# Hurford disjunctions: an in-depth comparison of the grammatical and the pragmatic approach

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**Abstract.** Hurford disjunctions are disjunctions where one disjunct entails another. Some of these are perfectly natural while others seem infelicitous, at least out of context. 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. An alternative, pragmatic approach to Hurford disjunctions relies on neither Hurford's Constraint nor grammatical exhaustification, but it has received much less attention. This paper offers a comprehensive overview and comparison of both approaches. It touches on central topics such as the granularity of one's semantics, the status of Hurford's Constraint as a derivative of considerations of redundancy, constraints on relevance and questions under discussion, levels of categorization, and ways in which pragmatic principles can operate in embedded contexts.

**Keywords:** Hurford's Constraint, disjunction, redundancy, alternatives, pragmatics, grammar

## 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).

The grammatical approach to Hurford disjunctions 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 received much less attention: to take the felicity of (1) as given (hence not necessarily adopt Hurford's Constraint) and, rather, try to predict the infelicity of (2) by other means. And yet, such an approach is suggested by pragmatic accounts of Hurford disjunctions (e.g., Schulz and Van Rooij 2006; Westera 2017a), which have thus far concentrated only on deriving the right (non-)exhaustivity effects for felicitous Hurford disjunctions like (1), and which do so without relying on Hurford's Constraint. As we will see, nothing really new is required for these accounts to extend to *in*felicitous Hurford disjunctions like (2). Nevertheless explaining how exactly this works, and furthermore showing how the pragmatic approach may deal with some of the more sophisticated examples from the literature (e.g., involving embedded Hurford disjunctions) will occupy a good portion of this paper.

The aim of this paper is to carefully explicate and compare the two approaches. As will become clear, they end up dividing the empirical landscape very differently, and sometimes in surprising ways. First, section 2 states an important background assumption about exhaustivity, which will be taken for granted in this paper. Section 3 then looks closely at the nature of Hurford's Constraint, in particular its purported derivation from considerations of semantic/pragmatic redundancy. Sections 4 and section 5, subsequently, outline the grammatical and the pragmatic approach to Hurford disjunctions in detail and offer a comparison. Section 6 zooms in on an important issue faced by both approaches alike (and their partial resolutions of this issue): both approaches offer a way of dealing with both infelicitous and felicitous Hurford disjunctions, but what causes this variation in felicity to begin with? Section 7, following much of the recent literature, considers Hurford disjunctions in various embedded positions, and shows how each approach may cope with these. Section 8, finally, wraps up with a summary and outlook.

## 2   A preliminary assumption: a matter of relevance

Hurford disjunctions relate crucially to the phenomenon of exhaustivity, i.e., the exclusion of alternatives. In the literature it isn't always clear where these alternatives are supposed to come from, and this makes a proper discussion and comparison difficult. To avoid this, I will adopt throughout this paper 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 exhaustivity (of the type under discussion here), whether pragmatic or by a grammatical 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 most pragmatic accounts of exhaustivity (though see below for those based on "scales"), and also by most grammatical accounts (e.g., Fox 2007; Singh 2008; Magri 2009; Fox and Katzir 2011; Chierchia et al. 2012).

Two clarifications are in order. First, Assumption 1 is 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. Second, 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.

Instead of Assumption 1, 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 (depending on the occasion) be taken to represent either what is *typically* relevant when a certain expression is uttered, or what is *actually* relevant in a given context.[1]

My main reason for using the term "relevance" 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). Moreover, stating something like Assumption 1 in terms of relevance rather than "scales" makes more obvious that, as stressed in Potts 2013, the grammatical approach too relies centrally on pragmatics. This realization may enable one to see commonalities between the grammatical and the pragmatic approach that one might have otherwise missed, and to see that the grammatical approach, contrary perhaps to what the label "grammatical" suggests, leaves room in principle for counterexamples to the simple pattern in (1)/(2) – such as the many felicitous uses of (2) that can be found in corpora (see Potts 2013). Of course relevance should not be a wastebasket for apparent counterexamples; the notion must (just like "scale") be defined in sufficient detail. Fortunately for the purposes of the current

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[1]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.

paper, the grammatical approach and the pragmatic approach to Hurford disjunctions rely essentially on the same key assumptions about relevance (Assumption 1, and Assumption 2 in section 4).

# 3   Redundancy and semantic granularity

Although both approaches have yet to be introduced in detail, recall from the introduction that the grammatical approach relies crucially on Hurford's Constraint – that neither disjunct should entail the other – whereas the pragmatic approach tries to do without. In fact, for the pragmatic approach it is crucial that Hurford's Constraint is not generally valid, because if it were, there would be no way of predicting that some Hurford disjunctions can nevertheless be felicitous – after all, it cannot, like the grammatical approach, rely on local, grammatical exhaustification to break the entailment relation between the disjuncts. An important question therefore is whether there is independent reason to think that Hurford's Constraint is valid (or invalid). Such a reason on its own could already settle the question of which approach is right, rendering a further comparison redundant. Unfortunately (but fortunately for the present paper) it is not so simple.

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 2017): 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 (2017) note, whether a disjunct like "or both" is really redundant depends on the richness, or granularity, of one's semantics. If one's semantics is so coarse-grained as to not see a meaning difference between disjunctions with and without "or both", then the disjunct "or both" is redundant. But if one's semantics is more fine-grained, such that "or both" does make a difference to the meaning, this is no longer the case. This is schematically depicted in figure 1, for a Hurford disjunction like (1c), schematically $j \vee b \vee (j \wedge b)$. Classical (information-only) semantics assigns the same meaning (figure 1a.)  to both $j \vee b$ and $j \vee b \vee (j \wedge b)$. 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 always be there in the semantics. That is, Inquisitive Semantics assigns the meaning in figure 1b. to both $j \vee b$ and $j \vee b \vee (j \wedge b)$. 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. And this in turn may mandate adopting local exhaustification, as in the grammatical approach, in order to explain why the addition of "or both" can nevertheless be felicitous.

By contrast, as Ciardelli and Roelofsen (2017) note, *Alternative Semantics* for disjunction is defined such that 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). Accordingly adding "or both" does make a semantic difference: Alternative Semantics assigns to $j \vee b$ the meaning in figure 1c., and to $j \vee b \vee (j \wedge b)$ the meaning in figure 1d. A similar fine granularity is found in 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. Thus, Ciardelli and Roelofsen (2017) conclude, whether Hurford's Constraint can be explained as a derivative of considerations of redundancy depends on one's assumptions about the semantics of disjunction.
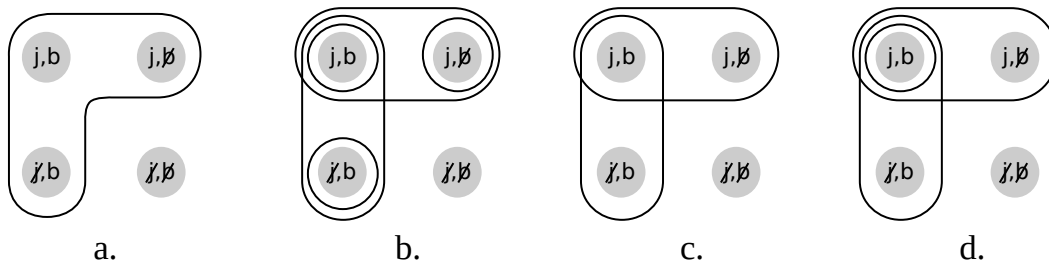
Figure 1: Classical semantics assigns the same meaning to both $j \vee b$ and $j \vee b \vee (j \wedge b)$ (figure a.). Likewise for Inquisitive Semantics (figure b.), due to *downward closure*. By contrast, Alternative Semantics does assign different meanings to $j \vee b$ (figure c.) and $j \vee b \vee (j \wedge b)$ (figure d.).

As we will see, the pragmatic approach to Hurford disjunctions relies crucially on these more fine-grained types of semantics, according to which non-weakest disjuncts like "or both" do make a difference. This is no coincidence of course: if the inclusion of such a disjunct did not make a difference to the semantics, then pragmatics could not be sensitive to it, at least not in any way other than the aforementioned route through considerations of redundancy (which in turn would plausibly mandate a grammatical approach, as explained). More generally, several theoretical choices concerning Hurford disjunctions 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. 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, whose reliance on Hurford's Constraint can in turn be justified by the fact that, given the coarse-grained semantics, it can be derived from redundancy considerations. Conversely, if one's semantics is more fine-grained, such that non-weakest disjuncts like "or both" do make a difference, then Hurford's Constraint cannot be motivated in terms of considerations of redundancy, making it essentially ad hoc and calling for a different approach to Hurford disjunctions, such as the pragmatic approach, which in turn relies crucially on the fine-grained semantics.

Zooming out a little, the question is not whether redundancy considerations play a role; the question is merely how restrictive this notion of redundancy is supposed to be. Even if one assumes a more fine-grained semantics like Alternative Semantics, such that plain Hurford disjunctions do not contain a redundancy, redundancy considerations more generally are still expected to play a role in various other types of examples, including many examples from the recent literature on Hurford's Constraint. I will discuss a small sample here, but the more intricate cases, which involve embedded disjunctions, will be left to section 7. The point of including the following examples here is to show that adopting a fine-grained semantics, essentially rendering Hurford's Constraint unavailable for the basic Hurford disjunctions, would not imply that we must give up all appeals to redundancy found in the recent literature on Hurford's Constraint (fortunately, because that would imply a considerable loss of empirical coverage).

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:

(3)   #  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:

(4)   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.

Disjunctions, too, can contain redundancies regardless of the granularity of one's semantics, either as such (5a), or given contextual knowledge (5b):

(5)   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 (5a) 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 (5b), 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 (5b) 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, discussed in more detail in section 5, has a ban on "attentional redundancy" that states you should draw attention only to things you consider possible independently of stronger things to which you draw attention, a constraint that is violated in (5) by the speaker's drawing attention to Bill's presence.

Summing up, the first part of this section showed, slightly expanding on Ciardelli and Roelofsen 2017, that the theoretical choices between the grammatical and the pragmatic approach to Hurford disjunctions, between a more coarse-grained and a more fine-grained semantics, and between adopting and not adopting Hurford's Constraint (at least as a

derivative of considerations of redundancy), are essentially the same single choice. The second part of this section was meant to clarify that this choice is independent of some of the other invocations of consideratios of redundancy in the literature (leaving some more intricate examples involving embedding to section 7). Let us now look in more detail at each of the two sides of this choice, starting with the grammatical approach.

# 4   The grammatical approach to Hurford disjunctions

As mentioned in the introduction, Hurford (1974) adopted what has come to be called Hurford's Constraint and proposed that Hurford disjunctions can be fine despite this constraint provided they can be 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:[2]

(6)   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.

The logical form (LF) in (6a) violates Hurford's Constraint because one disjunct entails the other, whereas the LF in (6b), 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.

Important empirical motivation for this kind of 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 (7), which are simply the weaker disjuncts of (1), have an exhaustive interpretation implying the negation of what is the stronger disjunct in (1):

(7)   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

By contrast, the utterances in (8), which are the weaker disjuncts of the infelicitous Hurford disjunctions in (2), do not normally imply the negations of the stronger disjunct:

(8)   a.   John is from France.    ⤳̸ not from Paris

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

|   |   |   |
|---|---|---|
| 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 correlation between the presence/absence of exhaustivity in (7)/(8) and the felicity/infelicity of their disjunctive counterparts in (1)/(2) 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 (7), 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 (8). This correlation between (7)/(8) and (1)/(2) is what makes the grammatical approach, based on Hurford's Constraint and exhaustive interpretation of the weaker disjunct, particularly appealing.

The grammatical approach can also explain why (given a classical semantics) the stronger disjunct of a Hurford disjunction makes a difference to the overall interpretation at all, compared to a disjunction that lacks the stronger disjunct, i.e., (9):

(9) 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 (9) has both an inclusive and an exclusive ("not both") interpretation, whereas in (6) both LFs are inclusive: even the one with exhaustivity operators still permits the "both" possibility. Morever, the predicted contrast between (6) and (9) holds up even if we consider the possibility of having an additional, wide-scope exhaustivity operator, resulting in the following LFs:

(10) 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.)

(11) 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 (10) is assumed to result in a felicitous LF for (10), it still won't predict the "not both" implication that is present in (11). Rephrasing, in a nutshell: adding "or both" as in (6) prevents the exhaustivity implication "not both" present in (11), 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.[3]

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[3]As an anonymous reviewer notes, the exhaustivity-preventing effect of a disjunct like "or both" is sometimes only partial, namely in cases of so-called *distant entailing disjuncts* (Fox and Spector 2018) 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.

Here the exhaustivity implication "not all" is prevented by the strongest disjunct, but intermediate propositions like "three/four/many/most of the problems" are still partially excluded, implying, e.g., "not *only* three/four/many/most". The grammatical approach straightforwardly accounts for this.

Now, explaining the correlation between the (in)felicity of the Hurford disjunctions in (1)/(2) and the (non-)exhaustive interpretations of the weakest disjuncts in (7)/(8) is one thing; what causes this variation in felicity to begin with, or the variation in exhaustivity for that matter? As I mentioned in the introduction, most current accounts build on Gazdar's (1979) proposal that the relevant expressions are members of the same scale in (1)/(7) but not in (2)/(8). Following the considerations in section 2, I will reformulate Gazdar's assumption about scales in terms of relevance, as follows:

- **Assumption 2:** The disjuncts in (1) but not in (2) – hence the asserted and excluded propositions in (7) but not (8) – are sufficiently easily construed as being relevant to the same, appropriate question under discussion (or goal, or topic; some model of relevance).

In fact, the inclusion of the word "appropriate" makes Assumption 2 slightly weaker than Gazdar's proposal, in the sense that it allows for cases where the propositions can in principle be construed as being relevant to a single question under discussion (i.e., where the expressions are members of a scale), provided any such question under discussion is inappropriate for the given example. This relaxation is required for Assumption 2 to be compatible with certain proposals in the more recent literature, both in the grammatical approach and the pragmatic approach. In the grammatical approach, for instance, several authors have noted that certain Hurford disjunctions may be infelicitous not because the two disjuncts are not alternatives, but because there are *too many* alternatives (Singh 2008; Katzir 2013; Ciardelli and Roelofsen 2017). This will be discussed in more detail in section 6, which considers why, for the examples under consideration, relevance would be as stated in Assumption 2. Until then, I will simply take Assumption 2 for granted (the pragmatic approach will likewise depend on it).

With Assumption 2 in place (along with Assumption 1, Hurford's Constraint and local exhaustification), let us consider (again) how the grammatical approach would proceed. According to Assumption 2, the asserted proposition and the stronger, to-be excluded proposition are jointly relevant in (7), but not in (8). 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 (7) and not in (8). 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 (7)/(8) 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 (to be discussed in section 6).

To the extent that Assumption 2 can be independently motivated, as well as Hurford's Constraint – and the latter depends on which semantics one assumes (section 3) – the grammatical approach offers a pretty economical account of the relevant examples. After all, if Hurford's Constraint is granted, then the adoption of local exhaustification is arguably required in order to save the felicitous Hurford disjunctions – and beyond this not much else is needed. In recent years the grammatical approach has, moreover, been successfully applied to ever more sophisticated cases, in particular those involving embedded Hurford disjunctions (e.g., Gajewski and Sharvit 2012). A discussion of these more advanced cases (and a comparison to the pragmatic approach in this regard) will be left to section 7.

# 5 The pragmatic approach to Hurford disjunctions

Pragmatic accounts have concentrated on felicitous Hurford disjunctions, in particular on the exhaustivity-preventing effect of a stronger disjunct like "or both". Infelicitous Hurford disjunctions seem to have been deemed less interesting, and in fact Hurford's Constraint is rarely even mentioned in the pragmatic approach. (In the grammatical approach, by contrast, the exhaustivity-preventing 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 in spite of it.) Nevertheless, as I hope to show, existing pragmatic accounts of felicitous Hurford disjunctions can be extended to infelicitous cases by combining them with a straightforward assumption from the broader pragmatics literature.

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 (for an early and influential formalization see Gazdar 1979). 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 (9), repeated here:

  (12)   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. Now, Soames (1982: p.534) pointed out, in a discussion of Gazdar's (1979) account, that this implication falls short of exhaustivity proper; there is a gap between not-knowing-that and knowing-that-not, which Sauerland (2004) recently called the *epistemic step*. To mend this gap, Soames proposed that participants in a conversation 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 (12) 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).

It has often been noted that this common pragmatic recipe for exhaustivity cannot distinguish (12) from the variant with "or both", repeated here from (6):

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

The reason is that the maxim of Quantity is assumed to operate on the classical informational content of the utterance (prior to computing exhaustivity). Since the disjunctions in (12) and (13) have the same classical informational content – due to the absorption laws of classical logic a disjunct like "or both" does not make a contribution – the maxim of Quantity and hence the standard pragmatic account as a whole is blind to the disjunct "or both". This shortcoming generalizes of course to other Hurford disjunctions: the common pragmatic recipe cannot account for the exhaustivity-preventing effect of a disjunct that does not contribute to the classical informational content.

Of course different authors have recognized this problem posed by Hurford disjunctions and taken steps towards a solution (Gazdar 1979; Schulz and Van Rooij 2006; Alonso-Ovalle 2008; Westera 2017a). Somehow, pragmatics has to be made sensitive not just to the informational content of the sentence as a whole, but also to the individual disjuncts. In a nutshell, Gazdar tries to achieve this 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, preventing exhaustivity in the relevant cases. Schulz and Van Rooij (2006) instead try to make pragmatics sensitive to the *discourse referents* introduced by an utterance, and assume (following, e.g., Aloni 2001) that a disjunction introduces its disjuncts as discourse referents. Unfortunately their solution, though based on the common pragmatic recipe summarized above, is in the end mostly a technical one: they define an exhaustivity operator that is sensitive to discourse referents, and that accordingly can handle Hurford disjunctions, but which lacks proper pragmatic motivation. Alonso-Ovalle (2008) tries something similar by adopting an Alternative Semantics for disjunction and defining an exhaustivity operator that negates only propositions that are "innocently excludable" from all disjuncts (a notion adopted from Fox 2007), blocking exhaustivity in roughly the same way as Gazdar's clausal implicatures. Like Schulz and Van Rooij's operator, Alonso-Ovalle's is mostly a technical solution, lacking a fully explicit pragmatic motivation. Finally, Westera (2017a) defines an operator that is essentially equivalent to the one from Schulz and Van Rooij 2006, but derived from a fully explicit pragmatic theory, i.e., a set of formally defined conversational maxims that, like the operator of Alonso-Ovalle 2008, operate on (something like) Alternative Semantics. I refer to Westera 2017a for a detailed formal comparison of the various operators. Because Westera's operator is the most recent, essentially equivalent to Schulz and Van Rooij 2006, and the most rigorously pragmatically motivated, I will zoom in on this account in what follows.

To clarify: although I will now zoom in on one account, all of the aforementioned pragmatic accounts share the intuition that pragmatics must somehow be made sensitive to the disjuncts, and most of what I will say subsequently, when comparing the pragmatic to the grammatical approach, will apply to these accounts indiscriminately. However, for certain more specific challenges posed by Hurford disjunctions, some of the novel aspects in Westera 2017a will be crucial, and these will be flagged as such.

The main idea of Westera 2017a is that, besides intending to provide information, speakers also intentionally draw each other's *attention* to certain possibilities. As a type of communicative intention, like information-sharing, attention-drawing must be governed by a set of conversational maxims, or an "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 possible (Attentional Quality, or A-Quality), relevant (A-Relation), and possible independently of anything stronger to which attention is drawn (A-Parsimony), and draw attention to *all* such propositions (A-Quantity). The maxim of A-Quality generates (the relevant part of) Gazdar's (1979) clausal implicatures, and as such it could already serve to prevent exhaustivity in the same way. However, in Westera 2017a it is shown that the right kind of exhaustivity can be derived directly from the maxim of A-Quantity, without any such blocking mechanism. In doing so, the account bypasses the traditional pragmatic recipe based on (informational) Quantity and opinionatedness (although the informational maxims are still assumed to be operative, they are no longer held responsible for exhaustivity).[4]

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[4]In Westera 2017a it is shown that, by deriving exhaustivity directly from A-Quantity rather than trying to refine the traditional recipe of (informational) Quantity plus opinionatedness, the account offers some advantages: it correctly predicts exhaustivity also in cases where opinionatedness is not assumed (though

To illustrate, consider the same kinds examples by which I illustrated the grammatical approach before (with the addition of a. and d. for the purpose of exposition):

(14)  a. Mary is having dinner with John.
      b. Mary is having dinner with John or with Bill.
      c. Mary is having dinner with John, with Bill or with both.
      d. Mary is having dinner with John, or with John, Bill and Sue.

Attentional Pragmatics predicts the following exhaustivity inferences through the maxim of A-Quantity. In (14a), the speaker didn't draw attention to Mary's having dinner with Bill, and this must be (assuming that would be relevant) because the speaker doesn't consider it possible – after all, A-Quantity requires that attention be drawn to everything relevant and possible (roughly, see below) – thus predicting the implication "not with Bill". In (14b) attention is drawn to Mary's having dinner with John and to her having dinner with Bill, but not to her having dinner with both, which again must be because the speaker doesn't consider it possible. In (14c) attention is drawn to all three propositions, so neither is excluded (though other propositions still may be). Finally, (14d) has what has been termed *distant entailing disjuncts* (Fox and Spector 2018); like (7) in Chierchia et al. 2009): the second disjunct entails the first, but there are some relevant propositions in between, such as Mary's having dinner with John and Bill, or with John and Sue. In this case, since no attention is drawn to these intermediate propositions, naively applying the foregoing reasoning again would predict their exclusion, which would be inaccurate in this case: Mary's having dinner with John and Bill should be only partially excluded, namely, all except for the part it shares with Mary's having dinner with all three of John, Bill and Sue. But Attentional Pragmatics is slightly more sophisticated, and can account for this: A-Quantity requires that attention be drawn only to propositions that are considered possible *independently of any stronger proposition* to which attention is drawn (the maxim of A-Parsimony accounts for this, as mentioned earlier). This predicts, then, that Mary's having dinner with John and Bill (or with John and Sue) is possible only as part of her having dinner with all three of John, Bill and Sue, which is exactly the right exhaustivity implication (see Westera 2017a for more detailed motivation and illustrations of Attentional Pragmatics).

More generally, the implications of A-Quantity can be captured by the following operator, for $A$ the set of propositions to which the speaker intended to draw attention, and $Q$ the question under discussion (likewise a set of propositions):

$$\text{Exh}(A, Q) = \{w \mid \text{ for all } p \in Q: \text{ if } p \notin A, \text{ then either } w \notin A,$$
$$\text{or for some } q \subset p: q \in A \text{ and } w \in q\}$$

In words: the operator computes the set of worlds in which all propositions ($p$) in the QUD to which the speaker didn't intend to draw attention are either false, or only true together with some stronger proposition ($q$) to which attention was drawn. The intersection of this set of worlds with the classical informational content formally corresponds with the output of applying the earlier operator of Schulz and Van Rooij 2006 (in a relevant subset of circumstances, see Westera 2017a for details and proof).[5] Accordingly, the above

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not 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).

[5]By contrast, the operator of Alonso-Ovalle 2008 cannot deal adequately with cases of distant entailing disjuncts like (14d): because of how it is defined, it never excludes only part of a proposition, which is what is needed here.

operator yields the same predictions concerning Hurford disjunctions; the novelty lies in its pragmatic motivation. In Westera 2017a it is furthermore shown that the operator excludes the exact same worlds that would be excluded by locally exhaustifying each disjunct, as in the grammatical approach.[6] This shows that a globalist (i.e., utterance-level) pragmatic theory can explain the appearance, at the level of overall truth conditions of the assertion *plus* pragmatic implications, of local exhaustivity effects – a theoretical possibility that is sometimes overlooked in the pragmatics vs. grammar debate, as noted by Simons (2011). 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 of a Hurford disjunction. The latter is what Schulz and Van Rooij (2006) try to achieve using discourse referents, Alonso-Ovalle (2008) by means of Alternative Semantics, and Westera (2017a) by assuming that attention-drawing is a type of communicative intention.

Speaking of which: I have said only very little thus far about how one might determine the nature of the speaker's attention-sharing intention for a given utterance, i.e., the set $A$ in the above formula. A simple answer would be that this is determined by the semantics, e.g., for present purposes, Attentional Pragmatics can safely be thought of as relying on Alternative Semantics for disjunction (Alonso-Ovalle, 2006), or, equivalently, the "unrestricted" variant of Inquisitive Semantics (Ciardelli 2009) mentioned in section 3 (and as explained there, it is crucial for the pragmatic approach to Hurford disjunctions that this would be the unrestricted variant; not the predominant version with its property of downward closure). But perhaps such an enrichment of the semantics is unnecessary: Westera (2017b) assumes instead that any sentence simply draws attention to the (classical, informational) semantic contents of any of its constituents. In many cases the attentional maxims themselves, in combination with the informational maxims, suffice to narrow down the subset of these things to which a rational, cooperative speaker may have *intended* to draw attention, i.e., the set $A$ in the formula. In this way, one can derive something close to Alternative Semantics from Attentional Pragmatics rather than having to assume it as a primitive enrichment of the semantics – and actual equivalence to Alternative Semantics can be proven for certain subclasses of sentences, like sentences in disjunctive normal form (I refer to Westera 2017b, chapter 6 for formal proofs). Now, the generalizability of these results to embedded cases has not so far been explored. But what starts out as pragmatic may well over time semanticize, hence a pragmatic derivation of Alternative Semantics for unembedded cases would have explanatory value even if ultimately we would need to assume Alternative Semantics for embedded cases after all. Either way, for present purposes it is safe to think of Attentional Pragmatics as receiving input from Alternative Semantics (as in Alonso-Ovalle 2008).

Let us zoom out a little, considering again the original examples from sections 1 and 4. So far we have seen how the pragmatic approach, whether through traditional Quantity and opinionatedness or the attentional maxim A-Quantity, can handle basic cases of exhaustivity like (7). It can also account, either by adopting clausal implicatures (or A-Quality) or through A-Quantity, for the exhaustivity-preventing effect of Hurford disjunctions like (1). Together with Assumption 2 about relevant alternatives, which it shares with the grammatical approach, the lack of exhaustivity in (8) is also directly accounted for (pending motivation for Assumption 2). What remains to be shown is how the pragmatic approach can predict that the Hurford disjunctions in (2) are infelicitous. Recall that the grammatical approach achieves this with Hurford's Constraint, banning any such disjunctions where local

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[6]Despite this descriptive correspondence (which, given the empirical facts, is inevitable) there is a crucial difference: 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.

exhaustification of the required sort is unavailable as a fix. No such approach is available in the pragmatic approach, where Hurford's Constraint would inevitably ban *all* Hurford disjunctions, felicitous and infelicitous alike. After all, no local exhaustivity operators are available to salvage the felicitous ones. This means that the pragmatic approach needs a different explanation for the infelicity of the Hurford disjunctions in (2).

A straightforward explanation is offered by a common assumption from the literature, which however (to my awareness) has not been applied to Hurford disjunctions per se:[7]

- **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, this 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 above, namely, the maxim of A-Relation.[8] 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 (on which the grammatical approach also relies) implies that the disjuncts in (1) but not those in (2) are sufficiently 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. But of course, a central issue remains for both approaches: Why should Assumption 2 be granted? Why would relevance be as stated there? I return to this in the next section.

To end this section I want to highlight an important difference between Hurford's Constraint and Assumption 3 – since in the pragmatic approach the latter essentially replaces the former. Hurford's Constraint bans only disjunctions whose disjunct are entailing (and cannot be exhaustified), whereas Assumption 3 applies more generally. This has empirical implications, as in this example from Singh (2008):

(15)   # John is from Russia or Asia.

As Singh notes, this is a disjunction that seems odd in the same way as some Hurford disjunctions, even though in this case neither disjunct entails the other (they merely overlap). In light of this example Singh proposes to strengthen Hurford's Constraint to rule out not just entailing disjuncts, but also disjuncts that are merely consistent. Although this

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[7]Note that Assumption 3 does not say anything about what counts as 'sufficiently easy', or about when a QUD is 'appropriate'. This may come across as overly vague, but it merely reflects a division of labor: these notions are fixed (for the relevant examples) by Assumption 2, which, recall, is shared by the grammatical and the pragmatic approach.

[8]Assumption 3 is formulated in terms of disjunction, i.e., a syntactic type of construction. As an anonymous reviewer notes, it would be preferable for such a constraint to be purely semantic/pragmatic. Indeed, some of its aforementioned kin are of this sort, e.g., the maxim A-Relation applies more generally to whatever a speaker intended to draw attention to, whether by means of a disjunction or otherwise. Assumption 3 is intended to capture just the part of such a more general constraint which matters for the present topic – and that happens to be disjunctions.

strengthened version of Hurford's Constraint would indeed extend to (15), it is difficult to see how this version could still be understood as a derivative of considerations of redundancy, as discussed in section 3. By contrast, Assumption 3 of the pragmatic approach can in principle apply to (15) – at least provided Assumption 2 can be extended to it in the right way too, i.e., that Russia and Asia are not easily construed as co-relevant (I return to this in the next section). In this regard the pragmatic approach seems to have a slight edge for this particular example.

# 6    Explaining the variation in felicity

The first step towards explaining the variation in felicity of Hurford disjunctions is, in both approaches, Assumption 2 about relevance. Accordingly, the follow-up should be to consider why relevance would be as stated in Assumption 2, or, more specifically, why no suitable question under discussion can 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. For the disjunction (2a), "John is from France or Paris", there seem to be at least two candidate questions under discussion that would have to be ruled out for this to be plausible, namely, those which might intuitively correspond to the following interrogatives:

(16)    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.[9] The question under discussion paraphrased in (16a) is intended 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.).[10] The one in (16b) pertains instead to three nested geographical regions (Europe is included

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[9]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 (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 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 introduce a question under discussion paraphrasable as "From which city is John?", and (1b) as "From which country is John?".

[10] An anonymous reviewer suggests that even a question that isn't explicitly about countries, like "From which city/region in France or Spain is John?", 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 closure of relevance under partial answerhood would make an account of English rise-fall-rise, as a marker of uncertain relevance *and* partial answerhood, unnecessarily complex (Westera 2019).

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 (16a) has received some attention in the grammatical approach (e.g., Singh 2008; Katzir 2013; Ciardelli and Roelofsen 2017). 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).[11] 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 (16a). 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 (16b) – 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 (16a) 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 (16a). This works as follows. Recall that in order to derive exhaustivity, Westera (2017a) defines an "attentional" maxim of Quantity, A-Quantity, which requires (roughly) that attention be drawn to all relevant propositions the speaker considers possible. It follows that the Hurford disjunction (2a), relative to the question under discussion paraphrased in (16a), 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 – 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 except 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 (16b), 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 approaches rely). In fact, unlike the situation with (16a) just described, the question in (16b) 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 accommodate. This is, I think, a puzzling fact, and I will try to demystify it a bit in what follows (and subsequently I will also briefly consider some other infelicitous Hurford disjunctions). My suggestions will be only tentative: since both the

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[11]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 4: if the alternatives are mutually exclusive, none can be innocently excluded.

grammatical and the pragmatic approach face this same issue, as well as the same range of possible solutions, a more definitive account is unnecessary for the main aim of this paper, which is merely to compare the two approaches.

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 what follows 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 (7b) "three" and "four" are both small, non-round numerals, and in (1c) "John" and "Bill" both denote individuals (who in the intended context happen to be dinner candidates).[12] 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 (8c), things seem not as clear: "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, as a consequence of which "different from" and "greater than" would not normally be simultaneously relevant (cf. footnote 10) – but a more serious inquiry into mathematical discourse would be required to test this.

It is important to note that levels of categorization are not the same for all speakers; they are personal and context-dependent. For instance, someone who grew up in "Western" culture and does not have particular ties to Asia may care more about whether a friend is in Paris or Toulouse, than about whether that same friend is in Beijing or Nanjing, or even which country in Asia. Accordingly, to such a person (as to an anonymous reviewer) the following sentence may appear completely fine:

(17)   John is in Paris or in Asia.

Ontologically, Paris and Asia may be different levels of categorization, namely a city and a continent; but psychologically, from, say, a European perspective, they may well have

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[12]An anonymous reviewer notes that felicitous Hurford disjunctions can mix expressions that are arguably of different semantic types, as in "John or everyone" – a proper name and a quantifier. This is not unexpected: differences in semantic type can, but need not, correlate with differences in level of categorization. This is because, in general, the expressions used do not rigidly determine the speaker's communicative intention. For instance, "everyone" can be used to answer both the fine-grained question "Who was there?" and the coarser-grained question "What proportion of people were there?".

roughly the same utility in most everyday contexts, and that's what matters here (also in Rosch et al. 1976). And of course, besides interpersonal differences in levels of categorization, speakers may also disagree about the precise extensions of the categories involved. Consider the following example (repeated from (15) above), reported as infelicitous by Singh (2008):

(18)   # John is from Russia or Asia.

My Russian colleague considers Russia and Asia to be mutually exclusive, and for her this example is predictably fine.

The view that differences in level of categorization are responsible for the infelicity of Hurford disjunctions like (2a) has not, to my awareness, been explicated before. 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)):

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

This inserted "more generally" indicates a shift in level of granularity, which may be analyzed either as flagging the question under discussion as non-standard (due to it 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 lends some support to the idea that mixed levels of categorization are to blame for the infelicity of Hurford disjunctions like (2a).[13] But it also shows that, apparently, it is not impossible to think of Paris and France as being (depending on one's analysis) either jointly relevant to a single QUD or relevant to one QUD after the other – it is merely sufficiently unconventional so as to require explicit markers, at least when the disjunction occurs without context.[14] This raises the question of what kinds of markers can be sufficient to render a Hurford disjunction felicitous. Interesting in this regard is the observation by Schlenker (2009) that "at least" can likewise fix Hurford disjunctions, and the same seems to hold for "even":

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

Unlike "more generally" and "more specifically", the markers "at least" and "even" arguably don't necessarily indicate a shift in level of categorization; what they mark instead is the relative value of the two pieces of information on some scale: John's being from Paris is being presented in (20a,b) as higher on some scale than his being from France. Apparently, marking one disjunct as higher or lower than the other on some scale can likewise suffice

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[13]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.

[14]Not coincidentally, the paraphrase in (16b) 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).

to introduce (again depending on one's analysis) either a question under discussion mixing levels of categorization, or a succession of questions under discussion at different levels. By contrast, an anonymous reviewer notes that insertion of "only" does not seem to improve Hurford disjunctions. This suggests that explicit reference to a question under discussion (as "only" supposedly does; Beaver and Clark 2009) is not enough; it's really the scalar relation between the two disjuncts that must be marked in order for mixing levels of granularity to be acceptable (see Winterstein 2012 for arguments that "only" does not encode scalarity).

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 (16b) – 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.

Let me zoom out a bit. If the foregoing is on the right track, then both the pragmatic and the grammatical approach rule out the two candidate questions under discussion in (16) in different ways. The question under discussion paraphrased in (16a) 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 informational or attentional Quantity (pragmatic approach). By contrast, the question under discussion paraphrased in (16b) could be cooperatively addressed by the disjunction (2a) in principle (again according to both approaches), but this is simply too hard to accommodate without explicit marking as in (20). This difference between the two candidate questions under discussion predicts that the Hurford disjunction in (2a) remains infelicitous when preceded by (16a), but improves when preceded by the question in (16b):

(21)    Q: From which country and which city/region is John?
        A: John is from France or from Paris.                    (predicted still bad)

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

This prediction seems to me plausible, but I will not seek to evaluate it empirically in the present paper – it is the same for both approaches, after all.

Zooming out even more, it is important to note that the foregoing proposal is at best only a partial explanation: there are many examples of infelicitous Hurford disjunctions where the infelicity can hardly be due to differences in level of categorization. Example (8c), "different from or greater than", was arguably of this sort already. Another example was pointed out to me by an anonymous reviewer (this likewise involves modified numerals, but it doesn't have the same technical, mathematical flavor as (8c)):

(23)    How many cookies did John eat?

a. # At least two or at least four.
b. # Exactly four or at least two.

An exhaustive explanation for the (in)felicity of all conceivable Hurford disjunctions lies beyond the present scope – the need to motivate (and expand) Assumption 2 is shared by the grammatical and the pragmatic approach anyway – but I will offer some remarks towards explaining (23). The literature on modified numerals suggests that there are at least two possible approaches, depending on one's analysis of the numeral modifier "at least". The first would be based on Coppock and Brochhagen 2013, who propose, in a nutshell, that "at least $n$" draws attention to propositions "at least $k$" for all $k \geq n$. If so, then (23a) is predicted to contain not just an informational redundancy (like ordinary Hurford disjunctions) but also an attentional redundancy: the disjunct "at least four" doesn't add anything even attentionally (cf. (5) in section 3). And perhaps (23b) could be ruled out by assuming that "exactly four" and "at least two" address what are normally different kinds of questions, namely, an exact answer vs. a lower bound, which are conceptually quite distinct things – and one might normally pursue a lower bound only if an exact answer could not be given. The second approach would be based on Geurts and Nouwen (2007), who observe that "at least" has an epistemic modal flavor. This can be captured either by giving it a modal semantics, as Geurts and Nouwen themselves propose, or by noting that the typical context of use for "at least" is one where an exact answer was desired but could not be given (Westera and Brasoveanu 2014), inviting a shift to a less demanding QUD such as "what is the greatest lower bound your epistemic state supports", delivering the modal flavor of "at least" instead as a relevance-driven impliciture (in the sense of Bach 1994). Either way, the resulting modal flavor of "at least" predicts that (23a) is strange because it goes against epistemic introspection: one generally knows which propositions are and aren't supported by one's epistemic state, hence wouldn't normally be uncertain about whether the lower bound is two or four. And yet the disjunction (23a) predicts such uncertainty, as one should normally consider both disjuncts of a disjunction possible (e.g., in Attentional Pragmatics this is required by the maxim of A-Quality). And as for (23b), strangeness is predicted because, since "exactly four" does not have the same modal flavor, it would not normally address the same QUD as "at least two". I will not pursue either of these explanations further at present; what I hope to have highlighted by this brief sketch is that we need not (and arguably should not) expect a single explanation (e.g., in terms of levels of categorization) to work for all infelicitous Hurford disjunctions; their infelicity is expected to depend on multiple, independently operating pragmatic principles as well as on various aspects of the lexical semantics of the words involved.

Summing up, previous sections have shown that 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)/(8), compared to those in (1)/(7). The present section revealed that both approaches offer a partial explanation for Assumption 2, by ruling out (in different ways) a question under discussion like (16a), but that thus far they have left open the possibility of the question under discussion paraphrased in (16b). For the latter I explored a possible explanation: 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". My remarks concerning a number of other Hurford disjunctions were more brief and more tentative. Since both approaches face the same challenges in this

regard, exploring this further would not contribute to the main aim of this paper.

# 7 Embedded Hurford disjunctions

An important point of comparison between the pragmatic and the grammatical approach to exhaustivity is the apparent occurrence of exhaustivity effects in grammatically embedded positions (e.g., Chierchia et al. 2012). After all, the grammatical approach in principle allows for exhaustivity operators to be inserted anywhere in a sentence, whereas the pragmatic approach is more restricted: the conversational maxims apply primarily to an entire utterance, namely, to the communicative intentions expressed by it. Now, I already showed that the pragmatic approach can predict *some* seemingly embedded exhaustivity effects, such as the apparent local exhaustification of the weaker disjunct in a Hurford disjunction, provided one assumes the existence of a type of communicative intention that reflects the individual disjuncts – in the case of Attentional Pragmatics (Westera 2017a) the intention to draw attention to things. Still, the type of pragmatic reasoning involved is essentially global, i.e., utterance-level, hence it does not (or at least not exactly) generalize to more proper cases of embedding, such as under a negation or a modal verb. This is not necessarily a problem for the pragmatic approach, for there are different routes to exhaustivity-like effects (Geurts 2011), such as grammatical operators, different types of pragmatic implicature, pragmatic impliciture (Bach, 1994), typicality inference, lexical semantics, and interactions of these mechanisms. In fact, different modal verbs give rise to different kinds of exhaustivity effects, suggesting that the lexical semantics of these predicates has some role to play (e.g., Uegaki 2015), either instead of or in interplay with grammar and/or pragmatics.

Over the last decade far more attention has been paid to embedded exhaustivity in the grammatical approach than in the pragmatic approach, and this makes a fair comparison difficult – differences may well reflect expended effort rather than theoretical promise. Exploring and comparing the various possible routes to embedded exhaustivity lies beyond the scope of this paper. Given the aims of this paper, I will concentrate on how each approach may account for the (in)felicity of a number of embedded Hurford disjunctions, mostly under the supposition that either approach will have some way or other to deliver the right exhaustivity effects where they are needed.[15] Although the validity of this supposition is an important open issue, granting it for the duration of this section will enable a more meaningful comparison between the grammatical and the pragmatic approach, properly centered on Hurford disjunctions.

Among the different embedding contexts there is considerable variation in the felicity of Hurford disjunctions (as well as in the kinds of exhaustivity effects). In general, Hurford disjunctions that are infelicitous when unembedded are infelicitous also in embedded contexts. But the converse is not true: depending on the embedding contexts, even Hurford disjunctions that are felicitous when unembedded can become infelicitous when embedded. In this section I want to discuss a number of examples of either type, starting with cases where the felicity contrast between embedded Hurford disjunctions parallels that between their unembedded counterparts.

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[15]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. For attempts to experimentally distinguish some of the various possible routes to exhaustivity see Chemla and Spector 2011; Chemla et al. 2017.

Embedding under "believe" is such a case (e.g., Gajewski and Sharvit 2012):

(24)  a.  John believes that some or all of his students disappeared.
      b.  #  John believes that his student is from France or Paris.

This kind of parallelism is expected under the grammatical approach: grammatical operators can in principle be inserted anywhere, and there is no reason to suppose that Hurford's Constraint, conceived of as a derivative of considerations of redundancy, would be less strict in embedded contexts (one would have to assume a more fine-grained semantics in embedded positions than at the matrix-level, which seems ad hoc). By contrast, it appears more challenging for the pragmatic approach, which relies on Assumption 3 instead, i.e., a global, pragmatic, utterance-level constraint on relevance. This type of constraint is not expected to apply in the exact same way to embedded positions: material in embedded positions need not itself be relevant, as long as it contributes compositionally to the expression of something relevant higher up. This first appearance notwithstanding, I will show that, in fact, Assumption 3 does generalize to certain embedding contexts.

When reporting on what someone believes, not just any old belief will do. We report beliefs *about* some topic, such as about what happened to John's students, in (24a), or about where John's student is from, in (24b). In part this is a consequence of the fact that belief reports can serve as components in a strategy for resolving some prior question under discussion about the external world, in which case it is this prior question to which the contents of the reported beliefs have to be relevant. Hence, if in this case the contents are specified by a disjunction then Assumption 3 will apply: (24b) is bad because the two disjuncts are insufficiently easily construed as being relevant to a single, appropriate question under discussion. In this way the pragmatic approach can account for at least some Hurford disjunctions embedded under "believe".[16] But even when beliefs are reported not as components of this kind of strategy but merely for the sake of exploring or assessing what someone believes (e.g., suppose that what actually happened in the external world is already known, or irrelevant) it still makes sense that one would conduct an inquiry into someone's beliefs one topic, or question, at a time – "What does John believe about *everything*?" is simply insufficiently specific as a conversational goal. This idea, that belief reports implicitly or explicitly concern a person's beliefs *about a question*, aligns with the question-sensitivity of "know" proposed in Schaffer 2007. If this is on the right track, then the pragmatic approach to the (in)felicity of Hurford disjunctions carries over to embedding under "believe" more generally.

Similar considerations apply to Hurford disjunctions in the antecedent of a conditional (suggested by an anonymous reviewer):

(25)  a.  If some or all of John's students disappeared, I'll be surprised.
      b.  #  If John's student is from Paris or France, I'll be surprised.

Again, the felicity contrast between these embedded Hurford disjunctions parallels that between their unembedded counterparts. The pragmatic approach can extend to these cases too if an argument can be made that the antecedent of a conditional should, like the complement of "believe", relate to a possible question under discussion. Such an argument

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[16]Another prerequisite for the pragmatic approach to extend to a given embedded Hurford disjunction is that in the given embedding context the individual disjuncts matter, say, that the embedding predicate is sensitive to something like the Alternative Semantic value of its complement. I return to this below.

may begin from the observation that the antecedent of a conditional serves to introduce one or more hypothetical scenarios to the discourse, against which the consequent is then evaluated (see, e.g., Kaufmann 2000; Schlenker 2009; for a treatment of conditionals sensitive to the alternatives introduced by the antecedent see Santorio 2018; Ciardelli et al. 2018). Again, not just any old hypothetical scenario will do: it seems reasonable to assume that the scenarios considered will tend to correspond to different possible answers to some question, e.g., in (25a), the question of how many of John's students disappeared. The reason is that, just as considering all of John's beliefs wasn't an option, considering all possible ways the world may be isn't an option either – which hypotheticals one considers needs to be organized by something like topic. A plausible assumption would be that this organization of hypotheticals follows essentially the same principles as the organization of discourse goals into questions under discussion. If valid, it entails that the pragmatic approach can in principle extend to the cases of embedding in (25).

What the foregoing shows is that a more or less uniform explanation of the (in)felicity of unembedded and embedded Hurford disjunctions is available to the pragmatic approach at least for some of the cases of embedding. The reason is that, although only the utterance as a whole needs to be relevant to the *current* question under discussion (simplifying a bit, cf. Beaver and Clark 2009), certain parts of an utterance may nevertheless have to be relevant to an *earlier* question under discussion (as in the strategic use of belief reports) or to a *possible* question under discussion (as in other uses of belief reports and arguably in conditionals). Crucially, for Assumption 3 it does not matter whether the question under discussion to which a disjunction must relate is actual or hypothetical. Although this may seem surprising from the perspective of a certain narrow understanding of pragmatics, it is only one of many ways in which pragmatics can apply or appear to apply to parts of an utterance, as noted in Simons 2006, 2011.

Let me now turn to cases where a Hurford disjunction that is felicitous when unembedded, becomes infelicitous when embedded. Examples (26b,c) show embedding contexts in which the felicitous Hurford disjunction of (26a) becomes infelicitous (examples from Gajewski and Sharvit 2012):

(26)  a.  The boss, her assistant, or both, disappeared.
      b.  # It isn't true that the boss or her assistant, or both, disappeared.
      c.  # John was sorry that the boss or her assistant, or both, had disappeared.

Gajewski and Sharvit (2012) themselves, working within the grammatical approach, explain the pattern in (26) as follows. Recall that the grammatical approach explains the felicity of "or both" at the matrix level, as in (26a), as an exception to Hurford's Constraint, due to local exhaustification breaking the entailment between the disjuncts. This means that the *in*felicity of "or both" in (26b,c), in turn, must be explained as an exception to that exception, as it were. Gajewski and Sharvit (2012) do so by assuming that the only possible contribution of "or both" is to prevent an exhaustive interpretation. Since 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.

What about the pragmatic approach? Surprisingly perhaps, a very direct explanation is available in terms of Hurford's constraint. Recall that in the pragmatic approach, since it relies on a more fine-grained semantics, Hurford's Constraint cannot be derived from considerations of redundancy, making it essentially ad hoc – see section 3. As I noted there, this doesn't mean that redundancy considerations more generally have no role to play

in the pragmatic approach. In fact, even Hurford's Constraint itself can play a role in a more restricted set of contexts, namely, those contexts in which the fine granularity of the semantics is not used, say, in which the Alternative Semantic value is ignored. Interestingly, this is the case 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). This gives the pragmatic approach an easy handle on (26b,c): since the sole contribution of "or both" is to introduce an alternative, but in these embedding contexts alternatives are ignored, the disjunct "or both" is redundant. So, somewhat paradoxically, the infelicity of certain embedded Hurford disjunctions can be directly explained in terms of (a more restricted) Hurford's Constraint, *provided* we adopt a semantics like Alternative Semantics that is sufficiently fine-grained for Hurford's Constraint not to be more generally valid – after all, the latter would (as in Gajewski and Sharvit 2012) require a mechanism to render (26a) felicitous despite it, and another mechanism in turn to render (26b,c) infelicitous despite the first mechanism.

Similar to downward-entailing contexts like those in (26), modal verbs may render Hurford disjunctions infelicitous too, but here there is more variation (examples from Gajewski and Sharvit 2012):

(27)  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 a crucial observation of Gajewski and Sharvit (2012) is 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 without "or both":

(28)  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 (27) and (28), Gajewski and Sharvit (2012) can explain the pattern in (27) in essentially the same way as for (26): since the embedding verbs in (27c,d) do not give rise to exhaustivity effects concerning their complements to begin with, as illustrated in (28c,d), "or both" is predicted to be redundant there (since its only purpose in the grammatical aproach, given its coarse-grained semantics, is to prevent exhaustivity).

As for the pragmatic approach, a fairly direct explanation is again available, similar to (26), provided we assume that the verbs in (27a,b) but not those in (27c,d) care about alternatives introduced in their scope. This is a matter of the lexical semantics of embedding verbs, which is a complex issue, but in this case the reason seems quite intuitive. Examples (28a,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, "be sorry" in (28c) seems to be more about John's emotion about a piece of information that is already known to be true, than about finding out what the world or John's epistemic state is like, hence one would not expect "be sorry" to care about which alternatives John considers possible.[17] And "doubt that" in (28d), finally, is a downward-entailing operator that for that reason is expected to pattern with those in (26) in not caring about alternatives. Now, if indeed alternatives introduced in the verb's complement matter in (28a,b) but not in (28c,d), then "or both" serves a purpose in the former while it is redundant in the latter, explaining the difference in felicity in the same way as for the downward entailing contexts in (26).

Although the grammatical and the pragmatic account of (26) as well as (27) are quite different, they exhibit a striking and insightful parallelism. A crucial assumption in Gajewski and Sharvit's (2012) account is that the only possible contribution of "or both" is to prevent exhaustivity, hence it is redundant in contexts where no exhaustivity occurs to begin with. In the pragmatic approach, based on a more fine-grained semantics, "or both" makes a more significant contribution, namely, to introduce an additional alternative (thereby also preventing exhaustivity), but this contribution is redundant in contexts where alternatives don't matter to begin with. Now, let us assume, if only as a starting point for future work, that the contexts in which no exhaustivity occurs coincide exactly with those in which alternatives don't matter. The latter seems attractive, because exhaustivity relies crucially on alternatives. If this assumption is correct, then the pragmatic and the grammatical approach will yield essentially the same predictions for Hurford disjunctions like the foregoing, i.e., Hurford disjunctions that are infelicitous only when embedded.

Summing up, this section supports two main conclusions, both of which run somewhat counter to expectation. First, crucial components of the pragmatic approach, such as Assumption 3, can generalize to certain embedded contexts. Second, although Hurford's Constraint cannot be generally valid in the pragmatic approach, due to its more fine-grained semantics, it is nevertheless operative in embedding contexts where this finer granularity is ignored. Because of this the pragmatic approach is able to explain the infelicity of certain embedded Hurford disjunctions more directly in terms of Hurford's Constraint than the grammatical approach. The latter adds important nuance to the discussion in section 3, on the relation between the pragmatics/grammar debate, the granularity of one's semantics and the general validity of Hurford's Constraint as a derivative of considerations of redundancy: the notion of redundancy, and hence the availability of Hurford's Constraint, depends not just on the granularity of one's semantics, but also on how much of that granularity is actually used in any given embedding context.

# 8 Summary and outlook

This paper offered a detailed overview and comparison of two approaches to Hurford disjunctions. The predominant, grammatical approach to Hurford disjunctions relies on Hurford's Constraint – that one disjunct may not entail the other – to ban the infelicitous examples and invokes local exhaustification to rescue the felicitous ones from this general

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[17]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".

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 an appropriate question under discussion (Assumption 2). By contrast, the pragmatic approach assumes neither Hurford's Constraint nor local exhaustification. Instead, it takes the felicitous disjunctions for granted and bans infelicitous ones by assuming, in addition to Assumption 2, that a disjunction is infelicitous if its disjuncts cannot really be jointly relevant to a suitable question under discussion (Assumption 3). Which approach one can pursue determines (and is determined by) which type of semantics one can use as the backbone (expanding on the dependency noted by Ciardelli and Roelofsen 2017).

Both approaches rely crucially on Assumption 2, which concerns which propositions are and aren't sufficiently easily construed as being relevant to the same, appropriate question under discussion. I reviewed existing (partial) motivations for this assumption, and slightly extended them, primarily by proposing that questions under discussion tend not to mix levels of categorization. This is one of only a small set of new theoretical proposals made in this paper, as the main aim was a comparison of the two approaches. Other theoretical novelties are the application of the pragmatic approach to *in*felicitous Hurford disjunctions, namely by combining it with Assumption 3 from the broader pragmatics literature, and its application to various embedded cases. The latter relied on the conjecture that the embedding contexts in which exhaustivity arises are exactly those in which semantic alternatives matter.

The two approaches were shown to cover the various examples in very different ways, where sometimes the difference went in a direction one might not have expected, e.g., some infelicitous embedded Hurford disjunctions could be straightforwardly ruled out by Hurford's Constraint only by *not* assuming its general validity. Overall the comparison revealed no clear winner or loser, except perhaps for a slight edge for the pragmatic approach with respect to example (15). This corroborates the view in Potts 2013 that the two approaches are in principle compatible with wider ranges of data than the usual grammar vs. pragmatics opposition would naively seem to permit.

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