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Depiction Verbs and the Definiteness Effect

1 Introduction

This paper is part of a longer project on the semantics of depiction verbs and their associated relational nouns. Depiction verbs include verbs for physical acts, such as ‘draw’ (with relational noun ‘drawing’), ‘sketch’, ‘caricature’, ‘sculpt’, ‘write (about)’, and verbs for mental ones, such as ‘visualize’, ‘imagine’, and ‘fantasize’. They are a type of intensional transitive verb (ITV), and the primary problem they raise is shared with other ITVs, namely, how to give a compositional semantic account of the *relational/notional* ambiguity in the verb phrases they form with quantified noun phrases (QNP’s) as complements. For instance, though ‘Guercino drew a dog’ can be understood relationally to mean that there is a particular dog he drew, there is an alternative notional reading according to which he drew a dog but maybe not any particular dog. The logical form of this reading is obscure. However, there is also a problem about depiction-verb semantics that is not shared with other ITVs: a depiction-verb phrase has a notional reading only if its noun phrase is either a bare plural or has a determiner from a restricted group.

For example, though ‘Guercino drew *a* dog’ has a notional reading, ‘Guercino drew *every* dog’ does not. In what follows I will try to explain this restriction.

2 The definiteness effect

Comparing the following two groups,

- (1) a. Agatha seeks exactly two Pharaohs’ tombs
- b. Agatha seeks another Pharaoh’s tomb
- c. Agatha seeks every Pharaoh’s tomb

- (2) a. Agatha sketched exactly two Pharaohs’ tombs
- b. Agatha sketched another Pharaoh’s tomb
- c. Agatha sketched every Pharaoh’s tomb

we see that all the cases in (1) have non-generic notional readings: each statement may sensibly be provided with the coda ‘but no particular one(s)’. By contrast, (2c) can only be understood as saying that, for each Pharaoh’s tomb, Agatha sketched it. Synonymy with an explicitly wide-scope or relational formulation is also inevitable with certain other determiners in place of ‘every’ in (2c): ‘most’, ‘neither’, ‘the’, and so on.¹

What explains the absence of notional interpretations of depiction verb

¹ The domain quantified over with, e.g., ‘every’, does not have to be the domain of real *individuals* of the relevant sort. There is some doubt about whether both angels in Verrocchio’s *Baptism of Christ* were painted by Verrocchio, or whether one was by Leonardo. ‘Verrocchio painted every angel’, in the context of a dispute about attribution, means that every angel-figure in the painting was done by Verrocchio. Another kind of case is ‘Verrocchio painted every angel praying’, which in its most likely reading has a quantifier that is again over angel-figures in the painting, which does not prevent the reading being relational. A third kind of case arises when Audubon prepares a field guide to birds: he may be said to *draw every bird*. Here the relational quantifier is over *kinds* of bird.

phrases with these QNP's? There is a striking match between the determiners that force relational readings of depiction VP's and those that do not occur naturally in the "existential" contexts like 'there is/are' and 'there must be':

- (3) a. There are exactly two Pharaohs buried here
 b. There is no Pharaoh buried here
 c. There are more male than female Pharaohs buried here
 d. *There is every Pharaoh buried here²
 e. *There are most Pharaohs buried here
 f. *There is some but not every Pharaoh buried here.

So one way of accounting for the contrast between (1) and (2) would be to use the explanation of the "definiteness effect" exhibited in (3) as a pointer.

A persistent idea, going back to (Milwark 1977), is that the determiners which are natural in existential contexts are in some sense not really quantificational. For instance, Reuland and ter Meulen (1987:14) contrast NP's which are used to "modify" the conversational domain – these are non-quantificational – from those whose meanings may be defined as generalized quantifiers over the current conversational domain. The indefinite NP 'a Pharaoh' is a non-quantificational domain-modifier – 'a Pharaoh is buried here' adds to the conversational domain – while the universal 'every Pharaoh' is simply quantificational. It is claimed that only non-quantificational NP's are natural in existential contexts.

However, accounts which focus on discourse-related features are *prima facie*

²There is a special "list" usage that allows 'every', 'the' and (perhaps) 'most' to occur with 'there is' (Milwark 1977:n.1), as in 'Who is buried here? – There is every Pharaoh, every Pharaoh's mother...'; and there is the idiomatic exception 'there is every reason to believe'.

extensionally incorrect. Right-downward entailing (RDE) determiners such as ‘no’, ‘at most three’ and ‘few’ pattern with existential determiners as regards acceptability in existential contexts – see (3b) – but are not used to modify the conversational domain in any interesting sense.³ For example, in terms of “file-change semantics” (Heim 1983), an assertion of ‘a Pharaoh is buried here’ will start a new file, whereas ‘no Pharaoh is buried here’ will simply update the contents of existing files on Pharaohs.⁴

Avoiding this objection requires adoption of a *decomposition* of ‘no’, on which, for example, (3b) would become ‘not: there is at least one Pharaoh is buried here’ (see McNally 1997:102–3, 106–7). This allows us to explain the acceptability of ‘no’ with ‘there is’ on the grounds that it is really the non-quantificational ‘at least one’ that is in the scope of ‘there is’. However, we must then be willing to swallow an extension of the decomposition strategy to other RDE determiners, say:

- (4) a. There must be few Pharaohs buried here
 b. There must not be more than few Pharaohs buried here
 c. There must not be more than roughly n Pharaohs buried here.

Here ‘must’ expresses epistemic necessity. (4b) and (4c) explain the acceptability of ‘few’ with ‘there is’ on the grounds that it is really the non-quantificational

³ \exists is RDE iff ‘ $\exists A$ are B’ and ‘all C are B’ entail ‘ $\exists A$ are C’.

⁴ However, in (Kamp and Reyle 1993:333, 458–61) RDE determiners are treated as domain modifiers: they introduce a discourse referent that is neutral between being an individual and being a set, and a cardinality condition is placed on this discourse referent. This seems to me to be an unintuitive extension of the notion of discourse referent, violating such characteristics as anaphora-support: ‘There are no/few/at most two Pharaohs buried here, because they couldn’t afford a Pyramid’ is unsuccessful, though a pronoun of laziness standing for ‘Pharaohs’ is acceptable: ‘...because they preferred to be inside a Pyramid.’

‘more than few/more than roughly n ’ that occurs in the scope of ‘there is’ (the value of n presumably given by the subject-matter): we would have ‘ $\square[\neg[[\text{there are}] \text{ more than few/more than roughly } n \text{ Pharaohs buried here}]]$ ’. But it stretches credibility that the semantics of (4a) involves such double negations. Both (4b) and (4c) seem to move from the less to the more complex, and (4c) raises new problems about what is required for successful communication and about the sense in which speakers *intend* a specific value of n . Moreover, decomposition of a determiner should surely be a systematic strategy, not an *ad hoc* one. But there is a good argument that it fails for ‘no more than n ’ in some cases, so could not be used in a systematic way for, say, ‘there must be no more than three Pharaohs buried here’ (see the ‘Literary Example’ in Richard 2002:113–4).

A better way of delineating the determiners that are acceptable in existential contexts, due to Keenan (1987, 2001), is as follows.⁵ We regard monadic determiners as functions which take a single set as input and output a function from sets to truth-values. Schematically, we write $\mathfrak{D}AB$, where A is input to \mathfrak{D} and B is input to $\mathfrak{D}A$. Equivalently, \mathfrak{D} is a relation between the sets A and B , and we have such definitions as $\text{EVERY}(A)(B)$ iff $A \subseteq B$, $\text{NO}(A)(B)$ iff $A \subseteq \bar{B}$, and so on. We call A the *restriction set* and B the *predicate set*. The main concepts are:

- (5) a. \mathfrak{D} is *conservative* iff whenever $A \cap B = A \cap C$, $\mathfrak{D}AB = \mathfrak{D}AC$
 b. \mathfrak{D} is *co-conservative* iff whenever $A \cap C = B \cap C$, $\mathfrak{D}AC = \mathfrak{D}BC$
 c. \mathfrak{D} is *intersective* iff whenever $A \cap B = E \cap F$, $\mathfrak{D}AB = \mathfrak{D}EF$

⁵I follow the terminology and definitions of (Keenan 2001).

- d. \exists is *co-intersective* iff whenever $A \cap \bar{B} = E \cap \bar{F}$, $\exists AB = \exists EF$
- e. \exists is *cardinal* iff whenever $|A \cap B| = |E \cap F|$, $\exists AB = \exists EF$.

These definitions give what Keenan calls ‘invariance conditions’, from which the more usual linguistic criteria follow. For instance, according to (5a), \exists is conservative iff (the truth-value of) $\exists AB$ remains the same under all changes to the predicate set that preserve its intersection with the restriction set. Hence the set-theoretic difference between B and $A \cap B$ is semantically inert. So we arrive at the standard linguistic criterion for conservativity, that \exists is conservative iff (necessarily) “ \exists A’s are B” has the same truth-value as “ \exists A’s are A’s that are B”, for every A and B . Thus the restriction set contains all domain elements relevant to evaluation of the sentence (if not, putting the narrower “A’s that are B” for ‘B’ should affect truth-value in some cases). Though it is easy to invent non-conservative determiners (see Larson and Segal 1995:300), it seems that extensional determiners that occur in natural languages are conservative.⁶

Similarly, according to (5c), \exists is intersective iff $\exists AB$ remains the same under all changes to predicate *and* restriction set that preserve their intersection $A \cap B$. And \exists is co-intersective iff the same condition is met by changes that preserve $A \cap \bar{B}$. Intersective determiners are known as ‘generalized existential’ determiners (despite including ‘no’) since the paradigm is ‘at least one’, and co-intersective de-

⁶ \exists is *extensional in restrictive position* iff $x = y$ implies $\exists xB = \exists yB$ and *extensional in predicative position* iff $x = y$ implies $\exists Ax = \exists Ay$; \exists is *extensional* iff \exists is extensional in both positions. (Lappin 2000 presents an appealing unitary treatment of *few* and *many* as intensional determiners that subsumes various extensional accounts of them that have been proposed. On Lappin’s semantics, *few* and *many* are not conservative.)

terminers are known as ‘generalized universal’, since the paradigm is ‘all’.

The determiners which occur naturally in existential contexts are the intersective determiners.⁷ And it is not difficult to see that, if all determiners are conservative, then the intersective and co-conservative determiners are the same. We have also seen that for conservative determiners, the restriction set contains all domain elements relevant to evaluation of the sentence. Correspondingly, for co-conservative determiners, the predicate set contains all such elements, since the difference between restriction sets that agree on intersection with a fixed predicate set has no semantic import. When the restriction set or the predicate set contains all the elements relevant to evaluation of sentences $\exists_{\mathfrak{D}}AB$ with determiners of a given sort, Keenan calls it a *conservativity* domain for those sentences. So for co-conservative determiners, the predicate set is the conservativity domain.

3 Why some determiners exclude notional readings

From the foregoing, it is apparent that the empirical generalizations that are of interest to us are that, for any depiction verb v ,

- (α) If \mathfrak{D} is a determiner such that for sentences $\exists_{\mathfrak{D}}AB$, \mathfrak{B} is a conservativity domain, then a verb-phrase of the form $v \exists_{\mathfrak{D}}A$ will permit a notional reading.
- (β) If $\exists_{\mathfrak{D}}AB$ is such that \mathfrak{B} is not a conservativity domain, $v \exists_{\mathfrak{D}}A$ will not permit a notional reading.

⁷ In (1)–(3), the intersective determiners are all cardinal as well, but Keenan argues that there are intersective non-cardinal determiners in natural language, such as ‘several...besides John’. Since these occur naturally in existential sentences, the characterization of the target group of determiners needs the more general notion of intersectivity

Since intensional transitives generally allow notional readings, it is the failure of the determiners mentioned in (β) to permit a notional reading that needs to be explained.

The explanation has to do with the way in which notional descriptions of depictions are evaluated, and is best presented in terms of a contrast with cases where there is no restriction on the determiners that permit notional readings. Why, for instance, does (1c), “Agatha seeks every Pharaoh’s tomb”, have a notional reading? The answer is that a notionally interpreted objectual attitude ascription made with a search verb will be true iff there is an appropriate *general* proposition that specifies the content of the intention governing the relevant search. For (1c), the truth of the notional reading requires Agatha to have an intention whose content she could express by “I find every Pharaoh’s tomb”. There is of course no obstacle to her having such an intention; so the use of the co-intersective ‘every’ is entirely compatible with our conception of what the truth of a notional reading would require.

In other words, because “I find every Pharaoh’s tomb” is just as suited as “I find exactly two Pharaohs’ tombs” for stating the content of an agent’s intention that might govern a search, it follows that ‘every’ is just as suited as ‘exactly two’ for notional readings of search-verb phrases. The same goes for a proportionality determiner such as ‘most’. Agatha may know how many Pharaohs there were, so she can be the agent of a search governed by the intention “I find most Pharaohs’ tombs” even though she has no attitudes towards particular Pharaohs’ tombs.

By contrast, in depiction-verb phrases, the use of co-intersective or proportionality determiners introduces conditions on evaluation of depiction-descriptions that *do* conflict with our conception of what the truth of notional readings of depiction-descriptions requires. For any depicted scene, we can make a *neutral inventory* of the items depicted in it. The inventory is neutral in the sense that it does not prejudge whether or not a figure represents a specific item of the type portrayed. So in the case of *The Aldrovandi Dog*, the inventory would list, among others things, a dog, a castle, a tower, several trees, and so on, without any implication that the figures portray a real dog, castle, tower, or trees. The idea is that the inventory can be made on the basis of inspection of the picture by someone who has the relevant recognitional capacities for the types of thing depicted, but who need not have any particular capacity to recognize specific objects.

Notionally interpreted, depiction-descriptions such as

- (6) a. Guercino drew a dog
- b. Verrocchio painted two angels

are true only if a dog and two angels are mentioned in the respective neutral inventories of the works (or range of works) under discussion.⁸ Other notionally interpreted depiction-descriptions would be justified if they are consequences of the inventory, perhaps ‘Verrocchio painted a few angels’, or, in conjunction with

⁸ One reason for ‘only if’ rather than ‘if and only if’ is given in note 1: two angels are mentioned in the inventory for *The Baptism of Christ* but Verrocchio may not have painted one of them. Another reason is for compatibility with both weaker (‘not necessarily a particular one’) and stronger (‘no particular one’) construals of ‘notional reading’.

orthodox views about the size of the angel-cohort attending the baptism of Christ, ‘Verrocchio painted few angels’.⁹

Intersective determiners can be used in making a neutral inventory of a scene because of their conservativity-domain property. Since ‘several’, for example, is intersective, ‘several trees are in the scene’ has *things in the scene* as a conservativity domain. ‘Things in the scene’ is itself ambiguous between ‘items reproduced in the scene’ and ‘figures positioned in the scene’. It is the second sense that is relevant to neutral inventories. So the figures positioned in the scene can constitute the relevant domain for evaluation of a depiction description. And we can say that several trees are in this domain.

In this context, ‘tree’ takes tree-figures positioned in the scene as its extension, not real trees. This is not to say that ‘tree’ changes its meaning, though it is a good question how it retains literal meaning in this use. Perhaps, as is argued in (Walton 1973), it is because of the implicit presence of an ‘it is make-believedly the case’ operator; or perhaps (Wolterstorff 1980) it is because ‘tree’ occurs as part of the state-of-affairs description that specifies the state of affairs “introduced” by the picturing; or perhaps it is because of a pragmatically licensed operation on “tree”’s extension (Partee 2003). But whatever the correct account, the occurrence of the phenomenon (of applicability to figures) with intersective determiners can hardly be denied.

On the other hand, if \exists does not have the conservativity domain of figures po-

⁹ I think of inventories as listings of what is in the picture. So we need a notion of inventory-completeness to explain the notional truth of ‘Verrocchio painted few angels’.

sitioned in the scene, \exists cannot be used in making a neutral inventory of a scene. This is borne out by such cases as ‘every tree, but no particular one, is in the scene’, which makes little sense (except perhaps in the Audubon context of note 1). Since ‘every’ is co-conservative, as defined in (5c), the items relevant to evaluation of ‘every_{(A)(B)}’ are just those that lie in $A \cap \bar{B}$. That is, evaluation of ‘Every tree is in the scene’ requires consideration of whether any of the things that are *not* in the scene are trees. This evaluation requirement automatically imposes on ‘tree’ a semantic value that can accept, or be satisfied by, trees not in the scene. These will be the trees in some domain given by the conversational context; for instance, if it is *The Aldrovandi Dog* that is under discussion, the domain may be that of things on Aldrovandi’s estate, and every such tree could well be in the scene. Whatever the domain is, evaluating whether or not all trees in it are in the scene is no part of a *neutral* inventory of *The Aldrovandi Dog*.

Similarly, with proportionality determiners like ‘most’, $A \cap B$ has to be compared with $A \cap \bar{B}$. The restriction set must be the same in both terms of the comparison, so ‘tree’ has to have the same semantic value. Since one of the terms is $A \cap \bar{B}$, this means, according to our discussion of ‘every’, that the semantic value is one that can accept, or be satisfied by, trees not in the scene.

In sum, a notionally interpreted depiction-verb phrase $v \exists A$ holds of an artist when a neutral inventory of the relevant work(s) of art includes $\exists A$. But if \exists is non-intersective, $\exists A$ cannot be a QNP in any neutral inventory (contrast search-governing intentions, where there is no analogous restriction). However, as it stands, this

guarantees merely that, say,

(7) Guercino painted every tree.

cannot be true. So we have not told the whole story, for this result is compatible with the “notional reading” of (7) being necessarily false. Something more is needed to explain why there *is* no notional reading of (7).

There are various reasons why a QNP might be absent from every neutral inventory of every work of art. It may be a necessary truth that finitely many paintings of finite size cannot, even cumulatively, depict uncountably many trees. So ‘Guercino painted uncountably many trees’ will be false in every physically possible world, and arguably in an even wider range of worlds. Hence in some robust sense, ‘uncountably many trees’ is guaranteed to be absent from neutral inventories. However, our cases are ones where *the semantics of the determiner* guarantees the absence of the QNP in neutral inventories, even inventories carried out with respect to *impossible* scenarios. These special grounds make a difference: ‘uncountably many trees are in the scene’ can be understood neutrally, ‘every tree is in the scene’ cannot be, for the reasons we have given. So we can say that the absence of a notional reading of (7) is explained by the fact that absence of a neutral reading of ‘every tree is in the scene’ is demanded by the meaning of ‘every’.

This still falls short of an account of the *mechanics* of (7)’s failure to express something notional. One possibility is that in a type-theoretic representation of (7)’s meaning, there is a function which take the meanings of intensional transi-

tives as arguments, and this function is undefined when the *rrv* argument is a depiction verb. But that is a stipulation about the function. So the non-existent readings fail to be generated by *fiat*.

An alternative is to arrange the parsing of (7) so that the mapping from its syntactic structure to its semantic analysis does not produce anything with the same form as notional readings that do exist. From a syntactic perspective, obligatory raising is the default treatment of *QNP* complements of transitive verbs, and intensional transitives are the special case, allowing *in situ* interpretation. But even from this perspective, it still has to be explained why, in the case of depiction verbs, the option of ignoring the default is available *only* to complement *QNP*'s with intersective determiners. The semantic account of *truthmakers* offered here can fill this explanatory *lacuna*. But some element of stipulation in the syntax still looks unavoidable.¹⁰

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