

# A, the, another: A Game of Same and Different

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**Abstract.** Indefinites face competition at two levels: Presupposition and content. The antipresupposition hypothesis predicts that they signal the opposite of familiarity, or uniqueness, namely, novelty, or non-uniqueness. At the level of descriptive content, they are pressured from two sides: definites expressing identity and *another* phrases expressing difference, and Gricean reasoning predicts that indefinites signal both difference and identity and are infelicitous when definites and *another* phrases are felicitous. However, occasionally a space opens between *the* and *another*, for *a* to fill. This is in part due to conditions handicapping *the* or *another* semantically, in part to *another*'s phonological handicap. The division of labor between determiners in the field of difference and sameness is thus the result of an intricate competition. We model this competition in a version of game-theoretic pragmatics.

**Keywords:** novelty, definiteness, indefiniteness, sameness and difference, antipresupposition, informativity, competition, Game Theory

## 1. Introduction

As argued by Farkas (2006), the indefinite determiner  $a(n)$  is semantically unmarked and so has a great freedom of distribution and interpretation. On the other hand, since “the interpretation of a particular form in a particular language depends on the other forms the language has” (Farkas 2006: 96), it is to be expected that this freedom is pragmatically constrained and that the unmarked determiner can implicate that the conditions imposed by more marked determiners do not obtain. In this paper, we focus on a particular aspect of this, namely, the hypothesis that due to the competition with the singular definite determiner *the*,  $a(n)$  can signal **novelty**. We will be concerned with the empirical question of when an indefinite signals novelty and with the theoretical question of how it does so.

As we will understand the notion of novelty, an indefinite signals novelty if it signals difference from a discourse referent which could serve as antecedent for the corresponding definite, as seems to be the case in (1).<sup>1</sup>

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<sup>1</sup> More precisely, it signals novelty if it signals that any witness for its referent is different from any witness for a potential antecedent. This corresponds to a ‘novelty condition’ both stronger and weaker than the one formulated by Heim (1982: 369f.) (stronger because it involves individuals, weaker because it involves descriptions).

- (1) There were four chairs in the room. The boy sat down on a chair. Then the girl walked in and knocked a chair over.

As noted by Heim (t.a.), we understand the second indefinite to imply that a different chair from the one that was sat on by the boy was knocked over. (We return to this example in Sect. 3.3.)

Hence the relevant contexts are contexts where (in the sense of Roberts 2003) a presupposition of ‘weak familiarity’ for a definite would be satisfied, and the empirical question can be stated thus: What happens if a (loosely) anaphoric definite is replaced by the corresponding indefinite? We will find that a novelty effect is rather rare and that what mostly results is infelicity, and when a novelty effect does obtain, it is due to a quantity implicature and in competition with another competitor, namely, *another*.

Before embarking on the investigation proper, it will be useful to introduce the subject by reviewing the seminal discussion by Heim (1991).

### 1.1. NOVELTY AND (IN)FELICITY

A case in point for a novelty effect in connection with indefinites is the sentence pair discussed by Heim (1991: 515f.), here in English rendering:

- (2) Richard heard the Beaux-Arts Trio last night and afterwards had a beer with the pianist.  
 (3) Richard heard the Beaux-Arts Trio last night and afterwards had a beer with a pianist.

Heim notes that while (2) expresses that Richard had a beer with Pressler, the pianist of the Beaux-Arts Trio, (3) licenses the inference that Richard had a beer with a different pianist. Her explanation of this has two parts. First, she appeals to the generalization (4):

- (4) In situations of utterance where it is known that the presupposition of [*the* ζ] ξ is fulfilled, it is forbidden to utter [*a* ζ] ξ.

Assuming that the context for the second conjunct of (2) or (3) is such that there is exactly one pianist in the domain of discourse, (2) is fine but (3) is *prima facie* infelicitous; to save it, the domain of individuals is extended, as a form of accommodation, to include less salient pianists. With respect to this wider domain, the uniqueness presupposition of the definite is not fulfilled, so the indefinite is permitted, and (3) says that Richard had a beer with Pressler or some other pianist.

Next, to explain why (3) not only allows but also requires that Richard had a beer with some other pianist, Heim appeals to the maxim of Quantity: it would be more informative to establish coreference with Pressler by using the definite article, so assuming that the speaker knows whether it was Pressler Richard had a beer with, one can infer from her use of the indefinite article that she means he had a beer with some other pianist.

Ingenuous as this two-stage explanation of the novelty effect in (3) may appear, we are still intrigued by certain aspects of it. For one thing, note that if we alter the first conjunct of (3) slightly, the novelty inference is no longer available; instead, the sentence is mildly deviant:<sup>2</sup>

- (5) ?Richard heard the Beaux-Arts Trio with its new cellist and its new violinist last night and afterwards had a beer with a cellist.

The only way to make sense of (5) is to suspend the assumption that the speaker knows which cellist Richard had a beer with ('speaker expertise'). The indefinite could hardly here be used, as according to Stalnaker (1998) and Dekker (2002, 2004) (surface) indefinites generally are, with a 'referential intention'. The question thus arises why, if the story told by Heim (1991: 515f.) is correct, it is evidently more difficult to save (5) than to save (3) by extending the domain of discourse.

Note further that sometimes an indefinite is permitted even though the presupposition of the corresponding definite is known to be fulfilled, without giving rise to a novelty inference:

- (6) Along came a Samaritan woman, and Jesus talked to her.  
She was surprised that he would talk to a Samaritan; his disciples were surprised that he would talk to a woman.

There is exactly one woman in the domain of discourse, yet (6) is fine and cannot be taken to mean that the disciples were surprised that Jesus would talk to some other woman.

## 1.2. THE PLOT

From the above we can see that there are three cases to be distinguished when the presupposition of a singular definite description is known to be fulfilled in a context:

1. the corresponding indefinite is infelicitous,
2. the corresponding indefinite is felicitous and there is a novelty effect,

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<sup>2</sup> The year is 1998, Meneses replacing Wiley and Kim replacing Kavafian.

3. the corresponding indefinite is felicitous and there is no novelty effect.

These observations motivate us to investigate the semantic and pragmatic division of labor between definites and indefinites more closely, empirically and theoretically. We will be led to conclude that the first part of the two-part account offered by Heim (1991), the part which relates to a competition at the level of presupposition, only plays a minor role, while the second part, which relates to a competition at the level of descriptive content, is all the more important – in other words, as already argued by Krifka (2001: 11f.) and Heim (t.a.: 15f.), informativity plays a major role. We will furthermore show that competition at a third, contextual level is part of the picture.

We are guided by three strategic considerations. First, we maintain, uncontroversially, that indefinites do not encode novelty, or non-uniqueness; novelty is at most a kind of implicature. Second, we need to distinguish carefully between the presupposition and the descriptive content of articles. Third, as becomes apparent once that is done, we need to take into account that the indefinite article does not only compete with the definite article but in particular also with the determiner *another*, which presupposes more or less the same as the (singular) definite article but expresses the opposite.

In fact, we will argue that an indefinite signals novelty (in the sense outlined above) if and only if the corresponding *another* phrase is somehow blocked or there is a bias for a novelty interpretation.

The rest of the paper is structured as follows. In Section 2, we address the ‘antipresupposition hypothesis’ and discuss its applicability to the case at hand, with particular regard to its ‘*ceteris paribus* condition’, concluding that this condition is rarely, if ever, given. In Section 3 we show how at the level of descriptive content, simple indefinites compete with definites on the one hand and *another* phrases on the other, and model this competition in a game theoretical framework. In Section 4, we move to more involved contexts, including ‘non-surface’ indefinites, showing how features of these contexts can render them competitive. Section 5 brings conclusions.

## 2. Competition at the Level of Presupposition

Heim (1991: 515) tentatively subsumes (4) under (7):<sup>3</sup>

- (7) Make your contribution presuppose as much as possible!

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<sup>3</sup> This is the English rendering given by Sauerland 2008: 585.

This is the first formulation of the hypothesis which has recently come to be known as ‘Maximize Presupposition’, ‘Antipresupposition’, or ‘Implicated Presuppositions’ (Percus 2006, Sauerland 2008 and earlier work). There have been applications in the fields of determiners (e.g., *both* vs. *all*), attitude verbs (*know* vs. *believe*), and additive markers (*too* vs.  $\emptyset$ ) (Amsili and Beyssade 2010).

There have been various attempts at making the hypothesis precise and at deriving it from pragmatic principles. As for the latter of these two tasks, Heim (1991: 515) warned that Gricean reasoning is problematic in this case, since when the presupposition of [*the*  $\zeta$ ]  $\xi$  is known to be fulfilled, [*the*  $\zeta$ ]  $\xi$  is not more informative than [*a*  $\zeta$ ]  $\xi$  (so she tentatively postulated (7) as a novel maxim). This scepticism persists in recent work (e.g. Percus 2006): attempts to reduce (7) to the maxim of Quantity are discouraged by the realization that when satisfied, as they are supposed to be, presuppositions are not informative, the information being in the common ground already.<sup>4</sup>

As for stating a general rule in precise terms, the assumption is generally made – explicitly or implicitly – that a less presupposing item is compared with a more presupposing item with otherwise the same meaning. That is, a *ceteris paribus* condition is assumed: the relevant items are to differ only in their presuppositions, one being ‘presuppositionally stronger’ than the other (Percus 2006). Sauerland (2008: 599) formulates the principle (8) (where the notation  $\underline{p}q$ , from Schlenker 2008, means  $q$  plus the presupposition  $p$ ):

- (8) *Maximize Redundancy*  
 If  $\underline{p}q$  and  $q$  can be uttered felicitously in a syntactic context  $\alpha \underline{\quad} \beta$ ,  $\alpha \underline{p}q \beta$  is preferable to  $\alpha q \beta$

Let us formulate a theory neutral but fairly explicit working definition:

- (9) **Antipresupposition**  
 When you have a choice between two forms  $\alpha$  and  $\beta$  differing only in a presupposition  $\pi$ , triggered by  $\alpha$  but not by  $\beta$ , if the context supports  $\pi$ , you are to choose  $\alpha$ . Thus when you use  $\beta$ , this will signal the opposite:  $\pi$  is not supported by the context.

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<sup>4</sup> But Schlenker (2011), building on Stalnaker (2002), outlines a way to reduce Maximize Presupposition to scalar implicature, partly restoring informativity to presuppositions (they may be hearer’s and speaker’s belief but not yet common belief), partly appealing to ‘Fallibility’ (the addressee may forget a common belief), and adopting from Singh (2011) the hypothesis that presupposition maximization is computed relative to local contexts.

When this definition is applied to the pair consisting of the definite and the indefinite article, it is not immediately clear that these two expressions form a minimal pair in the sense required. To a certain extent, this depends on whether the definite article is given a quantificational, a referential, or an anaphoric analysis.

## 2.1. QUANTIFICATIONAL AND REFERENTIAL ANALYSIS

Percus (2006) presents the idea that *the* only differs from *a* in its partiality by giving (simplified) the semantic values in (10) and (11), literally identical but for the definedness conditions (in the notation due to Heim and Kratzer 1998, material between colon and stop represents such conditions):

$$(10) \quad \llbracket a \rrbracket = \lambda P \lambda Q \lambda w . \text{ For some } x, P_w(x) \text{ and } Q_w(x)$$

$$(11) \quad \llbracket the \rrbracket = \lambda P \lambda Q \lambda w : |P_w| = 1 . \text{ For some } x, P_w(x) \text{ and } Q_w(x)$$

Given this quantificational analysis, we do have a minimal pair in the sense of (9). True, there is the perhaps more common way of formulating such an analysis shown in (12) (used by Barwise and Cooper 1981: 169 for *the*  $n$  when  $n=1$ ), but as long as the definedness condition is met, (11) is equivalent.

$$(12) \quad \llbracket the \rrbracket = \lambda P \lambda Q \lambda w : |P_w| = 1 . \text{ For every } x \text{ s. t. } P_w(x), Q_w(x)$$

If we move on to a referential analysis, as defended by Heim (t.a.), retaining the existence-and-uniqueness presupposition but letting definite descriptions denote individuals, there is a difference between the content of *the* and that of *a* (as given in (10)) beyond the level of presupposition, a type difference:<sup>5</sup>

$$(13) \quad \llbracket the \rrbracket = \lambda P \lambda w : |P_w| = 1 . \iota x P_w(x)$$

If we move up to propositional level, we get  $\lambda w : |P_w| = 1 . Q_w(\iota x P_w(x))$ , and from this it might seem that the definite is stronger than the indefinite both in the presupposition and in the descriptive content (the ‘assertion’). But again, one may say that whenever the definedness condition is satisfied, the two contents are equivalent. Generally, we can say that if one formulates the presupposition of the definite in terms of existence and uniqueness with respect to the denotation of the description in the world of evaluation, the content of the indefinite can be used as the content of the definite.

<sup>5</sup> There are alternatives to (10), both such that differ insubstantially, e.g., in terms of choice functions and existential closure, and such that differ more substantially, like the referential analysis of specific indefinites given by Fodor and Sag (1982).

Based on such an analysis, then, the antipresupposition hypothesis is applicable and can account for a number of cases where an indefinite is infelicitous, notably cases where uniqueness is either intrinsically given, as with functional nouns or superlatives, like #*A father of the victim arrived at the scene* (Sauerland 2008) or #*We bought a smallest house on the street* (Heim, t.a.), or entailed by the common ground or encyclopaedic knowledge, like #*The bicycle was fine after a front wheel was replaced* (Heim, t.a.).<sup>6</sup>

An antipresupposition of non-uniqueness can also partly account for cases where an indefinite signals novelty. Recall Heim's explanation of the novelty effect in (3): the indefinite forces us to take the description in a wider sense than we do in (2); Heim (t.a.) gives an analogous analysis of (1). But note that this is only half the story: to derive not just non-uniqueness but novelty, a Quantity implicature is also needed, based on the realization that (3) is weaker than (2) and the assumption that the speaker is well-informed.<sup>7</sup>

- (2) Richard heard the Beaux-Arts Trio last night and afterwards had a beer with the pianist.
- (3) Richard heard the Beaux-Arts Trio last night and afterwards had a beer with a pianist.

And, it is hard to see how the difference between (3) and the mild infelicity of (5) (assuming 'speaker expertise') can be explained along similar lines. We believe it has to do with the availability of the determiner that directly expresses novelty-as-difference, *another*, but it is not clear how to directly compare this determiner with the articles in a framework of a quantificational or referential analysis of the definite.

- (5) ?Richard heard the Beaux-Arts Trio with its new cellist and its new violinist last night and afterwards had a beer with a cellist.

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<sup>6</sup> Note that if one defines the presupposition of definiteness as a definedness condition on the description and the world of evaluation, the antipresupposition of indefiniteness can in fact be seen as a kind of Quantity implicature; Heim (t.a.), following Hawkins (1991), explicitly describes definites as informationally stronger than indefinites in virtue of the presupposition.

<sup>7</sup> Note that an antipresupposition based on Dekker's theory of indefinites (2002, 2004) would on its own predict a novelty effect in all relevant cases, without the help of a Quantity implicature; there, (surface) indefinites are like definites (usually) used with referential intentions, but differ from definites in (i.a.) not presupposing that the hearer is able to identify the referent; an antipresupposition to the effect that the hearer is *not* able to identify the referent would immediately rule out coreference with a potential antecedent, which the hearer *would* be able to identify.

Now when we turn to familiarity analyses of definiteness, we obtain a framework where an antipresupposition is not predicted but the difference in strength between (2) and (3) can be read off the content of the articles and where they are directly comparable with *another*.

## 2.2. FAMILIARITY ANALYSIS

Consider first the theory of Roberts (2003), based on ‘weak familiarity’ (the antecedent may be introduced through common-ground entailments) and ‘informational uniqueness’ (there is exactly one discourse referent known to satisfy the description). Meanings are functions from contexts to contexts, pairs of a domain (a set of discourse referents) and a satisfaction set (a set of pairs of a world and an assignment), and it is a presupposition that the domain of the context contains the index on the NP. This feature is not essential, though; (14) is a slightly adapted meaning definition for the singular definite article where coindexation is replaced by a coreference constraint:

$$(14) \quad \llbracket the_j \rrbracket = \lambda P \lambda Q \lambda C : |\{i \in \text{Dom}^C : \forall \langle w, g \rangle \in \text{Sat}^C : P_w(g(i))\}| = 1. \\ \langle \text{Dom}^C \cup \{j\}, \text{Sat}^C \cap \{\langle w, g \rangle \mid Q_w(g(j)) \text{ and} \\ g(j) = g(\iota i \{i \in \text{Dom}^C : \forall \langle w, g \rangle \in \text{Sat}^C : P_w(g(i))\}(i))\} \rangle$$

The first line, the presupposition, a definedness condition on the input context and the description, says that there is a unique discourse referent in the domain of the context for which the satisfaction set of the context entails that it satisfies the description. The second and the third line describe the output context as one whose domain contains the introduced discourse referent and whose satisfaction set (i) entails that the introduced discourse referent satisfies the predication and (ii) generally assigns the same individual to this referent as to the one and only referent entailed to satisfy the description.

A corresponding meaning definition for the indefinite article would lack the first line (the presupposition) and the third (the coreference condition), and in the second line, the condition  $P_w(g(j))$  would be added. It could safely (if redundantly) be added in the second line of (14) as well, and then we see that the ‘descriptive content’ (the specification of the output context) is properly stronger for the definite than for the indefinite, something which makes the antipresupposition principle (9) inapplicable.<sup>8</sup>

<sup>8</sup> True, the descriptive content in (14) could be simplified to  $Q_w(g(\iota i \{i \in \text{Dom}^C : \forall \langle w, g \rangle \in \text{Sat}^C : P_w(g(i))\}(i)))$ , but the point is that this is irreducible to the content of the indefinite article, so the two articles do not form a minimal pair differing only in the presupposition, as there is an essential difference also in the content.



It also becomes apparent that the field of natural competitors is wider: A corresponding meaning definition for *another* would differ from (14) in replacing = by  $\neq$ . It would differ in the presupposition as well, of course, as its resolution conditions are different from those of *the* – both slightly weaker (since there can be two or more equally salient antecedents) and slightly stronger (since the antecedent(s) should be contextually given, cf. Sect. 3.3). But importantly, there are contexts where the presupposition of *the* and that of *another* are both satisfied, and such cases will be central to our concern: to precisely predict novelty effects in connection with indefinites.

The theory of Roberts (2003) may be the most generally applicable and plausible version of familiarity, but it is cumbersome to work with. To have a more handy tool, we formulate a DRT-type analysis of the definite and the indefinite article (using the fraction notation due to Sauerland (2008) where the numerator is the presupposition and the denominator the content):

$$(15) \quad a \mapsto \lambda P \lambda Q \lambda w \frac{\quad |}{x \mid P_w(x), Q_w(x)}$$

$$(16) \quad the \mapsto \lambda P \lambda Q \lambda w \frac{z \mid P_w(z)}{x \mid P_w(x), Q_w(x), x=z}$$

Here, what corresponds to the uniqueness presupposition is built into the resolution of the presupposition:  $z$  must be mapped onto a discourse referent introduced in the context under the same or a more specific description; should there be more than one, one has to stand out as most salient.<sup>9</sup>

An analysis of *another* might look like this:<sup>10</sup>

$$(17) \quad another \mapsto \lambda P \lambda Q \lambda w \frac{z \mid P_w(z)}{x \mid P_w(x), Q_w(x), x \neq z}$$

<sup>9</sup> An anonymous reviewer has pointed out that the (quasi) determiner *the same* is in a sense the mirror image of *another*, expressing sameness in much the same way as *another* expresses difference; indeed, (16) seems a fair representation of this ‘determiner’, yet there are of course differences between *the same* and *the*. These differences are an interesting topic but will not occupy us here; let (16) stand for the meaning of the join of the two.

<sup>10</sup> We realize that the field of determiners resembling the articles closely is still wider, comprising items like *one (of the)* and *the other*, as discussed by Kamp (2001), and items like *some.SG* and *a certain*, as discussed by Farkas (2002). We do not aim at providing a full picture of the competition in this field; the reason *another* is particularly interesting here is that it is the direct expression of novelty in the relevant sense.

This abstracts away from the above-noted fact that the resolution conditions for *another* are different from those for *the*, in particular that there may be several ‘antecedents’, in which case what is expressed is difference from all.

On a familiarity analysis of definites, then, the situation looks like this: Since indefinites are weaker than definites and *another* phrases with respect to presupposition **and** with respect to descriptive content, it is undecidable whether a novelty effect, as in (3), or an infelicity effect, as in (4), is due to antipresupposition or to competition at the level of descriptive content, where quantity of information can come into play.

We are aware that this type of analysis is not optimally suited for cases where uniqueness is intrinsically given (as with functional nouns or superlatives), where there are infelicity effects in connection with indefinites. Other cases noted by Abbott (2004) as difficult for the “familiarity approach” are definites with a rich descriptive content where the referent does not seem to be familiar to the addressee or salient in the context or otherwise already accessible in the discourse. However, again, since novelty effects are what we are concerned with and novelty is only relevant in cases where a definite would have an antecedent in the form of a (weakly) familiar discourse referent, a discourse oriented analysis is what will serve our purpose best.

In the next section, we investigate and model the division of labor between *a*, *the*, and *another* at the level of descriptive content in contexts with potential co-text antecedents.

### 3. Competition at the Level of Content

On the basis of the definitions of *a*, *the*, and *another* given in (15)–(17), we can predict that in contexts where there is a most salient discourse referent *y* introduced under  $\zeta$  or a more specific description, *a*  $\zeta$  will systematically lose out to *the*  $\zeta$  or *another*  $\zeta$  on account of being underinformative – if the speaker can be assumed to know whether *x* is equal to *y* or not and this piece of information can be considered relevant. Another way of putting it is that *a*  $\zeta$  will conversationally implicate both that *x* is equal to *y* and that *x* is different from *y* – an insoluble dilemma, resulting in infelicity.

This can be modelled in strong Bidirectional OT (Blutner 1998), where a form–content pair  $\langle f, c \rangle$  is (strongly) optimal iff (signalling cost aside) for any  $\langle f', c \rangle$  or  $\langle f, c' \rangle$ ,  $P(c/\llbracket f \rrbracket) \geq P(c/\llbracket f' \rrbracket)$  and  $P(c/\llbracket f \rrbracket) \geq P(c'/\llbracket f \rrbracket)$  ( $P(c/\llbracket f \rrbracket)$  is the probability of the interpretation *c* given *f*’s literal meaning) (see also Benz and van Rooij 2007).

Thus if there is a most salient discourse referent  $y$  introduced under  $\zeta$  or a more specific description, strong BiOT predicts (assuming relevance and speaker expertise; signalling cost still aside) that  $a \zeta$  consistently loses out to *the*  $\zeta$  or *another*  $\zeta$  on the ground that it is underinformative: cf. Table I. Neither the form–content pair  $\langle a \zeta \xi, [x | \zeta(x), \xi(x), x=y] \rangle$  nor the pair  $\langle a \zeta \xi, [x | \zeta(x), \xi(x), x \neq y] \rangle$  is strongly optimal because for both second members there is another form, *the*  $\zeta \xi$  and *another*  $\zeta \xi$ , respectively, giving a higher probability for the content on the strength of its semantic meaning. Thus  $a \zeta \xi$  loses on both counts.

Table I. Probability of sameness / difference given content of *the*, *a*, *another*

$P(\cdot / [\cdot])$	$x   \zeta(x), \xi(x), x = y$	$x   \zeta(x), \xi(x), x \neq y$
<i>the</i> $\zeta \xi$	$\Rightarrow 1$	0
<i>a</i> $\zeta \xi$	$\frac{1}{2}$	$\frac{1}{2}$
<i>another</i> $\zeta \xi$	0	$\Rightarrow 1$

And to be sure, this is often what seems to happen, but in Sect. 1 above, we noted that two other outcomes are also possible:  $a \zeta$  can be felicitous, and if so, there can, but need not, be a novelty effect. The first possibility – the use of the indefinite in a context satisfying the presupposition of the definite is accompanied by a novelty implicature – is addressed in Sect. 3.3, while discussion of the second option is postponed to Sect. 4. Sects. 3.1 and 3.2 are devoted to infelicity cases, where two variants can be distinguished: the context can leave no other choice but to identify  $x$  with  $y$ , the previously introduced discourse referent, in which case the speaker is not really underinformative and we could consider reviving the notion of antipresupposition; or the context can leave it open, in which case we have, in the words of Krifka (2001: 12), a classical instance of a quantity implicature.

### 3.1. INFELICITY: SAMENESS IS GIVEN

Often, substitution of the indefinite for the definite article in a context leads to infelicity although there cannot be much or any doubt

that the discourse referent introduced should corefer with a previously introduced one.

- (18) ??Madeleine Albright ... told me that she'd met a woman and asked her if she was going to vote for me, and a woman said no, because ...
- (19) The First Lady addressed the group of girls and asked one of them to sing a song. #A girl refused.

Here it is not as if the speaker is being underinformative – all the relevant information is in the context. Due to the presupposition of the verb *refuse*, which brings about the unification of  $x$  with  $y$  on its own, (19) is even worse than (18); the speaker could omit the subject of the clause altogether and would be saying something ungrammatical, but not be underinformative. In fact, it appears to us that hearers of (19) would be likely to suspect an articulatory or acoustic error.

There seem to be two ways to interpret this situation. One is to say that the antipresupposition hypothesis, which requires that the content of the presupposing and the nonpresupposing item(s) is constant, takes effect here after all and causes infelicity because the principled difference in strength between the definite and the indefinite is annulled or obliterated here, it being clear that  $x = y$ .

However, the case resembles one like (20), where a run-of-the-mill scalar implicature is preempted in the context, causing a similar infelicity:

- (20) ??The village was totally empty, many of the inhabitants being gone.

And here, there can be no question of an antipresupposition taking effect.

The other possible way to interpret the situation under consideration, in agreement with the plausible way to interpret the situation in (20), is to say, with, e.g., Blutner (2007), that scalar implicatures are not all always computed on the spot on each occasion of use of a low-scale item but can ‘fossilize’ into an inference accompanying the item on any occasion of use, and that the indefinite is infelicitous in (19) because it is underinformative in principle if not in *casu*. In other words, a case like (19) could be viewed as a further instance of a ‘conventionalized’ conversational implicature, in the sense of Geurts and Nouwen (2007), “a pragmatic inference that has become part of the lexical content”. Recent work in this direction includes Magri (2009) (‘Blind Implicatures’) and Schlenker (2011) (‘Misleading Implicatures’).

It is not evident to us which of these two interpretations of cases like (19) is the more reasonable, or explanatory. At the present stage of our understanding of antipresupposition and of ‘conventionalized’ implicature, the question may in fact be undecidable. However, it is interesting to note that the existence of cases like (20) indicates that the boundary between antipresupposition and Quantity implicature is not as sharp as has been assumed (e.g. by Percus 2006; cf. Sect. 2): if *bona fide* low-scale items give infelicity effects in contexts which entail a high-scale item so that there is no difference in informativity in the particular case, antipresupposition effects are no different and might ultimately be derivable from Quantity as well.

### 3.2. INFELICITY: SAME OR DIFFERENT

Substitution of the indefinite for the definite article can result in a real loss of information – and in an infelicitous utterance, and it is not unnatural to attribute the infelicity in such cases to the speaker being underinformative. These are contexts where, as opposed to those considered above, it is open whether the new discourse referent should corefer with the most salient old one and where *another* is a viable option. Consider a couple of examples:

- (21) ??Vicky lives with a Spanish man and a Spanish woman. She loves a man. (adapted from Woody Allen’s *Vicky Cristina Barcelona*)
- (22) ?Richard heard the Beaux-Arts Trio with its new cellist and its new violinist last night and afterwards had a beer with a cellist. (=5)

Provided the speaker can be assumed to have sufficient relevant knowledge – and the examples suggest that she has – she should choose *the* or *another*, so the situation is that modelled in Table I above: at the level of content, the indefinite article is blocked by *the* on one side and *another* on the other.

That this is what is going on here is supported by the effect we get if we revoke the assumption that the speaker has sufficient relevant knowledge; then felicity is restored (the corresponding point was made by Heim (1991: 516) in connection with the novelty effect in (3), cf. Sects. 1.1 and 3.3):

- (23) ✓ Richard heard the Beaux-Arts Trio with its new cellist and its new violinist last night and afterwards had a beer with a cellist. He didn’t tell me who this cellist was, though.

As discussed by de Jager and van Rooij (2007), if the denotation function  $\llbracket \cdot \rrbracket$  is lifted from sets of worlds (“contents” in the BiOT setting above) to information states (sets of sets of worlds), we can effectively model speaker (in)expertise:  $a \zeta \xi$  will be initially compatible with three information states, (i)  $x \mid \zeta(x), \xi(x), x = y$ , (ii)  $x \mid \zeta(x), \xi(x), x \neq y$ , and (iii)  $x \mid \zeta(x), \xi(x), x = y$  or  $x \neq y$ ; the added assumption of an expert speaker serves to eliminate the last state, the “weak epistemic reading” (the speaker does not know whether  $x = y$  or  $x \neq y$ ), in favor of the “strong epistemic implicature”, in this case, the first or the second state (where both are blocked for  $a \zeta \xi$  by *the*  $\zeta \xi$  and *another*  $\zeta \xi$ , whose pragmatic interpretation equals their semantic meaning). Such an analysis immediately predicts that cases like (23), where inexpertise is explicitly stated, are felicitous; what cases like (22) seem to show is that expertise is the natural assumption as long as nothing is said to the contrary.

### 3.3. NOVELTY EFFECTS

There may be a most salient discourse referent introduced under a suitable description and an indefinite description can still be felicitous – and signal novelty, that is, difference from (a witness of) that salient discourse referent. This may be the case in a context where (as a mirror image of the case considered in Sect. 3.1 above) the difference is evident, or in a context where it is still open whether difference or sameness is intended; in this latter case, we may properly speak of a novelty *effect*.

In Sect. 3.1 above, we noted that when the context makes it clear that the newly introduced discourse referent should corefer with a previously introduced one, the indefinite article is blocked by the definite. One might expect this picture to be symmetric vis-à-vis *another*. However, this is not the case: it may be clear enough that  $x \neq y$ , and yet  $a \zeta$  may be okay:<sup>11</sup>

- (24) A Roxbury man has admitted to a rape that wrongfully sent a man to prison 15 years ago.

Substitution of *another* is possible here, but by no means necessary. Why?

Note, first, that indefinites are not invariably okay in contexts where it is evident that the new and the old discourse referent have disjoint reference; (25) is a case in point:

<sup>11</sup> It seems to be significant that  $y$  was introduced under a more specific description, or at least that the two descriptions are not identical (hence (24) deteriorates if the modifier *Roxbury* is left out); however, this factor will be disregarded in the following.

- (25) A young man was sent to the lake with a basket to bring water. He did not return. After a time the people, thinking he had forgotten his errand, sent a#(nother) man.

Here, the indefinite article is evidently blocked by its inability to carry an accent (or if it carries one, this creates separate problems in the context); both *sent* and *man* must be deaccented because they are given, so the second syllable of *another* is the only place for the VP to have an accent at all.

In this case, the added phonological complexity of *another* turns out to be an advantage. Generally, complexity of form is a disadvantage, though, and our answer to why *another* is unnecessary in (24) is that here, as in many other cases, this disadvantage lifts the blocking of the indefinite article – due to a conventionalized Quantity implicature – otherwise to be expected. Hence the asymmetry between *another* and *the*: while *the* is approximately as simple as *a*, *another* is considerably more complex, incurring a distinctly higher *signalling cost*. This cost, we believe, serves to deblock the indefinite article in many cases where it is (more or less) clear that  $x \neq y$ .

This is not yet a novelty effect in the strict sense, though – that requires a context leaving it relatively open whether  $x = y$  or  $x \neq y$ . Heim's (1991) example (3), repeated here as (26), is a case in point:

- (26) Richard heard the Beaux-Arts Trio last night and afterwards had a beer with a pianist.

Here, there is no bias for the difference interpretation – rather the opposite. So what distinguishes this case from the cases considered in Sect. 3.2 above, in particular, from (22), where the indefinite is blocked? To answer this, it is useful to try to substitute *another* in both cases, cf. (27) and (28):

- (27) ??Richard heard the Beaux-Arts Trio last night and afterwards had a beer with another pianist.
- (28) Richard heard the Beaux-Arts Trio with its new cellist and its new violinist last night and afterwards had a beer with another cellist.

While (28), based on the infelicitous case, is felicitous, (27), based on the novelty case, is not. This strongly suggests that (the English version of) Heim's (1991) original case, (26) (=3), is felicitous and shows a novelty effect because *another* is blocked. The reason it is blocked in (27) but not in (28) is evidently that it requires a co-textual antecedent; once there is a co-textual potential antecedent available, as in (22), we

do not get a novelty effect but rather a blocking effect for the indefinite. But if, as in (2), the definite version of (26), the resolution of the definite depends on **bridging**, *another* is blocked and *a* is deblocked. And with *another* out of the way, *a* encroaches upon its content to signal novelty, as a Quantity implicature.

Finally, we should also consider the case offered by Heim (t.a.) to illustrate “the superficial impression that indefinites . . . are governed by a novelty condition”, (29) (=1):

- (29) There were four chairs in the room. The boy sat down on a chair. Then the girl walked in and knocked a chair over.

As in (24) above, substitution of *another* is here possible but not necessary. That may be due to its signalling cost. But note that the situation changes subtly if we substitute a context where the probability that the girl knocked over the salient chair is higher (and whether she did is highly relevant):

- (30) ?There were four chairs in the room. The boy placed a crystal vase on a chair. Then the girl walked in and knocked a chair over.

This suggests that the relative probability of sameness and difference plays a decisive role. In (29) there is a certain bias for a difference interpretation, but in (30) the probabilities of difference and sameness are of the same order, and the speaker is felt to be underinformative: if she knows, as she seems to, whether the chair the girl knocked over was the same chair that the boy had placed the vase on, she should choose either *the chair* or *another chair*. The failure to do so implicates on the one hand that it was a different chair and on the other that it was the same chair, hence the (mild) infelicity (mild on account of the extra signalling cost of *another*, we may conjecture).

We can summarize the content-level competition between *the*, *a*, and *another* in the following way. If there is a most salient discourse referent *y* introduced under the same (or a more specific) description as (than) *x*, there are three cases to be distinguished:

- (i) the context makes it (relatively) clear that  $x=y$ ,
- (ii) the context makes it (relatively) clear that  $x\neq y$ ,
- (iii) the context leaves it open whether  $x=y$  or  $x\neq y$ .

In case (i), *a* is infelicitous, due to antipresupposition or a conventionalized implicature. In case (ii), *a* is felicitous, due, we hypothesize, to the added complexity of *another*. In case (iii), finally, *a* is normally (that is, if *y* has been introduced in a manner meeting the resolution



conditions of *another*) infelicitous – given relevance and speaker expertise regarding the  $=/\neq$  issue. A novelty effect in the proper sense thus emerges as an exceptional case.

In the next subsection we attempt to model this competition in a game theoretical framework.

### 3.4. MODELLING THE GAME

In the canonical version of our article game, the speaker and hearer’s shared goal – or *decision problem* in the framework of Benz and van Rooij (2007)<sup>12</sup> – is to inform the hearer about the identity of the discourse referent (same or different) having property  $\zeta$ .<sup>13</sup> This game can be straightforwardly modelled in strong BiOT or Game theory.

In the following, we make a few simplifying and standard assumptions, notably that there is a uniform distribution of “worlds” (or, alternatively, information states, as assumed by de Jager and van Rooij 2007), that is, the context does not give a bias for either sameness or difference. (As we saw above, this assumption makes a subtle, yet crucial difference for the felicity judgments of Heim’s example (29) versus (30).) – Furthermore, we assume that the hearer and speaker share all relevant knowledge about each other’s beliefs and strategies, except that the hearer does not know which world the speaker is in – the shared decision problem. As soon as we abandon these standard assumptions and try to model a wider range of *realistic* scenarios, BiOT may have to be given up in favour of the more fine-tuned algorithms provided by Game theory. However, for our current purposes, the article game finds its natural solution (equilibrium) both in BiOT and Game theory. In fact, as shown in several recent papers on formal pragmatics, the quantity implicature follows automatically from the architecture of strong BiOT and the rationality principle in game theoretical approaches – provided that the speaker can be assumed to obey the Gricean maxim of quality.

The parallel between strong BiOT and Game theoretical treatments is brought out by the following rule, Benz’ and van Rooij’s (2007) “Prag<sub>3</sub>” (in words: strengthen the interpretation of  $f$  to those worlds  $w$  in the proposition expressed by  $f$  s.t. no alternative to  $f$  makes  $w$  more probable).

$$\text{Prag}_3(f) = \{w \in \llbracket f \rrbracket \mid \forall f' \in F: P_H(w \mid \llbracket f \rrbracket) \geq P_H(w \mid \llbracket f' \rrbracket)\}$$

<sup>12</sup> The *speaker’s* decision problem is to provide an utterance which supports the hearer’s decision problem.

<sup>13</sup> As we will see in Sect. 4, article use is not always only about same versus different, hence the competition outlined below is not always relevant.

It is clear that this is a reformulation of the treatment of quantity implicatures in strong BiOT (cf. Sect. 3.0) (on the assumption made above that the hearer’s probability distribution ( $P_H$ ) is common knowledge).

In our game – as with scalar implicatures in general – higher utility thus amounts to higher probability. However, Benz and van Rooij (2007) also provide a version of their rule in more familiar Game theoretic terms, with explicit mention of the speaker’s utility function:

$$\text{Prag}_3(f) = \{w \in \llbracket f \rrbracket \mid \forall f' \in F: U_S(f, a_f, w) \geq U_S(f', a_{f'}, w)\}$$

Here  $f$  and  $f'$  are as before forms, or messages,  $a_f$  and  $a_{f'}$  are their literal meanings, and  $w$  is a world. The speaker’s utility  $U_S(f, a_f, w)$  is equal to  $U_H(a_f, w) - C(f)$ , the hearer’s utility minus the cost of sending  $f$ .  $U_H(a_f, w)$  can in turn be equated with  $P_H(w|a_f)$ .

Let us now say that there are three messages, 1, 2, and 3, corresponding to *the*  $\zeta$   $\xi$ , *another*  $\zeta$   $\xi$ , and *a*  $\zeta$   $\xi$ , with these literal meanings:

$$a_1 \ [x \mid \zeta(x), \xi(x), x=y]$$

$$a_2 \ [x \mid \zeta(x), \xi(x), x \neq y]$$

$$a_3 \ [x \mid \zeta(x), \xi(x)]$$

And let us assume a utility structure as in Table II:<sup>14</sup>

Table II. Sender’s utilities in article game (no bias, no costs)

$y \mid \zeta(y)$	$a_1$	$a_2$	$a_3$
$w_1 : x \mid \zeta(x), \xi(x), x=y$	1	0	.5
$w_2 : x \mid \zeta(x), \xi(x), x \neq y$	0	1	.5

This predicts that the indefinite article is blocked when both the definite article and *another* are viable alternatives, the situation considered in Sect. 3.2. We also observed, in Sect. 3.1, that the indefinite article is blocked when the definite article is a viable alternative but *another* is not because of a strong bias for sameness, and this is predicted as well – in both cases, the interpretation of *a*  $\zeta$   $\xi$  is effectively strengthened to the empty set of worlds. However, we observed, in Sect. 3.3, that the indefinite article is not blocked when there is a bias for difference, and

<sup>14</sup> The following is an adaptation from the treatment of *some* given by Jäger (to appear).

we conjectured that that is due to the added cost of using *another*; in other words,  $C(2)$  subtracted from the utility value for *another* and a certain fraction added to the utility value for *a* due to the bias for  $w_2$  evidently conspire to deblock the indefinite – say, if both fractions are .25; cf. Table III:

Table III. Sender’s utilities in article game (bias for  $x \neq y$ , cost for 2)

$y \mid \zeta(y)$	$a_1$	$a_2$	$a_3$
$w_1 : x \mid \zeta(x), \xi(x), x=y$	1	0	.25
$w_2 : x \mid \zeta(x), \xi(x), x \neq y$	0	.75	.75

As a result,  $a \zeta$  can be used in lieu of *another*  $\zeta$ .

#### 4. Competition at the Level of Context

So far, we have been concerned with ‘surface indefinites’, “indefinite noun phrases which do not occur in the scope of other operators” (Dekker 2004); it is to be expected that the competition with definites and *another* phrases takes different forms once ‘background’ or ‘dependent’ indefinites are taken into account, in particular, that these competitors become less competitive. And indeed, in many cases this effect is obvious, almost trivial; for example, when the indefinite is indirectly bound by a universal quantifier, as in (31):

- (31) In the night she got a bat bite. As it turned out, she was not alone: Every cat had been bit by a bat.

On the natural interpretation here, the witness of the *bat* phrase may vary with those of the *cat* phrase, which it could not if *the* were used instead of *a*; but not necessarily as strictly as would be required by *another* or *a different* (cf. Beck 2000 and Brasoveanu 2009 for accounts of this ‘determiner’); that is, when indefinites are in the scope of quantifiers, their alternatives do not exhaust the logical space, leaving room for them to fill a useful function.<sup>15</sup>

<sup>15</sup> In fact, a speaker of (31) will normally not know which relation obtains between bats and cats, or the exact pairing will not be relevant, so a (strong epistemic) quantity implicature will not arise.

Other cases where *a*  $\zeta$  is preferred over *the*  $\zeta$  or *another*  $\zeta$  even though there is a most salient discourse referent *y* in the context such that *y* is  $\zeta$  are less straightforward. In this section we will consider two more complex cases where the context places extraneous constraints on the descriptions: one involving a presupposition and the other a modal operator.

#### 4.1. PRESUPPOSED SAMENESS

A particle like *too* adds to a sentence  $\phi$  the presupposition that there is an alternative  $\alpha'$  to the ‘associate’  $\alpha$  such that  $\phi[\alpha/\alpha']$  (cf., e.g., Sæbø 2004).  $\alpha'$  is anaphoric in the sense that it must unify with a referent in the context, and if  $\phi$  contains an indefinite, this, too, is anaphoric *in the presupposition*, licensing the inference from (32) that Gianni Romme is a Dutch skater:

- (32) Janneke has the autograph of Gianni Romme. Jennifer too has the autograph of a Dutch skater, Bob de Jong.

However, as made clear by the apposition *Bob de Jong*, **in the assertion** the indefinite must be free to differ from its “counterpart” in the context, – hence (33), with a definite instead, is infelicitous.

- (33) ??Janneke has the autograph of Gianni Romme. Jennifer too has the autograph of the Dutch skater, Bob de Jong.

Conversely, *another Dutch skater*, while correct for the assertion – as shown by (34), without the additive particle – is incorrect for the presupposition, hence (35) is also infelicitous.

- (34)  $\surd$  Janneke has the autograph of Gianni Romme.  
Jennifer has the autograph of another Dutch skater, Bob de Jong.
- (35) ??Janneke has the autograph of Gianni Romme.  
Jennifer too has the autograph of another Dutch skater, Bob de Jong.

In sum, as far as the presupposition is concerned, sameness is necessary, but as far as the assertion is concerned, difference is necessary. This dilemmatic situation incapacitates *the* and *another* and deblocks the indefinite article.

## 4.2. USEFUL INDEFINITENESS

Descriptions occurring in clauses embedded by, in the sense of Asher (1987), ‘negative factive’ attitude predicates (like *surprised* or *happy*) are often indefinite even though the context would lead us to expect a definite: there is a most salient discourse referent introduced under a more specific or the same description, and it is clear that, loosely speaking, the speaker is referring to that discourse referent. There must be some gain in using the indefinite, but what?

Let us consider one example in detail. The context is John 4:7–9:<sup>16</sup>

- (36) When a Samaritan woman came to draw water, Jesus said to her, “Will you give me a drink?” (His disciples had gone into the town to buy food.) The Samaritan woman said to him, “You are a Jew and I am a Samaritan woman. How can you ask me for a drink?”

Among the 15 English translations of John 4:27 listed at <http://bible.cc>, 4 employ “the woman” and 11 employ “a woman” in the embedded clause.<sup>17</sup> These are the five most recent translations:

- (37) a. Just then his disciples returned and were surprised to find him talking with a woman.  
 b. At this point His disciples came, and they were amazed that He had been speaking with a woman,  
 c. At this point his disciples arrived, and they were amazed that he was talking to a woman.  
 d. At that time his disciples returned. They were surprised that he was talking to a woman.  
 e. And upon this came his disciples, and marvelled that he talked with the woman:

Note that *prima facie*, from a superficial point of view, the versions with the indefinite should be infelicitous: there is a most salient discourse referent  $y$  introduced under a more specific description than  $x$ , and the context neither makes it clear that  $x \neq y$  nor leaves it open whether  $x = y$  or  $x \neq y$ ; it makes it fairly clear that  $x = y$ . So why is *a woman* preferred over *the woman*?

Note, first, that the latter might suggest a contrast to another individual to whom Jesus might have talked instead, which would be misleading since the Samaritan woman was the only other individual

<sup>16</sup> New International Version 1984

<sup>17</sup> There is no definite article in the Greek original: *ethaumazon oti meta gunaikos elalei* / wondered that with woman spoke / ‘marvelled that he talked with a woman’.

present. The accent on the noun in *a woman* does indicate a contrast, but one at property level.

Next, we might speculate that the indefinite signals a shift in perspective, from the narrator's to the disciples', setting up a new, local common ground: the woman may be familiar to us but she is novel to them. As shown by (38), however, where the Samaritan woman herself is the subject of the attitude, a shift in perspective is not necessarily relevant (she is not novel to herself):

(38) She was surprised that he talked to a Samaritan.

One advantage of the indefinites in (37) seems to be to ensure that the description is interpreted *de dicto*, so that the argument proposition builds on the property expressed by the noun *woman* – it is the set of worlds  $w$  such that there is a woman in  $w$  who is talked to by Jesus in  $w$ . By contrast, the definite permits a *de re* reading where that property is in the extensional presupposition and not in the intensional descriptive content, contrary to the intuition that it is relevant for the surprise.<sup>18</sup>

However, even if the definite is (somehow) interpreted *de dicto*, it does not follow from the generalization in Sect. 3.1 (if the context makes it clear that  $x = y$ , the indefinite is infelicitous) that it outcompetes the indefinite. That generalization is based on the assumption that the definite leads to a stronger statement than the indefinite. But here, even if the 'indefinite' is a superset of the 'definite' proposition, the use of the indefinite does not in the context at issue make for a weaker statement, implicating that the use of the definite is unwarranted. Because the surprise context is, on a standard analysis of surprise predicates as offered by von Stechow 1999, (weakly, i.e., on the premiss that the agent believes the stronger proposition) downward entailing, the use of the indefinite here actually serves to strengthen the statement and implicates nothing. This, we believe, is ultimately what makes the indefinite the preferred option in (37) and many similar contexts.

## 5. Conclusions

In terms of its encoded meaning, the indefinite article provides the hearer with very little; say, a discourse referent, with a description but without any indication of whether it must or cannot corefer with another discourse referent. Observations have suggested that there is extra meaning that speakers can rely on hearers to work out on the

<sup>18</sup> For a recent survey of the state of the art regarding *de re* and *de dicto* interpretations, see von Stechow and Heim (2010).

basis of comparisons with, e.g., the definite article, and hypotheses have been suggested to predict such extra meaning. We have attempted to disentangle and test these hypotheses and to present a clarified picture.

It should be noted that the scope of our inquiry has been limited to cases where we might expect the indefinite description to display a “novelty effect”, that is to say, contexts where a discourse referent is available with which the corresponding definite description would convey coreference. Cases where intrinsic uniqueness is what makes indefinites inappropriate have thus not been central to our study, nor have cases where definites and indefinites alike (would) introduce discourse-new referents.

Theoretically, it has proven necessary to distinguish carefully between the level of presupposition and the level of content; and at the former, the notion of antipresupposition has been shown to, in all probability, play a subordinate role in the division of labor between definites and indefinites. A more prominent role is evidently played by a (conventionalized) Quantity implicature which can be modelled – in strong BiOT or in Game theory – as the solution to a probability-based interpretation optimization problem. Empirically, we have seen the need to compare indefinites not just with definites but also with a determiner encoding difference, viz., *another*.

To be sure, the picture we have drawn of the competition of determiners in the range of sameness and difference is greatly simplified; we have disregarded the adjectives *same* and *different*, indefinite determiners conveying varieties of (non)specificity, and plurals. Also, our study has been confined to English, and its transfer value to languages with richer inventories of articles is limited. Still, within these narrow confines, the study has resulted in some novel answers to the questions of when an indefinite signals novelty and how it does so.

Our chief finding is this: It is not easy to find indefinites that actually signal novelty. Cases where a definite would convey coreference but the indefinite conveys the opposite are rare, and limited to contexts which are biased toward the difference interpretation or where *another* is somehow incapacitated. In contexts with a strong bias for coreference, indefinites are awkward; in contexts with a strong bias for difference, they coexist with *another* phrases – due to the extra signalling cost incurred by the latter.

This game is overturned once more complex intrasentential contexts are taken into account – as a matter of course, many would say; yet here, too, it has proved fruitful to work out some specifics of how *a* makes a place for itself in its highly competitive environment.

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