitably violate it)?

So we see that the same two issues that arise within the grammatical approach, surface also in the pragmatic approach, albeit from a different perspective. In the following sections I will discuss these two issues, in each case comparing the two approaches.

4   Issue (i): Variation in felicity/exhaustivity

The first issue left open by my discussion so far of the grammatical and pragmatic approaches alike is how to explain the variation in felicity of Hurford disjunctions in (1)/(2), or the correlated variation in the presence of exhaustivity in (3)/(4) for that matter. Let me repeat the relevant examples:

(1) a. Mary read most or all of the books on this shelf.
     b. John and Mary have three or four kids.
     c. Mary is having dinner with John, with Bill, or with both.

(2) a. ⁽ʔ⁾ John is from France or from Paris.
     b. ⁽ʔ⁾ The painting is of a man or a bachelor.
     c. ⁽ʔ⁾ The value of x is different from 6 or greater than 6.

(3)	a.	Mary read most of the books on this shelf.	⤳ not all
	b.	John and Mary have three kids.	⤳ not four
	c.	Mary is having dinner with John or with Bill.	⤳ not both
(4)	a.	John is from France.	⇸ not from Paris
	b.	The painting is of a man.	⇸ not of a bachelor
	c.	The value of x is different from 6.	⇸ not greater than 6

As I mentioned in the introduction, Gazdar (1979) proposed that the relevant expressions are members of the same scale in (1)/(3) but not in (2)/(4). I will adopt and try to partially motivate this proposal in what follows. However, following the considerations in section 2, and the formulation of Assumption 1 there in terms of relevance, I will reformulate Gazdar's assumption about scales as follows:

- **Assumption 2:** The disjuncts in (1) but not in (2) – hence the asserted and excluded propositions in (3) but not (4) – are sufficiently easily construed as being relevant to the same, appropriate question under discussion (or goal, or topic; some model of relevance).

Of course, just as Russell (2006) notes that scales by themselves don't explain the patterns they help describe, replacing scales by the term "relevance" is only an improvement to the extent that we have some independent knowledge about relevance. But in this regard we should not be overly skeptical I think, and I will offer some tentative explanations further below and in section 5. But since both the pragmatic approach and (predominantly) the grammatical approach rely on Assumption 2 (whether formulated in terms of scales as in Gazdar 1979 or otherwise), I will mostly take its validity for granted in this paper.

Let us consider (again) how the grammatical approach would proceed on the basis of Assumption 2 – combined with Assumption 1, Hurford's Constraint and local exhaustification. According to Assumption 2, the asserted proposition and the stronger, to-be excluded proposition are jointly relevant in (3), but not in (4). According to Assumption 1 the stronger proposition has to be relevant for it to be excluded by exhaustification, correctly predicting this to be the case in (3) and not in (4). For the same reason, in (1) locally exhaustifying the first disjunct will imply the negation of the second, whereas in (2) local exhaustification will not have such an effect. As a consequence, the disjunctions in (1) can comply with Hurford's Constraint, hence are felicitous, while the disjunctions in (2) cannot, hence are infelicitous. Altogether, this accounts for the correlation of the (non-)exhaustivity of (3)/(4) and the (in)felicity of (1)/(2), but also, in outline, for the source of both sides of this correlation – of course pending the important question of why relevance would be as stated in Assumption 2.

What about the pragmatic approach? In the previous section we have seen how it handles basic cases of exhaustivity like (3), as well as the exhaustivity-canceling effect of Hurford disjunctions like (1). Together with Assumption 2, which it shares with the grammatical approach, the lack of exhaustivity in (4) is also directly accounted for. What remains to be shown is why the Hurford disjunctions in (2) should be infelicitous. Whereas the grammatical approach achieves this with Hurford's Constraint – banning any such disjunctions where local exhaustification of the required sort is unavailable as a fix – no such approach is available in the pragmatic approach. The reason is that in the pragmatic approach Hurford's Constraint would inevitably ban *all* Hurford disjunctions, felicitous and infelicitous alike – after all, no exhaustivity operators are available to salvage the felicitous disjunctions. This means that a different approach is called for.

A straightforward approach is offered by a common assumption from the literature (which to my awareness has not been applied to Hurford disjunctions per se). Instead of Hurford's Constraint plus local exhaustification, the pragmatic approach can explain the infelicity (2) as follows:

- **Assumption 3:** Disjunctions are strange if their disjuncts are not sufficiently easily construed as being relevant to a single, appropriate question under discussion (or goal/topic).

This has been assumed by a wide range of authors independently of the issue of Hurford disjunctions, e.g., Lakoff (1971) writes that "two sentences may be conjoined if one is relevant to the other, or if they share a common topic", Lang (1984) speaks of a necessary conceptual "common integrator", Grice (1989) considers a standard use of disjunction to be the specification of possibilities "that relate in the same way to a given topic", and Simons (2001) derives a "relatedness condition" on disjunctions to the effect that both disjuncts should be able to answer the same question. More recently Assumption 3 is found for instance as a relevance constraint on disjunctive questions in Biezma and Rawlins 2012, and as a conversational maxim on assertions too in the approach to exhaustivity of Westera 2017a, summarized in section 3: the maxim of A(ttentional)-Relation (which is not particular to disjunctions). All in all, it is fair to say that within the pragmatic approach Assumption 3 is uncontroversial. And it already suffices for accounting for the (in)felicity contrast of (1)/(2): Assumption 2 given earlier implies that the disjuncts in (1) but not those in (2) are easily construed as being relevant to the same question under discussion – and Assumption 3 then immediately predicts only (1) and not (2) to be felicitous.

It is worth noting that if Assumption 3 is added to the grammatical approach – which may be hard to avoid given its independent motivation – then Hurford's Constraint is no longer strictly necessary for explaining the infelicity of the Hurford disjunctions in (2). But it would still be necessary for the grammatical account of the exhaustivity-canceling effect of the stronger disjunct in felicitous Hurford disjunctions in (1), namely, as the reason why exhaustivity operators should be inserted on the disjuncts.

As I mentioned, a core issue faced by both the grammatical and the pragmatic approaches concerns Assumption 2, on which both approaches rely: why would relevance be as stated in Assumption 2, or, more specifically, why can no suitable question under discussion be accommodated (say, imagined) to which both disjuncts of the disjunctions in (2) are relevant, thereby allowing compliance with Hurford's Constraint and/or Assumption 3? There seem to be at least two candidates that would have to be ruled out for this to be plausible, namely, those which might intuitively correspond to the following interrogatives:

(8)   a. From which country and which city/region is John?
       b. Is John from Paris, or at least from France, or even Europe?

Beware that these are intended as mere paraphrases; whether these interrogative sentences could actually serve to introduce the questions under discussion they are intended to paraphrase is a complex issue concerning the semantics and pragmatics of interrogatives, that I will not go into.[7] The question under discussion paraphrased in (8a) is intended

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[7] Despite their names, there is no simple one-to-one mapping between "questions" as (the meanings of) interrogatives and "questions" as representations of conversational goals, i.e., "questions under discussion". For instance, the same interrogative sentence can be used to introduce different questions under discussion

to contain countries in some domain of discourse (say, France and Spain) as well as their cities/regions (say, Paris, Toulouse, Marseille, etc., and Madrid, Barcelona, Granada, etc.).[8] The one in (8b) pertains instead to three nested geographical regions (Europe is included to ensure that the Hurford disjunction "France or Paris" is at least informative). I will discuss each in turn.

The candidate question under discussion paraphrased in (8a) has received some attention in the grammatical approach (e.g., Singh 2008; Katzir 2013; Ciardelli and Roelofsen 2016). As these authors note, if the question under discussion contains both France and all cities/regions in France, then exhaustifying "France" would exclude all cities and regions in France, implying that John is from France but from no place *in* France, which is contradictory. As a consequence, either no exhaustivity operator is to be applied to "France", or, alternatively, the operator will be vacuous because no place is innocently excludable (Fox 2007).[9] This means that the entailment between the two disjuncts in (2a) is not broken by exhaustification, and as a result the disjunction cannot be saved from violating Hurford's Constraint. In this way, the grammatical approach can explain why (2a) cannot felicitously address the question under discussion paraphrased in (8a). But of course to explain why it is infelicitous *in general*, the same would need to be shown for any potentially accommodatable question under discussion, in particular (8b) – I will return to this further below.

Infelicitous Hurford disjunctions have received only little attention in the pragmatic approach, so no explanations have been proposed for why the question under discussion paraphrased in (8a) would not be appropriate for the disjunction in (2a). Nevertheless, the account of exhaustivity in Westera 2017a, Attentional Pragmatics, does in fact predict this; more precisely, it predicts that the disjunction in (2a) cannot comply with all the maxims relative to the question under discussion paraphrased in (8a). This works as follows. Recall that in order to derive exhaustivity, Westera (2017a) defines an "attentional" maxim of Quantity, A-Quantity, which requires that attention is drawn to all relevant propositions the speaker considers possible. It follows that the Hurford disjunction (2a), relative to the question under discussion paraphrased in (8a), must either violate Gricean I(nformational)-Quantity or A(ttentional)-Quantity. To see why, first suppose that the utterance complies with I-Quantity. It follows that the speaker doesn't have the belief that John is from Paris –

(just as the same declarative sentence can be used to assert different things). It is unsurprising then that the following examples are both fine, as pointed out to me by an anonymous reviewer:

(1) a. Q: Where is John from?   A: John is from Paris.
     b. Q: Where is John from?   A: John is from France.

This doesn't imply that "Paris" and "France" are therefore relevant to the same single question under discussion, which would be contrary to Assumption 2. Rather, if Assumption 2 is right (as both approaches require), the interrogative in (1a) must be understood to question a question under discussion paraphrasable as "From which city is John?", and (1b) as "From which country is John?".

[8] An anonymous reviewer suggests that even a question that isn't explicitly about countries, like "From which city/region is John?", with at least all French cities/regions in the domain of discourse, will automatically contain, as a partial answer, France in its entirety (along with other unions of regions). However, there are some problems with assuming that partial answers are generally relevant. A conceptual problem is that depending on the extralinguistic context, partial answers may well be completely useless (and their uselessness be commonly known). An empirical problem is that assuming such closure would make an account of English rise-fall-rise, as a marker of uncertain relevance *and* partial answerhood, unnecessarily complex (see Westera in press). Either way, below I discuss how the grammatical and the pragmatic approach predict that a question which contains both cities and countries – the one paraphrased in (8a) – is not suitable for the Hurford disjunction in (2a) – regardless of this broader issue of partial answerhood.

[9] Recall that a similar mechanism is relied upon in the grammatical approach to prevent the global exhaustivity implication of felicitous Hurford disjunctions (Fox 2007), as summarized in section 2: if the alternatives are mutually exclusive, none can be innocently excluded.

otherwise the speaker should have asserted that. This implies that the speaker considers it possible that John is from some place other than Paris. But since no attention was drawn to any such possibility, the utterance violates A-Quantity. Conversely, suppose that the utterance does comply with A-Quantity. It follows that the speaker doesn't consider any place possible accept Paris (or attention would have been drawn to such places). But that means the speaker should have asserted that John is from Paris, which the speaker didn't, hence the utterance violates I-Quantity.

As for the question under discussion paraphrased by (8b), to my awareness neither the grammatical approach nor the pragmatic approach explains why this sort of question would be too hard to accommodate (as required, recall, for Assumption 2 on which both types of accounts rely). In fact, unlike the situation with (8a) just described, the question in (8b) is such that, relative to it, the Hurford disjunction (2a) would be perfectly fine: it would violate neither Hurford's Constraint in the grammatical approach (because local exhaustification relative to this kind of question under discussion would rescue it) nor any of the maxims in the pragmatic approach. So in this case it has to be the question itself that is, for some reason, too hard to imagine without explicit contextual cues. This is, I think, a puzzling fact, and I will try to demystify it a bit with some tentative remarks in section 5. The reason for postponing this to its own section is that, since both the grammatical and the pragmatic approach face this same issue, and arguably the same range of possible solutions, this is not necessary for the main aim of this paper, which is to compare the two approaches – yet as a side-issue it is important enough to be deserve some further attention. There I will also (briefly) consider the other infelicitous Hurford disjunctions (2b) and (2c).

In conclusion, the grammatical approach and the pragmatic approach try to explain the varying felicity of Hurford disjunctions (and its correlation with variation in exhaustivity inferences of the weaker disjuncts in isolation) from a shared starting point, namely Assumption 2, about the difficulty of accommodating an appropriate question under discussion for the pairs of propositions in (2)/(4), compared to those in (1)/(3). The grammatical approach relies on this assumption in order for local exhaustification of the weaker disjunct to be either able or unable to break the entailment and, thus, comply with Hurford's Constraint. The pragmatic approach relies on Assumption 2 by, in addition, assuming that the two disjuncts of a disjunction should normally serve to address the same question under discussion, as framed in Assumption 3. Furthermore, both approaches offer a partial explanation for Assumption 2, by ruling out a question under discussion like (8a), but leave open the possibility of the question under discussion paraphrased in (8b) – and the next section will delve a bit deeper into why the latter may be difficult to accommodate too.

5   Intermezzo: a closer look at Assumption 2

Assumption 2, on which both approaches rely, may to some look so implausible on the surface that they may be tempted to abandon it (and perhaps even go so far as to abandon Assumption 1, that exhaustivity has something to do with relevance). I would like to prevent this impression if at all possible, and so I will offer some tentative remarks to boost the plausibility of Assumption 2. However, this section will not offer any definitive explanations, nor would such a contribution be necessary for the aim of this paper, since the issue and the range of possible solutions seem to be no different for the pragmatic and the grammatical approach. Hence the "intermezzo" title of this section.

As I explained in section 4 both the grammatical and the pragmatic approach seek to explain

the variation in (in)felicity/(non)exhasutivity in terms of our ability to accommodate, out of context, an appropriate question under discussion containing the crucial pairs of propositions. I considered two possible questions under discussion for the Hurford disjunction (2a), "Paris or France":

(8) a. From which country and which city/region is John?
     b. Is John from Paris, or at least from France, or even Europe?

I also explained that both the grammatical and the pragmatic approach can rule out the question paraphrased in (8a), leaving a discussion of (8b) to the present section – as well as a discussion of the other Hurford disjunctions in (1)/(2), for that matter – because neither approach has, for the moment, much to say on these matters.

It seems to me that a big factor in explaining variation in the felicity of Hurford disjunctions (and its correlate, variation in the presence of exhaustivity implications) is whether the two disjuncts belong to the same *level of categorization* (Rosch et al., 1976). According to Rosch et al. our conceptual system is organized in levels of categorization, not unlike an ontology, and contexts can differ as to what the appropriate level is – e.g., different categories are used in botany vs. amateur gardening. If two levels of categorization do co-occur in a context at all, they tend not to be simultaneously relevant, but in sequence: the more fine-grained categorization is pursued only after a more coarse-grained category is established – e.g., we tend to ask "Is it an oak?" only after first establishing or presupposing that it is a tree – in accordance with the strategical view of discourse in Roberts 2012. For the modest purpose of this short intermezzo the notion of level of categorization can remain somewhat intuitive.

It seems to me that the disjuncts in (1) can be argued to reside at the same level of categorization, and address a question under discussion that is quite naturally asked without first having to establish the weaker proposition. That is, in (1a) "most" and "all" are both basic, coarse proportional quantifiers, in (3b) "three" and "four" are both small, non-round numerals, and in (1c) "John" and "Bill" both denote individuals (that in the intended context happen to be dinner candidates). By contrast, in (2) this doesn't seem to be the case, at least in (2a), where France is a country and Paris a city, and (2b), where "man" is simply a standard way of referring to any male person whereas "bachelor" is about a person's marital status, which tends to be relevant only in particular contexts – and even then, one would normally not ask whether someone is a bachelor without first having established (or presupposing) that he is a man. For (4c), things are not as clear to me: "different from" and "greater than" don't seem to belong to different levels of categorization, since both are simply precisely defined mathematical relations, and both can used, e.g., in mathematical proofs. Perhaps a case can be made that questions in mathematical discourse tend to be partitions, i.e., that the alternatives in mathematics tend to be mutually exclusive options (cf. rows in a truth table), as a consequence of which "different from" and "greater than" would not normally be simultaneously relevant (cf. footnote 8) – but a more serious inquiry into mathematical discourse would be required to test this.

The view that differences in level of categorization are responsible for the infelicity of Hurford disjunctions like (2a) has not, to my awareness, been made so explicit. However, Baumann (2014) at least notes that such infelicitous Hurford disjunctions can be fixed by inserting "more generally" (and the same seems to hold for "more specifically") as in the following example (Baumann's (7)):

(9) It was not entirely the reality of life in Paris or in France more generally, however.

It seems to me attractive to treat this inserted "more generally" as indicating a shift in level of granularity, which may be analyzed either as flagging the question under discussion as non-standard (due to mixing levels of granularity) or as marking a shift mid-utterance to a coarser question under discussion (with disjunction "or" perhaps taking on a more metacommunicative role, like corrective "or"). Either way, Baumann's observation at least offers some support for the idea that mixed levels of categorization are to blame for the infelicity of Hurford disjunctions like (2a).[10] Closely related is the observation by Schlenker (2009) that "at least" and "even" can likewise fix Hurford disjunctions:

(10)   a. John is from Paris or #(at least) France.
        b. John is from France or #(even) Paris.

Again two analyses are conceivable in principle: "at least" and "even" may either mark a shift from one question under discussion to another, each at a different level of categorization (with "or" being metacommunicative); or it may indicate a single question under discussion that mixes levels of categorization. Schlenker's interpretation favors the second kind of analysis, and I must say I also find it the more plausible one in this case (whereas for "more generally" and "more specifically" I'm drawn more to the first kind, for what it's worth). If this is true, then apparently it is not impossible to think of Paris and France as being jointly relevant – it is merely sufficiently unconventional so as to require explicit markers, at least when the disjunction occurs without context. Not coincidentally, the paraphrase in (8b) contains such markers too – without these the interrogative itself (technically a Hurford disjunction too) seemed as infelicitous to me as the original Hurford disjunction (2a).[11]

I want to end by highlighting two predictions of the foregoing, though leaving their empirical assessment for another occasion. Recall that the question under discussion paraphrased in (8a) is simply not a suitable candidate for the disjunction (2a), regardless of the fact that it mixes different levels of categorization – the disjunction would, relative to this question under discussion, either violate Hurford's Constraint (grammatical approach) or the maxim of I/A-Quantity (Attentional Pragmatics). By contrast, the one paraphrased in (8b) could be cooperatively addressed by the disjunction (2a) in principle (again according to both approaches); apparently it is simply too hard to accommodate without explicit marking as in (10). But this also predicts that, when the question in (8b) *is* made explicit, no such markers are necessary. Accordingly, one would expect the Hurford disjunction in (2a) to improve when preceded by the question in (8b), but to remain infelicitous when preceded by (8a):

(11)   Q: Is John from Paris, or at least from France, or even Europe?
        A: John is from France or from Paris.   (predicted fine)

_____

[10]In fact, Baumann (2014) proposes that sometimes "more generally" can be implicit, predicting that Hurford disjunctions can be fine to the extent that (given the context) an implicit "more generally" can be accommodated. The examples he gives are conjunctions, but they illustrate the idea:

(1)   a. Mary enjoys life in Paris and [more generally] in France.
       b. # Mary was born in Paris and [# more generally] in France.

Baumann claims that (1a) is at least possible because an implicit "more generally" can fix it; but (1b) is really infelicitous because it doesn't make sense even with "more generally" inserted.

[11]An anonymous reviewer notes that "only" doesn't seem to improve (examples related to) Hurford disjunctions, unlike "at least". This may suggest that explicit reference to a question under discussion (as "only" supposedly does; Beaver and Clark 2009) is not enough; it's really the scalar nature of this question that must be marked.

(12)   Q: From which country and which city/region is John?

        A: John is from France or from Paris.   (predicted still bad)

These predictions seem to me plausible, but I will not seek to evaluate them empirically in the present paper – this is merely an intermezzo after all, and they are the same for both approaches.

Now, none of the foregoing establishes *why* mixing different levels of categorization would result in a question under discussion that is too hard to accommodate without explicit marking. Part of the reason may be that a speaker's choice of utterance or question under discussion that in its own right is only somewhat nonstandard can become downright infelicitous simply because (even slightly) better alternatives are available. A better alternative to "France or Paris" might be "France, perhaps Paris", where the intonation phrase break makes it easy to interpret the two parts as conjoined answers to two separate questions, in a natural strategic progression from coarse granularity (country) to fine (city). In this light, (2a) is infelicitous not because we cannot imagine a question under discussion like (8b) – this was fairly easy after all – but because we cannot imagine why a speaker would actually choose to pursue it out of context and without explicit marking, as opposed to relying on a more standard strategy.

Summing up, I have tried to offer the following partial answer to the main issue raised by Assumption 2, on which both the grammatical and the pragmatic approach rely: questions under discussion that mix different levels of categorization cannot be easily accommodated – they must either be made explicit, or the disjunction that addresses them must contain a marker like "at least" or "more generally". I have illustrated this by concentrating on (2a), for which I considered the two superficially plausible questions under discussion in (8). I proposed that (8b) is merely difficult to accommodate in this way, whereas (2a) would, even when explicit or accommodated, be inadequate for the disjunction in (2a) – for reasons identified in the grammatical approach and in Attentional Pragmatics. My remarks on the other Hurford disjunctions in (1) and (2) were more brief and in some respects more tentative, but it seems to me that the notion of levels of categorization is helpful in accounting for many examples in the literature on Hurford disjunctions. But let me close this intermezzo, and move on to an issue that is actually relevant to a comparison between the pragmatic and the grammatical approach.

6   Issue (ii): Hurford's Constraint from redundancy

Recall that, for both the grammatical approach and the pragmatic approach to exhaustivity, it is important to understand the nature of Hurford's Constraint. For the grammatical approach this is because it crucially relies on Hurford's Constraint for predicting both the infelicity of certain Hurford disjunctions and the (non-)exhaustivity effects of others, and it shouldn't be ad-hoc. For the pragmatic approach this is because, if Hurford's Constraint generally holds, it has no obvious means for predicting the felicity of certain Hurford disjunctions – after all, it cannot, like the grammatical approach, rely on local exhaustification to break the entailment relation between the disjuncts.

Many authors have sought to derive Hurford's Constraint from considerations of redundancy (e.g., Singh 2008; Katzir and Singh 2013; Mayr and Romoli 2016; Ciardelli and Roelofsen 2016): if one disjunct entails the other, then the stronger disjunct is redundant, for it could

have been omitted without a change in basic semantic meaning. However, as Ciardelli and Roelofsen (2016) note, whether a disjunct like "or both" is really redundant depends on the richness or granularity of one's semantics. In classical (information-only) semantics a disjunct like "or both" is redundant, given that the logical law of absorption holds: $\varphi \vee (\varphi \wedge \psi) \equiv \varphi$. The same is true in *inquisitive semantics* (Ciardelli et al., 2013), because its meanings are *downward-closed* sets of propositions, which effectively causes non-weakest disjuncts like "or both" to disappear in the semantics. Accordingly, adopting either of these frameworks as one's semantics would commit one to assuming that Hurford's Constraint – conceived of as a derivative of redundancy considerations – should generally hold, at least as generally as one would expect redundancy to be worth avoiding. And this in turn may mandate adopting local exhaustification in order to explain why the addition of "or both" can nevertheless be felicitous.

By contrast, as Ciardelli and Roelofsen (2016) note, *Alternative Semantics* for disjunction is defined such that basically all (distinct) disjuncts matter semantically, not just the weakest ones (e.g., Alonso-Ovalle 2008; the same is true for an "unrestricted" variant of inquisitive semantics, Ciardelli 2009); these semantic frameworks do not validate the law of absorption. The same holds for closely related ideas, e.g., the proposal in Schulz and Van Rooij 2006 that a disjunction introduces its disjuncts as discourse referents, and the notion in Westera 2017a that a disjunction serves to draw attention to its disjuncts, including non-weakest disjuncts like "or both". Thus, Ciardelli and Roelofsen (2016) conclude, whether Hurford's Constraint can be explained as a derivative of considerations of redundancy depends on one's assumptions about the semantics/pragmatics of disjunction.

Now, Ciardelli and Roelofsen (2016) do not consider the pragmatic approach to Hurford disjunctions, hence their conclusion is limited in scope to the grammatical approach. For the pragmatic approach to Hurford disjunctions it is essential that a disjunct like "or both" makes a difference to the overall semantics or speech act – otherwise pragmatics could not be sensitive to it (as discussed in section 3). Therefore, we can extend the conclusion of Ciardelli and Roelofsen (2016) in the following way: the granularity of one's semantics in large part determines which approach to Hurford disjunctions one can/should take. If one's semantics is too coarse-grained to represent non-weakest disjuncts like "or both", then so is one's pragmatics, hence the only approach to Hurford disjunctions that is available is the grammatical one. Conversely, if one's semantics is more fine-grained, and does represent non-weakest disjuncts like "or both", then Hurford's Constraint cannot be motivated in terms of considerations of redundancy, making it essentially ad hoc, and then the pragmatic approach enabled by a fine-grained semantics will be preferable.

Perhaps this choice between the two approaches, essentially between Hurford's Constraint and Assumption 3, is not merely theoretical. The following is an interesting example from Singh 2008 where the two approaches diverge:

(13) # John is from Russia or Asia.

As Singh notes, neither disjunct entails the other, yet the disjunction seems odd in the same way as a Hurford disjunction. Accordingly, Singh proposes to strengthen Hurford's Constraint to rule out not just entailing disjuncts, but even disjuncts that are merely *consistent*. Although this strengthened version of Hurford's Constraint extends to (13), it is difficult to see how this version could still be understood as a derivative of considerations of redundancy – at least it couldn't be mere informational redundancy. By contrast, the explanation of infelicitous Hurford disjunctions based on Assumption 3 generalizes to (13),

because it is about disjunctions in general, not just those with entailing disjuncts. It may be, of course, that this modified Hurford's Constraint can be motivated in some way other than from considerations of redundancy, but until this is shown its modification proposed by Singh (2008) is ad hoc, i.e., motivated only by the data to be described.

Now, this possible advantage of Assumption 3 over considerations of redundancy may seem rather limited compared to the much wider range of examples to which Hurford-like redundancy considerations have been applied in recent years (e.g., Gajewski and Sharvit 2012; Katzir and Singh 2013; Mayr and Romoli 2016): from disjunctions to conjunctions and from matrix clauses to embedded clauses. Indeed, this wide range of application gives the grammatical approach some leverage. But it is not as if redundancy considerations have no role to play in the pragmatic account – obviously they do. What differs between the grammatical and the pragmatic approach – because of the difference in granularity of the underlying semantics – is just how restrictive the notion of redundancy is. Even if one assumes a more fine-grained semantics like Alternative Semantics, such that plain Hurford disjunctions do not contain a redundancy, redundancy considerations of various other kinds are still expected to play an important role – indeed, redundancy can still play a role in many of the other examples in the recent literature on Hurford's Constraint. I will discuss a more or less representative sample.

For instance, in the case of conjunction "and", all three semantic frameworks – classical, inquisitive and Alternative Semantics – yield essentially the same criterion for semantic redundancy, because it does not introduce alternatives even in the latter. For this reason, existing redundancy-based accounts of conjunctions like the following (e.g., Mayr and Romoli 2016) can be maintained regardless of one's approach to Hurford disjunctions, i.e., pragmatic or grammatical:

(14) # John was there, and both John and Bill were there.

The first conjunct "John was there" is informationally redundant (or the occurrence of "John" in the second conjunct, for that matter), and since conjunction does not introduce alternatives even in a semantics as fine-grained as Alternative Semantics, the conjunction as a whole is predicted to be infelicitous anyhow. For the same reason existing analyses of the following well-known contrast (e.g., Mayr and Romoli 2016) can in principle be maintained regardless of one's approach to Hurford disjunctions:

(15) a. Either there is no bathroom, or (there is one and) it is upstairs.
b. If there is a bathroom, (# there is one, and) it is upstairs.

This contrast has been thought to show that the relevant notion of "redundancy" is sensitive to incremental processing, with disjunction and implication, despite their truth-conditional equivalence, differing in the local context they create against which their second clause is evaluated (see Katzir and Singh 2013; Mayr and Romoli 2016; building on Schlenker 2009). So, a considerable portion of the literature of Hurford-like constructions, namely the part which deals with informational redundancy in *conjunctions*, can be maintained regardless of one's approach to Hurford *disjunctions*, hence regardless of the granularity of one's assumed semantics.

Moreover, disjunctions, too, can contain redundancies regardless of the granularity of one's semantics, either as such (16a), or given contextual knowledge (16b):

(16) a. # John was there, or Bill, or John, or both.
      b. *(The speaker knows that if Bill was there, then so was John)*
         # John was there, or Bill, or both.

In (16a) one of the two occurrences of "John" is redundant, regardless of whether we take classical semantics, inquisitive semantics or Alternative Semantics, since in neither of these frameworks do repeated disjuncts make a difference to the semantics. In (16b), the second disjunct "Bill" is intuitively redundant because, given the speaker's knowledge that Bill's presence entails John's, it is equivalent to the last disjunct – and this too holds independently of the precise semantics one assumes. The technical details do not matter for present purposes, but the grammatical approach would account for (16b) by relativizing Hurford's Constraint (or a more general anti-redundancy constraint) to contextual knowledge (Singh 2008 and subsequent work), whereas the pragmatic approach of Westera 2017a has an "attentional redundancy" maxim (technically a part of the A(ttentional)-Quality maxim) that states you should draw attention only to things you consider possible independently of stronger things to which you draw attention.

Even if one's semantics is as fine-grained as Alternative Semantics, it is possible for disjunctions to be embedded in linguistic contexts in which this richness does not play a role and, accordingly, Hurford's Constraint can be a crucial factor after all. This is the case for instance for disjunctions in downward entailing contexts like the scope of negation, which have been assumed to "flatten" any alternatives introduced in its scope (e.g., Ciardelli 2009) – and indeed, as Gajewski and Sharvit (2012) note, the addition of "or both", which was perfectly fine at the matrix level (1), is bad in downward entailing contexts:

(17) a.   The boss, her assistant, or both, disappeared.
      b. # It isn't true that the boss or her assistant, or both, disappeared.
      c. # No students like chemistry or math, or both.

This effect of embedding is easily explained in terms of Hurford's Constraint, paradoxically, *provided* we adopt a fine-grained semantics like Alternative Semantics. After all, "or both" is then predicted to be fine in (17a) because while informationally redundant it still serves to introduce the disjunct as an alternative (say, to draw attention to it), but bad in (17b,c) because there the disjunction is embedded under an operator that ignores alternatives, making "or both" redundant after all. More generally: if we assume something like Alternative Semantics, then Hurford's Constraint is nevertheless predicted to hold in contexts where alternatives don't matter.

To compare: the explanation for the data in (17) offered by Gajewski and Sharvit (2012), who do assume Hurford's Constraint, is necessarily very different. Since Gajewski and Sharvit (2012) assume that Hurford's Constraint is generally valid, they must explain the felicity of "or both" at the matrix level (as in (1c)) in terms of local exhaustification breaking the entailment between the disjuncts. This means they must explain the *in*felicity of "or both" in (17b,c), in turn, as an exception to that exception as it were. They do so by assuming that the only possible contribution "or both" is to cancel an exhaustive interpretation (which works as discussed in section 2). Since as is well known no exhaustive interpretation tends to occur in the scope of downward entailing operators to begin with, "or both" is redundant and hence infelicitous in these cases. Now, this seems to me a fine explanation, and it has been worked out in far greater detail than my suggestion above. What I want to point out is merely that Hurford's Constraint can still play a role in certain contexts, regardless of the

richness of one's semantics. In fact, paradoxically, because Alternative Semantics doesn't enforce Hurford's Constraint for unembedded cases like (17a), no local exhaustification is necessary to save those, and embedded cases like (17b,c) can be ruled out simply by Hurford's Constraint, unlike in Gajewski and Sharvit's proposal. Note that their assumption that the only possible contribution of "or both" is to cancel exhaustivity is again an assumption about the semantic framework used; it holds for classical and inquisitive semantics, but not for Alternative Semantics, where "or both" serves to introduce an alternative.

Similar to downward-entailing contexts like those in (17), certain model verbs too may block the alternative-introducing potential of disjunction. Consider the following examples (from Gajewski and Sharvit 2012):

(18) a. John discovered that the boss or her assistant, or both, had disappeared.
      b. John believes that the boss or her assistant, or both, had disappeared.
      c. # John was sorry that the boss or her assistant, or both, had disappeared.
      d. # John doubted that the boss or her assistant, or both, had disappeared.

The empirical picture of embedding verbs is complicated, but I will just go along with Gajewski and Sharvit (2012) in assuming (following much previous literature; for a recent overview see Uegaki 2015) that the felicity of "or both" in the scope of an embedding verb correlates with the presence of an exhaustive interpretation of the embedded clause. Thus, the assumption is that, without "or both" we get the following implications:

(19) a. John discovered that the boss or her assistant had disappeared.
              ⤳ John discovered that not both had disappeared
      b. John believes that the boss or her assistant had disappeared.
              ⤳ John believes that not both had disappeared
      c. John was sorry that the boss or her assistant had disappeared.
              ⤳̸ John was sorry that not both had disappeared
      d. John doubted that the boss or her assistant had disappeared.
              ⤳̸ John doubted that not both had disappeared

Because of this correlation between (18) and (19), Gajewski and Sharvit (2012) can explain the pattern in (18) in essentially the same way as for (17): since the embedding verbs in (18c,d) do not give rise to exhaustivity effects concerning their complements to begin with, as illustrated in (19c,d), "or both" is predicted to be redundant there (since its only purpose is to prevent exhaustivity), hence infelicitous.

As for the pragmatic approach, a fairly direct explanation is again available, similar to my proposal concerning (17), provided we assume that the presence/absence of exhaustivity in the scope of a verb, as illustrated in (19), correlates with whether the subject's (i.e., John's) stance with regard to alternatives introduced in the scope of the verb matter, say, whether they are relevant to the conversation. Intuitively, (19a,b) could be uttered in a crime-scene dialogue aimed at finding out who exactly had disappeared, with John a witness (say), where it matters not just which information John believes or has discovered to be true, but also which propositions John considers possible (the disjuncts). By contrast, (19c) seems to be more about John's emotion than about finding out what the world or John's

epistemic state is like.[12] And "doubt" in (19d) is a downward-entailing operator that one would expect to pattern with those in (17) in not caring about alternatives. Now, if indeed alternatives introduced in the verb's scope matter in (19a,b) but not in (19c,d), then the alternative introduced by "or both" matters in (18a,b) but not in (18c,d). And since the only thing "or both" does is introduce an alternative, it is redundant in (18c,d), thus explaining their infelicity. This explanation for (18) is essentially the same as the one I proposed with regard to the downward entailing contexts in (17): it shows again that even though for the pragmatic approach, in which "or both" can make a contribution in its own right, Hurford's Constraint (conceived of as a redundancy ban) cannot be generally valid, it is still predicted to be valid in contexts where alternatives don't matter.

Whether an exhaustivity implication is present (the starting point of Gajewski and Sharvit 2012) and whether alternatives matter (the starting point of the foregoing pragmatic proposals) are of course closely related, such that explaining either one would conceivably explain the other. Gajewski and Sharvit (2012) offer an explanation for the varying presence of exhaustivity implications in embedded positions that relies on the grammatical approach; pragmatic accounts have been proposed by Simons (2006); Russell (2006); Geurts (2009, 2011); for an account that is more neutral with regard to the pragmatics/grammar debate, concentrating on the lexical semantics of various embedding verbs, see Uegaki 2015. A comparison of these existing approaches falls outside the scope of this paper; it is an instance of the much broader issue of embedded exhaustivity. With the foregoing I have wanted to show merely that redundancy considerations, and even the derivative Hurford's Constraint, are predicted to still play a role in the pragmatic approach – just not exactly the role assigned to it in the grammatical approach. Accordingly (and for reasons of scope) I have not presented any definitive, formal pragmatic account (formalizing pragmatics is particularly tricky); I have only pointed out some plausible and, I think, hitherto overlooked pragmatic approaches to a variety of examples from the Hurford disjunctions literature.

Summing up, this section supports three main conclusions. First, expanding on Ciardelli and Roelofsen 2016, if we assume that Hurford's Constraint should be explained in terms of semantic redundancy, then the choices between adopting and not adopting Hurford's Constraint (vs. Assumption 3), between the pragmatic and the grammatical approach, and between classical/inquisitive semantics and Alternative Semantics, are all essentially the same single choice. Second, this choice is not just theoretical: the pragmatic approach generalizes to disjunctions whose disjuncts aren't entailing but merely consistent, like (13), an example in which there is no redundancy (at least in any of the semantic frameworks considered). And third, redundancy considerations more generally and even Hurford's Constraint specifically are nevertheless predicted to play a role in the pragmatic approach. The choice we face is not between admitting and not admitting redundancy considerations; rather, it is about how exactly redundancy is to be defined – more concretely: on the basis of which kind of semantics – and accordingly which examples should and shouldn't be explained in terms of it. A pragmatic approach based on something like Alternative Semantics gives rise to a less restrictive notion of redundancy, calling for a different explanation of the infelicity of Hurford disjunctions like (2), while still permitting a redundancy-based explanation of the infelicity of the many examples discussed in the present section. In fact, paradoxically, in the case of infelicitous embedded Hurford disjunctions the pragmatic approach can rely on Hurford's Constraint in a more direct way than the grammatical approach.

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[12]This intuition fits the generalization in Uegaki 2015 that "cognitive/epistemic predicates and communication predicates such as *know, discover, predict* and *tell* allow the strongly-exhaustive interpretation [...] whereas emotive factives such as *surprise, happy* and *annoy* select for the weakly-exhaustive interpretation".

7 Outlook

The predominant, grammatical approach to Hurford disjunctions relies on Hurford's Constraint – that one disjunct in a disjunction may not entail the other – to ban the infelicitous examples, and grammatical exhaustification to rescue the felicitous examples from such a ban. The grammatical approach seeks to explain variation in felicity in terms of variation in availability of exhaustification, and this in turn in terms of variation in the availability of a suitable question under discussion (Assumption 2). This paper explored an alternative, based on the pragmatic approach to exhaustivity: to not assume Hurford's Constraint, take the felicitous ones for granted, and instead ban the infelicitous ones by assuming, in addition to Assumption 2, that a disjunction is infelicitous if its disjuncts are insufficiently easily construed as jointly relevant to an suitable question under discussion (Assumption 3). Both the grammatical and the pragmatic approach offer a partial explanation for Assumption 2 (ruling out one candidate question under discussion), and I have tentatively tried to expand on that, as an intermezzo, in section 5.

I have not tried to argue in favor of either approach (except marginally, by means of example (13)); rather, the aim was to demonstrate as feasible, as far as possible within the scope of a single paper, the pragmatic approach to Hurford disjunctions, and to compare it to the grammatical approach, which has received far more attention in the recent literature. This comparison showed that the two approaches, despite some shared assumptions, end up dividing the empirical pie in very different ways, though also with a surprising twist: that sometimes Hurford's Constraint can play a more direct role in the pragmatic approach than in the grammatical approach. Another main conclusion of this paper is that several theoretical choices we face are deeply connected: whether or not to assume the general validity of Hurford's constraint, whether to adopt a pragmatic or grammatical approach to exhaustivity, and which type of semantics to use as the backbone. This realization, which expands on Ciardelli and Roelofsen 2016, is essential for a proper understanding of the theoretical landscape. Both approaches seem to me worth developing further.

Acknowledgements

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