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The distribution of controlled exhaustivity*

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Abstract While predicates in taxonomies (e.g. colour terms) are interpreted as mutually incompatible, this paper shows that their incompatibility is in many cases not lexical. Rather, it is the result of a previously undescribed exhaustivity effect. What is more, this class of exhaustivity effects displays novel behaviour. Exhaustivity is both obligatory and tightly constrained: at first approximation, any taxonomic predicate must be in the immediate scope of the exhaustivity operator it requires. Taxonomic predicates, in this sense, are argued to 'control' exhaustivity.

Keywords: exhaustivity, predication, additive particles, colour terms

1 Introduction

The grammatical view of exhaustivity, as spelled out by Chierchia, Fox & Spector (2012), posits a syntactically represented Exh(aust) operator, whose domain is a set of propositional alternatives. The domain's membership can be shaped by alternative-triggering expressions in Exh's scope. Notably, such expressions are not assumed to have a grammatical link to Exh. Alternative-triggering expressions do not require the presence of an Exh operator, and if one is present, they do not directly govern where it appears.

The present paper argues that there are cases where a closer relationship exists between Exh and alternative-triggering expressions. Indeed, certain expressions, whose meaning has for the most part not previously been described as involving exhaustification, are obligatorily exhaustified (cf. Magri 2009, Bade 2016), and they dictate Exh's syntactic position: it must take scope immediately above the alternative-triggering expression. The goal of this paper is to identify what the class of expressions that 'control' Exh in this way is, with the intent of empirically expanding on previous work on colour terms (Paillé to appear). A general theory of why or how Exh is sometimes controlled is left for future work.

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Finding instances of controlled Exh poses a methodological dilemma. How would it be possible for the meaning contributed by controlled exhaustivity to be teased apart from the lexical meaning of the controller? After all, controlled Exh is both obligatory and necessarily local to its controller. To find controllers across natural language, this paper proposes to take advantage of controlled Exh's proclivity for creating sentence-internal contradictions. Crucially, additive particles remove the contradiction, in line with Bade's (2016, in progress) argument that additives can generally serve to avoid the presence of Exh. Hence, while a sentence like (1a) is intuited as a contradiction, the contradiction is lifted with an additive particle, as in (1b), showing that the contradiction of (1a) is in fact the result of exhaustivity, rather than the predicates' lexical meaning.

(1) a. #Some comedies are tragedies.

b. Some comedies are also tragedies.

I will propose that we find this pattern (and thus, controlled Exh) with many predicates taken from a single taxonomy, whether it's the set of literary genres (2a), colour terms (2b) (Paillé to appear), or other taxonomies.

(2) a. {comedy, tragedy, epic, . . . }

b. {green, white, red, . . . }

I suggest that the logical quality that makes taxonomies stand apart from much previous work on exhaustivity is that their predicates lack any stronger excludable alternatives, while still having logically independent excludable alternatives. This is in contrast to sets of predicates that form entailment scales like (3), which (as normally assumed) involve a free Exh operator, neither obligatory nor necessarily local.

(3) {warm, hot, boiling} (cf. Horn 1972)

This paper is organized as follows. Section 2 reviews and expands on arguments provided in Paillé to appear showing that colour terms' meaning involves exhaustivity, but that Exh is both obligatory and necessarily local to the colour term. Then, in section 3, I propose to find other instances of controlled Exh by relying on predicates' behaviour with additive particles—as just described. I show that far from being unique to colour terms, controlled Exh abounds in language. Section 4 discusses the generalization that controlled Exh is observed with taxonomies, and section 5 concludes.

2 Controlled Exh: evidence from colour terms

This section offers arguments in favour of taking colour terms' meaning to involve exhaustification. But we'll also see that colour terms in fact have special demands regarding exhaustivity: not only is it obligatory, but it must also obligatorily be local to the colour term.

2.1 Colour terms are lexically partial

The aspect of colour terms' meaning that concerns us is whether they are lexically *total* or *partial*, to borrow terminology from Yoon (1996). In basic sentences like (4), colour terms are interpreted in a total way, i.e. universally quantifying over all parts of the noun they modify.

(4) The flag is green.
≈ the flag is completely/only green

Nonetheless, it has been argued (Levinson 1983, Paillé to appear) that the meaning of colour terms is lexically partial, as in (5); the total interpretation in sentences like (4) comes about from exhaustivity, which will be illustrated momentarily.

(5) $[\![\text{green}]\!] = \lambda x.\ \exists y[y \sqsubseteq x \wedge \text{green}(y)]$

Levinson (1983) first made this argument based on the observation that conjoined colour terms are interpreted partially; they are not contradictions, as would be the case if their lexical meaning was total.

(6) The flag is white and green.
$\not\approx$ the flag is completely/only green

On the other hand, Krifka (1990) suggests (on the assumption that colour terms are lexically total) that such data should be handled with a non-intersective *and*. This brings about the truth conditions in (7) by having one conjunct predicated of one mereological part of the flag, and the other conjunct of the other part of the flag. This is in contrast to Levinson's view that each lexically partial conjunct is predicated of the entire flag.

(7) $\exists x, x'[\text{the.flag} = x \oplus x' \wedge \text{green}(x) \wedge \text{white}(x')]$
(Krifka 1990: 165)

Krifka's proposal is argued to be incorrect in Paillé to appear, where it is claimed that a non-intersective *and* is in fact unavailable with atomic subjects like in (6). I review the arguments here briefly. First, it is possible to add *both* to (6), as in (8a), which is a property of intersective conjunction: contrast (8b) with (8c).

(8) a. The flag is (both) white and green.
b. Juan and Allison are (both) tall and happy.
c. Juan and Allison are (#both) husband and wife.

Further, if a non-intersective *and* was available at all in (6), it should be possible to make the colour terms explicitly total via modifiers like *completely*, contrary to fact:

(9) #The flag is completely white and completely green.

For Krifka (1990), this should be acceptable and paraphrasable as 'the flag has a completely white part and a completely green part.' Since a non-intersective interpretation of *and* is apparently unavailable for (6), the fact that (6) is non-contradictory shows that colour terms are compatible with one another: they are lexically partial, as initially suggested by Levinson (1983).

Another argument for the view that colour terms are lexically partial and totality is the result of exhaustivity comes from the behaviour of colour terms with additive particles. In general, additive particles can serve to thwart unwanted implicatures (Krifka 1998, Sæbø 2004, Bade 2016, in progress). Bade (2016, in progress) specifically argues that when additives are obligatory, it is to avoid an unwanted Exh operator; see her work for an implementation of this idea. Assuming this is correct, the hypothesis that colour terms' totality is the result of exhaustivity leads to the expectation that additive particles should remove it. This is indeed the case:

(10) A: This flag is white.
B: Yes, but it's #(also) green.

Here, the colour terms are used by B as partial. Such data present a steep challenge for the view that colour terms are lexically total. Additive particles strengthen meaning: they add an additive presupposition (Kripke 2009[1990]). If colour terms were lexically total, and there was a lexical contradiction in (10), strengthening the meaning would do nothing to resolve the contradiction.

To generate colours' observed totality, I follow Chierchia et al. (2012) in taking exhaustivity to be calculated by an Exh operator (11), which asserts its prejacent and negates non-entailed alternatives.

(11) $[\![\text{Exh}_{\text{ALT}}\ \text{S}]\!]^{\text{w}} = 1$ iff $[\![\text{S}]\!]^{\text{w}} = 1$ and $\forall \text{S}' \in \text{ALT}\ ([\![\text{S}']\!]^{\text{w}} = 1 \rightarrow \{\text{w}\colon [\![\text{S}]\!]^{\text{w}} = 1\} \subseteq \{\text{w}\colon [\![\text{S}']\!]^{\text{w}} = 1\})$
(adapted from Chierchia et al. 2012: 2304)

I also follow Katzir (2007) and Fox & Katzir (2011) in assuming that alternatives are syntactic objects which are at most as complex as the assertion. This means that colour terms' alternatives are other bare (non-conjoined) colour terms, as shown in (12).

(12) $[\![\text{Exh}_{\text{ALT}}\ [\text{the flag is white}]]\!]^{w}$
= 1 iff the flag is white in w & ¬[the flag is green in w] & ¬[the flag is red in w] & ...

In section 2.3, I will be tweaking the placement of Exh in (12), but for our current purposes (12) is sufficient. Moving forward, I will depart slightly from (11) and (12) in not marking world parametres in this paper, since they do not substantially come into play.

2.2 Exh is obligatory with colour terms

Exhaustivity is standardly portrayed as optional. For example, it is absent from examples like (13), where *some* is not strengthened to mean 'some but not all.'

(13) Mary ate some cookies. In fact, she ate all of them.

(13) does not involve the speaker correcting themselves; the first sentence can be interpreted non-exhaustively, expressing that there are cookies such that Mary ate them. The second sentence goes on to specify that those cookies constitute all the cookies.

In this sense, colour terms are unlike run-of-the-mill exhaustivity. Indeed, the sentences in (14) do not successfully convey that the flag is partly white and partly green. But in light of their lexically partial meaning, this is what would be expected if their exhaustification was optional.

(14) #The flag is white. In fact, it's green.

The second sentence in (14) can only serve as a correction ("no, it's isn't entirely white; it's entirely green"). It can't act as an addition: it does not mean the flag is both white and green. Hence, colour terms join a growing list of data in which exhaustivity is argued to be obligatory (Magri 2009, Bade 2016).

2.3 Exh is always local to colour terms

In addition to being obligatory exhaustified, colour terms require Exh to take scope immediately above them. Indeed, there are many cases where colour terms must be interpreted as total, but an Exh operator that is global or otherwise non-local to the colour term would in fact make their partial lexical meaning visible. In this section, in addition to empirically motivating the lack of non-local Exh, I will suggest specifically that Exh with colour terms is so local as to necessarily be within their AP. Since Exh is defined in (11) as a propositional operator, I assume that the colour term's AP is turned into a proposition through lambda-abstraction of a vacuous

subject (à la Heim & Kratzer 1998: §8.5); for ease of presentation, I will abbreviate LFs like (15) as in (16).

(15) ⟦The flag is [$_{AP}$ PRO λ_1 [$_{AP}$ Exh$_{ALT}$ t_1 white]]⟧
= 1 iff the flag is white & not blue & not red & not …

(16) The flag is [Exh$_{ALT}$ white].

To see this, let's begin with data from the scope of Exh vis-à-vis some other operator. Consider for example a sentence with a universal quantifier.

(17) Every flag is green.
⇒ attested meaning: all flags are completely green

A global Exh creates the following meanings. Here and below, pretend for simplicity that the only colours are green, white, and red.

(18) ⟦Exh$_{ALT}$ [every flag is green]⟧
= 1 iff every flag is green & ¬[every flag is white] & ¬[every flag is red].

But in contrast to the intuition for (17)—that all the flags are *entirely* green—(18) would be compatible with all flags being half green, with some of the flags being half white and the rest being half red, for example. This is unattested. Apparently, something must constrain exhaustivity with colour terms so as to prevent (18).

Another way to see the limits on the scope of Exh is to have it in a downward-entailing (DE) context, such as the antecedent of a conditional. Normally, exhaustivity optionally disappears in DE contexts, depending on whether Exh is above or below the DE operator (or not there at all). For instance, a disjunction in a DE context can be interpreted as either inclusive (19a) or exclusive (19b).

(19) a. If you take salad or dessert, you'll be really full.

b. If you take salad or dessert, you pay $20; but if you take both there is a surcharge.
(Chierchia et al. 2012: 2306)

But this is not the case with colour terms, which are necessarily interpreted as total in DE contexts.[1] As shown in (20), colour terms in antecedents are intuited as total.

1 The only clear exception to this I have found is sentential negation.

(i) This flag is not green.

(i) means that the flag is not even partially green (it is negating the partial lexical meaning), rather than meaning that it is not only green (Exh below negation), or meaning that it has every colour other than green (Exh above negation). Since sentential negation is the exception among DE operators, I leave a proper understanding of this to future work.

(20) does not mean that waving the (partially white) Canadian flag would end the battle, for example. But a global Exh for (20) would create the meaning in (21), where *white* fails to be strengthened to being total.

(20) If the flag is white, the battle ends.
⇒ attested meaning: If the flag is entirely white, the battle ends.

(21) $[\![\text{Exh}_{\text{ALT}}$ [if the flag is white, the battle ends]$]\!]$
= 1 iff if the flag is white, the battle ends &
¬[if the flag is red, the battle ends] &
¬[if the flag is green, the battle ends].

To be sure, the intuited strong meanings of (17) and (20) can be captured by exhaustivity, as long as Exh is located below the operators *every* and *if*. In principle, Exh can take any position that c-commands the colour term and that is below these operators. In (22), Exh is placed very locally to the colour term (in the AP: see (15) and (16)) to show that this is a possible parse, but it's not the only logical possibility at this point.

(22) a. $[\![$Every flag is [Exh_{ALT} green]$]\!]$
= 1 iff every flag is [green & not red & not white].

b. $[\![$If the flag is [Exh_{ALT} white], the battle ends$]\!]$
= 1 iff if the flag is [white & not green & not red], the battle ends.

In addition to looking at Exh's scope vis-à-vis some other operator, Exh's locality requirement can be seen in whether two colour terms are able to be exhaustified together or not. If two colour terms are both in Exh's prejacent, and they modify the same noun, Exh will not strengthen them to be incompatible with one another. After all, Exh is defined in (11) to be contradiction-free as far as its prejacent is concerned: it does not negate alternatives that are entailed by what is asserted in its prejacent. But in fact, having two colour terms modifying the same noun in a sentence, without being joined by a connective, creates a contradiction:

(23) #The white flag is green.
⇒ attested meaning: the entirely white flag is entirely green (contradiction)

If a parse with a global Exh as in (24) was available, it would be non-contradictory: Exh's prejacent in (24) entails that the flag is partly white and that it is partly green. As a result, *white* would not be strengthened to mean 'not green' and *green* would not be strengthened to mean 'not white.' Hence, a global Exh creates the non-contradictory (24a), rather than the contradictory meaning in (24b), which states that

the white flag is not white.[2]

(24) ⟦Exh$_{ALT}$ [the white flag is green]⟧

a. = 1 iff the white flag is green & ¬[the white flag is red].

b. ≠ 1 iff the white flag is green & ¬[the white flag is white] & ¬[the white flag is red].

To generate sentence-internal contradictions, there must be an Exh local to each colour term (or at least one of them), so that they are strengthened irrespective of the other. Instead of (24), we need something along the lines of (25), with Exh local enough to (at least) one colour term to fail to have the other one in its prejacent.

(25) ⟦The [Exh$_{ALT}$ white] flag is [Exh$_{ALT}$ green]⟧
= 1 iff the [white & not green & not red] flag is [green & not white & not red].

This is the only way to make *green* mean 'not white' despite the sentence entailing that the flag is partly white (and/or vice-versa). What is crucial is that the parse with non-local exhaustivity is not available at all: if it was, a non-contradictory parse would be available, so no contradiction would be intuited.

The evidence looked at so far has pushed for the conclusion that Exh must in some sense be 'local' to colours: (24) is ruled out and only (25) is possible, for example. This raises the question of how exactly this locality constraint is to be understood. At first glance, a relative notion of locality seems to be the simplest hypothesis. Relative locality would require colour terms to be in the immediate scope of Exh: no other scope-bearing element may occur between the colour term and Exh. However, colour conjunction show that this is incorrect. As we saw, such conjunctions are non-contradictory; to avoid a contradiction, conjunctions must have a single Exh taking scope over both colour terms at once, as in (26). This shows that an operator (the conjunction) *can* intervene between Exh and a colour term.

(26) The flag is [Exh$_{ALT}$ [green and white]].

Having Exh any lower, as in (27), would create a contradiction. To be clear, there is no need to rule out (27), as long as (26) exists as well, making a non-contradictory parse available.

2 For ease of exposition, (24) only shows the predicative adjective *green* as having alternatives, but presumably *white* does so too; nothing hinges on this. The simplest hypothesis is that both colour terms behave alike. Either way, with an Exh operator that is high enough to have both colour terms in its prejacent, neither will be strengthened to be exclusive of the other.

(27) ⟦The flag is [Exh$_{ALT}$ green] and [Exh$_{ALT}$ white]⟧
= 1 iff the flag is [green & not white & not red] and [white & not green & not red].

Since a relative view of locality is insufficient, we turn to an absolute locality requirement instead. Rather than requiring that no operator intervene between Exh and its colour term, I suggest that the locality requirement is that Exh must be within a projection of the colour term. That is, colour terms need an associated Exh operator in their own AP. (24) and (25) follow automatically, and (26) is predicted to be acceptable on the assumption that the whole conjunction is itself an AP, with the category of the adjectives projecting to the entire phrase.

This predicts that stacking two colour terms as adjuncts on a single noun should create a contradiction, rather than a meaning akin to conjunction. Each colour heads its own maximal projection, so each would have its own Exh. This is indeed the case:

(28) #the white green shirt

Since (28) is a contradiction, it follows—for the same reasons given for the contradiction in (23)—that the colour terms are made total independently of one another, as in (29).

(29) ⟦the [Exh$_{ALT}$ white] [Exh$_{ALT}$ green] shirt⟧
= the [white & not green & not red] [green & not white & not red] shirt

The absolute notion of locality correctly rules out a non-contradictory structure like (30) from being generated, since the colour terms there have no Exh within their projection.

(30) the [Exh$_{ALT}$ white green shirt]

Further, a merely relative requirement on locality would fail to rule out (30): there is no operator in the phrase 'white green shirt' forcing Exh into any particular position.

In sum, since conjunctions like (26) have an intervening operator and DP-internal contradictions like (28) do not, relative locality would rule in (28) while ruling out conjunction. It would fail to create a contradiction where one is observed while creating one where none is observed. Hence, the kind of locality constraint that Exh has vis-à-vis colour terms must be absolute rather than relative.

2.4 Interim conclusion

This section has presented evidence that the lexical meaning of colour terms is partial, based on data from conjunction and additive particles. Hence, the strong

(total) meaning intuited in many sentences must be the result of exhaustivity. But this is exhaustivity of a special sort: it is both obligatory and necessarily computed locally to the expression that requires it. To capture the data discussed, the locality requirement must be defined in absolute terms rather than relative to other operators. I suggested that, specifically, Exh must be inside the colour term's AP. Moving forward, I will refer to this as 'controlled' exhaustivity: colour terms 'control' Exh.

The conclusion that Exh is controlled by colour terms raises the question of what else in language controls Exh in this way. If it was only colour terms, this would cast some doubt on the above discussion, given how ad hoc it would be. And if the above account was accepted nonetheless, it would mean that whatever explanation we give for why Exh is ever controlled in this way would be something specific to colour terms, rather than anything general. In the rest of this paper, I therefore aim to broaden the empirical picture to find controlled Exh with expressions other than colour terms.

3 Beyond colour terms

To find controlled Exh outside of colour terms, we need to tease lexical meaning apart from meaning obtained from an Exh that is both local and obligatory. What I propose is to take advantage of the fact that controlled Exh creates sentence-internal contradictions due to its inability to appear non-locally, but that it still patterns like other instances of Exh in that this contradiction disappears with additive particles. The creation of sentence-internal contradictions and the interaction with additives have been independently discussed for colour terms in section 2, and I will show momentarily that they interact. Hence, to find controlled Exh beyond the domain of colour terms, we want to find sentences which:

i. are internally contradictory in the basic case, but

ii. become acceptable with *also*.

To give an example of what this looks like for colour terms, the relevant type of sentence is in (31).[3]

(31) Some of the blue flags are #(also) grey.

Without *also*, (31) is a contradiction, as already discussed. It can sensibly be responded to with (32) or the like.

3 Of course, (31) requires a scenario explaining why one colour term is attributive but the other predicative. For example, there could be a pile of flags all of which are at least partially blue, but a few of which are also partially grey. See Paillé to appear for discussion.

(32) Sorry, which one is it? Are those flags blue or grey?

But we know the contradiction arises from Exh, due to (31)'s acceptability with *also*. The fact that Exh creates sentence-internal contradictions in these cases means that it is controlled; free Exh, as already discussed, cannot create sentence-internal contradictions.

With this in mind, let us see if we can find sentences that parallel (31) outside the domain of colour terms. As it turns out, they are easy to find. Let's start with (33).

(33) #Some tragedies are comedies.

Much like (31) with colour terms, (33) is intuited as a contradiction, and could be answered by (34), for instance.

(34) Sorry, which one is it? If they're comedies, they're not tragedies!

But the predicates *comedy* and *tragedy* cannot be lexically incompatible with one another, because the contradiction is removed with the help of an additive:

(35) a. Some tragedies are also comedies.

b. A tragicomedy is a tragedy that is #(also) a comedy.

Hence, in spite of what I suspect is a common initial reaction to examples like (33), the contradiction we intuit is in fact derived meaning, rather than being lexically hardwired. What looks like a simple and semantically uninteresting datapoint in fact constitutes a real semantic puzzle. My claim is that the contradiction in (33) comes about from the predicates *tragedy* and *comedy* being exhaustified independently of one another, as in (36)—the alternatives being the set of literary genres. (36) overlooks the exhaustification of *some* to keep things simple.

(36) $[\![$Some [Exh$_{\text{ALT}}$ comedies] are [Exh$_{\text{ALT}}$ tragedies]$]\!]$
$=$ 1 iff some [comedies & not tragedies & not epics] are [tragedies & not comedies & not epics] $\Rightarrow$ contradiction

In other words, these predicates too 'control' Exh.

Of course, predicates like literary genres differ from colour terms in one way: there is no reason to think that the predicates in (35) involve existential quantification over mereological parts of the subject. It's not as if one part of the subject—a play, for example—is a comedy, and the other part a tragedy: the entire play is both, at once. But this difference is orthogonal to my discussion of exhaustivity. The point stands that the genres pattern like colour terms: they are regularly strengthened to being incompatible with one another, and the fact that this occurs even if it yields a

sentence-internal contradiction shows that Exh is both obligatory and constrained to being local.

Here are some more examples that fit the same pattern, to give a sense of the breadth of the phenomenon.

(37) a. A spork is a fork that is #(also) a spoon.

b. Some live-action movies are #(also) animated.

c. i. This car is #(also) a boat.

ii. This train is #(also) a plane.

d. i. Some snowshoes are #(also) skis.

ii. There's a new kind of bicycle that is #(also) a skateboard.

e. A labradoodle is a poodle that is #(also) a labrador.

f. This newly discovered species is a plant that is #(also) an animal.
(intended meaning: one species simultaneously in two kingdoms)

g. Some federal responsibilities are #(also) provincial.

h. Some residential neighbourhoods are #(also) industrial/business neighbourhoods.

i. i. SCENARIO: *Apple starts selling computers with two operating systems.*
Now, some Macs are #(also) PCs.

ii. SCENARIO: *McDonald's and A&W collaborate to make a two-in-one restaurant:*
This McDonald's is #(also) an A&W.

j. He made a sling that is #(also) a bandaid.

k. Futons are couches that are #(also) beds.

l. Cyborgs are humans that are #(also) robots.

In addition to the examples from colour terms (31) and literary genres (35), we now also have examples from utensils (37a), method in filmmaking (37b), mode of transport (37c), outdoors equipment (37d), dog breeds (37e) and biological kingdoms (37f), types of jurisdiction (37g), types of neighbourhood (37h), brand names (37i), medical equipment (37j)—an example taken from social media—, furniture (37k), and actors in a science-fiction scenario (37l). These are all instances of controlled exhaustivity, as evidenced by the fact that they display a sentence-internal contradiction, but one that can be removed by *also*. In conclusion, the phenomenon of controlled Exh is robust and far from specific to colour terms.

4 Exh is controlled by taxonomies

If it is accepted that using *also* to fix sentence-internal contradictions is a proper test for finding controlled exhaustivity, then with these new data in hand, we can set out to characterize the kind of expressions that control Exh.

4.1 Taxonomies vs. other predicates

What we have in (31), (35), and (37) are predicates that are in sets that form taxonomies. I will discuss more what I mean by 'taxonomy' in section 4.2; suffice to say for now that the sets of alternative predicates do not form entailment scales (Horn 1972)—the empirical basis of previous discussions of exhaustivity with predicates. At first approximation, members of taxonomies are logically independent of one another. For instance, given that colour terms are lexically partial, *green* doesn't entail or exclude *white*, and vice-versa. The same goes for the other types of predicates in the above examples. They come from sets of alternatives like the following:

(38) a. COLOURS: {green, white, red, ...}
b. GENRES: {comedy, tragedy, epic, ...}
c. UTENSILS: {fork, spoon, knife, ...}
d. DOG BREEDS: {poodle, labrador, bulldog, ...}
e. FURNITURE: {couch, bed, table, ...}
f. ...

To be clear, I am not proposing that sets like those in (38) are part of grammar or the lexicon. It suffices to say that they are the result of bona fide pragmatics, stemming from a notion of relevance (Geurts 2010).

In addition to the discussion already provided, evidence that sets of alternatives like those in (38) are at play in creating the contradictions in (31), (35), and (37) comes from copular sentences that take predicates from different taxonomies, rather than two predicates from the same taxonomy. These are fully acceptable without requiring *also*, as shown in (39). The examples given here all take predicates from different taxonomies that have already been made use of in previous examples, as cross-referenced on the right-hand side.

(39) a. Some live-action movies are comedies. cf. (35) and (37b)
b. The train is a federal responsibility. cf. (37c) and (37g)
c. This robot is a car. cf. (37c) and (37l)

Unlike single-taxonomy examples, no contradiction arises with these multiple-taxonomy examples. Of course, it is possible to create conceptually nonsensical examples, but they are not *contradictions* as such.[4]

If this much is correct, then we are headed towards an empirical generalization about controlled exhaustivity: it is taxonomic predicates that control Exh. This creates sentence-internal contradictions when two predicates from the same taxonomy are applied to the same referent (but little happens if the predicates come from different taxonomies).

It's suitable at this point to check whether we find controlled Exh anywhere else. Might it be too narrow to claim it only exists with predicates from taxonomies like those in (38)? Without going back over the entire literature on exhaustivity, arguably the likeliest candidates for controllers are other predicates, given that it is with certain sets of predicates that we have come to observe controlled Exh in the first place. It is traditionally assumed in the literature that predicates that form entailment scales like {warm, hot, boiling} (Horn 1972) allow non-local Exh or a lack of exhaustification. And indeed, this is correct: putting such predicates through the same test using *also* invites the conclusion that Exh is not controlled by these predicates: it can be non-local or simply not there at all.

(40) Some of the warm plates are hot.

(40) is acceptable without *also*, meaning that there exists a parse where *warm* has not been locally exhaustified to mean 'warm and not hot.'

4 There are some examples that don't clearly fit the pattern. Some contradictory copular sentences that can be fixed with *also* have predicates that do not immediately appear to come from the same set of alternatives.

(i) This floor wax is #(also) a dessert topping.

I thank Michael Wagner for pointing this out this issue in general, and Jacob Hoover for suggesting this particular example (a modified sentence from a *Saturday Night Live* sketch: https://snltranscripts.jt.org/75/75ishimmer.phtml). But as pointed out in the main text, it is generally not the case, even in conceptually outlandish copular sentences similar to (i), that *also* is necessary when the predicates don't come from a particular taxonomy. Compare (i) with (ii)—sentences that are meant to be conceptually outlandish in order to approximate (i).

(ii) a. This knife is a credit card.

b. This door is a fire alarm device.

c. This comic book is a PhD dissertation.

A possible explanation for (i) would be that the taxonomy is the set of liquids, or maybe even more specifically viscous liquids, i.e. conceivable identities/functions of the substance at hand.

4.2 The alternatives in taxonomies

While the sets of alternatives in (38) are presented as involving entirely logically independent predicates, there is in fact evidence that some entailment relations are possible, as suggested by the term 'taxonomy.' To see this, consider again the domain of colour terms. I built my case based on colours like *red*, *green* or *white*: what Berlin & Kay (1969) call *basic* colour terms, as opposed to non-basic ones like *scarlet*, *blond* or *greenish*. Berlin & Kay (1969) suggest several criteria for distinguishing between basic and non-basic colour terms, but what concerns me here is that basic colour terms are logically independent of one another (there is no logical relation between *red* and *green*), while non-basic ones (usually) entail a basic one. Scarlet, for example, is a type of red.

In deciding how best to characterize the sets of alternatives that control Exh, then, it's important to consider that non-basic colour terms receive a total interpretation, just like basic colours.

(41) This flag is scarlet.

(41) means the flag is entirely scarlet and would be false if it was half white, for example. Hence, *scarlet* must be competing with other basic colour terms like *white*, and not (for example) just other types of red. Indeed, if the only alternatives were other types of red, (41) would be only strengthened to mean that there is no other hue of red on the flag, but would still be compatible with the flag having some other non-red colour.

As a result, the alternatives for colour terms must in fact have some entailment relations between them, even if they still do not form a single entailment scale like in (40).

(42) COLOURS: {green, white, red, scarlet, vermilion, crimson, ...}

Before moving into the consequences this has for this paper's purpose of describing the distribution of controlled exhaustivity, let me show that such a set of alternative colours poses no problem as far as deriving the right exhaustivity inferences is concerned. If you say the flag is scarlet, *scarlet* is not strengthened to mean 'not red' because *scarlet* entails *red*. This follows from the definition of Exh in (11). If you say the flag is *red*, there are two possibilities in regards to what happens. One possibility is that the set of alternatives is now only other basic colour terms (i.e. the previous discussion stands as-is): non-basic colour terms are absent because they represent a finer level of conceptual granularity than what is present in the assertion (cf. Hirshberg 1985). The second possibility is that the non-basic colour terms are still included in the set of alternatives. Even so, no issue arises. Indeed, *red* would never be strengthened to mean 'not scarlet' by Fox's (2007) concept of

innocent exclusion. Innocent exclusion has the effect of Exh only excluding those alternatives that can all be excluded together without this creating a contradiction (a contradiction internal to Exh's prejacent, that is). Hence, under the assumption that the conceptual space associated with basic colour terms like *red* is fully partitioned between different non-basic colour terms, innocent exclusion ensures that no type of red is excluded. That is, *red* cannot be strengthened to mean 'not scarlet,' 'not vermilion,' etc., because this would end up meaning 'red, but no shade of red.'

But it would be inaccurate to describe controlled Exh as occurring generally with sets of alternatives that exhibit no *or only some* entailment relations. After all, this is the make-up of the alternatives for disjunction, too, where each individual disjunct is an alternative and it is possible for the disjuncts not to be ordered by entailment (Sauerland 2004).

(43) $Alt(\text{A or B}) = \{(\text{A or B}), \text{A}, \text{B}, (\text{A and B})\}$

There is no reason to think disjunction controls Exh, and in fact examples like (19a) show that it does not. Of course, one could try to rely on the difference between predicates and propositions to capture how (43) is distinct from taxonomies. But there is another difference that seems more conducive to capturing the distinction (although ultimately what the correct characterization is depends on one's theory of what makes taxonomies control Exh in the first place). Specifically, while the assertion in (43), 'A or B,' has a stronger excludable alternative, namely 'A and B,' taxonomies lack stronger excludable alternatives, as just discussed for *red* and *scarlet*. Innocent exclusion does not prevent 'A or B' from excluding 'A and B,' but it does stop 'red' from excluding 'scarlet.' Hence, taxonomies—unlike (43)—are 'as if' their member predicates were entirely logically independent of one another: stronger predicates aren't excludable.

In summary, we find controlled Exh with predicates from taxonomies, and we do not find it with sets of predicates that form entailment scales. I suggested that taxonomies' lack of *excludable* stronger predicates sets them apart from other sets of alternatives. Looking ahead, an explanation for why Exh is controlled in this way with taxonomies might well make use of this logical characterization of their alternatives.

5 Conclusion

In this paper, I have elaborated on the existence of a new class of exhaustivity effects that shows unique behaviour. I argued that certain expressions 'control' exhaustivity: Exh is both obligatory and necessarily local to the expression that makes it obligatory. I first outlined and expanded on the arguments provided in Paillé to appear on the meaning of colour terms; then, I sought to answer the new question of whether there

is any evidence of such a controlled Exh beyond colour terms. I suggested to find controlled Exh by looking for sentences that are internally contradictory in the basic case, but that become acceptable with *also*. We find precisely this in examples like (44). This demonstrates the existence of controlled Exh because if a parse with a non-local Exh was available, this parse would not generate a contradiction: Exh does not rule out any alternatives that are entailed by its prejacent.

(44) Some federal responsibilities are #(also) provincial.

The conclusion reached is that controlled exhaustivity is very far from existing only with colour terms. Rather, the class of 'controllers' consists generally of sets of predicates that form taxonomies. Such predicates lack stronger excludable alternatives, but they do have logically independent excludable alternatives.

This leaves open a central question, of course, namely why Exh should ever be controlled in this way. I leave this for future research. If the claims in this paper are accepted, what we now have, at least, is a characterization of the empirical situation needing to be explained.

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