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Gricean views of exhaustification: A note on Westera (2022)*

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Abstract As a puzzle for the Gricean view of exhaustification, Fox (2014) describes a game show scenario where the maxim of Quantity is arguably canceled, but the use of a disjunctive sentence still invites an exclusivity inference. Westera (2022) proposes that this puzzle can be solved in an *Attentional Pragmatics*, where the Gricean maxims are supplemented with *Attention-maxims*. In this commentary, we identify a gap in Westera's solution and propose two possible amendments. We point out that under either amendment, the resulting proposal requires a departure from Grice's original view of exhaustification as arising from a clash between the maxims of Quantity and Quality.

Keywords: exhaustification, maxim of Quantity, maxim cancellation, Attentional Pragmatics, disjunction, game show scenario

1 Introduction

Building a theory of exhaustification that expands the empirical coverage of previous proposals, Westera extends Gricean pragmatics into *Attentional Pragmatics* by positing a new family of maxims, complementing maxims of the sort originally posited in Grice (1975). Setting aside Manner, Westera posits *A(ttention)-maxims* (A-Quality, A-Relation, A-Quantity) that parallel familiar Gricean maxims, or their modern incarnations, which Westera refers to as *I(nformation)-maxims* (I-Quality, I-Relation, I-Quantity). While the I-maxims regulate what propositions speakers can or must *assert*, the A-maxims regulate what propositions speakers can or must *draw attention to*. In (1) and (2), we juxtapose Westera's rendition of the I-maxims with the proposed A-maxims, glossing each maxim with Westera's English paraphrase.

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Note that while p in (1) is an asserted proposition, A in (2) is an *attentional intent*, a set of proposition that an utterance draws attention to; and in both (1) and (2), Q is the question under discussion, the set of propositions that count as relevant.[1]

(1) **Westera's I-maxims**

a. I-Quality(p) $\Leftrightarrow$ $\Box$p
'Intend to share only propositions that you take to be true.'

b. I-Relation(p,Q) $\Leftrightarrow$ Q(p)
'Intend to share only propositions that are relevant.'

c. I-Quantity(p,Q) $\Leftrightarrow$ $\forall$q[[I-Quality(q) $\wedge$ I-Relation(q,Q)] $\rightarrow$ p$\subseteq$q]
'Intend to share all relevant propositions that you take to be true.'

(2) **Westera's A-maxims**

a. A-Quality(A) $\Leftrightarrow$ $\forall$q[A(q) $\rightarrow$ $\Diamond$q]
'Intend to draw attention only to propositions that you consider possible.'

b. A-Relation(A,Q) $\Leftrightarrow$ $\forall$q[A(q) $\rightarrow$ Q(q)]
'Intend to draw attention only to relevant propositions.'

c. A-Quantity(A,Q) $\Leftrightarrow$ $\forall$q[[A-Quality({q}) $\wedge$ A-Relation({q},Q)] $\rightarrow$ A(q)]
'Intend to draw attention to all relevant propositions you consider possible.'

In this commentary, we will scrutinize one of Westera's arguments for the adoption of the A-maxims. Westera proposes that the A-maxims open up a new path to understanding of a phenomenon noted in Fox (2014), which we will call *selective exhaustification*. Fox notes that certain exhaustivity inferences can unexpectedly arise in contexts where I-Quantity appears to be suspended, and where other exhaustivity inferences are expectedly absent. Specifically, Fox reports that in a game show scenario where I-Quantity is plausibly canceled, the disjunctive sentence (3) expectedly fails to invite possibility inferences about the individual disjuncts, yet an exclusivity inference is nevertheless intuited.

(3) **Fox's example**
There is money in box 20 or 25.

Such selective exhaustification is unexpected under a classic Gricean view of exhaustification. On this view, all exhaustivity inferences arise from of a conspiracy

1 We provide the definitions and paraphrases in (1) and (2) with inconsequential simplifications to notation and wording. Clause (2a) moreover simplifies Westera's definition of A-Quality, but in a way that still does not affect our arguments. In Westera's formulation, "$\Diamond$q" in (2a) is strengthened to "$\Diamond$(q $\wedge$ $\forall$p[[p$\subset$q $\wedge$ A(p)] $\rightarrow$ $\neg$p])". As Westera notes, this conjunct has no effect in cases where the elements of A are logically independent. Since we will only consider cases of this sort, it is safe for present purposes to omit this conjunct.

of I-Quantity and I-Quality. By removing one of the conspirators, cancellation of I-Quantity should therefore not merely result in the obviation of *some* exhaustivity inferences, but exhaustification should be obviated across the board. Fox's finding that some exhaustivity inferences can nevertheless persist in such a context is unexpected. Westera argues that the A-maxims can fill the gap, supporting the inferences that are observed in selective exhaustification.

We will comment on Westera's solution in three steps. First, we will ask how exactly the adoption of the A-maxims can have the intended effect. We will identify friction between two central assumptions. On the one hand, Westera's account generalizes the Gricean view of exhaustification by assuming that exhaustivity based on the A-maxims arises from a conspiracy of A-Quality and A-Quantity. On the other hand, Westera posits that Fox's scenario cancels not only I-Quantity, but A-Quality as well. But this then begs the question. How does canceling one of the two novel conspirators, A-Quality and A-Quantity, not once again obviate exhaustification across the board, rather than just selectively? Westera's proposal is in danger of simply recreating a version of the undergeneration challenge that it is intended to solve.

Second, we will consider two alternative avenues to a solution. One solution revises the content of A-Quantity: a cross-reference to A-Quality posited by Westera is replaced with a duplicate of the condition that A-Quality is taken to impose in default contexts. The other solution revisits the effect of so-called maxim cancellation as it applies to A-Quality: "canceling" A-Quality can amount to a mere weakening of the demands that this maxim imposes, as opposed to lifting those demands completely.[2]

Third, we will draw attention to a shared consequence of the two solutions. Both solutions entail a necessary departure from Grice's original conception of the role of I-Quantity in exhaustification. Grice suggests that exhaustification involves the *violation* of I-Quantity. This violation is taken to resolve a "clash" between I-Quantity and I-Quality, and exhaustivity inferences arise as an explanation for why the speaker opted to resolve the clash in the way they did. We will argue that, in contrast, under either of the two proposed amendments to Westera's approach to selective exhaustification, it becomes necessary to derive exhaustivity inferences under the assumption that I-Quantity is *satisfied*.

2 While we hope that our findings will inform the debate about the proper analysis of selective exhaustification, we will focus exclusively on Westera's proposal, without discussing alternative analyses. Fox's (2014) own account of selective exhaustification, which Westera critiques, credits the exclusivity inference to a covert exhaustivity operator in the object language. We will not try to evaluate further how Westera's analysis fares in comparison to Fox's. We will likewise not discuss other works that have proposed alternative accounts of Fox's observation (e.g. Meyer 2013, Marty et al. 2022).

Our paper is structured as follows. To set the stage, Section 2 reviews Westera's proposal on how the A-maxims support an account of selective exhaustification. Sections 3–5 then take the three steps previewed above. Section 3 shows that Westera's approach does not actually derive selective exhaustification without further assumptions; Section 4 outlines two possible amendments; and Section 5 argues that under either amendment, the resulting account is incompatible with Grice's original view of exhaustification. Section 6 concludes.

2 The attentional path to selective exhaustification

This section reports in more detail on Westera's account of selective exhaustification (Section 2.3). To prepare our report, we will first review Fox's (2014) observation and the challenge to the Gricean view of exhaustification it presents (Section 2.2). To to set the stage for this review, it will in turn be useful for us to begin by recapitulating the Gricean derivation of exhaustivity inferences as it is often elaborated, including in Westera's own proposal (Section 2.1).

2.1 Setting the stage

To focus on the phenomenon centrally discussed by both Fox and Westera, consider the case of disjunctive sentences. The assertive use of a disjunctive sentence typically supports a pair of *possibility inferences* and an *exclusivity inference*, viz. that the speaker considers the truth of each disjunct to be possible, but not the truth of their conjunction. Consider Fox's sentence (3), repeated below. Letting "20" and "25" name the propositions that there is money in box 20 and 25, respectively, a use of (3) in typical scenarios leads the listener to draw the possibility inferences $\Diamond 20$ and $\Diamond 25$, and the exclusivity inference $\neg\Diamond(20 \wedge 25)$.

(3) **Fox's example**
There is money in box 20 or 25.

Contemporary developments of Gricean pragmatics can derive these very sorts of inferences. This holds in particular for Westera's rendition of the I-maxims in (1). To review the derivation, we start by assuming the I-maxims hold for an assertion of (3). Suppose, then, that p in (1) is set to the asserted proposition $(20 \vee 25)$, the basic meaning of (3). We can now confirm that the maxims in (1) support the target possibility and exclusivity inferences if, as Westera assumes, the question under discussion Q, in addition to $(20 \vee 25)$, includes 20, 25 and $(20 \wedge 25)$.

To begin, with Q containing $(20 \vee 25)$, the use of (3) will meet I-Relation in (1b). As for I-Quality in (1a), it will be met only if the speaker believes that there is money in box 20 or 25, $\Box(20 \vee 25)$. So, by assuming that I-Quality is met, this is an inference the listener can draw.

Consider now I-Quantity in (1c). This maxim demands that each proposition that meets I-Quality and I-Relevance, that is, that the speaker considers true and relevant, must be entailed by the assertion. As none of the three propositions 20, 25, or $(20 \wedge 25)$ are entailed by $(20 \vee 25)$, the consequent of the conditional in (1c) must be false with respect to these propositions so long as p is set to $(20 \vee 25)$. Also, each of those three values for q is in Q, ensuring the truth of the conjunct I-Relation(q,Q) in the antecedent of the conditional in (1c). Therefore, I-Quantity will be met only if each of those three values for q renders the conjunct I-Quality(q) false: ¬I-Quality(20), ¬I-Quality(25), and ¬I-Quality$(20 \wedge 25)$. Thus, with I-Quality as in (1a) and assuming that I-Quantity is met, the listener can infer the speaker is not certain about any of the three propositions, concluding $\neg\Box 20$, $\neg\Box 25$, and $\neg\Box(20 \wedge 25)$.

Now, the conjunction of $\neg\Box 20$ and $\neg\Box 25$ with the previously derived $\Box(20 \vee 25)$ entails the target possibility inferences $\Diamond 20$ and $\Diamond 25$. And $\neg\Box(20 \wedge 25)$ will strengthen to the target exclusivity inference $\neg\Diamond(20 \wedge 25)$ if the listener makes the auxiliary assumption that the speaker is opinionated about $(20 \wedge 25)$, that is, that either $\Box(20 \wedge 25)$ or $\neg\Diamond(20 \wedge 25)$.

2.2 Selective exhaustification

Against this background, let us now consider the challenge that Fox (2014) presents for the Gricean account of exhaustification. Fox considers a scenario where (3) is used in a TV game show with the following set-up. There are 100 boxes, five of which contain a million dollars each, while all the others are empty. At some stage of the game, a contestant can choose a particular box. If that box contains money, the contestant leaves the game with the money, otherwise they leave empty handed. At various points of the game, the host provides hints regarding the identity of the five boxes that contain money. Of course, given that the host is assumed to know which boxes those are, it is understood that the hints only disclose a part of the relevant information that the host has. Given all this, suppose now that the host provides a hint by uttering (3).

Contrasting with intuitions in more ordinary scenarios, Fox notes that the use of (3) in this particular context does *not* support possibility inferences about the disjuncts. Intuitively, game show contestants will likely assume that for either of the two boxes 20 and 25, the show host may know full well that it is actually empty. In other words, contestants are unlikely to draw the inference $\Diamond 20$, that the show host's beliefs are compatible with there being money in box 20, or the corresponding inference about box 25, $\Diamond 25$. At the same time, however, according to Fox's report, this use of (3) *does* invite an exclusivity inference. That is, contestants will likely infer $\neg\Diamond(20 \wedge 25)$, that the show host knows that it is not the case that both boxes contain money.

Fox's point is that this pattern of selective exhaustification is unexpected under a Gricean approach. The absence of the possibility inferences $\Diamond 20$ and $\Diamond 25$ is in itself unsurprising. In the game show scenario, contestants are aware that the host's statements are mere hints, statements that withhold certain information that the show host possesses. Hence it seems natural to assume that for the interpretation of (3), the Gricean Quantity maxim, I-Quantity, is *canceled*. That is, in interpreting the host's statements, contestants plausibly suspend the assumption that those statements respect the demands of I-Quantity. Given that, on the Gricean view as elaborated above, possibility inferences can arise only if I-Quantity is respected, the absence of such inferences in the case at hand can be explained. However, since I-Quantity is, in fact, a crucial ingredient to *all* exhaustivity inferences under the Gricean view, this straightforward explanation leads to the incorrect expectation that the exclusivity inference $\neg\Diamond(20 \wedge 25)$ will likewise be absent.

To make this more concrete, let us see how the problem manifests itself under the particular rendition of the I-maxims in (1). Looking back to the possible derivation of exhaustivity inferences stated above, we noted that I-Quantity was central to the derivation of the inferences $\neg\Box 20$ and $\neg\Box 25$. Canceling I-Quantity would therefore prevent these inferences from being generated. This would ensure that, as intended, the possibility inferences $\Diamond 20$ and $\Diamond 25$ are likewise not supported. However, if I-Quantity is canceled, then the inference $\neg\Box(20 \wedge 25)$ is preempted as well. Hence, even if contestants take the host to be opinionated about $(20 \wedge 25)$, by assuming that either $\Box(20 \wedge 25)$ or $\neg\Diamond(20 \wedge 25)$, it us unclear how they could exclude the option $\Box(20 \wedge 25)$, so as to arrive at the target exclusivity inference $\neg\Diamond(20 \wedge 25)$.

2.3 The attentional path

How, then, is selective exhaustification to be captured? Westera suggests that an answer becomes available under the assumption that speakers' utterances can be regulated by the A-maxims in (2) in addition to the I-maxims in (1). Specifically, Westera argues that selective exhaustification is captured under the additional premise that in the game show scenario, A-Quality is canceled alongside I-Quantity.

Let us first see how *without* this additional premise, the A-maxims can for an assertion of (3) support a derivation of *both* the possibility inferences and the exclusivity inference. Recall that for (3), Westera takes the question under discussion Q to include 20, 25 and $(20 \wedge 25)$. Westera moreover assumes that the attentional intent for a disjunctive sentence contains just the propositions given by the disjuncts, and crucially not their conjunction. Thus, for sentence (3), the set A in the A-maxims in (2) will be set to {20, 25}.

Under these assumptions, A-Relation in (2b) is met, as Q includes both 20 and 25. Moreover, A-Quality in (2a) will be met only if the speaker takes both members of A, 20 and 25, to be possible. So the listener can draw the possibility inference $\Diamond$20 and $\Diamond$25, based on the assumption that A-Quality is met.

Consider now A-Quantity in (2c). This maxim demands that each proposition that obeys A-Quality and A-Relation, that is, that the speaker considers possible and relevant, must have attention drawn to it. With A being {20, 25}, the only values for q that render the conditional consequent in (2c) true are 20 and 25; hence, crucially, the value (20 $\wedge$ 25) renders the consequent false. Moreover, the assumption that (20 $\wedge$ 25) is in Q ensures that the conjunct A-Relation({q},Q) is true for q set to (20 $\wedge$ 25). Therefore, A-Quantity can be met only if the conjunct A-Quality({20 $\wedge$ 25}) is false. Hence, the listener can infer $\neg$A-Quality({20 $\wedge$ 25}), which, given A-Quality as in (2a), amounts to $\neg\Diamond$(20 $\wedge$ 25). The listener can therefore reach the exclusivity inference by assuming that A-Quantity is met.

This means that without further assumptions, the adoption of the A-maxims would merely turn the undergeneration problem identified by Fox into an overgeneration problem. The unwanted prediction that *neither* the possibility inferences nor the exclusivity inference are derived would be replaced by the unwanted prediction that *both* types of inferences are derived.

As noted, however, Westera makes the additional assumption that the game show scenario does not just lead to the cancellation of I-Quantity, but of A-Quality as well. And if A-Quality is canceled, Westera suggests, contestants are correctly expected to infer just the exclusivity inference $\neg\Diamond$(20 $\wedge$ 25), not the possibility inferences $\Diamond$20 and $\Diamond$25, thereby capturing selective exhaustification.[3]

Westera moreover suggests that the proposed pattern of maxim cancellation in Fox's scenario is principled. The maxims that are canceled, A-Quality and I-Quantity, are maxims that support *possibility* inferences, inferences of the form $\Diamond\phi$ or $\neg\Box\phi$. In contrast, the non-canceled partner maxims, I-Quality and A-Quantity, support *necessity* inferences, inferences of the form $\Box\phi$ or $\neg\Diamond\phi$. While a necessity inference reports on what the host knows, a possibility inference, if drawn, would instead signal a lack of knowledge. Westera suggests that in the game show scenario,

3 In addition, the account seems to predict that (3) invites exhaustivity inferences about all boxes other than 20 and 25. For instance, since the proposition (that there is money in box) 15 is arguably in Q but not A, the account derives $\neg\Diamond$15. But this conflicts with the assumption in the scenario that there are five boxes that contain money. At the same time, though, Westera's exposition prefixes (3) with a phrase that singles out a more restricted subset of boxes ("Of these boxes over here ..."), and with such a prefix, exhaustivity inferences about the boxes in the restricted subset *do* seem to emerge. We will set this issue aside.

maxims that would support inferences entailing a lack of knowledge are canceled, while maxims that support inferences entailing knowledge remain in effect. It is on those grounds that contestants are taken to assume that the host's hint in (3) respects I-Quality and A-Quantity, but to suspend this assumption for I-Quantity and A-Quality.

Westera's analysis of selective exhaustification is innovative and elegant. However, we will now argue that on closer inspection, the proposal as stated falls short of its objective, requiring further elaboration or revision.

3 Another undergeneration challenge

A notion that is central to the problem we will identify is that of "cancellation". Westera does not spell out how cancellation is to be understood within the framework of attentional pragmatics. However, we will point out in this section that under what may be the most obvious construal of cancellation within Westera's frame of assumptions, the proposed account of selective exhaustification just leads back to much the same sort of undergeneration problem that it was meant to solve.

To recap, for sentence (3) in Fox's scenario, Westera's account posits that the *unattested* possibility inferences $\Diamond 20$ and $\Diamond 25$ are prevented in virtue of A-Quality being canceled. While this by itself is unobjectionable, what remains unclear is how exactly the *attested* exclusivity inference $\neg\Diamond(20 \wedge 25)$ can arise under the assumption that A-Quality is canceled. We saw that A-Quantity in (2c) supports the inference $\neg\Diamond(20 \wedge 25)$ with reference to A-Quality, in the form ¬A-Quality($\{20 \wedge 25\}$). Hence, Westera's account of selective exhaustification requires that even when A-Quality is "canceled" for the purposes of possibility inferences, this cancellation not have an effect on the demands imposed by A-Quantity. This is necessary to preserve the derivation of the exclusivity inference.

The problem is that it is not obvious how this desideratum can be met. Under a construal of cancellation that would otherwise seem natural, canceling a maxim amounts to *trivializing* its content, so that the "canceled" maxim relates any possible input (here, any attentional intent A) to a condition that is trivially met. On this view, cancellation of A-Quality amounts to the modification of (2a) in (4), that is, the replacement of the condition $\forall q[A(q) \rightarrow \Diamond q]$ in (2a) with a tautology.

(4) **Cancellation as trivialization**

$$\text{A-Quality(A)} \Leftrightarrow \forall q[A(q) \rightarrow \Diamond q] \quad \rightsquigarrow \quad \text{A-Quality(A)} \Leftrightarrow \top$$

Trivializing A-Quality in this way would ensure that any utterance's attentional intent will comply with the maxim, regardless of what the speaker may or may not believe. This has the benefit of preempting the unattested possibility inferences $\Diamond 20$ and $\Diamond 25$. But given the formulation of A-Quantity in (2c), with its *cross-reference* to A-Quality, if the content of A-Quality is altered, then the demands imposed by A-Quantity will likewise change. Under the assumption that the content of A-Quality is trivialized, via the substitution in (4), (2c) can be restated equivalently by simply dropping the conjunct *A-Quality({q})*, as shown in (5).

(5) A-Quantity(A,Q) $\Leftrightarrow$ $\forall$q[A-Relation({q},Q) $\rightarrow$ A(q)]

So given Westera's formulation of the A-maxims in (2), trivializing the content of A-Quality yields a concomitant change in the content of A-Quantity. To reiterate, under (2) as stated, the exclusivity inference ¬A-Quality({20 ∧ 25}), hence ¬◇(20 ∧ 25), follows from the assumption that A-Quantity is met, provided that (20 ∧ 25) is in Q but not in A. But with the substitution in (4), given its consequence in (5), A-Quantity *cannot* support the inference ¬◇(20 ∧ 25), based on the assumption that the maxim is satisfied. Instead, if (20 ∧ 25) is in Q but not A, A-Quantity is now necessarily violated.

Given this, Westera's analysis of selective exhaustification is in danger of just replacing one version of an undergeneration challenge with another. Once again, while the absence of possibility inferences in Fox's game show scenario is captured, the derivation of the attested exclusivity inference remains unclear.

4 Two avenues for a solution

Different types of responses to this challenge are conceivable in principle, as different ingredients of the challenge could be abandoned and replaced by alternative assumptions. One such ingredient is Westera's formulation of A-Quantity. Another is our suggested construal of maxim cancellation as trivialization. We will now show that changes to either of these ingredients can resolve the challenge. We will not attempt to decide between those two possible solutions here. Instead, we will, in the next section, identify a potentially significant consequence that they have in common.

4.1 The nature of Quantity

One conceivable solution to the undergeneration challenge targets Westera's formulation of A-Quantity. We already called attention to the fact that the rendition of A-Quantity in (2c) features a *cross-reference* to A-Quality. It is due to this cross-reference that the trivialization of A-Quality alters the demands of A-Quantity. Accordingly, the undergeneration challenge could be addressed through a reformulation of A-Quantity that does not have such a cross-reference. Concretely, consider an alternate formulation of A-Quantity where the clause "A-Quality({q})" in (2c) is replaced with "◇q", as in (6).

(6) **A-Quantity ("independent")**
A-Quantity(A,Q) $\Leftrightarrow$ $\forall$q[[$\Diamond$q $\wedge$ A-Relation({q},Q)] $\rightarrow$ A(q)]

This formulation replaces the cross-reference to A-Quality with a *duplicate* of the condition that A-Quality is taken to impose in default contexts according to (2a). Since in this revision, A-Quantity is not explicitly linked to A-Quality, we will refer to it as "independent" (of A-Quality), contrasting with "dependent" A-Quantity in (2c).

Rendering A-Quantity independent in this way can be seen to complete Westera's account of selective exhaustification. For sentence (3), the target exclusivity inference $\neg\Diamond(20 \wedge 25)$ now follows directly from the assumption that A-Quantity is met, again provided that $(20 \wedge 25)$ is in Q but not in A. Crucially, since A-Quality is not referenced in the derivation, this result does not merely hold in default contexts, but persist under the assumption that A-Quality has been trivialized, as we assumed for Fox's game show scenario.

To contextualize this solution, we note that the contrast between a dependent and independent rendition of A-Quantity is mirrored in the literature by a corresponding contrast in the formulation of I-Quantity. In virtue of cross-referencing I-Quality, Westera's own construal of I-Quantity in (1c) is dependent, and the same holds for the formulations of I-Quantity in, for example, Gamut (1991), Katzir (2007), and Heim & von Fintel (2014). At the same time, Harnish (1976), Spector (2006), Fox (2007), Mayr (2013), and Schwarz (2016), for example, state versions of I-Quantity that duplicate the content of I-Quality, and therefore qualify as independent. Importantly, though, with the exception of Zumchak (2024), previous literature does not seem to have identified the distinction between dependent and independent construals of I-Quantity as a theoretical choice point, suggesting that the choice between them has been merely expositional.[4]

4.2 The nature of cancellation

We now turn to a second conceivable solution to the undergeneration challenge. Assuming the A-maxims as stated in (2), let us revisit the construal of maxim cancellation as trivialization. To recap, a central feature of Fox's game show scenario is that for (3), the otherwise expected possibility inferences $\Diamond 20$ and $\Diamond 25$ are not actually drawn. To allow for their absence, Westera assumes that A-Quality in (2a) is canceled in the game show scenario, hence imposes no demands on cooperative

4 Zumchak (2024) advances an empirical case for a dependent formulation of I-Quantity. The argument is based on intuitions about exhaustification in a game show scenario where *I-Quality* is arguably canceled. Zumchak argues that those intuitions track the predictions of dependent I-Quantity better than those of independent I-Quantity.

utterances. The undergeneration problem arises if maxim cancellation is construed as maxim trivialization. We will now show, however, that to understand the absence of possibility inferences, it is not necessary to assume that A-Quality is *trivialized*. To preempt possibility inferences, a mere *weakening* of A-Quality can be sufficient. We will see that by assuming such a mere weakening, the undergeneration challenge can be resolved.

Suppose that instead of outright trivializing the content of A-Quality, as in (4), the game show scenario merely had the effect of weakening it by replacing universal with existential quantification. That is, suppose that, as stated in (7), the universal condition "$\forall$q[A(q) $\rightarrow$ $\Diamond$q]" in (2a) is replaced with its existential counterpart "$\exists$q[A(q) $\wedge$ $\Diamond$q]". For reference, the version of A-Quality that results from this replacement is stated in (8).

(7) **Existential weakening**
A-Quality(A) $\Leftrightarrow \forall$q[A(q) $\rightarrow \Diamond$q] $\rightsquigarrow$ A-Quality(A) $\Leftrightarrow \exists$q[A(q) $\wedge \Diamond$q]

(8) **Existentially weakened A-Quality**
A-Quality(A) $\Leftrightarrow \exists$q[A(q) $\wedge \Diamond$q]
'Intend to draw attention to at least one thing you consider possible.'

For the show host's use of (3) in the game show scenario, instead of demanding both $\Diamond$20 and $\Diamond$25, existential A-Quality would merely impose the disjunctive condition $\Diamond$20 $\vee$ $\Diamond$25, or, equivalently, $\Diamond$(20 $\vee$ 25). This condition entails neither $\Diamond$20 nor $\Diamond$25. Hence, existential weakening of A-Quality coincides with complete trivialization of A-Quality in its effect of preempting those possibility inferences. In fact, $\Diamond$(20 $\vee$ 25), while not logically trivial, is effectively redundant. It is already guaranteed by I-Quality in (1a), which is assumed to remain in force unaltered in the game show scenario. I-Quality demands $\Box$(20 $\vee$ 25), which entails $\Diamond$(20 $\vee$ 25). Hence, given I-Quality, existential A-Quality itself does not further strengthen the demands on a cooperative use of sentence (3). The fact that existential A-Quality does not support the possibility inferences $\Diamond$20 and $\Diamond$25 is a reflection of this redundancy.

Crucially, however, existential weakening of A-Quality is not equivalent to trivialization in it its overall effect within the system of A-maxims. The two versions of A-Quality come apart with regard to Quantity inferences. We saw in the last section that for (3), rather then deriving the observed exclusivity inference $\neg\Diamond$(20 $\wedge$ 25), assuming that (20 $\wedge$ 25) is in Q but not in A, canceling A-Quality through trivialization as in (4) would result in A-Quantity in (2c) being necessarily violated. The effect of mere existential weakening in (7) is different. Unlike trivialized A-Quality, existentially weakened A-Quality in (8) allows for (3) to meet A-Quantity. In fact, existential weakening of A-Quality does not change the condition imposed by A-Quantity in (2c) at all. This condition remains what it would be if default universal

A-Quality in (2a) were in effect unaltered. The reason for this invariance is that for a singleton restrictor, the effects of existential and universal quantification coincide. Concretely, for the case at hand, (2a) versus (8), we have the equivalencies in (9).

(9) A-Quality({a}) (as in (2a)) $\Leftrightarrow$ $\forall q[q \in \{a\} \rightarrow \Diamond q]$
$\Leftrightarrow$ $\Diamond a$
$\Leftrightarrow$ $\exists q[q \in \{a\} \wedge \Diamond q]$
$\Leftrightarrow$ A-Quality({a}) (as in (8))

Given (9), regardless of whether A-Quality is universal as in (2a) or existential as in (8), the clause A-Quality({q}) in (2c) is equivalent to $\Diamond$q. This has the welcome consequence that in the game show scenario, the exclusivity inference for (3) is captured in the familiar way. As before, if (20 $\wedge$ 25) is in Q but not in A, the assumption that A-Quantity in (2c) is met entails $\neg$A-Quality({20 $\wedge$ 25}), and hence $\neg\Diamond$(20 $\wedge$ 25). So the assumption that in the game show scenario, A-Quality is merely weakened existentially, rather than outright trivialized, is another way of completing Westera's account of selective exhaustification.[5]

In sum, we have in this section presented two approaches to the undergeneration challenge for Westera's approach to selective exhaustification. These solutions pursue different strategies, in that one targets the default content of a maxim, viz. A-Quantity, whereas the other revisits the effect of the "cancellation" of a maxim, viz. A-Quality, in a non-default context. While it is tempting to try to discriminate between these solutions on empirical grounds, we will not attempt to do so here. Instead, we will conclude our commentary by calling attention to a feature that the two solutions have in common.

5 The formulation of Quantity

The two alternative amendments considered in the last section, while targeting different ingredients of Westera's proposal, also share a potentially important implication. To see this implication, it will be useful to first review the classic understanding of

5 It may be useful to confirm that this solution crucially relies on Westera's assumption that A-Quantity quantifies over singleton attentional intents only. Under a stronger version that quantifies over attentional intents at large, stated in (i) below, the inferences derived would be bound to include $\neg$A-Quality({20, 25, (20 $\wedge$ 25)}), given that (20 $\wedge$ 25) is in Q but not in A. With A-Quality weakened as in (8), this inference amounts to $\neg(\Diamond 20 \vee \Diamond 25 \vee \Diamond(20 \wedge 25))$, which in turn is equivalent to $\neg\Diamond(20 \vee 25)$. In virtue of entailing $\neg\Box(20 \vee 25)$, this inference would be inconsistent with the inference $\Box(20 \vee 25)$ based on I-Quality. Thus, the version of A-Quantity in (i) would not be viable in the game show scenario with existentially weakened A-Quality.

(i) A-Quantity(A,Q) $\Leftrightarrow$ $\forall B[\,[\text{A-Quality}(B) \wedge \text{A-Relation}(B,Q)] \rightarrow B \subseteq A]$

exhaustification suggested in Grice (1975), and then consider how this view applies to the A-maxim and selective exhaustification.

5.1 Unrestricted Quantity and clashing maxims

We begin by reviewing Grice's original rendition of I-Quantity and the associated view of exhaustification. The relevant maxim in Grice (1975) is shown in (10).

(10) **Grice's I-Quantity**
"Make your contribution as informative as is required (for the current purposes of the exchange)."

Grice's formulation of I-Quantity differs from the formulations considered so far in that it does not feature any reference to I-Quality, be it through cross-reference or duplication, hence it is neither dependent nor independent. Let us refer to such a formulation of Quantity as "unrestricted", contrasting with the versions considered so far that are "restricted" (by cross-reference to or duplication of Quality). The emerging typology of conceivable formulations of Quantity is summarized by the diagram in Figure 1.

Coupled with the unrestricted formulation of I-Quantity in (10), Grice's discussion suggests a view where exhaustification does not arise from the assumption that I-Quantity is *satisfied*, as in Westera's construal, but from the assumption that the maxim is *violated*. Grice proposes that implicatures can be rooted in a "clash" between I-Quantity and I-Quality. Specifically, having observed that the speaker violated I-Quantity, the listener might assume that the speaker opted for this violation in order to preserve I-Quality. Exhaustification is construed as the listener's inference that the assertion of a given utterance that would have respected I-Quantity would have violated I-Quality instead.[6]

We noted above that with one exception, the choice between a restricted *dependent* and restricted *independent* formulations of I-Quantity does not seem to have been discussed in the literature. Likewise, we are not aware of explicit attempts in the literature to adjudicate between *restricted* and *unrestricted* formulations of I-Quantity. However, we will now argue that in the realm of the A-maxims, under either of the two amendments described in the last section, Westera's account of selective exhaustification crucially relies on a *restricted* formulation of Quantity.

6 For a recent in-depth exposition and appraisal of this classic view of exhaustification, see, for example, Geurts (2011).

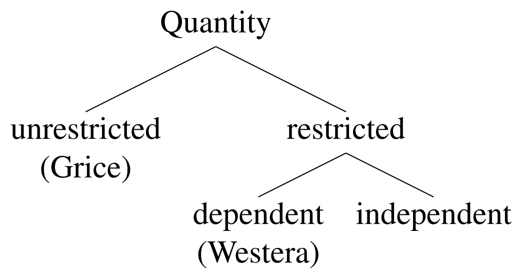

Figure 1 A typology of formulations of Quantity

5.2 The need for restricted Quantity

To make our case, let us consider a modification of Westera's A-Quantity in (2c) that is modeled after Grice's unrestricted I-Quantity in (10). Such a modification could be stated as in (11), which revises (2c) by omitting the conjunct "A-Quality({q})".[7]

(11) **A-Quantity ("unrestricted")**
A-Quantity(A,Q) $\Leftrightarrow$ $\forall$q[A-Relation({q},Q) $\rightarrow$ A(q)]
'Intend to draw attention to all relevant propositions.'

We will first show that, aligned with Grice's original view, this version of A-Quantity can support exhaustification in ordinary contexts where A-Quality as stated in (2a) is in effect unaltered. To illustrate, consider once again the disjunctive sentence (3).

(3) **Fox's example**
There is money in box 20 or 25.

As reviewed in Section 2, Westera assumes that (3) draws attention to 20 and 25, but not (20 $\wedge$ 25), so its attentional intent A is {20, 25}. Moreover, suppose again that 20, 25 and (20 $\wedge$ 25) are all relevant, hence in Q. As before, A-Relation is then met, since 20 and 25 are in Q, and the assumption that A-Quality in (2a) is met yields the possibility inferences $\Diamond$20 and $\Diamond$25. However, A-Quantity, in the unrestricted construal in (11), is now simply *violated*, since (20 $\wedge$ 25) is assumed to be in Q but not in A. A listener may then reason that this violation is the speaker's way of resolving a maxim clash. In more detail, the listener may wonder why the speaker did not avoid a violation of A-Quantity by drawing attention to the relevant proposition (20 $\wedge$ 25) in addition to the relevant propositions 20 and 25, to yield the attentional intent {20, 25, (20 $\wedge$ 25)}. This expanded membership of A would have avoided a violation of A-Quantity, since it includes all relevant propositions. The

7 Note that (11) reproduces (5) above, where we considered the effect of A-Quality having been trivialized.

listener may reason that the speaker refrained from expanding A in this way because it would have led to a violation of A-Quality.[8] The listener would thereby assume $\neg$A-Quality($\{20, 25, (20 \wedge 25)\}$), which by (2a) amounts to $\neg(\Diamond 20 \wedge \Diamond 25 \wedge \Diamond(20 \wedge 25))$. In conjunction with the possibility inferences $\Diamond 20$ and $\Diamond 25$ from A-Quality, this yields the target exclusivity inference $\neg\Diamond(20 \wedge 25)$.

Turning now to selective exhaustification, we can see that under an unrestricted rendition of A-Quantity, Westera's approach still encounters the same sort of undergeneration challenge that we identified in Section 3. With maxim cancellation understood as trivialization to a tautology, the inference $\neg$A-Quality($\{20, 25, (20 \wedge 25)\}$) would now be a contradiction, hence could not actually be drawn. The exclusivity inference $\neg\Diamond(20 \wedge 25)$ would remain unaccounted for, just as we found for Westera's actual proposal.

Crucially, while a clash-based version of Westera's approach to selective exhaustification encounters the same sort of challenge as Westera's original proposal, it is not amenable to either of the solutions presented in the last section. The solution from independent A-Quantity in Section 4.1 is not applicable in a clash-based reformulation. An unrestricted A-Quantity like (11) does not reference A-Quality in the first place, eliminating the possibility of replacing a cross-reference with a duplicate. In other words, including a duplicate of the default condition for A-Quality yields a restricted formulation of A-Quantity rather than an unrestricted one.

Consider now the solution in Section 4.2. With A-Quality existentially weakened as in (8) rather than outright trivialized, the potential inference $\neg$A-Quality($\{20, 25, (20 \wedge 25)\}$) amounts to $\neg(\Diamond 20 \vee \Diamond 25 \vee \Diamond(20 \wedge 25))$, which is equivalent to $\neg\Diamond(20 \vee 25)$, that the speaker believes that neither box 20 nor box 25 contains money. While this inference is not a logical contradiction by itself, it is still too strong. Entailing $\neg\Box(20 \vee 25)$, it contradicts the inference $\Box(20 \vee 25)$ that the listener is assumed to draw on the basis on I-Quality, that the speaker believes that box 20 or box 25 contains money. Given this inconsistency, the target exclusivity inference $\neg\Diamond(20 \wedge 25)$ is again left unexplained.[9]

In sum, if the solutions considered in the last section are representative, Westera's approach to selective exhaustification is incompatible with a clash-based construal of exhaustification of the sort suggested by Grice. If so, then Westera's approach is in-

8 Westera assumes that the attentional intent $\{20, 25, (20 \wedge 25)\}$ is associated with the sentence *There is money in box 20 or 25 or both*. If so, the listener's reasoning could invoke the question why the speaker did not avoid a violation of A-Quantity by asserting that sentence instead of sentence (3).

9 The problem just described in some respects recapitulates footnote 5 above. We noted there that our amendment in Section 4.2 exploits the fact that A-Quantity in (2c) quantifies over *singleton* attentional intents. Under an unrestricted version of A-Quantity like (11), it seems impossible to recreate the effects of this crucial feature of the formulation in (2c). That is, there seems to be no viable path to the target inference $\neg$A-Quality($\{20 \wedge 25\}$).

extricably committed to a restricted formulation of A-Quantity, with exhaustification arising from the assumption that A-Quantity is satisfied rather than violated.

6 Conclusion

As one of the motivations for positing a family of A(ttention)-maxims, Westera proposed that it enables an account of selective exhaustification in Fox's (2014) game show scenario. In this commentary, we called attention to a gap in this account, and we proposed two ways of closing this gap within the confines of Westera's approach. We observed that in the resulting account of selective exhaustification, it becomes essential that A-Quantity be stated as a conditional that references A-Quality in some way, by cross-reference or duplication, and as a consequence, that exhaustivity inferences arise from the assumption that A-Quantity is satisfied.

We pointed out that this constitutes a departure from Grice's original view of exhaustification as grounded in a clash of maxims. As we have reported, many previous proposals, including Westera's, assume a restricted formulation of a Quantity maxim and, accordingly, move away from Grice's clash-based view of exhaustification. However, a restricted formulation of a Quantity maxim has never, to our knowledge, been explicitly argued for. Westera's attention-based approach to selective exhaustification may be the first proposal in a Gricean framework to *necessitate* this departure from Grice's original view. The arguments for this approach advanced in Westera's paper may therefore constitute the first potential arguments for restricted Quantity maxim. We leave an evaluation of this implication to future work.[10]

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10 A possible starting point for such an evaluation is the observation that exhaustification sometimes appears to be obviated by a range of different sorts of pragmatic pressure, including the demands of politeness or secrecy (e.g. Geurts 2011, Bonnefon et al. 2009). As suggested in Geurts (2011), such obviation is expected in Grice's view without further assumptions, since it is expected that such alternate pressures can replace I-Quality in a listener's chain of reasoning. Such obviation of exhaustification may therefore support an argument for Grice's clash-based view.

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