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A note on contrast

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Abstract The semantics of association with focus and the pragmatic conditions governing the appropriateness of focus in discourse are usually taken to depend on focus alternatives. According to a common view, these alternatives are generated by a permissive process. This permissive view has been challenged by Michael Wagner, who has noted that certain alternatives are systematically excluded from consideration. Wagner describes a more restrictive view, on which only contrastive alternatives are relevant for association with focus and for the appropriateness of focus in discourse. I use recent work on the role of contradiction to show that the standard, permissive view derives the same results as the contrast-based view for the basic cases. These basic cases involve a contradiction that prevents us from using them to distinguish the two approaches. I show that when this contradiction is eliminated, evidence of non-contrastive alternatives emerges, supporting the permissive standard view over the restrictive contrast-based one.

Keywords Focus alternatives · Contrast · Innocent exclusion · Contradiction · Exhaustivity

1 Background: focus alternatives and contrast

1.1 Association with focus

The semantics and pragmatics of focus are usually taken to depend on focus alternatives—alternatives in which the focused constituents in the utterance are

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replaced with other values. Consider, for example, the following instance of *association with focus*:

(1) John only EATS muffins.

Sentence (1) involves the focus-sensitive operator *only*, and the focus that it associates with is on the verb *eats*. *Only* is an exhaustive operator: it affirms the prejacent and denies some of its focus alternatives.

(2) *Behavior of an exhaustive focus-sensitive operator*: affirms the prejacent and denies various focus alternatives to the prejacent.

In the case of (1), the prejacent is *John eats muffins*. Since the focus is on the verb *eats*, the focus alternatives will be variants of the prejacent in which *eats* is replaced with a different transitive verb. That is, the alternatives will all be of the form *John X muffins*. Thus, (1) entails that (3a) below is false but tells us nothing about the truth of (3b), in which it is the unfocused subject *John* that was replaced (with *Mary*).

(3) a. John bakes muffins.
b. Mary eats muffins.

1.2 Free focus

The conditions in which focus is appropriate in context—the so-called *free* use of focus—are likewise sensitive to alternatives. For example, in the context of (4), it is appropriate to respond with (4a), in which the subject *John* is focused, but it is inappropriate to continue with (4b), in which it is the verb *eats* that is focused.

(4) Mary eats muffins.
a. And JOHN eats muffins.
b. # And John EATS muffins.

The pattern in (4) is usually derived by requiring that the context contain—or support the accommodation of—a focus alternative of the utterance:

(5) *Appropriateness condition on free focus*: Each sentence must have a focus-alternative in the context.

Since *John* is focused in (4a), its focus alternatives are derived by replacing it with other elements, such as *Mary*, so (4) is a focus alternative. In (4b), on the other hand, it is the verb that is focused, and so its focus alternatives are of the form *John X muffins*, and nothing in the context is of this form.[1]

[1] There are additional factors that govern the placement of focus. For example, (i) has focus on the subject *John* (along with the verb *eats*) and consequently has the context-setting sentence *Mary eats muffins* in (4) as an alternative. Nevertheless, (i) is an inappropriate response to (4).

i. # And JOHN EATS muffins.

1.3 The standard picture

On most accounts, the actual focus alternatives that are available for association with focus or for the appropriateness condition depend both on the formal process of replacing focused constituents with allowable replacements and on contextual restriction. The present note concerns itself entirely with the former, specifically with the set of allowable replacements available for a focused constituent.[2]

On what I will refer to as the standard picture, the allowable replacements for a focused constituent are a large and non-discriminative set:

(6) *Permissive alternative generation on the standard picture (SP)*: There are many allowable replacements for focused constituents.

In many implementations of *SP*, notably Jackendoff (1972, pp. 240–247), Rooth (1985, pp. 13–14), and Schwarzschild (1999, pp. 149–152), the allowable replacements in *SP* are defined in terms of semantic type.[3] In (1) above, for example, the focused element was the transitive verb *eats*, of type $<e, et>$, and allowable replacements were other elements of the same semantic type, such as the transitive verb *bakes* in (3a).

1.4 Wagner's puzzle

SP has recently been challenged by Wagner (2005, 2006, 2012), who notes that the permissiveness of the local alternatives in (6) leads to puzzling results with respect both to the semantics of association with focus and to the pragmatics of free focus. Consider the example of association with focus in (7), in which focus falls on the adjective *red*. While all current implementations of *SP* would allow adjectives such as *red*, *blue*, and *expensive* to serve as alternatives to one another, (7) entails that John does not own blue convertibles but says nothing about whether he owns expensive convertibles. That is, (8a) appears to be negated and thus seems to be a well-behaved alternative to the prejacent in (7), while (8b) seems to be ignored.

Footnote 1 continued

Following Schwarzschild (1999), this is usually accounted for in terms of economy: focusing the subject alone, as in (4a), is sufficient, and hence the additional focus placement in (i) is ruled out. See Schwarzschild (1999) for additional constraints of this kind and much relevant discussion. Several proposals have argued for different implementations of the appropriateness condition, economy, and the remaining constraints on the placement of accent. See in particular Sauerland (2005), Wagner (2005), Spathas (2010), and Büring (2012).

[2] While contextual restriction will not help in distinguishing the two hypotheses compared here, it is of course still operative. For example, whether (1) above indeed has the entailment that (3a) is false depends on whether baking is salient in the context. It is easy to imagine a context where we conclude nothing about John's baking muffins from (1) and instead conclude that he does not sell muffins. To simplify the discussion below, all the examples should be understood as being uttered in a context where the alternatives discussed in the text are salient.

[3] The three proposals are quite different otherwise, but for the presentation here it will be convenient to group them together under *SP*. I will also include under *SP* more restrictive notions of allowable replacements, such as the one presented in Fox and Katzir (2011), where it is argued that the definition of allowable replacements should take structure into account. As far as I can tell, such distinctions can be ignored for the purposes of the present discussion.

(7) John only owns RED convertibles.

(8) a. John owns blue convertibles.
b. John owns expensive convertibles.

Similarly, consider the example of free focus in (9). Given the context-setting sentence in (9), (9a) is appropriate while (9b) is not. As noted by Wagner and others (see in particular Spathas 2010), (9a) and (9b) are both meant to deny an expectation that is accommodated with the help of the context-setting (9). In this case, the expectation is that Mary's uncle brought an expensive convertible. Call this expectation η. On *SP*, (9a) and (9b) both have η as an alternative, which means that both should be acceptable according to the appropriateness condition (5). Only the former, however, behaves as expected. This suggests that while *cheap* has *expensive* as an alternative, *red* does not.

(9) Mary's uncle, who is very rich and makes expensive convertibles, came to Mary's wedding. I wonder what he brought as a present.
a. He brought a CHEAP convertible.
b. # He brought a RED convertible.

1.5 Contrasting alternatives

Based on (7) and (9), Wagner proposes a departure from *SP*. Instead of permissive alternatives, he argues for a restrictive view on which true alternatives—that is, the alternatives that end up being relevant for association with focus and for the appropriateness condition—must be *contrastive* in the context of their sister node. Two elements are contrastive, according to Wagner, if they denote distinct cells in a salient partition. In particular, they must be mutually exclusive.[4,5]

(10) *Restrictive alternative generation according to Contrasting Alternatives (CA)*: A node α' is a true alternative to a node α in the context of a sister node β only if it contrasts with α in the context of β; that is, only if $[\![[\alpha' \ \beta]]\!] \Rightarrow \neg [\![[\alpha \ \beta]]\!]$.[6]

[4] Condition (10) states the restriction to mutually exclusive alternatives as part of the generation of alternatives. This choice is compatible with the discussion in much of Wagner's work but is by no means the only possibility. A different approach is suggested in Wagner (2012), where the formulation of the relevant operator for the appropriateness condition ensures the mutual exclusiveness of the alternatives within the operator itself. While possible in certain cases, it is not clear to me how this second option can handle examples like (7) compositionally: checking for contrast between the two potential alternatives and the prejacent is straightforward at the level of the object DP (*blue convertibles* contrasts with *red convertibles*; *expensive convertibles* does not), but no contrast is available at any higher constituent. Since the operator *only* takes a higher constituent as its argument, it would have to check for contrast in a non-compositional manner. For this reason, and since it makes the comparison with (6) simpler, I will keep the present formulation, in which mutual exclusiveness in *CA* is ensured at the level of the generation of alternatives. As far as I can tell, however, this choice does not play a role in the current discussion.

[5] Wagner's contrast-based definition of alternatives is part of a larger system that he proposes to account for a wide variety of facts regarding prosody and structure. Much of Wagner's proposal is independent of the contrast condition: Büring (2012), for example, adopts *CA* but not the rest of Wagner's system, while Spathas (2010) adopts many aspects of Wagner's system but not *CA*. The current note is concerned exclusively with the characterization of the alternatives and the question of contrast.

[6] Where $\Rightarrow$ is cross-categorial implication (for types that end in t): if x and y are of a type τ that ends in t, then $x \Rightarrow y$ iff either (a) $\tau = t$ and $x \rightarrow y$, or (b) $\tau = \sigma_1\sigma_2$ and for all z of type σ_1, $x(z) \Rightarrow y(z)$.

In (7) above, for example, *blue* is a contrasting alternative to *red* in the context of the sister *convertibles* since *blue convertibles* excludes *red convertibles*. According to *CA*, then, *blue* is a true alternative to *red* in this context. On the other hand, *expensive convertibles* does not exclude *red convertibles*, so *expensive* is not considered by *CA* to be a true alternative to *red* in the context of the sister *convertibles*. Consequently, when the operator *only* negates the alternatives to the prejacent, (8a) is negated and (8b) is not. Similar remarks apply to the free focus example in (9).[7]

1.6 Outline

The remainder of this note presents an argument in favor of *SP* and against *CA*. I will use recent work on scalar implicatures—specifically, Fox's (2007a) work on the role of contradiction in exhaustification—to show that it is possible to account for Wagner's puzzle within *SP*. As we will see, negating the alternatives obtained by replacing *red* with *cheap* and with *expensive* leads to inconsistency; consequently, a version of *SP* in which operators like *only* remove contradictory alternatives from consideration can derive the same results as *CA* for the examples above. This leaves us with a theoretical choice: we can restrict the set of alternatives according to *CA*, thus accounting for the puzzle in terms of too few alternatives; or we can maintain the permissive view in *SP* and cast the problem as one of too many alternatives.

I then show that the two approaches make predictions that can be teased apart. If we can modify the cases above in ways that eliminate the contradiction, then *SP*, which accounted for Wagner's puzzle in terms of too many alternatives, predicts that the previously unobserved alternatives will emerge. On the other hand, *CA*, which accounted for the puzzle in terms of too few alternatives, predicts that they will still be unavailable. I will show that the non-contrasting alternatives emerge, as *SP* predicts.

2 Comparing the two approaches

2.1 Association with focus: deriving the basic pattern with *SP*

Consider again (7) above, repeated here:

(11) John only owns RED convertibles.

Footnote 6 continued
Similarly, $\neg$ is cross-categorial negation (again, for types that end in t): if x is of a type τ that ends in t, then $\neg x$, is defined as (a) $1 - x$, if $\tau = t$, or (b) $\lambda f_{\sigma_1} . \neg x(f)$, if $\tau = \sigma_1 \sigma_2$. If ⟦ [α β] ⟧ or ⟦ [α' β] ⟧ are of type e, the condition is checked with respect to the corresponding Montagovian individuals (type $< et, t >$). For example, if ⟦ this boy ⟧=*John*, we will raise it to $\lambda f_{et} . f(John)$ and obtain the mutual exclusiveness of *this boy* and *no boy*.

[7] The assumption that true alternatives must be mutually exclusive raises the question of how to account for scalar alternatives such as *some* and *every* (or *or* and *and*), which are not mutually exclusive and yet serve as alternatives of one another. For the purposes of this note I will assume that *CA* has a way of addressing this matter.

Let us adopt Wagner's assumption that color adjectives, such as *red* and *blue*, induce one partition of convertibles and that price adjectives, such as *cheap* and *expensive*, induce a different partition of convertibles.[8] To simplify the discussion, let us further assume that the set of adjectives is limited to {*red*, *blue*, *cheap*, *expensive*}. This means that, on *SP*, the set of alternatives to which the operator *only* has access are the following:

(12) a. John owns blue convertibles.
b. John owns red convertibles.
c. John owns cheap convertibles.
d. John owns expensive convertibles.

A naive view of the exhaustivity operator *only* maintains that it negates all those alternatives that are not weaker than the prejacent. This, however, leads to contradiction: if John owns red convertibles, then there are convertibles (red ones) that he owns; but each convertible that he owns is either cheap or expensive; it is thus contradictory for him to own red convertibles and to not own cheap convertibles and to not own expensive convertibles. On the naive view, then, (11) should be contradictory, which it clearly is not.

On more careful views of exhaustivity, as embodied in Groenendijk and Stokhof (1984), van Rooij and Schulz (2004), Sauerland (2004b), Sevi (2005), Spector (2007), and Fox (2007a), exhaustification processes prevent contradiction from arising, at least in some cases. In particular, Fox (2007a), in developing an account of scalar implicatures, defines a criterion of *innocent exclusion* to ensure that exhaustivity is indeed contradiction-free. Informally, the version of *only* in (13a) affirms the prejacent and negates as many alternatives of the prejacent as it can while maintaining consistency and without making arbitrary choices.[9,10]

(13) *Exhaustivity and innocent exclusion*:
a. $[\![\text{ only }]\!](p)(A)(w) \Leftrightarrow p(w) \& \forall q \in IE(p, A).\neg q(w)$
b. $IE(p, A) := \bigcap \{B \subseteq A : B \text{ is a maximal set in } A \text{ s.t. } \neg B \cup \{p\} \text{ is consistent } \}$
c. $\neg B := \{\neg p : p \in B\}$

In the current case, given the prejacent (12b) and the alternatives in (12), negating (12c) entails that (12d) is true: if John owns red convertibles and does not own cheap convertibles, then he owns expensive convertibles. Similarly, negating (12d) entails that (12c) is true. The choice between negating (12c) and negating (12d) is thus arbitrary. Consequently, neither alternative is innocently excludable, and neither will be

[8] The assumption that adjectives induce partitions might be an oversimplification: it is not clear, for example, that every convertible has a color, and it is not clear that a single convertible cannot have more than one color. I will accept the assumption here, however, and not pursue it further in this note. I hope that the present argumentation can be extended to more realistic assumptions.

[9] As Gajewski (2009) notes, innocent exclusion does not always avoid contradiction. In the cases discussed here, it does.

[10] The definitions below are simplified in ways that are irrelevant to the present discussion. In particular, (13a) asserts rather than presupposes that the prejacent is true and applies at the sentence level rather than at the VP level.

negated. On the other hand, negating (12a) leads to no arbitrary conclusions: if John owns red convertibles and does not own blue convertibles the truth of the remaining alternatives remains undetermined (we still do not know whether he owns cheap convertibles, and we do not know whether he owns expensive ones). Consequently, (12a) is innocently excludable and will be negated. Equipped with innocent exclusion, then, *SP* derives the correct inferences for (11).

2.2 Association with focus: distinguishing *SP* and *CA*

What allowed *SP* to derive the same predictions as *CA* in (11) is the fact that it is contradictory to own red convertibles and yet not own cheap convertibles and not own expensive convertibles. If we could modify (11) so as to eliminate the contradiction between the prejacent and the negation of the two alternatives with 'cheap convertibles' and 'expensive convertibles', the predictions of the two approaches will diverge. *SP* predicts that those alternatives will now be negatable. *CA*, on the other hand, predicts that the modified version will exhibit the same pattern of negation: since neither *cheap convertible* nor *expensive convertible* excludes *red convertible*, neither will be a true alternative to it.

One way to eliminate the contradiction is to change the verb in the relevant examples. The contradiction allowing *SP* to account for the entailments of (11) depends crucially on inferences that stem from lexical properties of the verb *own*: if one doesn't own a certain kind of convertible, then one doesn't own any instance of that kind of convertible. This property (related to the extensionality of *own*) is not shared by all transitive verbs. The intensional verb *collect*, for example, exhibits a different pattern of entailment (other verbs that pattern with *collect* include *seek*, *wish for*, and *crave*): it is possible to collect red convertibles and yet to not collect cheap convertibles and not collect expensive convertibles. If we replace *own* with *collect* in (11), then, the contradiction will disappear. *SP* predicts that the potential alternatives with *cheap* and with *expensive* will now be negated. *CA*, on the other hand, predicts as before that these will not be true alternatives. The facts support *SP*: (14) entails that John does not collect blue convertibles, that he does not collect cheap convertibles, and that he does not collect expensive convertibles; that is, it entails that (15a), (15c), and (15d) are all false.

(14) John only collects RED convertibles.

(15) a. John collects blue convertibles.
b. John collects red convertibles.
c. John collects cheap convertibles.
d. John collects expensive convertibles.

A different way to make the same point is to keep the original verb and embed it under a universal operator such as *require*. While it is contradictory to own red convertibles and yet not own cheap convertibles and not own expensive convertibles, there is nothing contradictory about being required to own red convertibles (say, in order to be admitted into a club) and yet not being required to own cheap convertibles

and not being required to own expensive convertibles.[11] *SP*, then, predicts that (16) will entail the negation of (17a), of (17c), and of (17d), which it does. As before, *CA* makes the incorrect prediction that only the contrasting (17a) is a true alternative.

(16) John is only required to own RED convertibles.

(17) a. John is required to own blue convertibles.
b. John is required to own red convertibles.
c. John is required to own cheap convertibles.
d. John is required to own expensive convertibles.

At this point it might seem tempting to change the domain of locality at which contrast is determined. While the characterization of *CA* in (10) follows Wagner in checking for contrast at the level of the sister node, the questions of what semantic criterion is applied and where it is applied are distinct, as discussed by Büring (2012). In particular, it is possible in principle to choose bigger domains. For example, even though red convertibles do not contrast with expensive convertibles, one could hope to account for the fact that (14) entails that (15d) is false by making (15b) and (15d) contrast at the level of some constituent that is higher than the object DP. This move, however, will be of little help: collecting red convertibles does not exclude collecting expensive convertibles, nor does John's collecting red convertibles exclude his collecting expensive ones. That is, (15b) and (15d) do not contrast at *any* level. Similar remarks apply to the entailment from (14) that (15c) is false and to the entailment from (16) that (17c) and (17d) are false. The problem with *CA* cannot be addressed by modifying the level at which contrast is checked for: it is the contrast requirement itself that should be removed.

2.3 Free focus

We just saw that innocent exclusion allows *SP* to account for Wagner's puzzle in the case of association with focus. Moreover, we saw that when contradiction is eliminated, the predictions of *SP* and *CA* diverge and those of *SP* are borne out. In the present section I will try to show that a similar argument can be made in the case of free focus.

Consider again (9) above, repeated here:

(18) Mary's uncle, who is very rich and makes expensive convertibles, came to Mary's wedding. I wonder what he brought as a present.
a. He brought a CHEAP convertible.
b. # He brought a RED convertible.

As discussed in Sect. 1.4, *SP* considers the accommodated expectation η = *that Mary's uncle brought an expensive convertible* to be an alternative both of (18a) and of (18b), which makes the contrast between the acceptability of (18a) and the oddness

[11] This reasoning mirrors that in Sauerland (2004a), Fox and Hackl (2006), Fox (2007b), Katzir (2007), and Fox and Katzir (2011).

of (18b) look surprising. For *CA*, on the other hand, η is a contrasting and hence true alternative of (18a) but not of (18b), thus predicting the difference in acceptability.

(18) has no occurrence of the operator *only*, but I would like to suggest that the explanation for the contrast in acceptability between (18a) and (18b) involves exhaustification and innocent exclusion nonetheless.[12] Let us look first at the acceptable (18a). Without exhaustification, this response is irrelevant to the evaluation of η (it is possible to bring two convertibles, a cheap one and an expensive one, at the same time). If (18a) is exhaustified, on the other hand, we obtain the entailment that Mary's uncle did not bring an expensive convertible. This entailment addresses η, which in turn makes it an appropriate response in the given context. Turning now to (18b), we can again see that without exhaustification the utterance is irrelevant to the evaluation of η. In this case, however, adding exhaustification is of little help: both (19c) and (19d) are alternatives, and since negating both contradicts the prejacent (19b) and negating just one will be arbitrary, neither of them is innocently excludable; consequently, neither will be negated. The result of exhaustification, then, is as irrelevant to η as the original (18b).

(19) a. He brought a blue convertible.
b. He brought a red convertible.
c. He brought a cheap convertible.
d. He brought an expensive convertible.

If contradiction and exhaustification are indeed the source of the unacceptability of (18b), we again derive the prediction that eliminating contradiction should allow the non-contrastive alternatives to emerge. And again, *CA* predicts that such alternatives will not be allowed. As before, I will use both the verb *collect*, which does not share the entailments of *bring*, and embedding under the universal operator *require* to test the predictions of the two theories.

(20) The people in this club are very particular about the cars they collect. Mary, for example, collects expensive convertibles.
a. And John collects CHEAP convertibles.
b. And John collects RED convertibles.

(21) Mary was required to bring an expensive convertible.
a. And John is required to bring a CHEAP convertible.
b. And John is required to bring a RED convertible.

(20a) and (20b) are both acceptable responses to (20), and (21a) and (21b) are both acceptable responses to (21). We can conclude that in free focus, too, eliminating

[12] Exhaustification in the absence of an overt occurrence of *only* has been central to a variety of analyses in semantics and pragmatics. In what follows, exhaustification can be thought of as the attachment of a silent version of the operator *only* specified in (13a), as in Fox's (2007a) account of scalar implicatures. A (neo-)Gricean account along the lines of Sauerland (2004b), when modified to use innocent exclusion, offers an alternative view on exhaustification in such cases. The relevance of exhaustification to free focus was pointed out by Rooth (1992), who noted that such cases are similar to scalar implicature. See Spathas (2010) for additional arguments in favor of exhaustification of sentences with free focus.

contradiction allows non-contrastive alternatives to be negated.[13] Again, this is as expected by *SP* but it is surprising under *CA*. Note also that, as in the case of association with focus, the problem is with the contrast requirement itself and not with the height at which it is applied. The expectation η_1 = *that John collects expensive convertibles* is an alternative of (20b) even though the two do not contrast at any level above the focused adjective in (20b), and the expectation η_2 = *that John is required to bring an expensive convertible* is an alternative of (21b) even though the two do not contrast at any level above the focused adjective in (21b).

3 Summary

I have discussed Wagner's puzzle, which seemed to challenge *SP*, the standard picture on focus alternatives, and which has motivated *CA*, a restrictive view on the local source of alternatives. I showed how recent work on the role of contradiction allows *SP* to derive the same results as *CA* for the basic cases. In order to tease apart the predictions of the two approaches, I modified the basic cases so as to eliminate contradiction. *SP* predicts that in such cases non-contrasting alternatives will emerge, while *CA* predicts that they will not. As we saw, eliminating contradiction allowed the relevant non-contrasting alternatives to emerge, supporting *SP*.

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[13] As a reviewer points out, it is quite possible that the expectations relevant for (20) and (21) are not at the sentential level but rather at the VP level (the matrix VP for (21)). I agree, but since this does not seem to change the diverging predictions of *SP* and *CA* I will stay with sentential expectations to keep the presentation simple. A proper account of what the actual expectation is would of course be needed for a full treatment of free focus.

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