Alternatives are blind to some but not all kinds of context: the view from Hurford Disjunctions[1]

Adèle HÉNOT-MORTIER — *Massachusetts Institute of Technology*

Abstract. Hurford Disjunctions (HDs) are infelicitous disjunctions in which one disjunct entails the other (Hurford 1974). The infelicity of basic HDs has been successfully modeled by several competing approaches (Schlenker 2009; Meyer 2013; Katzir and Singh 2014; Anvari 2018). As first noticed by Singh (2008) however, HDs involving entailing scalar items like *all* and *some* are subject to an asymmetry: when the weaker scalar item linearly precedes the stronger one, the sentence seems to be rescued from infelicity. This fact is not readily accounted for by standard approaches, which treat the disjuncts in a symmetric fashion. Fox and Spector (2018) and Tomioka (2021) proposed different solutions to that problem and extensions thereof, but at the cost of positing relatively heavy and complex machineries. Here we propose a novel analysis of Singh's asymmetry, based on the familiar process of alternative pruning (Fox and Katzir 2011; Crnič et al. 2015 a.o.). In particular, we claim that exhaustification targeting the weak disjunct operates on a set of formal alternatives that is sensitive to previously uttered material. This leads us to propose a new *dynamic* constraint on alternative pruning, which ensures that the only remaining alternatives to a prejacent p are those which could be realistically entertained instead of p, *given the eventualities previously and overtly raised by the speaker*. Unlike other approaches, our account derives Singh's asymmetry *via* a direct computation, and not a global principle constraining either the insertion of the exhaustivity operator (Fox and Spector 2018), or the particular shape of the alternative set (Tomioka 2021).

Keywords: Hurford disjunctions, scalar implicatures, contrastive focus, formal alternatives, alternative pruning, relevance, redundancy.

1. Introduction

Hurford Disjunctions (henceforth HD) are disjunctions of the form $p \vee q$ where p entails q or q entails p. Those disjunctions are generally thought to be infelicitous (Hurford 1974). This is known as Hurford's Constraint (henceforth HC) exemplified in (1) below.

(1) # Michelle lives in **Paris** or **France**

Various constraints have been devised to capture those basic HDs: NON-TRIVIALITY (Schlenker 2009), MISMATCHING IMPLICATURES (Meyer 2013, 2015), NON-REDUNDANCY (Katzir and Singh 2014), LOGICAL INTEGRITY (Anvari 2018). Those constraints impose logical restrictions on the two disjuncts w.r.t. each other and/or the context. Yet, Gazdar (1979) noticed that some HDs involving two related scalar items (scalar HDs) appear to be felicitous. This *obviation* of HC is exemplified in (2), with scalemates *or* and *and*. As pointed out by Singh (2008) however, such scalar HDs are subject to an asymmetry. A scalar HD in which the weaker item precedes the stronger one – such as (2) above, or (3a) below – is felicitous, but a

[1]Many thanks to Danny Fox, Benjamin Spector and Martin Hackl for their comments and advice on that project; thanks also to all the people who attended the poster session at ESSLLI 33, and the presentation of this paper at Sinn und Bedeutung 27 for their insightful questions and comments. Thanks finally to Ido Benbaji, Omri Doron, Giovanni Roversi, Jad Wehbe, and all the other attendees of the Fall 2022 Workshop in Linguistics at MIT for the nice and challenging discussions around that topic. All mistakes are mine.

scalar HD in which the stronger item precedes the weaker one – such as (3b) – is not. We call HDs such as (3a) weak-to-strong, and HDs such as (3b), strong-to-weak.

(2) Jude ate an apricot **or** a banana, or (else) an apricot **and** a banana.

(3) a. Eleanor ate **some** or **all** of the cookies.
b. # Eleanor ate **all** or **some** of the cookies.

The various competing principles modeling HC in the basic case cannot account for this asymmetry, because they remain insensitive to the order of presentation of the disjuncts. Besides, given that the asymmetry seems restricted to disjunctions involving scalar items, it must result from an interplay between scalar implicatures and a specific implementation of HC. In the rest of this paper, we will go over the theories behind scalar implicatures (the grammatical approach in particular), then summarize previous attempts to solve Singh's asymmetry. This will set the stage for our own account and lead us to introduce critical datapoints that will be used to test its empirical adequacy. We will then propose our own take on the issue, which is based on the independently motivated idea of alternative pruning. We will show that our account can explain a variety of (in)felicity patterns attested in more complex instances of scalar HDs, as well as in other kinds of "contrastive" environments. We will conclude by briefly discussing the interaction between our theory and earlier approaches to alternative pruning.

2. Background

2.1. Scalar implicatures in Hurford Disjunctions

Let us first take a step back to review the core theories behind scalar terms and the inferences that seem to be specifically derived from them. Scalar implicatures (SI) are inferences that enrich the literal meaning of a given scalar item with the negation of more informative, relevant alternative(s). The exact nature of SIs has been subject to debate. The so-called Neo-Gricean framework (Horn 1972; Horn 1989; Fauconnier 1975a; Fauconnier 1975b; Gazdar 1979; Levinson 1983; Sauerland 2004 a.o.) posits that scalar implicatures result from pragmatic (Gricean) reasoning, i.e. occur after syntactic processing, at the level of the whole sentence. The grammatical approach to scalar implicatures (Chierchia 2006; Fox and Hackl 2006; Fox 2007; Spector et al. 2008; Chierchia et al. 2012, a.o.) on the other hand, assumes that scalar inferences are entailments which result from the action of a covert operator EXH (for EXHaustification), which is merged at the syntactic level and whose semantics is akin to that of *only* (Rooth 1992; Krifka 1993). More specifically, EXH is a function that takes two arguments: a proposition p (the *prejacent*) and a set of alternatives to that proposition $\mathscr{A}_p$.[2] EXH then returns the conjunction of the prejacent and the grand negation of logically non-weaker alternatives which are Innocently Excludable (IE, Fox 2007). Innocent Excludability is a condition which guarantees that the alternatives that are being negated (1) do not together contradict the prejacent, i.e. are Consistently Excludable (CE)[3] and (2) are selected in a non-arbitrary

[2]It has been traditionally assumed that alternatives where defined using lexically encoded *scales* ordered by entailment (Horn 1972; Gazdar 1979). Focus (Rooth 1992), or the question-under-discussion (Groenendijk and Stokhof 1984) were also argued to be responsible for the generation of alternatives. More recent approaches (Fox and Katzir 2011, building on Katzir 2007) propose a syntactic procedure to compute alternatives, that does not rely on scales.

[3]Cases of contradiction between the prejacent and its SIs happens in so-called *symmetric* configurations (first pointed out by Kroch 1972, and extensively discussed in Fox and Katzir 2011) where the disjunction of a subset

way.[4] Definitions of EXH, IE alternatives, and CE alternatives are given in (4) below. This relatively complex definition will however coincide with the following definition in (5) in many of the examples we will study throughout this paper.

(4) **Exhaustification with Innocent Exclusion**

a. $\text{EXH}(p, \mathscr{A}_p) = p \wedge \bigwedge\{\neg q \mid q \in \mathscr{A}_p \wedge \neg(p \Rightarrow q) \wedge q \in IE(p, \mathscr{A}_p)\}$

b. $\text{IE}(p, \mathscr{A}_p) = \cap\{S \mid CE(S, p, \mathscr{A}_p) \wedge \neg \exists S' \supset S.\ CE(S', p, \mathscr{A}_p)\}$

c. $\text{CE}(S, p, \mathscr{A}_p) \iff S \subseteq \mathscr{A}_p \wedge \bigwedge\{\neg q \mid q \in S\} \wedge p \nvdash \bot$

(5) **Basic Exhaustification**

$\text{EXH}(p, \mathscr{A}_p) = p \wedge \bigwedge\{\neg q \mid q \in \mathscr{A}_p \wedge \neg(p \Rightarrow q)\}$

Under that view, an occurrence of *some* ($\exists$) as in *Eleanor ate some of the cookies* will be strengthened with the negation of *all* ($\forall$), to yield a *some but not all*-meaning ($\exists \wedge \neg\forall$). Likewise, an occurrence of *or* ($\vee$) as in *Jude ate an apricot or a banana*, will be strengthened with the negation of *and* ($\wedge$), to yield an *exclusive or*-meaning. The key difference between the Neo-Gricean approaches and the grammatical approaches is that the latter, unlike the former, allow for "embedded" SIs, i.e. implicatures targeting a particular subconstituent of the sentence. If inferences that may *seem* local can sometimes be accounted for using carefully defined Neo-Gricean reasoning and alternatives (see e.g. Sauerland 2004), it does not seem to be the case with Gazdar-style Hurford Disjunctions such as (2) or (3a), which *require* embedded exhaustification (targeting the weaker disjunct) in order to be rescued from a violation of HC and to get the right intuitive meaning. This is schematized below.

(2) Jude ate an apricot **or** a banana, or (else) an apricot **and** a banana.
$\text{EXH}(A \vee B, \{A, B, A \wedge B\}) \vee (A \wedge B) = (A \vee B \wedge \neg(A \wedge B)) \vee (A \wedge B)$ HC ✓
$\rightsquigarrow$ Jude ate an apricot **or** a banana but **not both**, or else **both**.

(3) a. Eleanor ate **some** or **all** of the cookies.
$\text{EXH}(\exists, \{\exists, \forall\}) \vee \forall = (\exists \wedge \neg\forall) \vee \forall$ HC ✓
$\rightsquigarrow$ Eleanor ate **some but not all** of the cookies, or **all** of them.

Assuming that HC is real, these datapoints strongly suggest that the grammatical view of scalar implicatures is the best theory to tackle HDs. Yet, without further assumptions, this view predicts that EXH should be equally active in either of the disjuncts. In other words, both weak-to-strong and strong-to-weak HDs should be rescued from a violation of HC, and the contrast between (3a) and (3b) remains to be accounted for. This calls for further constraints on HC, EXH, or the arguments EXH operates on.

of non-weaker alternatives is equivalent to the prejacent – for instance, if the prejacent is $A \vee B$ and its alternatives contain both A and B.

[4] Arbitrariness is also somewhat related to symmetry: given a symmetric set of alternatives to a prejacent, a way to preserve consistency and break the symmetry would be to negate some but not all of these alternatives. For instance, if A and B are alternatives to $A \vee B$, one could either infer $\neg B$ or $\neg A$, without inconsistency. But the choice of which alternative to negate would be arbitrary. The notion of Innocent Exclusion allows to prevent such dilemmas: A and B may be *Consistently Excludable* given $A \vee B$, but crucially are not *Innocently Excludable*.

	Embedded SIs?	Weak-to-strong HD (3a)	Strong-to-weak HD (3b)
Neo-Gricean framework	No	HC ✗	HC ✗
Grammatical approach	Yes	HC ✓	HC ✓

Table 1: A summary of the predictions of the two approaches to SIs regarding basic scalar HDs

2.2. Previous accounts of the asymmetry

Three accounts have been put forward in the past literature to explain the asymmetries in scalar HDs. In this section, we provide a brief summary of those approaches, explain how they solve the main asymmetry, and point out some of their limits. This will allow us to introduce some critical datapoints that we will later use to evaluate the accuracy of our own account.

2.2.1. Singh's solution

The first solution, adopted by Singh (2008), was to impose additional constraints on the process checking the satisfaction of HC (let us call this process HC-checking for short). More specifically, Singh argued that HC-checking should apply incrementally at each point of application of the $\vee$ (*or*) operator, and should verify whether the *necessarily unenriched* right-hand-side disjunct, along with the *potentially enriched* left-hand-side disjunct, do not violate HC. This captures the basic contrast in (3), in the following way. In (3a), the two arguments passed to HC-checking are $\text{Exh}(\exists, \mathscr{A}_\exists) = \exists \wedge \neg\forall$ (enriched left-hand-side) and $\forall$ (unenriched right-hand side). Since $\exists \wedge \neg\forall$ and $\forall$ are mutually exclusive, HC is verified. In (3b) on the other hand, the arguments passed to HC-checking are $\forall$ (left-hand side) and $\exists$ (necessarily unenriched right-hand side). Since $\forall \Rightarrow \exists$, HC is violated. Under that line of analysis, the asymmetry between weak-to-strong and strong-to-weak HDs resides in a timing difference in the application of HC-checking *vs* Exh, which seems realistic from a language processing perspective. Singh's theory is also appealing due to its relative simplicity. This account however, is not very explanatory, and runs into problems when a basic HD gets embedded within universal operators,[5] as shown in (6) below (inspired by an example from Fox and Spector 2018).

(6) a. Robert must take **some** or **all** of the medicines.
$\rightsquigarrow$ Robert **must** take **some** of the medicines, and he **may or may not** take **all**.

b. Robert must take **all** or **some** of the medicines.
$\rightsquigarrow$ Robert **must** take **some** of the medicines, and he **may or may not** take **all**.

When both disjuncts of a scalar HD are embedded under a necessity modal, such as *must*, both the weak-to-strong and the strong-to-weak orders seem felicitous, meaning, HC gets *obviated*. This is unexpected under Singh's account, since by default the incremental HC-checking process is not sensitive to the global environment surrounding the disjuncts. Two other cases of apparent obviation of HC that Singh is unable to account for (and that are also discussed by Fox and Spector 2018) involve embedded exhaustification: the case of so-called Distant Entailing Disjuncts (DED), and that of universally-quantified disjuncts. The former, exemplified in (7), is characterized by disjoined scalar items (here, *some* and *all*) that are made "distant" on their scale by a salient alternative (here, *most*).

[5] A crucial point seems to be that the matrix universal operator is itself subject to exhaustification. We will come back to the precise mechanics of Exh in those examples later in the paper.

(7) *Context: if Lucy does **most** of the homework, she will pass the class.*
  a. Lucy did **some** or **all** of the homework.
     ⇝ Lucy did **some but not most** or **all** of the homework.
  b. Lucy did **all** or **some** of the homework.
     ⇝ Lucy did **all** or **some but not most** of the homework.

The felicity of (7b) is unexpected under Singh's view, because the two arguments passed to HC-checking in that case would be predicted to be the same as in (3b), namely $\forall$ (left-hand side) and $\exists$ (necessarily unenriched right-hand side). Likewise, Singh is unable to predict an obviation of HC when the two disjuncts are universally quantified, as in (8).

(8) *Context: John has been assigned a homework involving two Problems. The speaker is unsure of the conditions under which John will pass this assignment.*
  a. John **must** solve Problem 1 **or** Problem 2, or he **must** solve **both**.
     ⇝ John must solve either problem, without the need to solve any specific one.
  b. John **must** solve Problem 1 **and** Problem 2, or he **must** solve **either**.
     ⇝ John must solve either problem, without the need to solve any specific one.

More specifically, Singh predicts (8a) to be felicitous, because the exhaustified left-hand-side disjunct, $\text{Exh}(\Box(p_1 \vee p_2)) = \Box(p_1 \vee p_2) \wedge \neg\Box p_1 \wedge \neg\Box p_2$, is contradictory with the right-hand-side disjunct $\Box(p_1 \wedge p_2)$. But (8b) is incorrectly predicted to be infelicitous, because $\Box(p_1 \wedge p_2)$ (left-hand-side) and $\Box(p_1 \vee p_2)$ (unenriched right-hand-side), remain entailing. The attested contrast between (7b) and (3b), and the *absence* of such contrasts in (7) and (8), strongly suggest that the solution to the puzzle of scalar HDs does not solely reside in a refinement of HC as Singh originally suggested, but rather, in a more targeted restriction placed either on EXH or on its arguments ($\mathscr{A}_p$ in particular).

2.2.2. Fox and Spector's solution

The second solution, explored by Fox and Spector (2018) (henceforth FS18), and elaborating on Chierchia et al. (2012), was to impose additional constraints on the operator EXH. To this aim, FS18 posit the existence of an ECONOMY principle restricting EXH-insertion, based on the idea that EXH should *not* be inserted at a given point of a logical expression if it ends up being Incrementally Weakening (henceforth IW).

(9) **ECONOMY constraint based on Incremental Weakening (IW)**

$$\text{Exh applied to } p \text{ is IW in context } \Delta \iff \forall\Gamma.\ (\Delta\ p\ \Gamma) \Rightarrow (\Delta\ \text{Exh}(p, \mathscr{A}_p)\ \Gamma)$$
$$\iff \Delta\ ({}^{*}\text{Exh})(p, \mathscr{A}_p)$$

This constraint states that if applying EXH to a prejacent p, given a left-hand side context Δ, yields a globally weaker or equivalent meaning *for any right-hand side context* Γ, then EXH should not be inserted in the first place. The notion of logical context is clarified in (10) below.

(10) **Logical Contexts**[6]
Given a potentially partial expression U associated to a Logical Form LF_U, and an

expression E corresponding to the interpretation of a subtree of LF_U, we define the context C of E as the function which, applied to E, yields U, and applied to any other element x, yields the interpretation of LF_U where E has been substituted for x.

$$C = \lambda x.\ [\![LF_U[x/E]]\!](x)$$

Where [x/E] designates the syntactic substitution of E by x. C is a left-hand side context (resp. right-hand context) of E given LF_U iff the subtree of LF_U corresponding to E is linearized last (resp. first).

The constraint in (9) can account for the contrast between (3a) and (3b). In (3a), EXH applied to the first disjunct is not IW, because given an arbitrary continuation Γ, $\text{EXH}(\exists, \mathscr{A}_\exists)\ \Gamma = (\exists \wedge \neg\forall)\ \Gamma \not\Leftarrow \exists\ \Gamma$. EXH can thus be inserted within the first disjunct, making the resulting expression HC-compliant. In (3b), EXH applied within the second disjunct is IW, because $\forall \vee \text{EXH}(\exists, \mathscr{A}_\exists) = \forall \vee (\exists \wedge \neg\forall) = \forall \vee \exists$.[7] EXH therefore cannot be inserted and the structure remains HC-violating.

FS18's theory is very powerful and can account for more complex cases of HDs such as embedding under an exhaustified universal (cf. (6)), or Distant Entailing Disjuncts (cf. (7)). It also captures other apparent specificities of EXH, such as its general unavailibity in Downward Entailing environments. But this is achieved at the cost of positing a quite complex ECONOMY principle governing EXH-insertion. As FS18 already acknowledge, this principle requires to perform some abstract comparison on *all possible continuations* of the disjunction, with and without EXH, to eventually decide if EXH is weakening – or not.[8] We will also see in the next section that FS18 might not make the right prediction regarding "Close Bottom-Tier" disjuncts.

2.2.3. Tomioka's solution

Tomioka (2021) proposed a third way to tackle Singh's asymmetry, by devising a constraint on the structure of the alternative set of a *contrasted* expression. This account is based on the novel observation, attributed to Giorgio Magri, that a specific implementation of HC might be active in contrastive environments in general, which include disjunctions, but also conjunctive *but*-statements, as exemplified in (11), and dialogues expressing disagreement, as exemplified in (12). Both examples are taken from Tomioka (2021). From now on, focus-marked elements will be signaled using the $_F$ subscript.

(11) a. Adam$_F$ did **some**$_F$ of the homework, but Bill$_F$ did **all**$_F$ of it.
 b. # Adam$_F$ did **all**$_F$ of the homework but Bill$_F$ did **some**$_F$ of it.

(12) a. A: **Some**$_{(F)}$ of Professor Smith's students are smart.
 B: I disagree! **All**$_F$ of them are smart.

[6] We hope that this definition is true to FS18. We will appeal to it again when presenting our own approach.
[7] Note that these equalities still hold if we consider any continuation Γ to the disjunction.
[8] A less costly heuristic to achieve a comparable result may be the following, as FS18 mention. Instead of using an arbitrary continuation Γ to compare the informativity of the (un)exhaustified sentences, the listener may just (1) wait for the specific continuation to be uttered by the speaker, (2) judge if this continuation makes EXH IW, and if so, (3) re-compute the meaning of the whole sentence without EXH. If this process appears less abstract, it still implies that the semantic evaluation of a sentence is not a one-pass process.

b. A: **All**$_{(F)}$ of Professor Smith's students are smart.
B: I disagree! #**Some**$_F$ of them are smart.

But-statements crucially differ from HDs in that their conjuncts are generally *not* entailing in the first place, i.e. before the application of any EXH operator. This implies that *but*-statements cannot be HC-violating in the standard sense. Additionally, cases of cross-sentential disagreement such as (12) appear problematic for FS18. This is because the apparent absence of exhaustification in (12b) cannot be directly attributed to the ECONOMY principle in (9), which is based on the idea that information builds up incrementally. These observations motivate an reanalysis of HC in terms of contrastive focus, *via* the constraint in (13).

(13) **The Contrast Antecedent Condition (CAC)**
For any phrase α and α' s.t. α is dominated by α', when α is contrastively focused, there must be β which precedes α and is dominated by β' which generates $\mathscr{A}_{\beta'}$ s.t.:
(i) it is a subset of the focus semantic value of β';[9]
(ii) its members are mutually exclusive;
(iii) it includes both the ordinary value of β' and that of α'.

The CAC appeals to the notion of *focus semantic value*, as well as that of *ordinary value*, as first defined by Rooth (1992) and later by (Katzir 2007; Fox and Katzir 2011).

(14) **Focus semantics**
The *ordinary value* ($[\![.]\!]_o$) of an element refers to its regular semantics, while *the focus semantic value* ($[\![.]\!]_f$) is defined as the set of propositions identical to the ordinary value, except that the focused element is substituted for a salient alternative of the same type, and at most as complex.

Here is how the CAC accounts for the basic contrast in (3). In (3a), applying EXH to $\exists$ in the first disjunct allows to define $\mathscr{A}_{\text{EXH}(\exists,\mathscr{A}_\exists)}$ as $\{\exists \wedge \neg\forall, \forall, \neg\exists\}$ (where $\neg\exists$ is lexicalized as *none*). This set only contains at-most-as-complex, mutually exclusive alternatives to EXH($\exists$, $\mathscr{A}_\exists$), satisfying (i-ii), and also includes the ordinary value of both disjuncts ($\exists \wedge \neg\forall$ and $\forall$), satisfying (iii). In (3b) on the other hand, finding a CAC-compliant set of alternatives for $\forall$ is impossible, since this putative set should contain $\forall$ (ordinary value of the first disjunct), but also either $\exists$ (ordinary value of the unenriched second disjunct) or $\exists \wedge \neg\forall$ (ordinary value of the enriched second disjunct). The first option would violate (ii), and the second one would violate (i), since $\exists \wedge \neg\forall$ is strictly more complex than $\forall$.[10] This reasoning, which crucially relies on the interaction between the CAC and EXH-insertion to derive the relevant asymmetry, is summarized below.

[9]The final version of the CAC extends the notion of focus semantic value to that of actual or *potential* focus semantic value, to cover cases in which the relevant contrast antecedent is not focused (cf. (12)). The potential focus semantic value of an expression is the focus semantic value it would have had if focus had been put elsewhere.
[10]Note that computing EXH($\forall$, $\mathscr{A}_\forall$) does not help if complexity is understood in logical/semantic terms, since EXH($\forall$, $\mathscr{A}_\forall$) = $\forall$. But if complexity is seen as purely structural, then adding a vacuous EXH could introduce more complex alternatives in $\mathscr{A}_{\text{EXH}(\forall,\mathscr{A}_\forall)}$ (such as $\exists \wedge \neg\forall$) as opposed to $\mathscr{A}_\forall$. The additional "filter" that is needed to account for (15) happens to solve this issue.

(3) a. Eleanor ate **some**$_F$ or **all**$_F$ of the cookies.
$\mathscr{A}_{\text{EXH}(\exists,\mathscr{A}_\exists)} = \{\exists \wedge \neg\forall, \forall, \neg\exists\}$ (i) ✓ (ii) ✓ (iii) ✓

b. # Eleanor ate **all**$_F$ or **some**$_F$ of the cookies.
$\mathscr{A}_\forall = \mathscr{A}_{\text{EXH}(\forall,\mathscr{A}_\forall)} = \{\forall, \exists, \neg\exists\}$ (i) ✓ (ii) ✗ (iii) ✓
or $\mathscr{A}_\forall = \mathscr{A}_{\text{EXH}(\forall,\mathscr{A}_\forall)} = \{\forall, \exists \wedge \neg\forall, \neg\exists\}$ (i) ✗ (ii) ✓ (iii) ✓

This approach, which capitalizes on the relationship between focused expressions (and hence not necessarily full sentences), offers a unified treatment of all sorts of "contrastive" statements, in which the propositions at stake are not in an entailment relation *per se* (case of *but*-statements), or not combined in a purely logical way (cross-sentential disagreement). Tomioka's CAC, contrary to FS18's ECONOMY principle, also correctly predicts the *presence* of an asymmetry when two "close"-entailing (as opposed to distant-entailing) scalar items, none of them being at the top of the scale, are disjoined. We call such disjuncts Close Bottom-Tier Disjuncts (CBTD). This is illustrated in (15) below, along with schematic proofs for Incremental Weakening and candidate alternative sets for the CAC.

(15) a. Julia did **some**$_F$ or **most**$_F$ of the homework.
IW: $(\exists \wedge \neg\forall) \vee \text{EXH}(M) = (\exists \wedge \neg\forall) \vee (M \wedge \neg\forall) \not\Leftarrow (\exists \wedge \neg\forall) \vee M$ HC✓
⇝ Julia did **some but not most** or **most but not all** of the homework.
CAC: $\mathscr{A}_{\text{EXH}(\exists,\mathscr{A}_\exists)} = \{\exists \wedge \neg M, M, \neg\exists\}$ (i) ✓ (ii) ✓ (iii) ✓
⇝ Julia did **some but not most** or **most** of the homework.

b. Julia did **most**$_F$ or **some**$_F$ of the homework.
IW: $(M \wedge \neg\forall) \vee \text{EXH}(\exists, \mathscr{A}_\exists) = (M \wedge \neg\forall) \vee (\exists \wedge \neg M) \not\Leftarrow (M \wedge \neg\forall) \vee \exists$ HC✓
⇝ Julia did **most but not all** or **some but not most** of the homework.
CAC: $\mathscr{A}_{\text{EXH}(M,\mathscr{A}_M)} = \{M \wedge \neg\forall, \forall, \neg\exists\}$[11] (i) ✓ (ii) ✓ (iii) ✗
⇝ # Julia did **most but not all** or **some** $^?$**(but not most/all)** of the homework.

In brief, Tomioka's account can achieve good empirical adequacy, but again, at the cost of positing very strong (and somewhat unusual) structural constraints on the set of alternatives generated by the first scalar item. Mutual exclusivity (13-(ii)) in particular, can be seen as an emulation of HC in the realm of alternatives. Like FS18's account, Tomioka's approach ends up being relatively costly from a cognitive point of view, as alternative sets to both the non-exhaustified contrast antecedent, and its exhaustified counterpart may have to be computed to check CAC-compliance (itself being a complex process). Moreover, if the CAC did better than FS18 regarding the contrast in (15), it cannot readily account for cases of *obviation* by DEDs (judgments somewhat debated), or within universally quantified contexts (cf. (6)).

[11] Note however that the prediction of the CAC in (15) does not come totally for free; as Tomioka mentions, it requires an additional "filtering" principle imposing that the alternatives negated by exhaustification (e.g. $\forall$ in $\exists \wedge \neg\forall$) constitute the only additional alternatives to the exhaustified expression itself (so, $\forall \in \mathscr{A}_{\text{EXH}(\exists,\{\exists,\forall\})}$, but $M \wedge \neg\forall \notin \mathscr{A}_{\text{EXH}(\exists,\{\exists,\forall\})}$). This prevents $\mathscr{A}_{\text{EXH}(M,\mathscr{A}_M)}$ in (15b) from generating the CAC-compliant set $\{M \wedge \neg\forall, \exists \wedge \neg M, \forall, \neg\exists\}$. This principle however, may be problematic w.r.t. the specific *inferences* derived in (15a). Indeed, it forces $\mathscr{A}_{\text{EXH}(\exists,\mathscr{A}_\exists)}$ to contain *most*, instead of *most but not all*, which in turn suggests (*contra* FS18's prediction, that we think is correct) that the second disjunct (*Julia did most of the homework*) should not be exhaustified to mean *Julia did most but not all of the homework*.

	Basic (3)	DED (7)	CBTD (15)	∀-quantified disjuncts	∀-quantified disjunction (6)	Other contrastive (11-12)
Singh (2008)	✓	✗	✓	✗	✗	✗
Fox and Spector (2018)	✓	✓	✗	✓	✓	✗
Tomioka (2021)	✓	✗	✓	✓	✗	✓

Table 2: Empirical accuracy of the predictions of three approaches to scalar HDs

The rest of this paper is structured as follows. In section 3, we propose an alternative account of Singh's asymmetry, dubbed Dynamic Alternative Pruning (DAP), which exploits some aspects of both FS18's and Tomioka's approaches. We demonstrate that DAP accounts for (3). In section 4, we show that DAP also predicts an *obviation* of HC in specific environments, and the *presence* of a superficially HC-like pattern in contrastive (but non-disjunctive) environments. In section 5, we conclude by pointing out some differences between our account and previous approaches to alternative pruning, suggesting that the two views could be seen as complementary.

3. Capturing Singh's asymmetry *via* Dynamic Alternative Pruning

3.1. Motivation and assumptions

We propose a new way of deriving asymmetries in scalar HDs, based on the independently motivated notion of alternative pruning (Fox and Katzir 2011; Katzir 2014; Crnič et al. 2015; Denić 2023). More specifically, we propose that the set of alternatives to a prejacent somehow depends on previously and overtly raised alternatives – which is why we call the kind of alternative pruning at work in HDs *dynamic*. Instead of formulating the asymmetry as a problem of EXH-insertion as FS18 do, our account is closer to Tomioka's in that it assumes the asymmetry somehow originates in the structure of alternatives. Like FS18's account and unlike Tomioka's, our account retains a standard implementation of HC, and assumes that the contrasts observed in *but*-statement or cross-sentential disagreement examples are due to an interaction between DAP and the particular semantics of *but* or sentential operators such as *I disagree*.

3.2. Dynamic alternative pruning (DAP)

The key difference between our account and the previous accounts is that we assume $\mathscr{A}_p$ is sensitive to specific, previously uttered elements, i.e. it is determined dynamically. More concretely, let us consider a proposition R containing a focused scalar item. We define the set of alternatives to R as follows:

(16) **Dynamic Alternative Pruning (DAP)**

a. $\mathscr{A}_R = \begin{cases} [\![R]\!]_f \setminus [\![L]\!]_o & \text{if } \exists L \in C(R).\ \textsc{Contrast}(L,R) \\ [\![R]\!]_f & \text{otherwise} \end{cases}$

b. $\textsc{Contrast}(L,R) \iff [\![L]\!]_o \in [\![R]\!]_f \wedge [\![R]\!]_o \neq [\![L]\!]_o$[12]

c. $L \in C(R) \iff \exists \Delta, \Gamma.\ \Delta[L] \bowtie \Gamma[R]$

Where Δ and Γ are logical contexts, and $\bowtie$ is an arbitrary "contrastive" connector (*or*, *but*, *while*, *I disagree*...).

DAP imposes that whenever an expression R is contrasted with another expression L, the ordinary value of L should be pruned from the set of focus alternatives to R. Following Tomioka, we will call L the contrast antecedent of R. Using $[\![R]\!]_f$ as the default set of alternatives to R is probably an idealization; but it is worth noting that our account does not fundamentally prevent other "filters" from applying to this set, to *in fine* yield a smaller set of *relevant* alternatives. In what follows, we will use shorthands such as $\exists$ and $\forall$ to denote L and R, but one should keep in mind that we will be referring to entire disjuncts, unless otherwise stated. A last thing to mention is perhaps the presence of the contexts Δ and Γ in the above definition. If disjunctive statements generally feature null contexts (so that the whole disjuncts are contrasted, and subject to pruning), *but*-statements like (11a) and (11b) exhibit predicate-level parallelism (*do* all_F/$some_F$ *the homework*) which requires us to restrict the domain of pruning to relevant subconstituents of the individual conjuncts. This ensures that *do* all_F *of the homework* (and not the whole conjunct *Adam did* all_F *of the homework*) is pruned from the alternatives of *do* $some_F$ *of the homework* (and not from those of *Bill did* $some_F$ *of it*) when exhaustifying the second conjunct of (11b).

Let us now briefly explain how DAP allows to capture the simplest case of scalar HD, namely (3). In (3a), EXH applied to the first disjunct ($L = \exists$) operates on the default set of alternatives ($\mathscr{A}_L$=$\mathscr{A}_\exists$=$\{\exists,\forall\}$) because L has no contrast antecedent. Exhaustification thus yields the meaning $\exists \wedge \neg\forall$. This makes the two disjuncts of (3a) mutually exclusive and the structure is successfully rescued from HC-violation. In (3b), EXH applied to the second disjunct R operates on the reduced set of alternatives $\mathscr{A}_R$=$\{\exists,\forall\} \setminus \{\forall\} = \{\exists\}$, because R has $L = \forall$ as a contrast antecedent. Exhaustification of the second disjunct becomes idle, and the structure remains HC-violating. This result is schematized below, and can be easily generalized to other simple scalar HDs, such as $(p \vee q) \vee (p \wedge q)$ (cf. (17)).

(3) a. Eleanor ate **some**$_F$ or **all**$_F$ of the cookies.
$\text{Exh}(\exists, \mathscr{A}_\exists) \vee \forall = \text{Exh}(\exists, \{\exists,\forall\}) \vee \forall = (\exists \wedge \neg\forall) \vee \forall$ HC ✓

b. # Eleanor ate **all**$_F$ or **some**$_F$ of the cookies.
$\forall \vee \text{Exh}(\exists, \mathscr{A}_\exists) = \forall \vee \text{Exh}(\exists, \{\exists,\forall\} \setminus \{\forall\}) \vee \forall = \exists \vee \forall$ HC ✗

(17) a. Jude ate an apricot **or**$_F$ a banana, or **both**$_F$.
$\text{Exh}(A \vee B, \{A \vee B, A \wedge B, A, B\}) \vee (A \wedge B) = (A \vee B \wedge \neg(A \wedge B)) \vee (A \wedge B)$ HC ✓

b. # Jude ate an apricot **and**$_F$ a banana, or **either**$_F$.
$(A \wedge B) \vee \text{Exh}(A \vee B, \{A \vee B, A \wedge B, A, B\} \setminus \{A \wedge B\}) = (A \wedge B) \vee (A \vee B)$ HC ✗

3.3. Rationale behind DAP

This section attempts to spell out the conceptual motivation behind DAP. The starting point is that EXH, whether it is seen as the syntactic implementation of Grice's maxims, or just a

[12] This condition is inspired by Rooth's definition of contrast (Rooth 1992) except that instead of stating $[\![R]\!]_o \in [\![L]\!]_f$ as suggested in the original paper, we impose the opposite condition $[\![L]\!]_o \in [\![R]\!]_f$. This does not fundamentally change the nature and implications of the definition, if both L and R contain the same "parallel" focused elements. Indeed, both conditions state that the ordinary value of one of the two elements is the same as the ordinary value of the other modulo its focused elements. But as pointed out by Tomioka (2021), cases of cross-sentential disagreement can involve an unfocused contrast antecedent L. This never happens in the other direction. Because of this asymmetry, $[\![L]\!]_f$ may sometimes be less rich than $[\![R]\!]_f$ even though L and R clearly contrast; and that is why we prefer to state that the ordinary value of L is identical to that of R modulo the focused elements of R.

covert counterpart of *only*, involves reasoning about alternative propositions that the speaker *could have used but did not*. What could be legitimate reasons for the speaker's not using a specific alternative proposition? It could be either because (1) this proposition is not believed to be true by the speaker, (2) it is judged to be too costly to produce, or (3) it is deemed too precise w.r.t. the current question-under-discussion. In Gricean terms, (1), (2) and (3) roughly correspond to, respectively, the maxims of QUALITY, MANNER, and RELEVANCE (Grice 1975, 1989). Usually, whenever options (2) and (3) can be reasonably ruled out, the listener ends up believing that the alternative under consideration verifies condition (1), i.e., it is not believed to be true.[13] This is what eventually leads the listener to draw scalar implicatures. But if the candidate alternative has already been overtly entertained within a contrastive statement, there is one additional and obvious reason why the speaker would not use it again; namely, that an expression cannot contrast with itself. In (3b) for instance, a speaker entertains the possibility that *Eleanor ate* all_F *of the cookies*, and then entertains the weaker possibility that *she ate* $some_F$ *of them*. A listener encountering this disjunctive statement may want to enrich the meaning of *some* within the second disjunct, by reasoning about the plausibility of the alternative utterance *Eleanor* all_F *of the cookies or Eleanor ate* all_F *of the cookies*. This whole disjunctive statement happens to be highly redundant and in fact *non-contrastive*. It then seems intuitive to exclude the *all*-alternative from the set of relevant alternatives to *some*, *in that kind of contrastive context*. This leads us to claim that if EXH is active locally (at the level of the individual disjunct in (3b)), the *relevant* alternatives it operates on depend on a larger context. More specifically, we argue that in order to be *relevant*, an alternative should be *utterable in context*, which within a contrastive environment implies that the alternative should contrast with its antecedent.

(18) **Relevance as Utterability (in contrastive environments)**[14]
A relevant alternative A to an expression E within a contrastive environment C is s.t. $C[A]$ (C where E is substituted for A) is utterable, i.e. satisfies any contrast requirement that E satisfies, which means in particular: $\exists \Delta, \Gamma, L, R.\ C[A] = \Delta[L] \bowtie \Gamma[R] \wedge \textsc{Contrast}(L,R)$

Since non-relevant alternatives should be pruned from the set of alternatives passed to EXH, the above principle can be seen as the conceptual motivation behind DAP. Also note that an expression of the form $\Delta[q] \bowtie \Gamma[p_F]$ with $p \not\Leftrightarrow q$ and either $p \Rightarrow q$, $q \Rightarrow p$, or $p \overset{ctxt}{\Longleftrightarrow} q$, will not be automatically considered as non-contrastive; in fact, it will be considered contrastive as soon as $[\![q]\!]_o \in [\![p]\!]_f$. As a result, uttering *Eleanor ate* all_F *or* $some_F$ *of the cookies* should not lead to the pruning of an alternative such as *most* when exhaustifying *some* within the second disjunct, even if *most* contextually entails *all*. A correlate of this definition is that only the overtly (and previously) mentioned alternative to a given scalar item within a contrastive statement can be pruned, which is exactly what DAP achieves. In the next section, we show how our account captures a variety of more complex scalar HDs discussed in the past literature.

[13]One additional assumption, namely, *opinionatedness*, is in principle required to conclude that the alternative is believed to be *false* by the speaker. This is not a central point in the current discussion, but this distinction is discussed more in depth in e.g. Sauerland (2004).

[14]Note that, if we implemented this constraint specifically for contrastive environments, this does not mean that a generalized form of this condition is not at work in other constructions. In particular, we might be tempted to say that alternatives leading to a *redundant* utterance should be disregarded.

4. Accounting for more complex scalar HDs

4.1. Obviation of HC caused by a "Distant Entailing Disjunct" (DEDs)

As previously discussed, Singh's asymmetry vanishes when the scalar items present in the weak and strong disjuncts are separated on their scale by a salient alternative. This is illustrated in (7), repeated below.

(7) *Context: if Lucy does **most** of the homework, she will pass the class.*

a. Lucy did **some**$_F$ or **all**$_F$ of the homework.
$\rightsquigarrow$ Lucy did **some but not most** or **all** of the homework.

b. Lucy did **all**$_F$ or **some**$_F$ of the homework.
$\rightsquigarrow$ Lucy did **all** or **some but not most** of the homework.

In (7a), the weaker existential item occurs in the first disjunct *L*, which does not have any contrast antecedent. We thus have $\mathscr{A}_L = [\![L]\!]_f = \{\exists, \text{M}, \forall\}$, since *most* (M), has been made particularly salient by the context. *L* is therefore subject to standard exhaustification ($\text{E}\text{XH}(L, \mathscr{A}_L) = \exists \wedge \neg M$). This makes the two disjuncts mutually exclusive and in turn, HC-compliant. In (7b) on the other hand, the weaker existential occurs within the second disjunct, *R*, which has a clear contrast antecedent, $L = \forall$. As a result, we have $\mathscr{A}_R = \{\exists, \text{M}, \forall\} \setminus \{\forall\} = \{\exists, \text{M}\}$, and thus, $\text{E}\text{XH}(R, \mathscr{A}_R) = \exists \wedge \neg \text{M} \Rightarrow \exists \wedge \neg \forall$. This makes the disjuncts mutually exclusive, and therefore, HC-compliant, as expected. Note however that it is crucial to only prune the *literal* contrast antecedent of *some* (*all*), and not any additional item entailed by *all* (*most* in particular).

4.2. Presence of an asymmetry with Close Bottom-Tier disjuncts

Recall that CBTDs such as those in (15), repeated below, are disjuncts that are adjacent in their scale, but both dominated by a stronger alternative.

(15) *Context: someone is wondering how much of the homework Julia did. It is common ground that if Julia did most (but not all) of the homework, she will probably get a satisfactory grade.*[15]

a. Julia did **some**$_F$ or **most**$_F$ of the homework.
$\rightsquigarrow$ Julia did **some but not most** or **most but not all** of the homework. (IW/DAP)
$\rightsquigarrow$ Julia did **some but not most** or **most** of the homework. (CAC)

b. Julia did **most**$_F$ or **some**$_F$ of the homework.
$\rightsquigarrow$ Julia did **most but not all** or **some but not most** of the homework. (IW)
$\rightsquigarrow$ #Julia did **most but not all** or **some** $^?$**(but not most/all)** of the homework. (CAC)
$\rightsquigarrow$ #Julia did **most but not all** or **some but not all** of the homework. (DAP)

In that setting, both our account and FS18 correctly predict (15a) to be felicitous, and derive the same standardly exhaustified meaning. In our case, this is because pruning *some* from the alternatives to *most* while exhaustifiying the second disjunct does not affect the only alternative that is not weaker than *most*, i.e. *all*. CAC on the other hand, predicts felicity, but a different, less exhaustified meaning, that we do not think is the right one in that context. In the case of

[15] In this context, *most* is still salient but does not constitute the threshold for completion, because we want *all* to remain a relevant (i.e. informative) alternative.

(15b), our account aligns with the CAC to (correctly we think) predict infelicity. Our account however, may make more clear-cut predictions than the CAC about the infelicitous *reading* of (15b). Indeed, under the CAC it is a bit unclear whether the second disjunct *needs* to be exhaustified, because either way the structure would be CAC-violating. Under DAP, EXH applied to the second disjunct operates on a set of alternatives $\mathscr{A}_\exists = \{\exists, M, \forall\} \setminus \{M\} = \{\exists, \forall\}$. As a result, the exhaustified meaning EXH($\exists$,$\mathscr{A}_\exists$) is slightly weaker than usually predicted given the context: *some but not all* ($\exists \wedge \neg\forall$) instead of *some but not most* ($\exists \wedge \neg M$). Since the exhaustified first disjunct ($M \wedge \neg\forall$) and the exhaustified second disjunct ($\exists \wedge \neg\forall$) remain in an entailment relation, DAP predicts (15b) to be infelicitous. Under FS18's approach on the other hand, EXH operates on the standard set of alternatives within the second disjunct, leading to a global meaning $(M \wedge \neg\forall) \vee (\exists \wedge \neg M)$ which is stronger than its counterpart without right-disjunct exhaustification $(M \wedge \neg\forall) \vee \exists$. Since $(M \wedge \neg\forall)$ and $(\exists \wedge \neg M)$ are non-entailing, FS18 wrongly predict (15b) to be felicitous.[16]

4.3. Obviation of HC caused by universal operators

4.3.1. Embedded universals

As previously discussed, Hurford Disjuncts embedded under a universal operator (cf. (8), repeated below) do not exhibit the asymmetry characteristic of scalar HDs.

(8) *Context: John has been assigned a homework involving two Problems. The speaker is unsure of the conditions under which John will pass this assignment.*

a. John **must**$_F$ solve Problem 1 **or**$_F$ Problem 2, or he **must**$_F$ solve **both**$_F$.
$\Box(p_1 \vee p_2) \vee \Box(p_1 \wedge p_2)$
⇝ John must solve either problem, without the need to solve any specific one.

b. John **must**$_F$ solve Problem 1 **and**$_F$ Problem 2, or he **must**$_F$ solve **either**$_F$.
$\Box(p_1 \wedge p_2) \vee \Box(p_1 \vee p_2)$
⇝ John must solve either problem, without the need to solve any specific one.

Let us spell out how DAP predicts an obviation of the asymmetry in that configuration. In (8a), the first disjunct $L = \Box(p_1 \vee p_2)$ is being enriched by computing EXH$(\Box(p_1 \vee p_2), \mathscr{A}_{\Box(p_1 \vee p_2)})$.[17] We have $\mathscr{A}_{\Box(p_1 \vee p_2)} = \{\Box p_1, \Box p_2, \Box(p_1 \wedge p_2)\}$. L is enriched with $\neg\Box p_1 \wedge \neg\Box p_2 \wedge \neg\Box(p_1 \wedge p_2) = \neg\Box p_1 \wedge \neg\Box p_2$, which breaks the entailment between the disjuncts, and

[16]The exact judgment regarding (15b) might be hard to access. We are however tempted to claim that (15b) is as bad as the baseline (3b). It is interesting to note however, that a slight modification of DAP could emulate the prediction FS18 make for (15b). Indeed, we might assume that, instead of pruning the "bare" contrast antecedent of a given scalar item from the set of its alternatives, DAP should prune the *exhaustified* counterpart of this contrast antecedent. This way, EXH(M) = $M \wedge \neg\forall$ (and not simply M), would be tentatively pruned from $\mathscr{A}_\exists$ in (15b). But since $M \wedge \neg\forall$ is more complex than $\exists$, pruning it would not affect $\mathscr{A}_\exists$, and EXH($\exists$,$\mathscr{A}_\exists$) would yield $\exists \wedge \neg M$, just like FS18 would predict. This change in the definition of DAP is yet non-trivial to justify, as the exhaustified component of the contrast antecedent is not itself spelled out. Assuming that our conceptual justification for DAP is on the right track, we would have to modify the *Relevance as Utterability* principle by making it sensitive to the *exhaustified* context of a putative alternative – which is not straightforward.

[17]One could ask why EXH should not be inserted lower in the structure, meaning, below the necessity modal $\Box$ and above the disjunction operator – leading to $\Box((p_1 \wedge \neg p_2) \vee (p_2 \wedge \neg p_1))$. The fundamental reply to this concern remains unclear, as FS18 acknowledge. It is however true that the inferences triggered by a "high" EXH seem more accurate when the structure is considered in isolation, as noted by Chierchia et al. (2012).

renders the structure HC-compliant. In (8b), we have $\mathscr{A}_R = \{\Box p_1, \Box p_2, \Box(p_1 \wedge p_2)\} \setminus \{\Box(p_1 \wedge p_2)\} = \{\Box p_1, \Box p_2\}$, since $L = \Box(p_1 \wedge p_2)$ constitutes a contrast antecedent to R. Yet, alternative pruning does not affect exhaustification in that case, since the alternative to R that has been pruned, $\Box(p_1 \wedge p_2)$ is stronger than the two other alternatives $\Box p_1$ and $\Box p_2$ (in other words, its negation is entailed by the conjoined negations of the two other alternatives). As a result, exhaustification proceeds just like in (8a), and leads to the enrichment $\neg\Box p_1 \wedge \neg\Box p_2$, contradictory with L, as desired.

4.3.2. Matrix universals

The case of scalar HDs embedded under a universal operator (cf. (6) repeated below) is probably the most challenging for the various accounts of Singh's asymmetry; and it is one datapoint that DAP cannot straightforwardly account for.

(6) a. Robert must take **some**$_F$ or **all**$_F$ of the medicines.
$\text{Exh}(\Box(\text{Exh}(\exists) \vee \forall))$
$\rightsquigarrow$ Robert must take **some** of the medicines, and he **may or may not** take **all**.

b. Robert must take **all**$_F$ or **some**$_F$ of the medicines.
$\text{Exh}(\Box(\forall \vee \text{Exh}(\exists)))$
$\rightsquigarrow$ Robert must take **some** of the medicines, and he **may or may not** take **all**.

The problem is very simple: DAP is by default not sensitive to the context outscoping the exhaustified item and its contrast antecedent. As a result, pruning is predicted to occur in (6b) just as in the baseline (3b), and no obviation of HC can be predicted. DAP shares this kind on insensitivity to the surrounding context with Singh's and Tomioka's accounts. Let us nevertheless propose a tentative solution to this issue, within our particular framework, supplemented by two additional assumptions. The first one, that we dub *just-in-time DAP*, posits that the precise set of relevant alternatives to an expression is derived *via* DAP from the context that is active at the exact time a particular occurrence of Exh is computed. The second assumption is that Hurford's Constraint is itself somewhat context-sensitive. We implement this property by adapting the Non-Redundancy account of HDs developed by Marty and Romoli (2022):

(19) **Hurford's Constraint as Non-Redundancy**
A sentence S cannot be used if there is a sentence S' s.t. S' is a simplification of S, and S' (along with its potential SIs) is contextually equivalent to S (along with its potential SIs). S' is a simplification of S if it can be derived from S *via* successive replacements of a constituent by one of its subconstituents.

This definition, crucially, does not directly appeal to disjunctions; instead, it considers sentences (which may strictly contain an HD) and potential simplifications thereof. Let us first compute the SIs of (6a) and (6b) assuming just-in-time DAP.

(20) a. $\mathscr{A}_{\Box(\text{Exh}(\exists)\vee\forall)} = \mathscr{A}_{\Box(\forall\vee\text{Exh}(\exists))} = \{\Box(\text{Exh}(\exists) \vee \forall), \Box\exists, \Box\forall, \Box(\text{Exh}(\exists))\}$

b. (6a) $= \text{Exh}(\Box(\text{Exh}(\exists) \vee \forall), \mathscr{A}_{\Box(\text{Exh}(\exists)\vee\forall)})$
$= \Box(\text{Exh}(\exists) \vee \forall) \wedge \neg\Box\forall \wedge \neg\Box(\text{Exh}(\exists))$
$= \Box(\text{Exh}(\exists, \{\exists, \forall\}) \vee \forall) \wedge \neg\Box\forall \wedge \neg\Box(\text{Exh}(\exists, \{\exists, \forall\}))$

$= \Box(\exists \land \neg\forall \lor \forall) \land \neg\Box\forall \land \neg\Box(\exists \land \neg\forall)$
$= \Box\exists \land \neg\Box\forall \land \Diamond\forall$

c. (6b) $= \text{Exh}(\Box(\forall \lor \text{Exh}(\exists)), \mathscr{A}_{\Box(\text{Exh}(\exists)\lor\forall)})$
$= \Box(\forall \lor \text{Exh}(\exists)) \land \neg\Box\forall \land \neg\Box(\text{Exh}(\exists))$
$= \Box(\forall \lor \text{Exh}(\exists, \{\exists\})) \land \neg\Box\forall \land \neg\Box(\text{Exh}(\exists, \{\exists, \forall\}))$
$= \Box(\forall \lor \exists) \land \neg\Box\forall \land \neg\Box(\exists \land \neg\forall)$
$= \Box\exists \land \neg\Box\forall \land \Diamond\forall$

Following our assumption that alternatives are subject to DAP just when the relevant occurrence of EXH is resolved, we compute two potentially different set of alternatives for the two occurrences of the embedded EXH operator of (6a), obtained after resolving the matrix EXH. In that particular case, the two sets of alternatives are identical because no pruning occurs within the literal expression. In the case of (6b) however, the alternatives to $\exists$ computed for the literal utterance ($\Box(\forall \lor \text{Exh}(\exists))$) and for one of its SIs ($\neg\Box(\text{Exh}(\exists))$) end up being different. This is because DAP prunes the $\forall$-alternative to $\exists$ in the main utterance ($\exists$ having the contrast antecedent $\forall$), but not in its SI. Having a fully exhaustified $\exists$ within this SI will be crucial to rescue (6b) from a violation of HC. We then see that just-in-time DAP allows to derive the same exhaustified meaning for (6a) and (6b), thanks to the fact that the effect DAP has on the literal expression does not extend to the exhaustified SIs resulting from the resolution of the matrix EXH. Crucially, there is no simplification of (6a) or (6b) that can derive the very same SIs:[18]

(21)
a. $\text{Exh}(\Box(\text{Exh}(\exists)))$ $\rightsquigarrow \Box(\exists \land \neg\forall) \land \ldots$ $\not\Leftrightarrow$ (6a) or (6b)
b. $\text{Exh}(\Box(\forall))$ $\rightsquigarrow \Box\forall \land \ldots$ $\not\Leftrightarrow$ (6a) or (6b)
c. $\text{Exh}(\Box(\exists))$ $\rightsquigarrow \Box\exists \land \neg\Box\forall$ $\not\Leftrightarrow$ (6a) or (6b)

Therefore, neither (6a) nor (6b), when exhaustified *via* just-in-time DAP, violates the NON-REDUNDANCY implementation of HC.

4.4. Non-disjunctive environments

Because our account builds on structural considerations and in particular the notion of contrastive focus, it should extend to contrastive but non-disjunctive environments, such as those mentioned by Tomioka (2021). But if our account derives asymmetries in how contrastive statements get exhaustified, it does not make any direct prediction regarding the felicity of those statements. To fill this gap, we choose to retain a standard version of Hurford's Constraint in the domain of disjunctive statements,[19] and to supplement our definition of contrast with the condition in (22).

(22) **Contrasting expressions**
Statement making use of binary connectives like *but*, *while*, *whereas*, *I disagree* etc. contrasting two expressions *L* and *R*, should verify the following two conditions:

[18] Simplifications lacking a matrix EXH are not listed, because they clearly lack the relevant inferences.
[19] The NON-REDUNDANCY version being slightly preferable in order to account for HDs embedded under a universal, cf. Section 4.3.2.

(i) there exists a focus assignment pattern mapping L to $\tilde{L}$, s.t. each focused element of $\tilde{L}$ can be paired with a focused element in R;[20]

(ii) there is a subset of the pairs of contrasted element from $\tilde{L}$ and R $\{(\tilde{l}_1, r_1), (\tilde{l}_k, r_k) \dots\}$, s.t. mapping each pair to the same arbitrary value makes the two expressions contradictory, i.e. $\tilde{L}[x_1/\tilde{l}_1] \dots [x_k/\tilde{l}_k] \wedge R[x_1/r_1] \dots [x_k/r_k] \vdash \bot$.

This constraint roughly says that L and R should be contradictory, disregarding some pairs of contrasted elements. For instance, (23a) below satisfies (22) because substituting both $Adam_F$ and $Bill_F$ for, say, *Charlie*, makes the two conjuncts contradictory, given that *some* is exhaustified as *some but not all*. In a sense, (22) could be seen as "HC modulo focused elements". Yet, a motivation for a separate treatment of disjunctive *vs* contrastive statements regarding their felicity conditions comes from the contrasts between *or* and *but* in (23b-25b).

(23) a. Adam_F did **some**$_F$ of the homework, {or, but} Bill_F did **all**$_F$ of it.
 b. Adam_F did **all**$_F$ of the homework {or, #but} Bill_F did **some**$_F$ of it.

(24) a. Adam did **some**$_F$ of the homework_F, {or, but} he did **all**$_F$ of the readings_F.
 b. Adam did **all**$_F$ of the homework_F {or, #but} he did **some**$_F$ of the readings_F.[21]

(25) a. Adam_F did **some**$_F$ of the homework_F, {or, but} Bill_F did **all**$_F$ of the readings_F.
 b. Adam_F did **all**$_F$ of the homework_F {or, #but} Bill_F did **some**$_F$ of the readings_F.

Suppose that there were a general constraint encompassing both disjunctive and contrastive statement, either akin to HC, or to the contrast condition spelled out in (22). If the general constraint had the form of HC, it should target chunks of variable size (verb phrase, quantifier phrase, single quantifier...) in the *but* cases, and chunks of a fixed size (entire disjuncts) in the *or* case – potentially due to a difference in focus marking between the two kinds of structure. If the general constraint had the form of (22), it would again call for a difference in focus marking in *or*- *vs but*-cases. Yet, we do not think that disjunctive and contrastive statements exhibit fundamental differences in focus. Therefore a general constraint seems hard to justify, at least within the paradigms we explored. Let us now see how a combination of HC and the constraint in (22) can account for (23), the generalization to (24) and (25) being quite straightforward. The *or* cases in (23) are trivial: in none of the sentences are the two disjuncts entailing, so HC predicts *or* to be felicitous across the board. As for the *but* cases, we have already seen why (23a) complies with (22). Regarding (23b), we see that substituting $Adam_F$ and $Bill_F$ for *Charlie* does not help in making the two conjuncts contradictory because *all* will always entail *some* (which was vacuously exhaustified due to DAP). (23b) with *but* thus remains infelicitous.

5. Conclusion

We developed an account of the asymmetric felicity pattern of scalar HDs by proposing a new one-pass method to compute formal alternatives, Dynamic Alternative Pruning (DAP). DAP

[20] The need for a focus-modified version of L in the above definition is due to the existence of contrastive statements where only R (and not L) gets the relevant focus marking.

[21] The contrast between *or* and *but* may seem subtler in that sentence, in particular, the variant with *but* may not sound too infelicitous. Yet, we think that the contrast with (24a) remains. The relative weakness of the *or vs but* contrast in (24b) might be due to the availability of a "concessive" reading of *but* ($\sim$*but still*), caused by the two contrasted sentences having the same subject.

builds on the idea that alternative expressions which happen to be infelicitous in the context of the utterance should not be considered as *relevant*, and therefore should be discarded. This suggests that even if EXH can operate locally, the set of relevant alternatives it operates on is actually sensitive to more global features of the sentence. In that sense, and as a play on words on (Magri 2009), alternatives are both *blind to the context* (understand: common ground) and *not blind to the context* (understand: surrounding LF). This view may also supplement previous approaches to alternative pruning that were primarily based on some measure of informativeness (Chemla and Romoli 2015; Denić 2023). According to Denić (2023) for instance, alternatives that are made very probable *given* the current utterance should be seen as less informative, and therefore less attractive. But entertaining a $\forall$-alternative within the first disjunct of an HD should not in principle increase the probability of this alternative given the second disjunct (e.g. $\exists$). In other words, under informativeness-based accounts of pruning, mentioning a $\forall$-alternative in the first disjunct should not *reduce* the attractiveness of a $\forall$-alternative in the second disjunct. In that sense, DAP contributes some structural conditions to earlier accounts of alternative pruning. Beside the conceptual contribution of DAP, we saw that this account can capture most of the contrasts (or absence thereof) mentioned in Fox and Spector (2018), but also extends to the kind of contrastive environment mentioned in (Tomioka 2021), modulo one additional constraint. Further evidence, potentially experimental, would be welcome to assess the empirical adequacy of DAP in complex cases.

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