

OF CONTRADICTIONS AND TAUTOLOGIES

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According to one standard semantic definition of a contradiction, a sentence is a contradiction if (and only if) it is false in every model, whereas a sentence is a tautology if (and only if) it is true in every model. This dissertation explores three reinterpretations of these definitions, each of which seeks to extend the coverage of these definitions to new phenomena in natural language. The first reinterpretation excludes all models in which a term is undefined, and is used to classify certain Existential There Sentences as either contradictions or tautologies. The second reinterpretation excludes the very few models in which a sentence whose subject is a *but*-phrase that is headed by a non-universal determiner is true. The final reinterpretation requires that we shift our focus from models, to the more inclusive concept of an interpretation, and classifies a sentence whose meaning is compatible with only one interpretation that is always false as a contradiction. An example of this strategy is any statement of support for the position that all quantification is restricted in natural language, e.g. *I am not quantifying over everything*. The dominant focus of these reinterpretations has been the behaviour of the data in the sanctioned models (or interpretations). A strategy, I will argue, that does not yield nearly as much insight into the semantic properties of natural language as a close study of these constructions in the excluded models (or interpretations). The topics covered include the odd truth value assignment to Existential There Sentences in which a term is undefined, the influence of Grice's maxims of conversation on the distribution of DPs in *but*-phrases,

and the possibly related phenomenon of sentences in which the subject is modified by a sentence initial *only*, and finally, the impossibility of expressing the content of the view that all quantification is restricted in natural language.

BIOGRAPHICAL SKETCH

Louise Madeleine Vigeant has a BA in philosophy from the University of Ottawa, Canada, a MA in linguistics from Stanford University, USA, and a MA in philosophy from Carleton University, Canada.

Dedicated to my parents, Patricia and Claude Vigeant.

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Chapter One: Introduction

*...the declared meaning of a spoken sentence is only its overcoat,
... the real meaning lies underneath its scarves and buttons.*

Peter Carey, Oscar and Lucinda

0. Of Contradictions and Tautologies

As intuitively obvious as the notion of a *contradiction* may appear, there is no commonly agreed upon definition. Of the many possibilities, there are two common, but competing definitions.¹ The first is semantic in nature since it defines a contradiction in terms of the semantic notions of truth and falsity. Although there is a wide range of possible wordings, one that appears to be the popular with many formal semanticists and philosophers is one that makes reference to models:

¹ Two other plausible, but uncommon possibilities are the metaphysical and pragmatic definitions. Aristotle provides the best known example of a metaphysical definition in his discussion of the Law of Non-Contradiction:

Evidently then such a principle is the most certain of all; which principle this is, let us proceed to say. It is, that the same attribute cannot at the same time belong and not belong to the same subject and in the same respect...

Aristotle, *Metaphysics Γ* (c. 350 BC), 1011^b13-14 in Grim, 2004; 48-49

The other possibility, pragmatic, defines a contradiction as a sentence that is simultaneously asserted and denied by the speaker. The first definition has the obvious drawback of being obscure. It is far from clear what it is for a property to 'belong' to a subject. The other appears to equivocate between a sentence being negated and a sentence being denied. The problem with this equivocation, as first observed by Ayer (1952) and later reiterated in Horn (1989), is that the status of certain sentences as negative does not seem to rely on whether they have been uttered and hence, denied. Likewise, the status of certain statements as contradictions does not appear to rely on whether they have been uttered, and hence asserted and denied. Given these difficulties, the lack of interest in these alternatives is not surprising.

1. A sentence is a contradiction if (and only if) it is false in every model.²

The other widely used definition is one that focuses on the form of the sentence and hence is formal in nature.³ This approach, which is especially popular within the confines of logic, defines a contradiction as the conjunction of a statement and its negation:

2. $\Phi \wedge \neg\Phi$

As appealing as the formal definition of a contradiction may be in virtue of its simplicity, the semantic definition has many advantages. First, the semantic definition subsumes the formal definition. Every sentence that meets the formal definition of a contradiction will also meet the semantic definition, whereas the converse is not true. Second, the semantic definition covers more data. Although (3) does not meet the formal definition, it appears to be as contradictory as (4), which does meet this definition:

3. Paris is not Paris.
4. Paris is in France and Paris is not in France.

Finally, unlike the formal definition, the semantic definition of a contradiction has a natural counterpart for the related category of a *tautology*⁴:

² There is some controversy about whether it is a sentence or a proposition that is the bearer of truth. Although I use the term *sentence* throughout the introduction, nothing stated here is inconsistent with the possibility that propositions are the bearers of truth. The use of *sentence* is not intended to prejudge this question.

³ The formal definition may also be referred to as the *syntactic definition*. But as Brian Weatherston (p.c.) has pointed out to me, this secondary name is somewhat misleading. The semantic definition also incorporates notions that are syntactic in nature, making it difficult to distinguish between these two definitions in virtue of their names alone. Although the term *formal* is also prone to this problem, I will continue to use it because it is the better of the two choices.

⁴ The natural counterpart of the formal definition of a contradiction would be a definition that defines a tautology as: $\Phi \vee \neg\Phi$. To my knowledge, no one has ever advocated this as a definition of a tautology in natural language.

5. A sentence is a tautology if (and only if) it is true in every model.

Thus, it is the semantic definitions of both a contradiction and a tautology that will be used in this dissertation.

Although less restrictive than its formal counterpart, the semantic definitions of contradictions and tautologies have nevertheless not satisfied many researchers. They have been subject to a variety of reinterpretations in an effort to expand their reach to cover more data in natural language. The easiest manner in which to achieve this goal is to restrict the domain of quantification associated with *every model*. Three of these interpretative strategies will play a central role in this dissertation.

The first, and by far most popular, excludes any model from consideration in which a constituent of the given sentence is undefined. An excellent example of this approach can be found in Barwise and Cooper's well-known test for classifying a determiner as either *strong* or *weak*:

To classify a determiner D as (1) positive strong, (2) negative strong or (3) weak, you form a simple sentence of the form

D N is a N/are Ns

And see if it is judged (1) automatically valid, (2) **contradictory** or (3) contingent on the interpretation. For example, every gnu is a gnu is true in every model, **neither gnu is a gnu is false in every model in which it is defined** and many gnus are gnus will be true just in case there are many gnus. These judgments classify every, neither and many as positive strong, negative strong and weak, respectively.⁵

According to Barwise and Cooper, *neither gnu* is only defined in a model where there are

⁵ Barwise and Cooper, 1981; 182: emphasis added

exactly two gnus. Thus, this sentence is only a contradiction if we limit our attention to models with exactly two gnus.

The second, and by far, most experimental reinterpretation of the semantic definition of a contradiction is found in von Stechow's (1997) discussion of *but*-phrases. He notes that *but*-phrases headed by determiners that are not universal in force are false in almost all models. As sentences that are so rarely true, and thus essentially contradictory, they may have been rendered unacceptable, perhaps via a process of grammaticalization. Thus, in this case, the (few) models that are excluded from the discussion are those in which the sentence is true.

Finally, at the most extreme end of the spectrum, is an reinterpretation that excludes all models, or in this case, excludes all interpretations,⁶ that are not compatible with the intended meaning of a sentence – a meaning that is, incidentally, false under its sole interpretation. Williamson (2003) provides an example of this approach:

6. I am not quantifying over everything.

If (6) is uttered by an individual that rejects the possibility of unrestricted quantification, then it appears that this statement can only be true if the speaker assumes the very thing she is denying – unrestricted quantification. The simultaneous commitment to and rejection of the same belief allows us to derive the following contradiction from an utterance of (6):

7. I am not quantifying over everything and I am quantifying over everything.

⁶ Because models are only compatible with a restricted domain of quantification, it is necessary to substitute the broader concept of an *interpretation* in this part of the discussion in order to avoid prejudging the question of whether unrestricted quantification is possible.

As a result, according to Williamson, any utterance of (6) must be false because the speaker is actually quantifying over everything. Thus, this sentence is a contradiction because it is false under the only interpretation that is compatible with its intended meaning.

With each reinterpretation of the semantic definition of a contradiction or a tautology, the focus of attention is always on the behaviour of the given phenomenon within the sanctioned models. This is unfortunate. On closer inspection, it is often on the fringes, i.e. within those models that are excluded, that these phenomena yield their most intriguing insights into the semantic properties of language. This dissertation will attempt to take advantage of this observation by focusing on the behaviour of these phenomena in those models (or more broadly, under those interpretations) that have been discarded.

Each chapter will introduce a phenomenon (or as is the case in chapter three, phenomena) and the attending semantic definition of either a contradiction or tautology that is adopted. The phenomena are as follows. In chapter two, the focus of attention is on the distribution of DPs in Existential There Sentences. In chapter three, it is the distribution of DPs in *but*-phrases and *only*-initial sentences. Finally, chapter four will explore the problem of unrestricted quantification, with a particular focus on the question of whether it is possible to express a commitment to restricted quantification in natural language.

In each of these cases, either the phenomenon itself or a certain subset of the phenomenon has been classified as a contradiction or a tautology under one of the three aforementioned reinterpretations of the semantic definitions of a contradiction or a tautology. I will focus particular attention on the behaviour of each of these respective phenomena in relation to the excluded models (or as is necessary in the case of the final chapter, excluded interpretations). Some of the topics that will be discussed include the odd truth values assigned to Existential There Sentences in which a constituent is

undefined; the possible influence that persistent violations of Grice's maxims of conversations may have on the acceptability of certain sentences; and finally, the impossibility of actually expressing the content of the position of restricted quantification. As even this brief survey hopefully demonstrates, this strategy has the potential to lead to some very exciting conclusions about the properties of natural language.

Below, I provide a more detailed introduction to each chapter of this dissertation.

1. Chapter Two – Keenan's Definition

Chapter two of this dissertation focuses on a well-known problem: the distribution of determiners in Existential There Sentences. These are characterized by the following division in their acceptability:

8. There are some/many/few/no/two children in the garden.
9. ??There is every/each/the/that/ChiSook's child in the garden.
10. ??There are most children in the garden.

Existential There Sentences that contain determiners in the first class, i.e. the weak determiners of Barwise and Cooper, are acceptable while those in the second class, i.e. the strong determiners, are not. Complicating the data is the fact that certain examples containing strong determiners, e.g. *every*, *each*, *that* and *the*, are acceptable within specific constructions such as superlatives or as part of a list. These distributional facts lead to two natural questions: first, what is the relation of the exceptions to the core data, and second, why are some of these sentences unacceptable.

My response to these two questions draws heavily on the work of Keenan (2003). I argue that DPs in the subject position of an acceptable sentence must meet one of the

two following conditions: 1) be headed by a determiner that has the property of being conservative₂, as defined by Keenan, or 2) be incompatible with a denotation of type $\langle\langle et \rangle, t \rangle$, i.e. do not denote a set of sets. DPs that characterize the core data generally fulfill the first condition, whereas the DPs of the exceptional data generally fulfill the second. DPs in unacceptable sentences fail to meet either condition, i.e. they contain a DP that is not headed by a determiner that is conservative₂ and they have a denotation of type $\langle\langle et \rangle, t \rangle$. With the full generality of Keenan's definition restored, a remarkable pattern among these sentences emerges: they are true even in those models that are excluded from the discussion because the DP in the post-copular subject position is undefined, i.e. denotes the empty set. The behaviour of these sentences in these formerly excluded models is odd; other examples of sentences that contain similarly undefined DPs are either judged false or to lack a truth value. This result suggests that the unacceptability of at least some ETS may be due to this anomalous truth value assignment.

2. Chapter Three – *But*, *Only* and Grice's Maxims of Conversation

The third chapter focuses on two different phenomena: sentences in which the subject is an exception phrase that contain the term *but* and what I term *only*-initial sentences. *But*-phrases have two very interesting distributional requirements. The first is that the initial DP of these phrases must be headed by a universal determiner:

11. Every/No student but ChiSook.
12. *Some/Many/Most/Few students but ChiSook and John

Additionally, the complement DP is limited to proper names, indefinite descriptions,

definite descriptions and certain cardinals.

A similar observation has been made in relation to *only*-initial sentences (see von Stechow 2000 and Moltmann 1995). The subject of these sentences is usually limited to DPs that are proper names, indefinite descriptions, definite descriptions and certain cardinals. In rare cases, a DP that is of type $\langle\langle et \rangle, t \rangle$ is permitted, but this requires the presence of an overtly contrasting DP of the same type:

13. Does **every** student smoke?
14. ?Only many/most/few students smoke.

There are consequently some important points of contact between these two constructions: a shared preference for proper names, indefinite descriptions, definite descriptions and certain cardinals in certain positions and an idiosyncratic restriction on the distribution of DPs of type $\langle\langle et \rangle, t \rangle$.

The task of explaining the nature of these restrictions is broken into two separate problems. The first is the obvious preference for DPs that are proper names, indefinite descriptions, definite descriptions and certain cardinals. What all of these categories of expressions share in common is an extreme flexibility in the type assignment of their denotation. Each is compatible with a denotation that is of type $\langle e \rangle$, i.e. an individual, type $\langle et \rangle$, i.e. a set, and type $\langle\langle et \rangle, t \rangle$, i.e. a set of sets. In the case of *but*, this flexibility is required because *but* is only compatible with DPs that have a denotation of type $\langle et \rangle$ and type $\langle\langle et \rangle, t \rangle$. *Only*, in contrast, generally requires a complement whose denotation is either of type $\langle e \rangle$ or type $\langle et \rangle$ in an *only*-initial sentence. The perceived similarity in the distribution of these expressions is thus the result of a much more general property that each of these expressions share: type flexibility.

The second part of the chapter focuses on the odd distributional pattern of DPs of

type $\langle\langle et \rangle, t \rangle$ in these two constructions. In the case of *but*-phrases, the distribution pattern that requires an explanation is the constraint on the head of the first DP to a determiner that is universal in force. For *only*-initial sentences, DPs of type $\langle\langle et \rangle, t \rangle$ are only licit if they are explicitly contrasted with another DP of this type. The unacceptable examples of each of these phenomena share an important property: they are false in many, but not all models. This fact has led von Stechow to suggest that, at least in the case of *but*-phrases, it may be this ‘contradictory’ status that is at the heart of their unacceptability. I argue that this focus on the models in which these sentences are false is misplaced; it is the behaviour of these sentences in the models in which they are true that is by far more important. Sentences in which the subject is an ill-formed *but*-phrase are only true under very specific conditions: models in which there are at least two individuals and the sole exception is the individual that is the denotation of the direct argument of *but*. In other words, these sentences are only true in those models in which a similar sentence with a *but*-phrase headed by a positive universal determiner in subject position would also be true. This suggests that the unacceptability of these sentences may be due to a violation of Grice’s maxims of conversation: Quantity. The maxim of Quantity requires that a speaker should be neither more nor less informative than the occasion demands. Any attempt to use a sentence in which the subject is an ill-formed *but*-phrase violates this maxim as another, more informative formulation of the sentence always exists, viz. one in which the subject is replaced by a *but*-phrase that is headed by a positive universal determiner. The only other option for the speaker is to use these sentences to utter something that is false – a strategy that would violate another maxim of Grice: Quality. Thus, **any** attempt to use a sentence in which the subject is an ill-formed *but*-phrase appears to result in a violation of at least one of Grice’s maxims.

Although interesting, a violation of one of Grice’s maxims of conversation does not generally result in an utterance being judged unacceptable. There is, consequently, an open question about whether such violations could really affect the distribution of DPs in

a construction. I turn to a similar phenomena to provide more evidence that this is indeed the case: the distribution of DPs of type $\langle\langle et \rangle, t \rangle$ in *only*-initial sentences. For one particular use of *only*-initial sentences, the context is unable to provide a clear set of alternatives for interpretation. This results in an utterance whose truth value cannot be easily assessed, making it very difficult for the speaker to observe the conversational maxim of Quality, i.e. to try and say only what you know to be true. The resulting failure of this maxim, and the attending unacceptability of *only*-initial sentences in which the DP has a base denotation of type $\langle\langle et \rangle, t \rangle$, suggests that once again, a violation of Grice's maxims of conversation may be responsible for the observed distribution of data. Although *only*-initial sentences offer some intriguing evidence of the role that Grice's maxims may play in explaining the unacceptability of certain utterances, this explanation is incomplete. An answer to the question of why consistent violations result in unacceptability, while occasional violations only result in an utterance that is stylistically marked is still needed.

3. Chapter Four: Silent Opposition

Williamson (2003) claims that those that reject unrestricted quantification, or as he calls them, the *generality relativists*, are unable to state their position without assuming unrestricted quantification. To prove his point, he derives a contradiction from a statement of their position, (6) repeated below for convenience,

15. I am not quantifying over everything.

standard truth conditions and logical rules. In order to generate a contradiction from (15), the domain of quantification associated with *everything* must be completely unrestricted. Williamson assumes that he can guarantee this interpretation on the basis of the speaker's

intentions alone – an assumption that I argue is unwarranted. With no manner in which to guarantee the needed domain of quantification, it is no longer possible to guarantee that (15) is false. Thus, (15) can not be classified as a contradiction under Williamson’s reinterpretation of the semantic definition of this concept and is no longer a *prima facie* threat to the coherency of the generality relativist’s position.

Although the generality relativist is no longer threatened by the possibility of a contradiction, the statement of her position is still rife with problems. If she is to maintain her commitment to restricted quantification, then she can never express the content of her view. All other interpretations of (15), i.e. those that were formerly excluded from consideration, are not compatible with the needed meaning. She is, in effect, silenced. Silence may seem like an extraordinary cost to pay to maintain a theoretical position, but she is not alone in her difficulties.

The advocate of unrestricted quantification, or the *generality absolutist*, still must contend with Russell’s paradox. Williamson provides his own version of the paradox and demonstrates that with only the assumption of unrestricted quantification and the standard rules of logic that it is possible to generate the contradiction in which an interpretation applies to a predicate if and only if it does not apply to that predicate. Unlike the previous case, this sentence meets the standard semantic definition of a contradiction, and accordingly, is substantially more difficult to dislodge.

I discuss two possible solutions to this paradox: Williamson (2003) and Rayo (2006). Of the two, Rayo’s is more convincing. Rayo argues that the best way to resolve Russell’s paradox is to conduct all semantic theorizing in a language that is of a higher type. In the case of Williamson’s version of the paradox, interpretations – a term that is part of our metalanguage – must belong to a language of a higher type, i.e. a second-order language. As part of a second-order language, interpretations are easily classified as second-order terms – a classification that blocks an important step in the generation of the contradiction of Williamson’s version of Russell’s paradox.

Although the generality absolutist is able to dodge the full effects of Russell's paradox, there is a cost to be paid. The fact that semantic theorizing about an object language must *always* be carried out in a language of a higher type leads to an ever ascending hierarchy of types of languages. Faced with a request to interpret certain predicates in his language, the generality absolutist will be forced to either end the process of interpretation at some arbitrary point or carry out the process of interpretation forever. Regardless of which choice he makes, the generality absolutist is unable to escape the conclusion that it is his and not the generality relativist's position that is the real threat to the project of semantic theorizing. This is a problem, which according to Williamson, should give any philosopher of language pause for thought. Consequently, if we heed Williamson's warning, it is unrestricted quantification and not restricted quantification that is the more costly, and hence less attractive of the two positions.

Chapter Two: Keenan's Definition

0. Introduction

In his seminal 2003 paper, Keenan seeks to provide a purely semantic definition of the class of determiners that are compatible with Existential There Sentences (ETS). The core of the data is standardly assumed to include the *weak* determiners of Milsark (1974; 1977):

1. There are some/many/few/no/two children in the garden.

The so-called weak determiners in (1) are fine in the post-copular position of an ETS, whereas universals and definites, i.e. the *strong* determiners of Milsark, appear to be unacceptable in this construction:

2. ??There is every/each child in the garden.
3. ??There is the/tha/ChiSook's child in the garden.

In addition to universals and definites, we can also include the *proportional* determiners, such as *most*, among the list of strong determiners:

4. ??There are most children in the garden.

Keenan's initial assumption is that all weak determiners are the head of a DP that is a generalized quantifier (GQ), a function that takes a set of subsets of objects of a given domain E, and maps it onto either True or False. A property of all natural language

monophonemic determiners is that they are *conservative*,¹ which is defined by Keenan as,

A map D from P_E into $GQ_{E,X}$ is conservative on its first argument (cons_1) iff $A \cap B = A \cap B' \Rightarrow DAB = DAB'$, for all $A, B, B' \subseteq E$.²

where E is the domain and P_E are the subsets of E .³ Keenan shows that this definition can be further refined. The above definition states what is required for a determiner to be conservative on its first argument, but a determiner may be conservative in relation to more than just one argument. It may also be conservative in relation to the second argument.⁴ Keenan refers to this property as conservativity_2 , i.e. conservative on the second argument:⁵

A map D from P_E into $GQ_{E,X}$ is conservative on its second argument (cons_2) iff $A \cap B = A' \cap B \Rightarrow DAB = DA'B$, for all $A, A', B \subseteq E$.⁶

Keenan claims that this is the property that distinguishes the class of weak determiners from their strong counterparts: the former, but not the latter are conservative in relation to their second argument. Weak determiners, therefore, are defined as those that have the

¹ Keenan identifies three possible exceptions to this claim: *only*, *just* and *mostly*. These expressions are not conservative on their first argument. Although Keenan categorizes them as determiners, their distribution differs a great deal from standard examples of determiners. Their inclusion in this category is, therefore, open to doubt. I will not include these three expressions in the discussion and adapt my presentation of Keenan's main thesis accordingly.

² Keenan, 2003; 199

³ Keenan also includes the more standard statement of this property: $DAB = DAA \cap B$, for all A, B .

⁴ Conservativity, in fact, can be defined in relation to any argument of a determiner. But because the usual examples of DPs headed by weak determiners are limited to those with only two arguments, Keenan limits his attention to determiners that have the property of being conservative_2 .

⁵ The more standard notation for this property is: $DAB = DA \cap BB$ for all A, B .

⁶ Keenan, 2003; 200

property of being conservative₂.⁷

Keenan's definition has two central strengths. First, it permits a simple and straightforward semantic analysis of ETS. The pleonastic subject *there* is semantically vacuous and the semantic content of an existential sentence is equivalent to that of a sentence in which the property denoted by the second argument of the ETS, or what is sometimes referred to as the *coda*, is predicated of the internal noun phrase(s).⁸ His analysis of ETS predicts that the two following sentences have the same truth conditions,

5. There are some children in the garden.
6. Some children are in the garden.

but that the (post-copular) subject of the former, an ETS, is headed by a determiner that adheres to Keenan's definition, while the latter is not.

Second, it is precise. Keenan is able to offer a complete specification of the class of determiners that have the property of being conservative₂. And as he notes each of these determiners heads a DP that is acceptable in ETS, he concludes that he has also defined the class of weak determiners. But it is here – the substitution of the class of determiners that are conservative in relation to each of their arguments for the class of weak determiners – that his argument encounters its first major setback. Although all DPs headed by determiners that have the property of being conservative₂ are acceptable in ETS, not all acceptable ETS contain a DP that is headed by a determiner that is conservative in relation to both of its arguments.

There are many examples to choose from, but I will stick to what I term the *standard exceptions*. A standard exception must meet the following two conditions.

⁷ A nice feature of his definition of conservative₂ is that it is closed under Boolean operations, allowing Keenan to extend his definition to complex determiners, assuring a complete specification of the class of weak determiners.

⁸ The relevant truth conditions are: For all models M, $[[BE, DP_{\text{There}}, Coda]]^M = [[BE]]^M ([[DP_{\text{There}}]]^M ([[Coda]]^M))$, (Keenan, 2003; 206).

First,

- i. The ETS must be interpreted existentially.

The aim of this condition is to not only exclude sentences that are obviously irrelevant to the discussion such as those in which the *there* is interpreted as indicating a location, but to guarantee the widest possible definition of ETS. A sentence should not be excluded from the class of ETS simply because it is rarely used or requires a non-standard intonation. Second,

- ii. The acceptability of the counterexample should be uncontroversial.

There are ETS for which no consensus exists about whether they are acceptable or not. I will exclude these examples in order to present the strongest case possible for my analysis.⁹

Of the remaining exceptions, three categories of ETS bear directly on Keenan's definition. The first, discussed at length in Ward and Birner (1995), are definites that are both *uniquely identifiable* and denote an individual that is assumed to be *hearer-new*, i.e. a definite that denotes an individual who the speaker believes to be unknown to the

⁹ Two categories of ETS that fail this latter condition are partitives and the proportional reading of *few* and *many* in some ETS:

7. ??There are most of the students in the room.
8. ??There are many speakers of Basque that are citizens of Spain. (proportional reading)

In the first case, there are varying intuitions about the acceptability of partitives containing *most*. McNally (1998) rejects them outright (McNally, 1998: 372), while Comorovski (1991) includes them among her data. I personally find many examples to be of borderline acceptability regardless of whether they include *most*, and therefore will exclude them from this discussion. Opinions about the proportional reading of *many* and *few* are similarly divided. McNally and Keenan reject them outright, while Herberger (1997) finds some acceptable. As there is no clear evidence that unambiguously supports the existence of a proportional reading for a sentence such as (8), I will also exclude this category of expression from the discussion.

hearer.¹⁰ This category includes superlatives and a lexically restricted group in which the definite contains the adjective *usual* or its synonyms (examples cited by Ward and Birner include *same, regular, traditional, and expected*)¹¹:

9. There was the tallest boy in my history class at the party last night.
10. There was the usual crowd at the beach today.¹²

The second are the *kind terms* of McNally (1998):

¹⁰ There are three other members of this group that Ward and Birner identify: hearer-old entities newly instantiating a variable, hearer-old entities treated as hearer-new, and false definites. The first category is usually referred to as the *list interpretation* and in this paper is discussed separately from definites as it may include other quantified expressions. The second category, sometimes called *reminder contexts*, will be discussed with the list interpretation for reasons that I discuss in section three. The final category includes examples such as,

11. There was this huge sheet of ice on the street.
12. There is the most curious discussion of them in our paper.
13. There is every reason to study them.

(Ward and Birner, 1995; 738-39)

False definites appear to be restricted to a few idiomatic expressions and are distinguished by the fact that the definite (or universal) heading the DP can be replaced by an indefinite (or cardinal) determiner with no loss of meaning. This has led some researchers such as Rando and Napoli (1978) and Ward and Birner (1995) to assume that these expressions are in fact headed by a determiner that is in some relevant sense weak. Although a paraphrase containing a weak determiner is often possible, it is very unclear what the relationship between this paraphrase and the actual meaning of these sentences is. The use of a DP headed by a strong determiner appears to be non-literal and designed to emphasize a given property of an object by exaggerating some dimension of it. Thus in (11) the hugeness of the ice is emphasized in virtue of its uniqueness; in (12), the speaker overstates the curiousness of the argument by using a superlative; while in (13) the quantity of the reasons is exaggerated. Although the relation between the non-literal interpretation of these DPs and their more prosaic semantic meaning is a fascinating question, it will not be addressed any further in this paper.

¹¹ Ward and Birner include another set of examples – definites whose referent is inferable – with this group. Definites that are inferable include adjectives such as *ideal, correct, perfect, necessary, and required*. Unlike definites containing *usual* and its synonyms, it is not clear what it is to be an inferable adjective and why some and not others are acceptable in ETS. The class is, therefore, not well-defined and will not be discussed here with the caveat that I do not think they constitute an exception to my general strategy as it is highly likely that my explanation of why definites that contain the term *usual* or its synonyms could be extended to this class.

¹² Ward and Birner, 1995; 737, 733

14. There was every kind of doctor at the convention.¹³

These expressions include the term *kind* or its synonyms in the DP. The final is the list interpretation of Rando and Napoli (1978). These utterances are distinguished by having a distinctive list intonation that rises at the end if the list is incomplete and falls if the list is complete:

15. Q: How could we get there?

A: Well, there's the trolley...¹⁴

16. And there's two components in [Division H], which is the operations division: the people that do the flight activity planning procedures work, provide for the crew activity planning and the time line support and integrated procedures development and overall flight data file management; and *then there is the payload support folks*,¹⁵

All of these exceptions contain a post-copular subject that is headed by a determiner that is not conservative in relation to all of its arguments, and hence is not weak according to Keenan's definition.

Keenan is aware that there are exceptions to his definition and attempts to head off this problem in two ways. The first is to narrow the scope of the relevant data by fiat. For example, he excludes the kind terms of McNally on the basis of the fact that they are 'different'.¹⁶ Without further justification, this is a clearly unsatisfactory response. His second strategy is to narrow the definition of ETS to those that retain their core propositional meaning under certain permutations such as polar questioning and negation:

17. Are there many children in the garden?

¹³ McNally, 1998; 358

¹⁴ Rando and Napoli, 1978; 300

¹⁵ Ward and Birner, 1995; 734

¹⁶ Keenan, 2003; 187

18. There are not many children in the garden.

Unfortunately, this test gives mixed results at best. It appears to exclude the list interpretation of Rando and Napoli and the definites of Ward and Birner. It also excludes ETS that contain DPs headed by clearly cardinal determiners:

19. ??There are not two children in the garden.

With no clear conception of what constitutes an ETS, it is unclear what Keenan has in fact defined. This problem not only threatens the modest goal of Keenan to define the class of DPs that are compatible with ETS, but also any larger role that this definition might play in an explanation of the syntactic and semantic properties of ETS.

As a consequence, the aim of this paper is to solve the problem that the exceptions pose to Keenan's definition of weak determiners. The key to solving this problem is to realize that although Keenan is correct in his assertion that all post-copular subjects that denote a set of sets, i.e. are of type $\langle\langle et \rangle, t \rangle$, are headed by a determiner that is conservative in relation to its second argument, he is not correct in his assumption that only expressions of this type are compatible with ETS. I will argue that expressions that denote individuals, i.e. of type $\langle e \rangle$, and expressions that denote sets, i.e. of type $\langle et \rangle$, and even those that quantify over properties, i.e. of type $\langle\langle et \rangle, t \rangle$, are acceptable in the post-copular subject position, but only if the expression lacks a denotation of type $\langle\langle et \rangle, t \rangle$. In other words, if we restrict the scope of Keenan's definition to expressions of type $\langle\langle et \rangle, t \rangle$, the exceptional definites of Ward and Birner, the kind terms of McNally and the list interpretation of Rando and Napoli do not constitute counterexamples to it. As they are not counterexamples, there is no reason to exclude them from the data.

This paper is divided into three main sections. The first section offers an overview of Partee's arguments for attributing multiple denotations to DPs such as proper

names, indefinites and definites. It will also summarize her claims about the relation of different denotations to definite descriptions. I question the exact mix of denotations that she assigns to definite descriptions and suggest that it should be replaced with a set of denotations in which both existence and uniqueness are presupposed instead of entailed. Evidence is offered that the sole definites that entail existence and uniqueness are the exceptions of Ward and Birner, i.e. superlatives and definites that include *usual* or its synonyms. I argue that these expressions are different than standard examples of definite descriptions in virtue of their meaning: their referent is always unique and hence uniqueness is plausibly entailed by this class of definites. With two classes of definites identified, it is possible to show that the latter class, i.e. the exceptional definites of Ward and Birner, not the former, i.e. the standard examples of definites, lack a denotation of type $\langle\langle et \rangle, t \rangle$. Therefore, they are not counterexamples to Keenan's definition.

The second section focuses on two categories of counterexamples: kind terms and the list interpretation. What binds these examples together is that the existential predicate, i.e. *there is/are*, is of a higher type, and hence, has a slightly different meaning than the existential predicate of Keenan. Because the predicate in these examples is of a higher type, it is not compatible with expressions whose denotation is of type $\langle\langle et \rangle, t \rangle$. Drawing heavily from the work of McNally (1998), I will argue that kind terms adhere to this condition. This conclusion is extended to cover the list interpretation, demonstrating once again that these ETS do not pose a challenge to Keenan's definition.

With the relationship of the standard exceptions to the core data explained, we are in a position to conclude (at least provisionally) that Keenan has in fact provided a fully general definition of the class of weak determiners. This result raises an immediate and obvious question: what motivates this particular distribution of DPs in ETS? I spend the final moments of the paper highlighting a property that many of the unacceptable ETS share in common and outline the beginnings of one possible response to this question.

1. The Type-Shifting Principles of Partee

Montague (1973) offers an elegant yet ultimately unsatisfactory analysis of DPs. He identifies three types of denotations that can plausibly be assigned to DPs. The first is type $\langle e \rangle$ and denotes an individual. This denotation is usually reserved for referring expressions such as proper names. The second is type $\langle et \rangle$. It denotes a set of individuals and applies to a DP that is predicative in nature. The final and highest type is $\langle \langle et \rangle, t \rangle$, which denotes a set of sets. Montague proposes a uniform treatment of DPs in which all are assigned the highest type, $\langle \langle et \rangle, t \rangle$, thereby greatly simplifying the semantic analysis of these expressions with no loss of explanatory power for his theory.

Partee and Rooth (1983) and Partee (1986) raise serious questions about the efficacy of a uniform treatment of DPs. In particular, Partee (1986) argues that there is a range of data in English that supports the assignment of multiple denotations to certain DPs. A denotation of type $\langle e \rangle$ for certain expressions is both obvious and natural; empirical evidence for this claim exists, but only partially. Partee cites the claim by both Kamp (1981) and Heim (1982) that only expressions which are individual denoting terms may be the antecedent of a singular discourse antecedent:

20. John/the man/a man walked in. He looked tired.

21. Every man/more than one man walked in. *He looked tired.¹⁷

A denotation of type $\langle e \rangle$, however, is not necessarily limited to DPs that are singular. Link's (1983) semantic analysis of plurals provides evidence of the need for a denotation of type $\langle e \rangle$ for these expressions too. He not only provides a simple and elegant explanation of the relationship between singular and plural nouns, but of a surprising

¹⁷ Partee, 1986; 119

range of data.¹⁸ Combining these theoretical considerations, the above evidence with the sheer plausibility of the existence of individual denoting terms in natural language provides strong motivation for the necessity of an <e> type denotation for certain DPs.

In contrast, the case for a predicative interpretation of certain DPs can be made on empirical grounds alone. The conjunction test provides central, although incomplete, evidence for the need to assign a denotation of type <et> to certain expressions. If we assume, as most semanticists do, that adjectives are of type <et> and further, that only expressions of the same type can be conjoined, then the fact that adjectives may be conjoined to definite and indefinite descriptions demonstrates that those expressions have a denotation of type <et>:

22. He is smart and an expert on unicorns/the expert on unicorns.¹⁹
23. *They are nice and every/more than one expert on unicorns.

However, the test only establishes a predicative interpretation of definite and indefinite descriptions. Names fail the test:

24. *He is smart and John.

Although surprising, there is evidence from other sources supporting the conclusion that names require a denotation of type <et>. Specifically, they may be predicated of a subject like adjectives, indefinite descriptions and definite descriptions:

25. He is smart/an expert on unicorns/the expert on unicorns/John.

¹⁸ Please see Link (1983) or Landman (1989) for further discussion of Link's theory.

¹⁹ This is not, in fact, the test that Partee (1986) uses to establish the necessity of a <et> type denotation for definites and indefinites. She instead focuses on their compatibility with the verb *considers*. This test, however, has not gained as wide currency in subsequent literature as the conjunction test and the predicative sentence test, and therefore, will not be discussed.

In contrast, DPs headed by determiners such as *every* or *more than one* are not usually acceptable in this position:

26. *They are every/more than one man.

The exception to this observation is a DP in which the noun denotes a property of properties, or an *attribute*:

27. This house has been *every colour*.²⁰

Partee argues that the exceptional nature of these DPs is due to the presence of the noun, which makes the complete DP particularly amenable to a predicative interpretation. Thus, on the basis of the evidence provided by these two tests, we can conclude that some DPs – in particular names, indefinite descriptions and definite descriptions – have a denotation of type $\langle et \rangle$.

Although some questions can be raised about the efficacy of the conjunction test, it nevertheless provides the best argument for assigning a denotation of the highest type, $\langle \langle et \rangle, t \rangle$, to certain DPs. If we take the failure of DPs headed by determiners such as *every* and *more than one* in the two previous tests as evidence of their incompatibility with a denotation other than $\langle \langle et \rangle, t \rangle$, then the only explanation of the ability of names, definite descriptions and indefinite descriptions to conjoin with these DPs is that they also have a denotation of type $\langle \langle et \rangle, t \rangle$:

28. ChiSook/a woman/the woman and every man finished the exam.

²⁰ Partee, 1986; 120

Thus, it appears that a denotation of type $\langle\langle et \rangle, t \rangle$ must be added to the family of denotations that may be assigned to names, definite descriptions and indefinite descriptions.

As this combination of linguistic evidence and theoretical considerations demonstrates, there are persuasive reasons to reject Montague's original thesis in favour of an approach that permits the assignment of multiple denotations to an expression. In particular, there is very good evidence of the need to assign denotations of type $\langle e \rangle$, $\langle et \rangle$, and $\langle\langle et \rangle, t \rangle$ to names, definite descriptions and indefinite descriptions.

From a theoretical standpoint, multiple denotations are not welcome news. They have the potential to generate a dizzying array of interpretations for any given sentence, undercutting the simplicity and elegance of any semantic theory. To forestall this possibility, Partee suggests the following three interpretation principles:

- i. each basic expression is lexically assigned the simplest type adequate to capture its meaning.
- ii. there are general type-lifting rules that provide additional higher-type meanings for expressions
- iii. there is a general processing strategy of trying the lowest types first, using higher types only when they are required in order to combine meanings by available composition rules.²¹

Proper names provide the most straightforward illustration of this theory. They have three possible denotations: $\langle e \rangle$, $\langle et \rangle$, and $\langle\langle et \rangle, t \rangle$. The simplest denotation, $\langle e \rangle$, is assumed to be its lexical meaning. Type-lifting rules are employed as needed to relate the higher type meanings of $\langle et \rangle$ and $\langle\langle et \rangle, t \rangle$ to the base type.

The question of how to relate the three meanings of definite descriptions proves to

²¹ Partee, 1986; 117

be substantially more difficult.²² The problem is that there is no clear division of labour between the semantic and pragmatic aspects of the meaning of these expressions. The existence and uniqueness requirement of definite descriptions may be either part of the semantic meaning of these expressions, and hence entailed, or not, and thus presupposed. This problem is of central importance to the project at hand. In what follows, I show that Partee's own solution, mixing denotations between those that entail existence and uniqueness and those that presuppose existence and uniqueness, is incorrect. It fails to meet the challenge of subsequent work that has questioned the desirability of entailing uniqueness. A better analysis is one in which existence and uniqueness are presupposed for all standard examples of definites. Exceptions to this analysis exist, however. Specifically, superlatives and definites that include the term *usual* and its synonyms are impervious to the arguments that purport to show that uniqueness is presupposed and not entailed. With two categories of definites carved out, I show that the exceptions of Ward and Birner, i.e. the latter category, lack a denotation of type $\langle\langle e, t \rangle, t \rangle$, and are, therefore, not exceptions to Keenan's definition.

1.2 Type-Shifting and Definite Descriptions

Partee begins her analysis of definites by suggesting that the base denotation type of a definite description may be of type $\langle e \rangle$ and offers the *iota* function as one possible interpretation of this meaning²³:

$$29. \textit{iota}: P \rightarrow \iota x[P(x)].^{24}$$

²² The question of how the denotations of indefinite descriptions relate is not directly relevant to this paper and hence will not be discussed.

²³ Partee, 1986; 121

²⁴ Partee, 1986; 123

The *iota* function is a partial function that maps a set, P in the above definition, on to its unique member. If there is no unique individual that meets the description in the given context, the sentence in which a definite description has an <e> type denotation will lack a truth value. Uniqueness and existence, therefore, are not entailed by the meaning of this expression; rather, they are conditions on their felicitous use, and therefore, presupposed.

A second function, THE, gives the meaning of the highest type, <<et>,t>. It is a complete function that maps a set onto a generalized quantifier:

$$30. \text{ THE: } \lambda Q \lambda P [\exists x [\forall y [Q(y) \leftrightarrow y = x] \ \& \ P(x)]]^{25}$$

The <et> denotation is achieved by applying the function BE to a definite description of type <<et>,t>:

$$31. \text{ BE: } \lambda \phi \lambda x [\phi (\lambda y [y = x])].^{26}$$

BE is also a complete function. It takes all of the singletons within the denotation of a generalized quantifier and collects them into a set. As THE and BE are complete functions, uniqueness and existence are entailed by the meaning of these expressions. If there is no unique individual that satisfies the description, both THE and BE yield the empty set.²⁷ When a definite description denotes the empty set, the sentence in which it appears is false.²⁸

Why Partee chooses these particular functions is not immediately obvious. She mentions the need for a non-presuppositional meaning of definite descriptions, but offers

²⁵ Partee, 1986; 116

²⁶ Partee, 1986; 124

²⁷ Partee, 1986; 125

²⁸ Unless of course, the sentence is negated. In this case, the truth value assigned to the sentence is true.

little justification for this belief. She also fails to provide a strong rationale for this particular mix of functions. It is, consequently, possible to raise serious doubts about her choice of functions. Specifically, her decision to interpret the $\langle et \rangle$ and $\langle\langle et \rangle, t \rangle$ type meanings as full functions fails to take into consideration the highly contentious nature of the uniqueness entailment.²⁹

As many authors have pointed out, not all felicitous uses of definite descriptions appear to require a denotation that is unique. Suppose that the following sentence is uttered in a room with more than one table:

32. *Naming and Necessity* is on the table.

Strictly speaking, the denotation of the definite description is not unique within the situation described above, and yet, the sentence is not necessarily false as predicted by an analysis in which uniqueness is entailed. The most straightforward response to this problem is to claim that the above expression is an *incomplete definite description*. It must be either supplemented by hidden lexical material that fills out the description or by a domain restriction that delimits the denotation to a single individual. Although these responses may work in standard cases, they are inadequate in a situation that contains two indiscernible individuals that satisfy the description.³⁰ If the individuals are truly indiscernible, then it will be impossible to provide lexical material or a domain restriction that uniquely identifies an individual. The consequences of this failure should be a sentence that is false, and yet it is easy to construct examples in which this is not the case. At its most serious, the sentences will not be merely false but contradictory as in (33):

²⁹ As it is only necessary to show that one of these properties is not entailed, I will ignore the question of whether existence is an entailment or a presupposition throughout this discussion.

³⁰ Szabo, 2005; 1197

33. There is an elementary particle in a large container. *The particle is absolutely indiscernible from another particle in the same container.*³¹

Uniqueness, therefore, cannot be an entailment of definite descriptions.

In order to accommodate the problem of incomplete definite descriptions, a few changes to Partee's analysis are required. The partial function *iota* is still a perfectly acceptable base meaning for definite descriptions. It is, however, necessary to change the highest type of definite description from THE to a partial function. Partee suggests replacing it with a composite of *iota* and a second function *lift*. *Lift* is a total function that maps an individual onto its principal ultrafilter³²:

34. *lift*: $j \rightarrow \lambda P[P(x)]$.³³

BE applied to this new composite function will yield a partial function that could be used to represent the meaning of the <et> denotation. As Partee points out, this alternative is fully commutative and leads to an interpretation of definite descriptions that is fully presuppositional.³⁴

And what are we to make of Partee's original claim that there are definite descriptions that entail uniqueness and existence? It need not fully drop by the wayside. There are at least two categories of definite descriptions that are immune to the conclusion of the incomplete definite description argument, and hence compatible with an analysis in which uniqueness is entailed. The first is the superlative; the content of a

³¹ Szabo, 2003; 280, italics added

³² This also imposes a change in meaning for definite descriptions of type <<et>,t> to that of Barwise and Cooper (1981).

³³ Partee, 1986; 121

³⁴ Partee, 1986; 125

superlative is only compatible with a unique denotation³⁵, as in (35):

35. There was the tallest boy in my history class at the party last night.

The use of a superlative in a situation in which more than one individual answers to the description is unacceptable. It is always possible at least in principle to complete the description of a superlative in order to yield an expression that denotes a unique individual. Superlatives are, thus, plausible candidates to be analysed as a definite description that entails uniqueness.

The second category of expression that is immune to this problem is what Ward and Birner refer to as *hearer-new tokens of hearer-old types*. These descriptions contain the term *usual* or its synonyms:

36. There was the usual crowd at the beach today.

According to Ward and Birner, the denotation of these definite descriptions is both the type itself and the token that instantiates the type. The dual reference is necessary to explain discourses in which the anaphoric reference of subsequent pronouns is divided between types and tokens:

37. There was the usual crowd at the beach today. They were there yesterday too. Today for the first time they sat around a fire and roasted marshmallows.³⁶

Sitting around the fire and roasting marshmallows are properties of the token that

³⁵ This is not meant to imply that some superlatives do not require completion. Rather, it implies that any completion must result in a unique denotation.

³⁶ Ward and Birner, 1995; 733

instantiates the type, while *being there yesterday* is a property of the type. Thus, the definite description *the usual crowd* must refer simultaneously to both its type and its token. Because each type is assumed to be known to the hearer, Ward and Birner conclude that these expressions, much like superlatives, refer to an individual that is uniquely identifiable.

Although Ward and Birner have identified an important property of this category of definite descriptions, viz. that they are uniquely identifiable, the type/token distinction will not work as an explanation. First, there is the matter of the dual reference. Ward and Birner appear to be implying that these expressions refer simultaneously to two individuals: a type and a token. The actual meaning of an expression that refers to two different individuals simultaneously would actually mean is far from clear. Second, if definite descriptions with *usual* or its synonyms denote a type, it is a very unusual type. What constitutes an instantiation of the type *the usual crowd* will depend a great deal on the context of utterance. Suppose that there are two usual crowds at the local beach: the early morning sunrise lovers and the all-night partiers. Now, suppose further that one night the partiers last well into the early morning, scaring away the early morning sunrise lovers. Even though there is a usual crowd at the beach, I cannot use (38) to describe the above situation during the same morning:

38. There was the usual crowd at the beach today.

Although there is a suitable dual reference available for the definite description, i.e. the type and the late night token, this sentence is false. Ward and Birner's theory cannot easily explain why this is so, casting further doubt on the utility of the type/token distinction as an explanation of the acceptability of this class of definites in ETS.

Instead of relying on a type/token distinction, I believe it is better to focus on two distinct aspects of the meaning of these expressions. First, the addition of the adjective

usual or its synonyms to a definite description has the effect of raising the denotation to a standard against which other objects, events or individuals can be measured. It is a point of reference, and as such, its denotation must be unique. Second, the meaning of the adjective *usual* or its synonyms is extremely context-sensitive. What constitutes *usual* for a given object, event or individual varies a great deal. So, for example, the properties that are necessary for a crowd to be usual are very different than those that are necessary for a way home to be usual. The best explanation of this observation is one in which we suppose that some aspect of the meaning of this adjective is contextually determined. In other words, context determines some or all of the semantic content of *usual*. Thus, the standard by which an object, event or individual is *usual* will vary from context to context. Combined with the first claim that an expression that includes the term *usual* denotes something that is a standard and hence unique, we can conclude that these definite descriptions denote exactly one individual – whether singular or plural – in each context.³⁷ With this analysis, the mystery of (38) is easily solved. Although the definite description in (38) can be used to refer to either the late night partiers or the early morning sunset lovers, it will only do so successfully in the right context. In the wrong context, i.e. a context in which there is either no or more than one possible referent, the definite description will denote the empty set and the sentence will be false – as (38) illustrates.

The above observations suggest that a separate analysis of superlatives and definites that contain *usual* or its synonyms is necessary. Unlike their standard counterparts, they appear to entail, not presuppose, uniqueness. The fact that uniqueness is entailed and not presupposed makes the classification of these expressions as individual-denoting terms particularly attractive. Like proper names, they are obvious

³⁷ This claim depends on a compositional analysis of definite descriptions in which the contextually determined aspects of meaning are not excluded. Please see Szabo (2001) for further discussion of how such an analysis can be implemented.

candidates for an interpretation in which they refer directly to an individual. This claim is borne out by the data. Both superlatives and definite descriptions are perfectly acceptable as the antecedent of a singular discourse anaphor:

- 39. The tallest boy in my history class finished the race first. He looked tired.
- 40. The usual woman was at the beach today. She didn't bother me, though.

There is consequently both strong theoretical and empirical evidence to not only suppose that these two categories of definite descriptions have an <e> type denotation, but that this denotation is its base type.

The evidence for assigning denotations of a higher type to these expressions is murkier. The tests for a denotation of type <et> deliver mixed results. Superlatives appear to support this denotation easily, while the evidence for assigning this denotation to definite descriptions that contain the term *usual* or its synonyms is less convincing:

- 41. He is the tallest boy in my history class.
- 42. He is clever and the tallest boy in my history class.

- 43. That is the usual way home.
- 44. ?This route is fast and the usual way home.

- 45. ?They are the usual students.
- 46. ??They are clever and the usual students.

These results suggest that there are constraints on a definite description containing *usual* receiving a predicative interpretation, but that it is a possible denotation for both of these categories of expressions.

The most interesting results are from the test for a denotation of type <<et>,t>. Conjoining either of these expressions to a DP of type <<et>,t> is substantially harder than it is in the standard cases. In each of the following pairs of examples, the first

sentence is somewhat awkward – even jarring in certain instances. The addition of further lexical material to the DP whose base denotation is of type $\langle\langle et \rangle, t \rangle$, however, greatly enhances the naturalness, and hence acceptability of the original sentence:

47. ?ChiSook likes the tallest boy in my history class and many teachers.
48. ChiSook likes the tallest boy in my history class and many teachers at my school.

49. ?ChiSook is building the tallest tower in Ithaca and every bridge.
50. ChiSook is building the tallest tower in Ithaca and every bridge in Utica.

51. ??ChiSook likes the usual students and many teachers.
52. ?ChiSook likes the usual students and many teachers at my school.
53. ?ChiSook is writing the usual memo and every letter.
54. ChiSook is writing the usual memo and every letter we need to send this week.

There consequently appears to be something “wrong” with the conjunction in (47), (49), (51) and (53). Specifically, there seems to be something wrong with conjoining a DP whose base denotation is of type $\langle\langle et \rangle, t \rangle$ and whose domain of quantification is not suitably restricted to superlatives or definites that contain the term *usual*.

An obvious candidate for the problem with these conjunctions is a type mismatch. (47), (49), (51) and (53) are interpretable, and yet odd – a potential outcome if the problem is that the types of the two conjuncts do not match. As we saw in section one, the meaning of the nominal argument of a determiner can affect the range of denotations available to a DP whose base denotation is of type $\langle\langle et \rangle, t \rangle$. Thus, one explanation of how the addition of a modifier to the nominal argument of the determiner “fixes” the problem with these conjunctions is that it makes available a wider range of denotations for the complete DP. The addition of lexical material in (48), (50), (52), and (54) may permit what is otherwise an unacceptable denotation for the second DP, i.e. type $\langle et \rangle$. This would resolve the type mismatch between the first DP and the second DP in the

majority of cases, thereby improving the acceptability of these sentences. Although I don't have an explanation of why this is the case, one particularly nice benefit of this approach is that it would explain why there is some variation in the acceptability of the "corrected" sentences in which the first DP is a definite that contains the term *usual*. Not all definites containing *usual* are compatible with a predicative interpretation, and hence this "fix" of the type mismatch between the two DPs will not always succeed.

In sum, the evidence does not appear to support assigning the same range of denotations to superlatives and definites that contain the term *usual* or its synonyms as their more standard counterparts. The theoretical arguments and empirical evidence alike both clearly support assigning a denotation of type $\langle e \rangle$ to these expressions, but the evidence for adding denotations of higher types is patchy. The two tests for a denotation of type $\langle et \rangle$ produced encouraging, but mixed results. The test for a denotation of type $\langle \langle et \rangle, t \rangle$ produced only mixed results. As my discussion of the data demonstrates, these mixed results do not unambiguously support the assignment of a denotation of type $\langle \langle et \rangle, t \rangle$ to these expressions. Given the lack of good empirical evidence or strong theoretical impetus, there is no reason to suppose that superlatives and definite descriptions that include the term *usual* or its synonyms have a denotation of type $\langle \langle et \rangle, t \rangle$.

An immediate consequence of this result is that superlatives and definite descriptions that contain the term *usual* or its synonyms can no longer be counted among the counterexamples to Keenan's definition. There is consequently no reason to exclude them from the data to which his definition applies, which allows us to extend the generality of his definition in a small but important way.

1.3 Conclusion

In this section, we have seen the versatility of a Partee-inspired analysis of

definite descriptions. I have argued that there are in fact two interpretations of definite descriptions. The first applies to the standard examples of definite descriptions and presupposes the existence and uniqueness of the denotation. The second is restricted to two categories of definites that entail uniqueness in virtue of their content. Unlike their standard counterparts, these expressions lack the full complement of denotations and are only compatible with an <e> type denotation and possibly a <et> type denotation. This difference was claimed to be the key to understanding why these expressions do not contravene Keenan's definition.

In the following section, I will extend this approach to include the kind terms of McNally and the list interpretation of Rando and Napoli. The key difference between this section and the next is that the existential predicate, i.e. *there is/are*, is of a higher type, and consequently, has a slightly different meaning than the existential predicate of Keenan. As a consequence, this new interpretation of the existential predicate is no longer compatible with DPs of type <<et>,t>. Both kind terms and the list interpretation adhere to this restriction and hence are acceptable in these sentences. Although the meaning of these ETS is not identical to the ETS of Keenan, this does not mean they should be excluded from the range of data to which his definition applies. As I will show, they pose no bigger challenge to it than the exceptions of Ward and Birner.

2. Kind Terms and the List Interpretation

McNally (1998) observes that the distribution of DPs that contain the term *kind* or its synonyms is completely unrestricted in ETS.³⁸ She also thinks that the best explanation of this observation is the difference in type between kind terms and other expressions headed by determiners. She argues that kind terms must denote an

³⁸ As Sally McConnell-Ginet has pointed out to me (p.c.), this is not perfectly true as these expressions appear to require a coda.

expression that quantifies over properties. The most basic definition of a property is that which denotes a set of individuals, namely the individuals to whom the property applies.³⁹ Properties are distinct from individuals and within type theory, receive a different designation. They are of type $\langle et \rangle$, while individual denoting expressions are of type $\langle e \rangle$. The sortal restriction on the denotation of the DP is motivated by the semantic type of the expression *there is/are*. It is a property of properties with the approximate meaning *is instantiated*.⁴⁰ Only properties or quantifiers over properties can combine with this expression to yield a well-formed sentence; all other expressions lead to a type mismatch and are therefore, unacceptable in ETS.

This analysis can be extended to the standard examples of ETS through the use of the type-shifting rules of Partee. Specifically, we can turn to the BE function, which takes a DP of type $\langle \langle et \rangle, t \rangle$ and maps it onto a DP of type $\langle et \rangle$. This function, however, does not give a communicatively useful value for all DPs. If the denotation of the initial DP input does not contain a singleton set, the output of the BE function will be the empty set – something that McNally considers to be pragmatically odd and of no communicative interest.⁴¹ Most weak determiners discussed at the outset of this paper meet this restriction easily.⁴² Of the strong determiners discussed in this paper, *most* is the only one heading a DP whose denotation lacks a singleton set, and hence is incompatible with the BE function. Surprisingly, neither definites nor universals are immediately ruled out. In the case of definites, it is necessary for McNally to supplement her theory with the pragmatic condition of Ward and Birner in order to rule out standard

³⁹ McNally is well aware of the problems of adopting a purely extensional definition of a property and includes a footnote that indicates that her theory is compatible with an intensional definition.

⁴⁰ McNally offers the following truth conditions for ETS: *There be DP* is true with respect to a Model M and variable assignment g iff $[[DP]]^{M,g} \in [[\text{There be}]]^{M,g}$. A DP is argued to be within the extension of the existential predicate when it is non-empty (McNally, 1998: 375-76).

⁴¹ McNally, 1998; 370

⁴² Of the examples listed at the outset of this paper, *some* and *two* are examples of determiners that head phrases that are acceptable inputs for the BE function. *Many* is assumed to receive a cardinal interpretation and as such also meets the requirements of the BE function. DPs headed by *few* and *no* are problematic and will be discussed momentarily.

definites. Universals, like definites, also meet the requirements of the BE function, but only in the case where the generator set contains a single individual. McNally argues that although it is possible to use a universal under these circumstances, it is much like a property that denotes nothing, i.e. extremely pragmatically odd, and thus a use that is disfavoured by speakers.

Although McNally's explanation of the distribution of DPs in the post-copular position in ETS is complete, it has two major drawbacks, both of which center on her attempt to extend her analysis to non-kind terms. First, counterexamples exist to her claim that the empty set is an unacceptable output for the BE function. DPs headed by weak determiners such as *no* and *few* are compatible with an interpretation in which they denote the empty set, and yet they are not banned from ETS. Though semantically well-formed, McNally's theory predicts that (55) and (56) should be ruled out on pragmatic grounds, which is clearly not the case:

55. There are no children in the garden.

56. There are few children in the garden.

The solution she pursues is to decompose each of these terms into two separate semantic units at logical form is admittedly less than perfect. In the case of *no*, she argues that it should be decomposed into a clausal negation and the indefinite *a*, giving the following interpretation for (55), while (56) is decomposed into a clausal negation and the determiner *many*:

57. It is not the case that there is a child in the garden.

58. It is not the case that there are many children in the garden.

Because DPs headed by *a* and *many* are both acceptable functions for the BE function, *no*

and *few* are not banned from ETS. This solution is rather ad hoc, especially given the fact that there is very little evidence for her claim that the empty set is an unacceptable output for the BE function. After all, properties that apply to no one and nothing are not that uncommon in language.

Second, it is unclear why some of the DPs that are acceptable inputs of the BE function fail the tests for a denotation of type $\langle et \rangle$. DPs headed by *many* are unacceptable in the predicative position of a sentence such as (59):

59. *Those students are many troublemakers.

This DP fares no better in the conjunction test for a denotation of type $\langle et \rangle$:

60. *Those students are smart and many troublemakers.

If this expression may denote an expression of type $\langle et \rangle$ as McNally contends, these results are unexpected and, more importantly, unexplained.

As a result, there are serious issues with McNally's attempt to extend her analysis of kind terms to the core examples of ETS. Therefore, I will reject her analysis as it applies to these expressions, but not the complete analysis. It appears that the existential predicate is ambiguous in meaning. Under one interpretation, this predicate denotes a property of individuals, while under the other, it denotes a property of properties. The first has the truth conditions ascribed by Keenan; the second has the truth conditions ascribed by McNally. As expressions with separate but related truth conditions, it is plausible to conclude that there are two separate but related types of ETS. Keenan's suggestion that kind terms are somewhat different is thus correct, but this fact does not require us to exclude kind terms from the purview of Keenan's definition. As kind terms lack the necessary denotation, they never run the risk of contravening Keenan's

definition, and hence do not pose any challenge to it. In this way, the need to draw an artificial distinction between the two types of sentences is averted – a fact that only strengthens the scope and reach of Keenan’s definition.

Let us now turn to the final category of exception: the list interpretation.

2.1 The List Interpretation

Little has been written about the semantics of the list interpretation. As noted by Rando and Napoli (1978), its taxonomy appears to fall into two broad categories. The first is the incomplete list, which is demarcated by a rising intonation pattern:

61. Q: How could we get there?
A: Well, there’s the trolley...⁴³

The second is the complete list, with a falling intonation pattern:

62. Q: Who attended your talk?
A: Well, there was a trustee, a provost and surprisingly, every student from my morning section.

As the data from Ward and Birner attests, this latter category also appears to include lists that contain only one member:

63. And there’s two components in [Division H], which is the operations division: the people that do the flight activity planning procedures work, provide for the crew activity planning and the time line support and integrated procedures development and overall flight data file management; *and then there is the*

⁴³ Rando and Napoli, 1978; 300

*payload support folks,*⁴⁴

This observation makes the identification of the list interpretation more complex than it first appears. For example, another category from Ward and Birner's list of exceptions displays the distinctive intonation pattern of the complete list: hearer-old entities treated as hearer-new:

64. Mr. Rummel: Well, didn't the designer of the orbiter, the manufacture, develop maintenance requirements and documentation as part of the design obligation.

Mr. Collins: Yes, sir. And that is what we showed in the first part, before the Pan Am study. *There were those other orbiter maintenance and requirement specifications.*

65. Like voters everywhere, Montanans are in a resentful mood, and Marlenee is adept at exploiting that resentment...To add to his troubles, Williams used to be the chairman of the subcommittee overseeing grants to the National Endowment of the Arts, and he firmly defended the agency against charges that it funded 'obscene' art works...

That is what won him the support of Keillor, who said, 'It's a measure of the man when he's courageous when it's not absolutely required of him.

But it has inspired the opposition of national conservatives, including Pat Robertson, who referred to Williams as 'Pornography Pat'.

*Then there is that resentment.*⁴⁵

This category is also sometimes referred to as *reminder contexts* as its most prevalent use is to remind a hearer of a momentarily forgotten entity. If we set aside the context of these utterances, they are indistinguishable from the list interpretation. Note, for example, the remarkable similarity between (63) and (65). Moreover, it is very easy to convert these examples to overt lists:

⁴⁴ Ward and Birner, 1995; 734

⁴⁵ Ward and Birner, 1995; 730

66. Like voters everywhere, Montanans are in a resentful mood, and Marlenee is adept at exploiting that resentment...To add to his troubles, Williams used to be the chairman of the subcommittee overseeing grants to the National Endowment of the Arts, and he firmly defended the agency against charges that it funded 'obscene' art works...

That is what won him the support of Keillor, who said, 'It's a measure of the man when he's courageous when it's not absolutely required of him.'

But it has inspired the opposition of national conservatives, including Pat Robertson, who referred to Williams as 'Pornography Pat'.

Then there is that resentment, that hate and of course, the fear.

These two observations strongly suggest that the difference in context is not sufficient to distinguish these two categories of expressions.⁴⁶ Reminder contexts may simply be a natural context of utterance for lists as enumerating items is an obvious way to remind someone of something. I will, therefore, treat ETS found within reminder contexts as another example of the list interpretation.

The consensus is that lists form a single syntactic constituent; it is the list and not each member of the list which is the complement of the existential predicate in an ETS. The most natural interpretation of this syntactic constituent is one in which it denotes a set of objects, making a denotation of type <et> an obvious choice. In the absence of any empirical evidence⁴⁷ or theoretical reasons to the contrary, I will assume the standard

⁴⁶ The need for a distinct category for reminder contexts appears to be partially motivated in Ward and Birner by their desire to justify one-member lists that contain definites in terms of their pragmatic condition on interpretation. However, there are some obvious reasons to reject their argument. First, lists are not limited to definites, and may include other expressions headed by either strong determiners or indefinites. The relationship between the pragmatic constraint and these other members of the list is far from clear. Second, the mechanism by which Ward and Birner argue the members of lists are licensed as hearer-new wildly over-generates. They argue that these definites are hearer-new because they newly instantiate a variable in an *open proposition* that is part of the background information of the conversation. Open propositions are formed by removing the constituent that receives nuclear focus in the sentence and replacing it with a variable. In the case of (64), they identify the open proposition as, *X is a component in Division H* (Ward and Birner, 1995; 734). The DP *the payload support folks* is a possible instantiation of the variable X, and hence licensed in ETS. But the question of what constitutes an acceptable open proposition is never addressed. Is any part of the background information relevant? If so, how do we prevent the licensing of all definites in ETS?

⁴⁷ Empirical tests offer very little insight into the denotation of lists. In particular, it is impossible to apply the conjunction test as lists often include a conjoined term, making it impossible to discern whether the newly conjoined term is part of the original list, and hence a member of the syntactic constituent whose denotation is of type <et>, or separate.

syntactic and semantic analysis for this category of ETS. As the post-copular subject has a denotation of type $\langle et \rangle$, the existential predicate of the list interpretation must be an expression that denotes a property of properties – roughly, as McNally puts it, means *being instantiated*. As a result, the list interpretation is yet another example of an ETS in which the predicate is of a different type the core data. As before, this in and of itself is not a sufficient reason to exclude the list interpretation from the data to which Keenan’s definition applies. Lists do not pose a larger challenge to Keenan’s definition than kind terms; the fact that the complement of the existential predicate may contain a DP headed by a determiner which is not conservative in relation to all of its complements is simply not relevant to determining whether these examples are counterexamples to his definition. Keenan’s definition applies to the complement of the existential predicate, and in the case of the list interpretation, this complement is the complete list. As lists lack the required denotation, they cannot contravene his definition, and hence can be safely included among the examples of ETS.

2.2. Conclusion

In this section I have argued that the final two categories of exceptions, the kind terms of McNally and the list interpretation of Rando and Napoli, are perfectly compatible with Keenan’s definition. The strategy that I have pursued here, as with the previous section, is to demonstrate that the putative counterexamples contain a DP whose denotation cannot be of type $\langle \langle et \rangle, t \rangle$. If we further assume that Keenan’s definition is limited to DPs of type $\langle \langle et \rangle, t \rangle$, the absence of the required denotation neutralizes the ability of these examples to undermine the generality of his definition. We are thus in a position to conclude that Keenan’s definition is fully general and, as promised, coextensive with the class of weak determiners.

Although this is an interesting result in its own right, it is impossible to ignore the

central problem that this definition raises: what motivates the peculiar distribution of DPs of type $\langle\langle et \rangle, t \rangle$ in ETS? In particular, why are DPs that have a denotation of type $\langle\langle et \rangle, t \rangle$ and are not conservative on all of their arguments unacceptable in ETS? I close this paper with a few thoughts on this problem. As Barwise and Cooper (1981) observed, unacceptable ETS are either true in most models or false in most models. The qualification of “most models” is necessary because Barwise and Cooper exclude from their discussion all undefined interpretations of the DP. I think that this is a mistake and draws attention away from what may be the real cause of the unacceptability of these sentences: the odd behaviour of ETS in which the DP is of type $\langle\langle et \rangle, t \rangle$, headed by a determiner that is not weak, and most importantly, is undefined.

3. Undefined DPs and ETS

At the outset of this paper, I identified three general classes of DPs that are unacceptable in ETS: universals such as *every child*, proportionals such as *most children*, and standard definites such as *the children*⁴⁸:

67. ??There is every child in the garden.
68. ??There are most children in the garden.
69. ??There is the child in the garden.

Barwise and Cooper analyse the semantic contribution of the *there is/are* predicate in the same manner as Keenan. Combined with a Barwise and Cooper’s semantic analysis of

⁴⁸ It should be noted that the examples of unacceptable ETS at the outset of this paper was not exhaustive. The three categories that I discuss form the core set of counterexamples, but others exist. For example, this discussion does not cover DPs that are headed by *neither*. ETS containing a DP headed by this determiner are false in most models, and thus not pseudo-tautological, but quasi-contradictory. The explanation offered here would not cover these examples, making it an incomplete, but nevertheless intriguing starting point for a more complete theory.

every child, *most children* and *the children*⁴⁹, (67), (68) and (69) are true in every model in which the DP is defined. In the case of (67) and (68), all that is required for a DP to be defined is that it not denote the empty set. In the case of (69), a DP is defined if it does not denote the empty set and there is not more than one individual in the model that meets the description.

Barwise and Cooper suggest that it is the status of these sentences as tautologies that may be the cause of their unacceptability. This suggestion, however, has been widely discredited. First, tautologies are not usually unacceptable as (70) demonstrates:

70. ChiSook is ChiSook.

Second, a point that is rarely mentioned, but worth highlighting, it is not actually the case that all of these ETS meet the semantic definition of a tautology. The standard semantic

⁴⁹ Barwise and Cooper define *every* and *the* as follows where E is a non-empty set and A an arbitrary subset:

[[Every]] is the function which assigns to each $A \subseteq E$ the family $[[\text{Every}]](A) = \{X \subseteq E \mid A \subseteq X\}$.

[[The]] is a function on a set defined by $[[\text{The}]](A) = \{[[\text{every}]](A) \text{ if } |A| = 1 / \text{undefined otherwise}\}$.

(Barwise and Cooper, 1981; 169)

(I have slightly modified the presentation of the definition of *the* for the purposes of my discussion). Barwise and Cooper only offer an informal definition of *most* in their article. Keenan and Stavi (1986) flesh it out a bit and offer the following Barwise and Cooper inspired definition of *most*, which they term *most*₂:

- (a) $t \in \mathbf{most}_1(s)$ iff $|s \wedge t| > |s \wedge t'|$
- (b) $\mathbf{most}_2(s) = \mathbf{most}_1(s)$ if $|s| > 1$
 $\mathbf{every}(s)$ otherwise

(Keenan and Stavi, 1986; 280)

where s and t are properties, t' is the complement of t , and $(s \wedge t)$ is read s meet t . For present purposes, the most important point to note about *most*₂ is that when the DP it heads is undefined, it has the same meaning as a DP headed by *every*.

definition of a tautology does not require that a sentence be true in a few or even most models, but that it be true in all models. Given this fact, it is even more dubious that the “tautological” status of sentences such as (67), (68) or (69) could be the cause of their unacceptability.

The decision to exclude certain interpretations from their explanation is actually quite surprising. If we set aside the case of a definite description that is undefined because more than one individual meets the description, and focus our attention solely on the cases where the relevant DP denotes the empty set, then (67), (68) and (69) will also be assigned the truth value of true.⁵⁰ To see why, let us take a closer look at the proposed semantic analysis for (66). If *every child in the garden* denotes the empty set, then it is must be the case that the model associated with the interpretation of this sentence has no members. If the model has no members, then the predicate *there is/are* also denotes the empty set. According to Barwise and Cooper’s semantic analysis of a DP headed by *every*, this sentence is true because the set of sets denoted by the DP *every child in the garden* includes the empty set, i.e. the set denoted by the predicate *there is/are*. Why? Because the empty set always takes itself as a subset. Thus, this sentence is true.

This analysis can be extended to cover (68) and (69). In each case, an analogous semantic analysis of these sentences is possible. This is because the semantic analyses of *most children* and *the child* are identical to *every child* when the DP denotes the empty set. Thus, (68) and (69) are also true when their post-copular subject denotes the empty set.

Sentences in which the DP is undefined do not usually result in a truth value of true. If we use the judgments about sentences that contain an undefined definite description (see Horn 2006) as a guide, there are two standard truth value assignments for

⁵⁰ Although this demonstrates that (67) and (68) meet the semantic definition of a tautology, it still leaves the problem of (69), which in virtue of the need to exclude interpretations in which there is more than one individual, does not. Thus, although Barwise and Cooper’s explanation of why certain ETS are unacceptable may still apply to two of these examples, it is not general enough to apply to all of the examples.

sentences such as (71), (72) and (73) when the DP denotes the empty set:

- 71. Every child in the garden exists.
- 72. Most children in the garden exist.
- 73. The child in the garden exists.

The first possibility is to assign a sentence such as (71) the truth value false. Since there are no children in the garden, it cannot be the case that every child in the garden exists. The other possibility is that the truth value of this sentence is indeterminate. When the denotation of a DP such as *every child* is the empty set, the sentence is neither true nor false. It lacks a truth value, and therefore is indeterminate. Similar arguments can be presented for both (72) and (73). Thus, the truth values standardly assigned to these sentences when the DP in the subject position denotes the empty set are either false or indeterminate, depending on the theory.

Thus it may not be the tautological status of sentences such as (66) and (67) or the almost tautological status of a sentence such as (69) that is the root of their unacceptability, but the fact that they are true when the DP denotes the empty set. This truth value assignment appears to be at odds with the usual assignment of truth values to other sentences with a similarly undefined DP. I think there are two promising explanations of why this may be a problem. The first, and less theoretical, is that such an assignment of a truth value of true is simply in conflict with our intuitions about what truth values are permissible in such a situation. Consequently, the sentences are ruled out. Another (related) possibility is that the DPs in (67), (68) and (69) presuppose the existence of at least one individual. When these DPs are undefined, the sentence is subject to a presupposition failure. If we assume that presupposition failures should result in sentences that are neither true nor false, then the truth assignment of true to these ETS is a problem. In this case, it is the conflict between what truth values are permissible

in the case of a presupposition failure and the actual truth value assigned that is the cause of the unacceptability of these sentences.

I will not attempt to defend one explanation over the other as the central point is not which of these possibilities is correct, but the observation that ETS that contain DPs that have a denotation of type $\langle\langle e, t \rangle, t \rangle$, are headed by a determiner that is not weak and denote the empty set do not receive the same assignment of truth values as other, closely analogous sentences. The peculiar status of these sentences suggests that the problem with unacceptable ETS such as (67), (68) and (69) is not the original focus of Barwise and Cooper's explanation – unacceptable ETS in which the DP is defined – but perhaps unacceptable ETS in which the DP is undefined.

To truly make the case, a closer look at both the behaviour of undefined DP in ETS and in other constructions would be necessary. But even as this short discussion hopefully illustrates, patterns such as this will only emerge with a fully general definition of the class of weak determiners. With a fully general definition, it is possible to provide a simple semantic analysis of the core data, which in turn, can be used to highlight aberrations in the properties of unacceptable ETS. Without a fully general definition, the relationship between the core, exceptional and unacceptable examples of ETS is likely to remain obscure as too will any explanation of what motivates the peculiar distribution of data that characterizes ETS.

Chapter Three: *But, Only* and Grice's Maxims of Conversation

0. Introduction

Von Stechow (1993) notes the following distribution of phrase-initial DPs in *but*-phrases:

1. Every student but ChiSook smokes.
2. No student but ChiSook smokes.
3. *Some student but ChiSook smokes.
4. *Many students but ChiSook and John smoke.¹
5. *Most students but ChiSook and John smoke.
6. *Few students but ChiSook and John smoke.

As 1-6 demonstrate, the phrase-initial DP must be headed by a determiner that is a universal. A second restriction applies to the complement of *but*. This DP must denote a proper name, indefinite description, a definite description and in certain cases, a DP headed by a cardinal²:

¹ A second proper name is added to these examples to preclude the possibility of an agreement clash. See below for more details.

² The best examples of cardinals are those in which the noun has been dropped. The reasons for this are unclear, and to my knowledge, are not discussed anywhere in the literature. One possibility is that this fact is related to the more general interpretation condition that prohibits the repetition of the same nominal argument in the *but*-phrase. Note that both examples improve with the addition of a modifier that differentiates the first nominal argument from the second:

7. ??Every student but a student
8. ??Every student but the student
9. ?Every student but a student who failed the exam
10. ?Every student but the student who failed the exam

Cardinals do not require an overt nominal argument, and hence can sidestep this restriction since they do not occur with a repeated nominal.

11. No student but ChiSook smokes.
12. No man but a blockhead ever wrote except for money.³
13. Every student but the blockhead smokes.
14. Every student but one smokes.

15. *No student but every blockhead smokes.
16. *Every student but no blockhead smokes.
17. ??No students but many blockheads smoke.
18. ??No students but most blockheads smoke.
19. ??No students but few blockheads smoke.

In a later handout (von Fintel, 2000), von Fintel remarks that others have observed that the second co-occurrence restriction requirement of *but*-phrases closely mirrors the DPs that are acceptable as the complement of *only* in what I will term for the purposes of this paper *only-initial sentences* (see Szabolcsi cited in Moltmann, 1995).⁴ Although this list is in an inchoate form, the similarities are striking:

20. Only ChiSook smokes.
21. Only the student smokes.
22. Only two students smoke.⁵

23. ??Only every student smokes.
24. ??Only many students smoke.
25. ??Only most students smoke.
26. ??Only few students smoke.⁶

³ von Fintel, 1993; 126 (credited to Dr. Johnson)

⁴ Although the distribution of DPs in *only*-initial sentences appears to mirror the distribution of DPs that are the direct complement of *only* in other positions,

27. ChiSook likes only John/the boys in her class/two boys in her class.
28. ??ChiSook likes only every boy in her class/most boys in her class.

I will restrict my attention to examples where *only* is in a sentence-initial position.

⁵ von Fintel includes DPs headed by *at most* on this list. I find these examples interpretable, but very unnatural:

29. ?All the students but at most five law students complained.
30. ?Only at most five law students complained.

(von Fintel, 2000, 3 [33])

Because it is unclear to me whether these sentences are in fact acceptable, I will not include them among the cited data.

With the addition of (31), the list of acceptable DPs in *only*-initial sentences includes proper names, indefinite descriptions, definite descriptions and cardinals:

31. Only a student (in my class) smokes.

Thus, the distribution of DPs in *only*-initial sentences and in the second position of *but*-phrases appears to be very closely related.

As promising as this initial observation is, there are two exceptions that mar a perfect correlation between the distribution of DPs in these two constructions. First, DPs headed by *some* and *a few*⁷ are perfectly natural in *only*-initial sentences, but not in *but*-phrases:

32. Only some students smoke.
33. Only a few students smoke.

34. ??Every student but some blockheads smoke.
35. ??Every student but a few blockheads smoke.

If we assume that *some* and *a few* have an interpretation that is cardinal in nature⁸, it is not surprising that they are acceptable in *only*-initial sentences. What is surprising and therefore, in need of explanation is the observation that these DPs are unacceptable in

⁶ Two points about *few* are worth mentioning. First, there is some variability in the acceptability of *only*-initial sentences in which the DP is headed by this determiner. For the purposes of this paper, I will restrict my attention to the dialect in which it is ruled out. Second, a distinction needs to be drawn between *few* and *a few*. *A few* is not a simple variant of *few*. It lacks a comparative form and also fails to license negative polarity items (Kayne, 2005; 189). Thus, there is no reason to believe that what holds for one necessarily holds for the other.

⁷ *A few* does not exhaust the list of determiners of this type that are acceptable in *only*-initial sentences. Other examples include *a hundred* and *a dozen*. Because these expressions appear to be part of the same category as *a few*, I will treat *a few* as representative.

⁸ See Keenan and Stavi (1986) for a discussion of the cardinal interpretation of *a few* and Milsark (1977) for a discussion of the cardinal interpretation of *some*.

but-phrases.

In the case of (34) and (35), the problem appears to be that there is a clash in the agreement requirements of the singular *every student* and the plural *some/a few blockheads*.⁹ This problem becomes even more pronounced when the verbal complement of the *but*-phrase is in a tense in which the distinction between singular and plural is (phonologically) clearer:

- 36. *Every student but a few blockheads was smoking.
- 37. ??Every student but a few blockheads were smoking.

In addition, note that (38), where the second DP is singular, is substantially more acceptable than (34)¹⁰:

- 38. Every student but some blockhead smokes.

Thus, if we assume that the difference in the distribution of plural DPs headed by *some* and *a few* in *only*-initial sentences and *but*-phrase is due to the unrelated problem of an agreement clash, this data does not prevent us from concluding there is a significant overlap in the distribution of DPs in these two constructions.

The second and more perplexing difference is that sentences such as 28-30 are substantially more acceptable in contexts where an explicit contrast has been made between the determiner in the *only*-initial sentence and a determiner in a related question or sentence:

⁹ I would like to thank Sally McConnell-Ginet for suggesting this possibility to me.

¹⁰ There is also some variability in the acceptability of singular *but*-phrases headed by *no*.

- 39. ?No student but a blockhead smokes.
- 40. No movie but an action flick will please the students.

I will not attempt to chart the conditions under which singular *but*-phrases headed by *no* are acceptable and treat singular *but*-phrases headed by *every* and *no* as a monolithic group.

41. Does **every** student smoke?
42. No. ?Only **many** students smoke.
43. No. ?Only **most** students smoke.
44. No. ?Only **few** students smoke.

There is no corollary of this phenomenon in the second position of a *but*-phrase. Thus, although the distribution of DPs in these two constructions is very similar, it is not identical. The co-occurrence restriction of *only*-initial sentences appears to be identical to the second co-occurrence restriction of *but*-phrases except in a situation where an explicit contrast between two determiners is made.

The objective of this paper is to offer some insight into the surprisingly similar distribution of DPs in *but*-phrases and *only*-initial sentences. In order to do this, I will offer a new explanation of the first co-occurrence restriction and discuss a highly promising, but still incomplete explanatory strategy for the second co-occurrence restriction of *but*-phrases. I will then attempt to strengthen both of these points with a discussion of the distributional pattern, including the exceptions, of DPs in *only*-initial sentences. Two ideas will play a central role in this paper: 1) type theory and its effects on the distribution of DPs and, 2) the interaction of the unacceptable sentences with Grice's maxims of conversation.

In the first section, I present von Stechow's (1993) analysis of *but*-phrases. I leave his semantic analysis untouched but question the motivation he provides for both the first and second co-occurrence restriction requirements of this construction. Von Stechow notes that his analysis predicts that sentences that contain a *but*-phrase that is not headed by a universal determiner will be false in most models. He suggests that this quasi-contradictory status is at the heart of the unacceptability of these sentences, perhaps via a

process of grammaticalization.¹¹ Although an intriguing observation, it is not an explanation since many sentences, such as contradictions, are perfectly acceptable and yet false in all models. Von Fintel's discussion of the second co-occurrence restriction is very limited, but does not fare much better. The observed limitation to proper names, definites, indefinites and cardinals appears to be motivated by the fact that *but* requires an argument that denotes a set. Of course, more than just these DPs may denote a set, leaving the explanation of the second co-occurrence restriction requirement incomplete at best.

My solution is two-fold. First, the type assignment of *but* is such that it is only compatible with arguments that may be of type $\langle et \rangle$ and type $\langle \langle et \rangle, t \rangle$. This is not wholly unexpected since the intuitive meaning of *but* is a "set-subtractor". Proper names, definites, indefinites and cardinals are the only DPs that are compatible with both of these denotations, and hence the only DPs that may be the argument of *but*. My observations about the first co-occurrence restriction on *but*-phrases find their roots in von Fintel's observation that all *but*-phrases headed by non-universal determiners are quasi-contradictory. However, instead of focusing on those interpretations under which these sentences are false, we should turn our attention to those under which they are true. Sentences in which the subject is an ill-formed *but*-phrase are only true in very specific models: those in which there are at least two individuals and the sole exception to the general claim is exactly one individual. In other words, these sentences are only true in models in which sentences whose subject is a *but*-phrase headed by a positive universal determiner are also true. This surprising convergence of models means that any speaker that attempts to use a sentence in which the subject is an ill-formed *but*-phrase to make a true utterance will consistently flout one of Grice's maxims of conversation: Quantity. If the speaker attempts to use one of these sentences to make a false utterance, she will

¹¹ von Fintel, 1993; 132

consistently flout another of Grice's maxims: Quality. Thus, regardless of what she does, the speaker will be unable to utter one of these sentences without violating at least one of Grice's maxims of conversation.

In the third section, I will discuss a different, but as I will argue, related phenomenon: the distribution of DPs in *only*-initial sentences. What is particularly interesting about this construction is the manner in which BOTH of the above explanations can be invoked to explain the distribution of DPs in this construction. Type theory will once again play a central role in my explanation of the linguistic facts that characterize *only*-initial sentences. The observed similarity between the distribution of DPs in *only*-initial sentences and within the second position of a *but*-phrase is argued to be the result of a general ban on DPs whose base denotation is of type $\langle\langle et \rangle, t \rangle$.¹² The exception to this claim, i.e. *only*-initial sentences for which an explicit contrast is made between the determiners, provides further evidence of the important role that conversational maxims may play in determining the acceptability of certain utterances. It is only in a context where a specific alternative determiner has been provided for the interpretation that a speaker can be confident that her utterance of certain *only*-initial sentences will not flout the conversational maxim of Quality. In short, the distribution of DPs in certain *only*-initial sentences may provide more evidence that Grice's conversational maxims impact the distribution of DPs in some constructions.

Thus, although the distribution of DPs in these two constructions is not identical, they nevertheless share much in common. The distribution of DPs of type $\langle\langle et \rangle, t \rangle$ in both of these constructions highlights not only the central role that type theory can play in the explanation of distributional facts such as these, but also provides evidence of the impact that Grice's conversational maxims may have on the acceptability of certain utterances. Expanding this last point to full-fledged explanation would require both more

¹² This terminology is taken from Partee (1986) and refers to DPs headed by determiners such as *every*, *most* and *many*.

evidence and as is discussed in the conclusion, a principled explanation of why consistent violations render an utterance unacceptable, whereas occasional violations merely render an utterance pragmatically odd. Nevertheless, the distributional facts that characterize *but* and *only* point to some very intriguing possibilities.

1. *But*-phrases

Recall that there are two co-occurrence restrictions on *but*-phrases. The first applies to the phrase-initial DP. It must be headed by a determiner that is universal in force:

45. Every student but ChiSook smokes.
46. No student but ChiSook smokes.

47. *Some student but ChiSook smokes.
48. *Many students but ChiSook and John smoke.
49. *Most students but ChiSook and John smoke.
50. *Few students but ChiSook and John smoke.

The second restriction applies to the complement of *but*. This DP must be a proper name, an indefinite description, a definite description, or a cardinal:

51. No student but ChiSook smokes.
52. No man but a blockhead ever wrote except for money.
53. Every student but the blockhead smokes.
54. Every student but one smokes.

Von Fintel attempts to provide an analysis that accounts for both of these observations, but as we shall see, with only limited success.

According to von Fintel, a semantic analysis of *but*-phrases has three goals. The

first is to capture the intuition that *set subtraction* is central to the meaning of this construction. In (55),

55. Every student but ChiSook smokes.

the use of the *but*-phrase is argued to “save” this sentence by removing ChiSook from the set of students that is under consideration. Unfortunately, a semantic analysis that consisted of nothing but set subtraction would fail to explain the distributional facts discussed above. It would also have the drawback of being unable to block unwanted inference patterns. Universal determiners are left downward monotonic, a property that licenses inferences from the set denoted by the left argument to any of its subsets:

56. Every human being is mortal.
⇒ Every male human being is mortal.

But-phrases retain the property of left downward monotonicity, and consequently license the same inference pattern:

57. Every student but ChiSook smokes.
⇒ Every student but ChiSook and Julie smoke.¹³

The set of students minus ChiSook and Julie is a subset of the set of students that lacks ChiSook alone, and hence the inference is predicted to be acceptable, which in this case is wrong. Consequently, the second goal of any semantic analysis of *but*-phrases is to rule this inference out. Finally, sentences that contain *but*-phrases are thought to entail

¹³ I ignore the agreement problem here in order to allow von Stechow to make his point.

three sentences.¹⁴ In the case of (55), those sentences are:

- i. ChiSook is a student
- ii. Every student other than ChiSook smokes.
- iii. ChiSook doesn't smoke.

Thus the third goal of an analysis of *but*-phrases is to generate the correct entailments.

The core of von Fintel's analysis is set subtraction, which is further augmented by a Uniqueness Condition that guarantees first and foremost that the unwanted entailments of the universal determiners are blocked:

¹⁴ von Fintel is somewhat ambivalent about the status of (i), (ii) and (iii) as entailments. In the case of (ii) and (iii), his classification appears to be the result of a process of elimination. (ii) and (iii) are either conventional implicatures or entailments. He applies Karttunen and Peters' (1979) test to disambiguate entailments from conventional implicatures and demonstrates that it yields very encouraging results for the classification of these two sentences as entailments. If a sentence such as *every student but ChiSook smokes* is embedded under a verb such as *notice*,

58. John just noticed that every student but ChiSook smokes.

it is possible to claim that not only has John noticed that every student other than ChiSook smokes, but that she doesn't smoke either. Nevertheless, he observes in a footnote that there may be "weak" dialects of English for which neither (ii) nor (iii) is entailed. My discussion is limited to dialects in which (ii) and (iii) are entailed.

The status of (i) is more difficult to adjudicate. Although von Fintel does not discuss his decision to classify (i) as an entailment in detail, an application of the tests for the classification of this sentence as an entailment or a conventional implicature yields very murky results. For example, (i) fails Karttunen and Peter's test. In the case of (58) it cannot be claimed that John just noticed that ChiSook is a student. This suggests that it may be a conventional implicature. If it is a conventional implicature, it should be difficult to cancel. An application of a cancellation test yields less than clear results.

59. ?Every student but ChiSook smokes. Although I don't know if ChiSook is a student.

The acceptability of this fragment of discourse is debatable. I do not have very clear intuitions about whether the speaker has in fact cancelled anything, and thus do not find it a particularly decisive piece of evidence for the classification of (i) as a conventional implicature. I suspect that the lack of clear evidence one way or the other may be why von Fintel decides to classify (i) as an entailment for the sake of "simplicity" (von Fintel, 1993; 125). Given the lack of an obvious alternative, I will follow him in this classification.

$$\begin{array}{c}
D A \text{ [[but]] } C P = \text{True} \\
\Leftrightarrow P \in D(A - C) \ \& \ \forall S (P \in D(A - S) \Rightarrow C \subseteq S).^{15} \\
\uparrow \qquad \qquad \qquad \uparrow \\
\text{Domain Subtraction} \qquad \text{Uniqueness Condition}
\end{array}$$

D is the determiner, A the first argument, C the exception and P the second argument of the determiner.¹⁶ In the case of (55), the set denoted by C in the second sentence is not the unique, smallest exception. This designation belongs to the set denoted by C in the first sentence of the inference pattern. Thus, the second sentence cannot be inferred from the first sentence.

It also can be shown that this semantic analysis entails claims (i) – (iii) in the case of a sentence like (55). This is because the first clause of this analysis, Domain Subtraction, assures that the set denoted by C contains all the exceptions, while the second clause, Uniqueness Condition, assures that these are the only exceptions. This combination precludes the possibility of there being any other student than ChiSook who doesn't smoke, thus entailing that ChiSook is a student, every student other than ChiSook smokes, and that ChiSook doesn't smoke.

One of the particularly interesting aspects of this analysis is the prediction that sentences that contain a left upward monotone *but*-phrase, such as those headed by *some* or *many*, will rarely meet the Uniqueness Condition, and consequently, will be, in most cases, false. Left upward monotone determiners license inferences from sets to supersets:

60. Some female human being is an athlete.
 \Rightarrow Some human being is an athlete.

¹⁵ von Stechow, 1993; 130

¹⁶ von Stechow assumes that C either denotes a set or is type-lifted to an entity of type <et> through the application of a type-lifting function.

So left upward monotone determiners license the replacement of any set denoted by C with any superset containing C . In the case of *but*-phrases, if $P \in D(A - C)$, then it is also the case that $P \in D(A)$, which means that C does not denote the unique exception to the original claim containing the *but*-phrase. To illustrate, let us suppose that (61) is uttered in a situation where there are three individuals who smoke, and two who do not, ChiSook and Alex.

61. ??Some student but ChiSook smokes.

In this situation, the set containing ChiSook is not the unique exception to those that smoke. There are alternative sets that C could denote, such as the set consisting of ChiSook and Alex. Consequently, the Uniqueness Condition would not be satisfied. The sole situation in which the Uniqueness Condition could be satisfied is one in which there is exactly one student that does not smoke.¹⁷ In this situation, there is no superset that contains C , and hence, no possibility that an alternative exception set exists.

A similar observation can be made about examples (49) and (50). In the majority of cases, they will also fail to meet the Uniqueness Condition because of the lack of a unique exception set. Take, for example, a DP headed by a determiner that is not upward left monotone such as *most*. Suppose that (62),

62. ??Most students but ChiSook and John smoke.

is uttered in a situation where there are three non-smokers, ChiSook, John and Kenneth, and four smokers. In this situation, ChiSook and John are not members of the set that is the unique exception to the set of students who smoke. The set containing ChiSook and

¹⁷ von Stechow does not note this case as he seems to think that the general inability of these sentences to block the unwanted inference pattern is sufficient to rule them out.

Kenneth is a viable alternative. As before, there is a situation in which this is not the case: one in which there is exactly one individual who is the exception.¹⁸ Thus, like the previous case, a sentence containing a *but*-phrase in which the initial DP is headed by *most* is almost always false.

In light of these observations, von Fintel suggests that the first co-occurrence restriction may be the result of a prohibition on sentences that are (usually) false. Although this observation is provocative, it is not an explanation. Contradictions are not ungrammatical in English. Consequently, there is no particular reason to believe that the quasi-contradictory status of the above examples is the cause of their unacceptability. A much better explanation of the first co-occurrence restriction of *but*-phrases is needed.

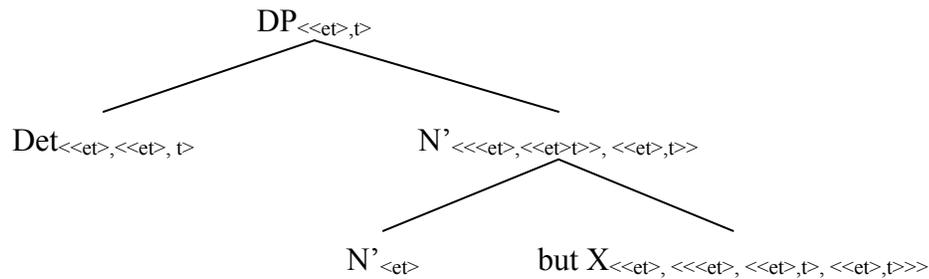
Von Fintel does not appear to have a fully worked-out explanation of the second co-occurrence requirement of *but*-phrases. Presumably, because his semantic analysis assumes that the second DP denotes a set, an explanation of the second restriction would hinge on this fact. Although it is clear that all the acceptable DPs in this position are compatible with this requirement, so are other DPs. Set denotation in and of itself cannot be the whole story; something else is needed to explain the second co-occurrence restriction requirement of *but*-phrases.

The following section attempts to respond to both of these problems. I begin with the second co-occurrence restriction, where I think type theory plays a central role in the distributional facts. To see why this is the case, it is necessary to turn to von Fintel's syntactic analysis of *but*-phrases.

¹⁸ Independently, a sentence uttered in this situation would be ungrammatical because of problems with agreement. The fact that it is ungrammatical does not affect the general point that it would be well-formed from the point of view of von Fintel's semantics.

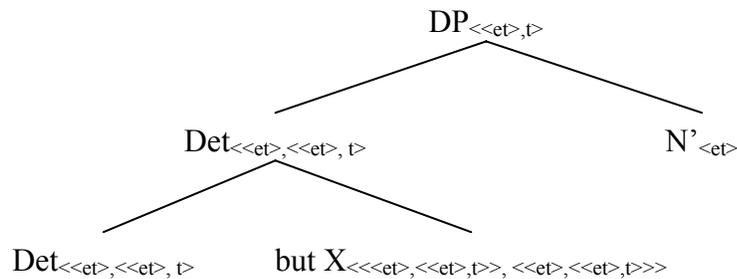
2.1 The Second Co-Occurrence Restriction

Von Fintel identifies two possible syntactic analyses of *but*-phrases. The first syntactic analysis that von Fintel suggests is to treat the internal *but*-phrase¹⁹ as an expression that combines with the denotation of an N' to yield another N':



The resulting N' takes a determiner as its argument and yields a DP of type <<et>,t>.²⁰

The other possibility he suggests is one in which the internal *but*-phrase directly modifies the determiner. The denotation of the determiner combines with the denotation of the internal *but*-phrase to form a discontinuous constituent that is a determiner:



¹⁹ The term *internal but-phrase* refers to the *but X* in von Fintel's syntactic analysis.

²⁰ von Fintel actually considers the resulting phrase an NP and not a DP. I have changed this feature of his analyses in order to keep the terminology in this paper consistent.

The resulting determiner takes a N' as an argument and yields a NP of type $\langle\langle et \rangle, t \rangle$.²¹

Neither of the analyses that von Fintel suggests is particularly obvious as they both demand an unorthodox assignment of types to the constituents of the *but*-phrase. The reason that von Fintel eschews more standard analyses – either one in which the internal *but*-phrase combines with an N' to yield a new expression that is the argument of the determiner that heads this construction OR one in which the internal *but*-phrase modifies the initial DP of this construction – is that he thinks his semantic analysis excludes these two options. His analysis requires that the internal *but*-phrase have access to both the determiner, i.e. *D* in his formalization, and the first argument of the determiner, i.e. *A* in his formalization. An analysis in which the internal *but*-phrase modifies the noun directly precludes access to the determiner, whereas an analysis in which it modifies the complete DP precludes access to both the determiner and the first argument. Thus, if the semantics is to be read directly off the syntax, an unorthodox syntactic analysis of *but*-phrases will be necessary.

Although a laudable goal, the desideratum of reading the semantics off of the syntax should be abandoned in the case of *but*-phrases. There are three very good reasons to prefer an analysis in which the internal *but*-phrase modifies the initial DP of this construction, i.e. the second standard option. Von Fintel offers the first reason in footnote eighteen of his paper. He notes an observation from Hoeksema (1990) that there is a close semantic parallel between certain *but*-phrases and relative clauses with conjoined heads or *hydras*:

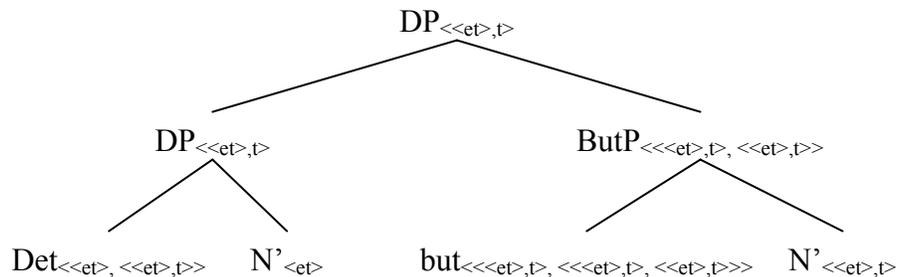
63. The boy and the girl who dated each other are friends of mine.

²¹ Of the two analyses, von Fintel prefers the second. He cites two reasons. First, discontinuous elements are attested in the grammar. Second, the type assigned to the *but*-phrase that modifies the determiner is also attested to. It has the same type as *almost*, a function that maps a determiner denotation onto a determiner denotation (von Fintel, 1993; 135).

64. Every man and every woman but Adam and Eve were born in sin.

The relative clause in (63) modifies the combined denotation of the two DPs, not each DP independently. Semantically, the best manner in which to account for this fact is to posit an analysis in which the relative clause modifies a DP whose denotation is the combined denotation of the conjoined heads of this construction (see Link 1983). Analogously, *but Adam and Eve* modifies the combined denotation the two initial DPs of the *but*-phrase in (64). And as with (63), the best analysis of this construction is one in which the internal *but*-phrase modifies a DP whose denotation is the combined denotation of the phrases *every man* and *every woman*. It is substantially easier to explain the acceptability of (64) if we assume that the standard analysis of this construction is one in which the internal *but*-phrase modifies the initial DP and not one of the options suggested by von Fintel.

A second advantage of adopting an analysis in which the internal *but*-phrase modifies the initial DP that heads this construction is that it facilitates a substantially simpler assignment of types to its constituent parts. To implement this analysis, let us assume that *but* combines with its nominal argument to yield its own syntactic head: *ButP*. If we further assume that the resulting expression is, as von Fintel assumes, of type $\langle\langle\text{et}\rangle, \text{t}\rangle$, then the following assignment of types follows naturally:



One immediate benefit of this analysis is that the type associated with the internal *but*-phrase is one that closely reflects its intuitive meaning. It is in some sense a “set subtractor” and hence, an expression that relates sets.

As natural as this type assignment appears, it raises an obvious question: why aren’t DPs that have a base denotation of type $\langle\langle et \rangle, t \rangle$ licit as the argument of *but*? Recall that in examples (15), (17) and (18), DPs headed by quantifiers such as *every*, *many* and *most* are unacceptable in the second position of this construction. In other words, how does the second co-occurrence restriction relate to this analysis of *but*-phrases?

The answer to this question is that the complement of *but* must be compatible with a denotation of type $\langle et \rangle$ and $\langle\langle et \rangle, t \rangle$. DPs that only have a denotation of type $\langle\langle et \rangle, t \rangle$ fail to meet this criterion and consequently, are ruled out. In contrast, proper names, definites, indefinites and cardinals have a substantially more flexible type assignment. They are compatible with a denotation of type $\langle e \rangle$, $\langle et \rangle$ and $\langle\langle et \rangle, t \rangle$, allowing them to easily meet this requirement.²²

The reason why the complement of *but* must be compatible with both denotation types and not just one or the other is due to the manner in which types are assigned to the remaining constituents of this construction, specifically the type assignment of the initial DP and the resulting type of the complete *but*-phrase.

Because our interest has been the distribution of DPs in the second position of this construction until this point, I have made the simplifying assumption in the presentation

²² Partee (1986) provides many of the best tests to establish the type assignment of an expression. In particular, she argues that the ability of an expression to conjoin with another expression whose sole denotation is of type $\langle\langle et \rangle, t \rangle$ or type $\langle et \rangle$ is evidence that the original expression shares the same denotation since conjunction is assumed to be only possible between expressions of the same type. The test that she provides for a denotation of type $\langle e \rangle$ only applies to an expression that is singular. On the basis of results from Heim (1982) and Kamp (1981), she argues that only expressions with a denotation of type $\langle e \rangle$ are suitable antecedents for discourse anaphors. Combined with Link’s (1983) subsequent arguments for an $\langle e \rangle$ type denotation for plurals, in particular plural definite descriptions, it is plausible to assume that proper names, definite descriptions, indefinite descriptions and cardinals are compatible with a denotation of type $\langle e \rangle$, $\langle et \rangle$ and $\langle\langle et \rangle, t \rangle$.

of the data that the initial DP of this construction is always a standard DP, i.e. one in which the determiner is separate from its nominal argument. This is, in fact, not true. The initial DP may also consist of a determiner that is fused to its nominal argument or a *fused-head DP*²³:

- 65. Nothing but a ridiculous hoax
- 66. Everything but the kitchen sink²⁴

Unlike other DPs that are quantificational in force, fused-head DPs pass the standard test for a denotation of type <et>. They are perfectly acceptable in the predicative position of a sentence:

- 67. It is nothing.
- 68. It is everything that I have ever wanted.²⁵
- 70. *She is every student.
- 71. *They are most things that I have ever wanted.

Thus, unlike examples of DPs where the determiner is not fused to its nominal

²³ The term *fused-head DP* is inspired by Huddleston and Pullum's term *fused-head NP*. It refers to a DP whose "head is realized jointly with a dependent function" (Huddleston and Pullum, 2002; 369). In this paper, it will refer solely to a DP in which the determiner and noun are fused.

²⁴ von Stechow, 1993; 126

²⁵ It should be noted that there is some variation in the acceptability of fused-head DPs in predicative position. Although (68) is fine, removing the relative clause *that I have ever wanted* results in an unacceptable sentence:

- 72. ??It is everything.

Although the ability to appear in the predicative position of a sentence is widely accepted as a basic test for a denotation of type <et>, there is no clear consensus on what mixed results suggest. I will, therefore, conclude that even in the light of counterexamples, fused-head DPs are compatible with a denotation of type <et>.

argument,²⁶ fused-head DPs must have a denotation of type $\langle et \rangle$.

The fact that the initial DP of *but*-phrases may have a denotation of type $\langle et \rangle$ forces us to rethink the types assigned to both the complete *but*-phrase and its remaining constituents. Recall that the type assigned to a complete *but*-phrase headed by a DP that is not fused is of type $\langle \langle et \rangle, t \rangle$. This designation is consistent with the performance of these expressions on the predication test:

- 73. ??Science is no theory but a ridiculous hoax.
- 74. ??This one is every music but jazz.

But not with the performance of *but*-phrases headed by fused-head DPs:

- 75. Science is nothing but a ridiculous hoax.
- 76. This one is everything but the kitchen sink. Jazz, hip-hop and a lot of soul.²⁷

Thus, a complete *but*-phrase in which the initial DP is fused must have a denotation of

²⁶ There are exceptions to the claim DPs headed by non-fused determiners are not acceptable to in predicative position. Partee (1986) offers one such example:

- 77. That house has been every colour.

She suggests that examples such as (77) are acceptable because of the special properties of the noun *colour*. Its inclusion results in a DP that is particularly amenable to a denotation of type $\langle et \rangle$. Consequently, these examples are assumed to be consistent with the general claim that predicative expressions have a denotation of type $\langle et \rangle$. The fact that these expressions are not acceptable as the complement of *but* may be evidence that that the second co-occurrence restriction applies to complete categories of expressions and not sub-categories. Proper names, definites, indefinites and cardinals are always compatible with a denotation of type $\langle et \rangle$ and type $\langle \langle et \rangle, t \rangle$, while DPs headed by determiners such as *every* are only compatible with both of these denotation types if their nominal argument belongs to a specific lexical class, i.e. if they are a member of a sub-category of a more general category of expression.

²⁷ As with simple fused-head DPs, not all examples of *but*-phrases headed by a fused-head DP are acceptable in predicative position. In particular, *but*-phrases headed by fused-head DPs in which the immediate argument of *but* is a proper name are very difficult to use in predicative positions:

- 78. *He is everyone but John

Although this variability is in need of an explanation, I do not think that it demonstrates that *but*-phrases headed by fused-head DPs lack a denotation of type $\langle et \rangle$.

type $\langle et \rangle$.

On the basis of the observation that both the complete *but*-phrase and the phrase-initial DP have a denotation of type $\langle et \rangle$, we can conclude that the type of ButP in these expressions must be $\langle\langle et \rangle, \langle et \rangle\rangle$. The assignment of a new type to the ButP requires that the type of *but* also be altered. In the original analysis, it is assigned the type $\langle\langle\langle et \rangle, t \rangle, \langle\langle\langle et \rangle, t \rangle, \langle\langle et \rangle, t \rangle\rangle\rangle$. An obvious type assignment for *but* when it is part of a *but*-phrase that is headed by a fused-head DP would be one in which all the types are lowered: $\langle\langle et \rangle, \langle\langle et \rangle, \langle et \rangle\rangle$.

This type assignment would require that the direct complement of *but* have a denotation of type $\langle et \rangle$ when it is headed by a fused-head DP. This restriction on the type of the complement could be implemented in two ways. One would be to restrict the complement of *but* to DPs whose denotation is of type $\langle et \rangle$ when the initial DP of the *but*-phrase is fused. The other would be to restrict the complement of *but* to DPs that are compatible with a denotation of type $\langle et \rangle$ and type $\langle\langle et \rangle, t \rangle$, thereby bypassing the need for a construction specific restriction when the initial DP of a *but*-phrase is fused. And this is indeed what appears to be the case. The complement of *but* is restricted to DPs that are compatible with both a denotation of type $\langle et \rangle$ and type $\langle\langle et \rangle, t \rangle$.

In sum, with careful attention to types and by adopting a new syntactic analysis of *but*-phrases, we derive three significant benefits. First, we are in a better position to explain the acceptability of hydra-like structures. Second, the type assigned to the constituents of this construction are more natural and in the case of *but*, more closely reflects its core meaning as an expression that relates sets. Finally, and most importantly from the point of view of this paper, it offers a straightforward explanation of the second co-occurrence restriction. I will therefore reject both of von Stechow's proposed analyses in favour of one in which the internal *but*-phrase modifies the initial DP of this construction.

And so, the first problem about the distribution of DPs in *but*-phrases is solved. Let us now turn to the other.

2.2 The First Co-Occurrence Restriction

Von Fintel's semantic analysis of *but*-phrases draws attention to a very interesting feature of sentences that contain *but*-phrases in which the initial DP is not headed by a determiner that is universal in force: they are false in most models. Left upward monotone *but*-phrases, i.e. those in which the initial DP is headed by a determiner such as *some* or *many*, will fail to meet the Uniqueness Condition in most models. The exceptions to this general claim are sentences interpreted against a model in which the nominal complement of *but* denotes a unique individual who is the exception. Sentences that contain *but*-phrases whose initial DP is headed by a non-left upward monotone determiners such as *most* are equally likely to run afoul of the Uniqueness Condition in most models. Again, the sole exception is one in which the nominal complement of *but* denotes the unique exception. Thus, like the previous example, sentences that contain these *but*-phrases are generally false.

The explanation that von Fintel suggests for the unacceptability of these sentences focuses on their quasi-contradictory status. He claims that a few "exotic" interpretations will not be enough to prevent a process of grammaticalization that renders these sentences unacceptable. Of course, as he points out and I reiterated above, the problem with this strategy is that contradictions are not generally unacceptable, and so shoehorning these sentences into that category provides us with little explanatory value.

Nevertheless, I think that von Fintel's observation about the status of these sentences is important to understanding why they are unacceptable. The key, however, is not to ignore models in which these sentences are true. When we focus our attention on these models, a very interesting pattern emerges: the conditions under which a sentence with an ill-formed *but*-phrase is true are the same as those under which a sentence with a *but*-phrase headed by a positive universal determiner is true. That is, a sentence with an ill-formed *but*-phrase is only true if it has what is essentially a universal interpretation.

This suggests that the problem with these sentences is not semantic in nature, but pragmatic. Any attempt to use these sentences to utter something true will result in a violation of one of Grice's main conversational maxims: Quantity.²⁸ Quantity consists of two parts:

Quantity

- i. Make your contribution as informative as is required (for the current purposes of the exchange)
- ii. Do not make your contribution more informative than is required.²⁹

A speaker whose utterance contains an ill-formed *but*-phrase in subject position can always make her contribution more informative, and thus avoid a violation of the first part of the maxim of Quantity, viz. by replacing the subject in her utterance with a *but*-phrase that is universal in force. Arguably such a replacement does not make the contribution *more informative* than is required, suggesting it would in fact be *as informative* as is required.

The other possibility is for the speaker to use a sentence with an ill-formed *but*-phrase in the subject position to make a false utterance. If she chooses this route, she will once again be in violation of one of Grice's maxims of conversation: Quality:

Quality

- (Supermaxim) Try to make your contribution one that is true.³⁰

Thus, any attempt to utter a sentence with an ill-formed *but*-phrase in the subject position will pose a challenge to the conscientious speaker – she will always be in violation of at

²⁸ I would like to thank Zoltan Gendler Szabo for highlighting this possibility to me in the case of ill-formed *but*-phrases headed by *some*.

²⁹ Korta and Perry, 2006; 8

³⁰ Korta and Perry, 2006; 8

least one of Grice's maxims of conversation. Before delving into the question of whether such violations could actually affect the distribution of DPs in this construction, let us first take a closer look at the interpretative possibilities for sentences with both well-formed and ill-formed *but*-phrases in the subject position.

2.3 *But*-phrases and the Conversational Maxim of Quantity

As an initial point of comparison, let us begin by looking at the various interpretations that are possible for a simple sentence in which the initial subject is a *but*-phrase headed by a positive universal determiner such as (79):

79. Every student but ChiSook smokes.

Of the possible models against which this sentence could be evaluated, two need to be removed from consideration at the outset. The first is one in which the name *ChiSook* fails to refer. For such a model, I do not think we have clear intuitions about whether (79) is true or false. The second is one in which there are no students. Interpreting (79) under these conditions appears to suffer from the same defect.

Of the remaining models, we are left with two main interpretative possibilities: those in which (79) is false and those in which (79) is true. There are three main types of models that will render (79) false. The first is one in which ChiSook smokes. As she is not an exception to the main claim, her 'subtraction' from the set of students does not 'save' the sentence from being false. The second possibility is a model in which there is exactly one student, ChiSook, and she doesn't smoke. Although the Uniqueness Condition is met, the sentence is still false because there are no students who smoke. The final possibility is one in which ChiSook is not the sole student who is a non-smoker. In these models, (79) is false because the Uniqueness Condition is not met. (79) is true

under exactly one set of conditions: there are students who smoke and the unique, smallest set of students who do not smoke contains ChiSook alone.

The distribution of true and false interpretative possibilities for sentences in which the subject is a *but*-phrase that is headed by a negative universal determiner are slightly different. As before, there are two types of models that must be excluded from the discussion: those in which ChiSook fails to refer and those in which there are no students. Of the remaining models, there are two types in which (80) will be false:

80. No student but ChiSook smokes.

The first is one in which ChiSook is a non-smoker. The other is one in which there are more students who smoke than just ChiSook, which leads to a failure of the Uniqueness Condition. Analogously two types of models are consistent with the truth of (80). The first is one in which ChiSook is the sole member of the model and is a smoker. Note the difference in acceptability of adding the following rejoinder to (80) and (79)

81. That is because she is the only student.

It is fine for (80), but a non-sequitur after (79). The other model is one in which there are other students, but once again, ChiSook is the sole student who smokes.

Now let us turn to the interpretation of sentences in which the *but*-phrase is not headed by a determiner that is universal in force. In this case, suppose our example sentence is:

82. ??Some student but ChiSook smokes.

As before, certain models need to be ignored: those in which ChiSook fails to refer and

those in which there are no students. The models under which this sentence is false once again fall into three main categories. The first are those in which ChiSook smokes. The second are those in which ChiSook is the sole student in the model. The third are those in which the Uniqueness Condition fails, i.e. when there is more than one student who does not smoke. The sole model in which the truth conditions of this sentence can be satisfied is one in which there is at least one other student who smokes and the smallest, unique exception set contain ChiSook alone. In other words, the conditions under which a sentence such as (82) is true are exactly those under which (79) is true.

The above observation holds for other *but*-phrases that are headed by non-universal determiners. Take *at least one* as another example:

83. ??At least one student but ChiSook smoke.

The break-down of models is for all intensive purposes identical. The conditions under which this sentence is false include the usual suspects: those in which ChiSook fails to refer, ChiSook is the sole student and is a non-smoker, or those in which the Uniqueness Condition fails. The sole model in which (83) is true is one in which there are at least two students, including ChiSook who does not smoke, i.e. models in which (79) is also true.

Extending this observation to cover cases in which the head of the ill-formed *but*-phrase is headed by determiners such as *most* or *many* is slightly more complicated. Suppose that our target sentence is (84):

84. ??Most students but ChiSook smoke.

As in the previous cases, the models in which (83) is true are just those models in which

(79) is also true.³¹ Consequently, sentences such as (83) will conform to the observed pattern. But it is worth adding, that as was argued at the outset of this paper, sentences such as (84) may be unacceptable for the completely unrelated reason of an agreement clash. Thus, although examples such as (84) are not counterexamples to my general claim, they may need to be handled more gingerly than examples such as (82) and (83) as their unacceptability may be traced to more than one source.

The fact that (82), (83) and (84) are true in just those models that (79) is true is remarkable.³² It suggests that any attempt by a speaker to use these sentences to make a true utterance will result in a violation of the conversational maxim of Quantity.³³ As I argued, another, more informative, alternative formulation of the utterance exists, viz. one in which the *but*-phrase is headed by a universal determiner. The other alternative is for the speaker to use these sentences to make an utterance that is false. This too will result in a violation of a conversational maxim. In this case, the speaker would fail to observe the maxim of Quality. Thus, utterances in which the subject is an ill-formed *but*-phrase have the very peculiar property of always resulting in a violation of at least one of Grice's maxims of conversation.

³¹ But not necessarily the converse. Whether (84) is true in a model with just two students, ChiSook, the non-smoker and one other smoker, will depend on the meaning of *most*.

³² Note too that this observation does not apply to the two sub-categories of acceptable sentences with a *but*-phrase in subject position. The conditions under which a sentence with a *but*-phrase headed by a positive universal determiner is true diverge from those in which the subject of the sentence is a *but*-phrase headed by a negative universal determiner. Recall that the latter is true in a model in which there is exactly one student, i.e. ChiSook, whereas the former requires a model with at least two students.

³³ This last point may also help explain why a sentence such as,

85. *One hundred percent of the students but ChiSook smoke

is unacceptable even though von Stechow's semantic analysis predicts the opposite. In the case of percentages, a substantially more informative formulation of the same sentence will usually exist, viz. one in which the actual percentage of students who fulfill the claim is identified. Thus, if we suppose that the above sentence is uttered in a situation where there are ten students, nine of whom smoke, then it may be more informative to simply state (86),

86. Ninety percent of the students smoke.

thereby avoiding a possible violation of the maxim of Quantity.

Although suggestive, whether such a consistent violation of the conversational maxims could result in these sentences being rendered unacceptable is far from clear. A very serious question can be raised in relation to this explanation. Why would an utterance that consistently violates the maxims be unacceptable? Conversational maxims can, and are often, flouted during the course of a conversation. Other utterances for which the maxim of Quantity is occasionally violated are not unacceptable, but stylistically marked. For example, it is sometimes argued that it is ‘pragmatically’ odd to utter sentences in which the subject is a quantifier phrase headed by *every* in a situation where there is exactly one individual (see McNally 1998 for discussion) because a more informative alternative exists: a sentence in which the subject is a definite description. Although the use of a sentence with universal subject is marked in this situation, it is not unacceptable. Instead, these sentences are generally used to express irony or sarcasm.

In the following section, I will attempt to respond to this concern by pointing to yet another phenomenon in which the distribution of determiners may be influenced by the possibility of a violation of the conversational maxim of Quality. This will hopefully add more weight to the contention that there may be a difference in the behaviour of utterances that consistently violate a conversational maxim, and those that occasionally do so. But even with more evidence, this explanatory strategy is still incomplete. For an explanation that relies on Grice’s maxims of conversation to be successful, a convincing response to the question of why utterances that occasionally violate the maxims are acceptable, while those that consistently violate them are not will be needed.

3. *Only*

As mentioned at the start of this paper, von Stechow (2000) makes a fleeting remark about the observed similarity between the DPs that are acceptable as the direct argument of *but* and those that are acceptable in *only*-initial sentences. His list includes the

following DPs:

- 87. Only ChiSook smokes.
- 88. Only the student smokes.
- 89. Only two students smoke.

The list is, however, incomplete. The first change that is necessary is the addition of indefinites. As the data discussed in relation to *but*-phrases demonstrates, indefinites may be the argument of *but*:

- 90. Every student but a blockhead

And as expected, they are also licit in *only*-initial sentences:

- 91. Only a student (in my class) smokes.

With the addition of indefinites, the DPs that are acceptable in *only*-initial sentences and as the argument of *but* – proper names, definites, indefinites, and cardinals – are identical. There is, consequently, some reason to believe that there is a connection between these two constructions.

The one distinction between these two distribution patterns is that range of acceptable DPs in *only*-initial sentences can be further expanded if an explicit contrast is made between the determiner in the *only*-initial sentence and an alternative:

- 92. Did every student attend the talk?
- 93. No. ?Only **most** students attended the talk.

- 94. Did some students attend the talk?
- 95. No. ?Only **every** student attended the talk.

Although there is some clear variation in the acceptability of these sentences, e.g. (95) strikes me as somewhat ironic whereas (93) does not, DPs headed by determiners such as *every* and *most* cannot be completely discounted.

Thus there are two distinct questions that can be raised about the semantic relation between *only*-initial sentences and *but*-phrases. The first is what motivates the nearly identical distribution pattern of DPs in these two constructions. The second is what allows *only*-initial sentences to deviate from the core set of categories in certain restricted cases. In what follows, I will attempt to answer each of these questions in turn. As before, I think that the answer to the first question can be traced to type theory. Proper names, indefinites, definites and cardinals are compatible with a wide range of types. In this case, the two salient denotations are of type $\langle e \rangle$ and type $\langle et \rangle$. DPs whose base denotation is of type $\langle \langle et \rangle, t \rangle$ are generally unacceptable in *only*-initial sentences. The sole exception to this claim is when an explicitly contrasting DP of type $\langle \langle et \rangle, t \rangle$ is provided in the course of a conversation. The explanatory strategy I will adopt of both of the general ban on DPs of type $\langle \langle et \rangle, t \rangle$ and the existence of the exceptions will draw from the above observations about the interaction of these sentences with conversational maxims.

3.1 The Semantics of *Only*

Rooth (1992) argues that *only* is a focus-sensitive adverb; focus is a feature that is marked on a syntactic phrase of a sentence and requires both a semantic and pragmatic interpretation.³⁴ A sentence containing *only* expresses a proposition that is asserted to be true, and depending on the analysis, either asserts or implies that it is the sole true

³⁴ Rooth, 1997; 271

proposition in relation to a set of alternatives. In this discussion, it will be assumed that the second claim is asserted and not implied. The semantic interpretation, consequently, must include a variable that ranges over these alternative propositions. The alternatives are derived by removing the focused element in the sentence and replacing it with a variable. The possible values for the variable are contextually determined. So for example, in the case of a sentence such as (96) where the noun is focused, the alternatives would be derived from a sentence such as (97), where *x* is the variable:

- 96. Only some [students]_F attended the talk.
- 97. Some *x* attended the talk.

(96) asserts that the proposition it expresses is true, and supposing a certain context of utterance, all alternatives of the form *some professors attended the talk* and *some administrators attended the talk* are false.

An *only*-initial sentence that has a noun in focus expresses a statement about the identity of the individuals under discussion. In contrast, an *only*-initial sentence which has the determiner in focus expresses a statement about quantity. The difference between these two interpretations can be brought out by explicitly asking a question about either identity or quantity. As expected, the felicity of the response depends on the position of the focus:

- 98. Who attended the talk?
- 99. Only two [students]_F attended the talk.
- 100. ??Only [two]_F students attended the talk.

- 101. How many students attended the talk?

- 102. ??Only two [students]_F attended the talk.
- 103. Only [two]_F students attended the talk.

A sentence in which the complete noun phrase *two students* is focused appears to be compatible with either interpretation. This fact bears directly on the exceptions noted above and will be discussed further below.³⁵

As the previous section mentioned, what binds proper names, definites, indefinites and cardinals together is that they are compatible with a wide range of type assignments. In addition to a denotation of type $\langle\langle et \rangle, t \rangle$ and type $\langle et \rangle$, these four categories of expressions are also compatible with a denotation of type $\langle e \rangle$.

The fact that *only*-initial sentences are generally compatible with expressions that are extremely flexible in their type assignment suggests that the restriction is type based. In this case, however, the relevant types do not appear to be $\langle et \rangle$ and $\langle\langle et \rangle, t \rangle$ as they were for the complement of *but*. Instead, the data seems to suggest that *only*-initial sentences are restricted in their compatibility with DPs that have a denotation of type $\langle\langle et \rangle, t \rangle$. In the majority of contexts, the denotation of a DP in an *only*-initial sentence must either be of type $\langle e \rangle$ or type $\langle et \rangle$. Although I lean towards restricting the denotation of this DP to type $\langle e \rangle$, I will leave open the question of whether the relevant denotations are type $\langle e \rangle$, type $\langle et \rangle$, or both. As proper names, definites, indefinites and cardinals easily meet this restriction and other DPs do not, they are the sole expressions that are generally acceptable in *only*-initial sentences.

I think that we can find the motivation for this general restriction on DPs with a base denotation of type $\langle\langle et \rangle, t \rangle$ (and its exception) by looking at the interaction of *only*-initial sentences that contain a DP of type $\langle\langle et \rangle, t \rangle$ with the conversational maxim of Quality. Specifically, we will examine the interaction of an *only*-initial sentence that

³⁵ This difference in meaning also explains some variation in the acceptability of DPs from the core set. For example, definites are not an acceptable answer to questions that require a cardinal response, and thus are unacceptable in situations where the determiner is focused:

104. How many students attended the talk?
105. ??Only [the]_F students attended the talk.

Although this variation exists, I will continue to treat proper names, definites, indefinites and cardinals as the class of DPs that are acceptable in *only*-initial sentences.

contains a DP with a denotation of type $\langle\langle et \rangle, t \rangle$ that expresses a statement about quantity with this maxim.

3.2 *Only*-initial Sentences and the Conversational Maxim of Quality

Suppose that during a fairly bland conversation about a talk in the lounge of a philosophy department someone asks:

106. How many students attended the talk?

If another person were to reply with an *only*-initial sentence in which the DP whose sole denotation is of type $\langle\langle et \rangle, t \rangle$, it would be necessary for either the determiner to be in focus, or alternatively, the whole noun phrase. In either case, the context would need to supply a set of alternatives in which the determiner is replaced. But a context of utterance is ill-equipped to handle this task; there is no tacit agreement about what determiners are salient, and hence no clear set of alternatives.³⁶ Thus an answer such as (106) might include (107) among its set of alternative propositions:

107. ??Only [most]_F students attended the talk.

109. Some students attended the talk.

Most students attended the talk entails that *some students attended the talk*. According to

³⁶ DPs headed by cardinals such as *one*, *two* etc. do not seem to have this problem. There appears to be an implicature associated with *only*-initial sentences that the number of individuals denoted by the DP is smaller than expected:

108. Only [six]_F students attended the talk.

The relevant set of alternatives appears to contain propositions in which the cardinal heading the DP is higher than six, i.e. *seven students*, *eight students*. If this is indeed how the set of alternatives is chosen, then an utterance of a sentence of this type will not necessarily run afoul of one of Grice's maxims.

Rooth's semantic analysis of *only*, (107) is false whenever (109) is included among the set of alternatives. Or it might not. There is simply no way in which to identify the salient set of alternatives, and thus no reason for the speaker to believe that what he has uttered is in fact true. A speaker who attempts to respond to (106) with (107) in the above context will be unable to observe the conversational maxim of Quality. He may try to make his contribution true, but he is far from guaranteed any success.

Fortunately, there is a solution at hand for the speaker who wishes to use (107): restrict utterances of these sentences to contexts where the choice of alternatives is carefully delimited. The provision of an explicit alternative during the course of a conversation exploits this fact and makes the evaluation of the truth or falsity of an *only*-initial sentence substantially easier. If the truth of a sentence that contains a DP headed by the alternative determiner is not entailed by the answer, then the *only*-initial sentence will also be true. (93) is an example of this interpretative strategy. In contrast, (95) is clearly false. The alternative provided by the discourse, *some*, leads to a situation in which the sole member of the set of alternatives, *some student attended the talk*, is entailed by the original sentence, *every student attended the talk*. With this information at her disposal, the speaker is in a much better position to either try and make her contribution to the conversation true, or as appears to be the case in (95), flout the maxim for ironic or sarcastic effect.

Thus, the restriction on DPs with a denotation of type $\langle\langle et \rangle, t \rangle$ in *only*-initial sentences may be motivated by the manner in which utterances of these sentences interact with the conversational maxim of Quality. The explicit provision of an alternative appears to improve the acceptability of these sentences – an observation that fits well with the claim that the problem with these sentences is pragmatic in nature.

One residual problem with this explanation is that although it is only the quantity interpretation of these sentences that pose a challenge to this maxim, all DPs with a base denotation of type $\langle\langle et \rangle, t \rangle$ are ruled out. A possible explanation of this fact is that an

only-initial sentence in which the complete noun phrase carries the feature of focus is compatible with both interpretations, leading to the need to ban the whole category of DPs to avoid those interpretations that cause problems for our conversational maxim. Without more proof, I will not insist on this point, concluding that this data provide suggestive, but not definitive evidence that the distribution of DPs in certain constructions may be influenced by Grice's conversational maxims.

3.3 Conclusion

There are two broad conclusions that can be drawn from a comparison of the distribution of DPs in *but*-phrases and *only*-initial sentences. The first is that the striking similarity in the choice of complements for *but* and as the subject of *only*-initial sentences finds its roots in type theory. Both of these constructions appear to restrict the type of their complement, although not in exactly the same way. The complement of *but* must be a DP that is compatible with a denotation of type $\langle e, t \rangle$ and type $\langle \langle e, t \rangle, t \rangle$, while the DP of an *only*-initial sentence is restricted in the majority of contexts to an expression that has a denotation of either type $\langle e \rangle$, type $\langle e, t \rangle$, or perhaps both. Proper names, definites, indefinites and cardinals fit the bill in each case, leading to a very similar distribution of DPs in these two constructions.

With a better grasp on the types associated with these expressions in each of these constructions, a second, and perhaps more interesting, similarity appears: *but*-phrases and *only*-initial sentences also share an idiosyncratic restriction on DPs whose base denotation is of type $\langle \langle e, t \rangle, t \rangle$. In each case, I have attempted to argue that the problem may be the interaction of utterances of these sentences with two common conversational maxims: both Quantity and Quality in the case of utterances containing *but*-phrases and just Quality in the case of utterances of *only*-initial sentences. Although this pragmatic explanation of the distribution of DPs in these two constructions is promising, it suffers

from a major drawback. It is unclear why sentences whose use would consistently flout a maxim of conversation are ruled out, whereas such behaviour for other utterances only results in them being stylistically marked, or limited to ironic or sarcastic uses. Thus, what is still needed, and well beyond the scope of this discussion, is a more comprehensive theory about the interaction of conversational maxims with our judgments about the acceptability of sentences – a theory that will hopefully confirm the intriguing possibility that the distribution of DPs in *but*-phrases and *only*-initial sentences is, in fact, due to violations of Grice's maxims of conversations.

Chapter Four: Silent Opposition

0. Introduction

Williamson (2003) claims that the position of restricted quantification is so incoherent that its defenders, *the generality relativists*, are unable to state their own position without assuming the very thing that they are denying: unrestricted quantification. To show that this is indeed the case, he derives a contradiction from nothing more than a simple statement of the generality relativist's position, unremarkable truth conditions and some basic rules of logic. From,

1. I am not quantifying over everything.

It is possible to infer,

2. Something is not being quantified over by me.

Let us suppose that (2) is true. The truth of the statement would probably depend on a semantic clause of the following type, where we replace the predicate *is not being quantified over by me* with F:

3. 'Something Fs' is true as uttered by *s* at *t* if and only if something over which *s* is quantifying at *t* satisfies 'Fs' as uttered by *s* at *t*.

and

4. Something satisfies ‘is not being quantified over by me’ as uttered by *s* at *t* if and only if it is not being quantified over by *s* at *t*.

which gives,

5. Something over which the generality relativist is quantifying at *t* is not being quantified over by the generality relativist at *t*.¹

(5) is a clear contradiction, and according to Williamson, a good indication that there is something very wrong with the generality relativist’s position.

Williamson explores a couple of possible responses to this paradox. The most promising solution that he suggests is to incorporate a reference to the context of utterance in the truth conditions. Suppose that the generality relativist uttered (1) and it was interpreted as (6), where *C** refers to a context of utterance that subsumes the original context of utterance *C*:

6. ‘Not everything is quantified over in *C*’ is true as uttered in *C**.

(6) solves the paradox, but at a price. The generality relativist must be willing to forego a homophonic account of its truth conditions within the original context of the utterance. Assessed in *C*, the right side of the bi-conditional in (7) is false:

7. ‘Not everything is quantified over in *C*’ is true as uttered in *C** if and only if not everything is quantified over in *C*.²

And hence the homophonic account of the statement in (6) in the original context of utterance is false. This failure is emblematic of Williamson’s wider concern about the generality relativist’s position: metalanguages that reject unrestricted quantification are

¹ Williamson, 2003; 427-428

² Williamson, 2003; 430

incomplete and therefore, prone to failure.

These metalinguistic problems are very surprising since, as Williamson points out, the best case for the generality relativist's position is in fact built on metalinguistic considerations. Generality relativists charge that those who advocate unrestricted quantification, within the terminology of Williamson, *the generality absolutists*, fail to appreciate the significance of an equally important paradox: Russell's paradox. Russell posed the original dilemma with the help of set theory, but it is possible to produce a version of the paradox without any recourse to sets and the controversial metaphysical commitments that they carry. Williamson provides just such an example. Given a language L, suppose we are charged with the task of giving some interpretation (I) for L. All that is required of I is that for any given predicate P, and any collection of things, F, P must hold of all members of F:

8. For everything o, I(F) is an interpretation under which P applies to o if and only if o Fs.

To generate a paradox, we need to introduce R, which is defined as all the objects to which the predicate P does not apply.

9. For everything o, o Rs if and only if o is not an interpretation under which P applies to o.

It is possible to substitute R for F in (8) and apply the definition of it in (9), to give (10):

10. For everything o, I(R) is an interpretation under which P applies to o if and only if o is not an interpretation under which P applies to o.

From (10), the following contradiction can be generated:

11. $I(R)$ is an interpretation under which P applies to $I(R)$ if and only if $I(R)$ is not an interpretation under which P applies to $I(R)$.³

The solution that the generality relativist advocates is to accept Russell's paradox at face value and reject the possibility of unrestricted quantification. Obviously, this solution is of little interest to the generality absolutist. Williamson offers an alternative: reject the classification of interpretations as objects. If this were to be done, premise (10) would no longer be valid and the contradictory conclusion of (11) would be blocked.

Thus each position has its own distinct disadvantage. In the case of generality absolutism, it is no longer possible to classify interpretations as objects. As counterintuitive as that may seem, it pales in comparison to what the generality relativist must be willing to accept: the impossibility of providing homophonic truth conditions for all sentences in our language. The latter option is substantially worse because it threatens the project of semantic theorizing – something that should be a central goal of any philosopher of language according to Williamson. Given the relative disadvantages of each option, the choice is clear for Williamson: generality absolutism.

The aim of this paper is to offer a reassessment of this conclusion. I will argue that Williamson's paradox does not pose nearly the threat to the generality relativist's position that Williamson contends. It is based on the faulty assumption that the domain of quantification of a quantifier phrase can be determined solely in virtue of the speaker's intentions. Denying Williamson this assumption undermines the paradox and his claim that restricted quantification is metalinguistically costly. The victory of the generality relativist is not complete, however. She is still left with an unsettling problem: her position is unsayable. She cannot maintain her commitment to restricted quantification and express the content of her position in a statement such as (1). She is silenced.

³ Williamson, 2003; 426

Although this may appear to be a fate worse than what Williamson envisions for her, I will show that she is not alone in her difficulties.

Russell's paradox poses a very serious problem to the position of the generality absolutist. The best response to Williamson's version of this paradox is to be found in Rayo (2006). The solution he advocates is to require that all object languages be interpreted in a language of a higher-order. This opens the door to the classification of interpretations as second-order terms – the solution that Williamson himself advocates – but more problematically, allows for the possibility of an ever ascending hierarchy of languages of higher and higher order. With an ever ascending hierarchy of metalanguages, there is the possibility that the interpretation of certain terms will never end. Instead of being occasionally trapped in silence, there are times when the generality absolutist cannot stop speaking.

Thus, it is true that each position has a distinct disadvantage, but they are not what Williamson claims they are. The task of making a choice between these two positions on the basis of their drawbacks alone is not easy, but if we follow the advice of Williamson, one position edges out the other: restricted quantification. An ever ascending hierarchy of metalanguages has the potential to undermine the project of semantic theorizing. Given the importance that this possibility is accorded in Williamson's original argument, it is clear that the disadvantages of unrestricted quantification far outweigh those of restricted quantification, making the latter the more attractive of the two.

This paper is divided into three main sections. The first presents Williamson's paradox in more detail and the problem with the assumption that lies at its heart. Drawing from the work of Gauker (2003), I present an argument that demonstrates that the domain of quantification of a quantifier phrase cannot be determined by speaker's intentions alone. Although the generality relativist's position is not paradoxical, it is still problematic. The subsequent part of this section discusses her ensuing silence. Section two introduces the other paradox that is the focus of this paper, Russell's, and its costs to

the generality absolutist's position. Two solutions are discussed, Williamson (2003) and Rayo (2006), of which only the second succeeds. The cost of this solution is the focus of the second part of this section and where I introduce the concept of an ever ascending hierarchy of languages. The paper ends with a comparison of the relative costs of each position, which keeping Williamson's advice in mind, leads to the conclusion that it is the generality relativist who has the better deal.

1. Unrestricted Quantification in Natural Language

Williamson's argument that the generality relativist assumes the very thing that she is denying when she utters a sentence such as (1), repeated below for convenience,

12. I am not quantifying over everything.

depends on one crucial assumption about the domain of quantification associated with the fused quantifier phrase *everything* in this sentence: it is completely unrestricted. Without a completely unrestricted interpretation, (12) cannot express the content of the generality relativist's position. And if (12) does not express the content of her position, then Williamson will be unable to derive a contradiction. The subsequent sentence that is inferred from an utterance of (12), repeated as (13),

13. Something is not being quantified over by me.

could no longer be associated with the controversial truth conditions that he provides in (3), repeated as (14) below:

14. 'Something Fs' is true as uttered by *s* at *t* if and only if something over which

s is quantifying at *t* satisfies 'Fs' as uttered by *s* at *t*.

If the domain of quantification is restricted, then there are things by definition over which the speaker is not quantifying and hence, no prima facie reason to believe that this truth condition holds in the case of a sentence such as (13). The above truth condition for *Something Fs*, therefore, would not be fully general, and so, false. Without this intermediary premise, it is no longer possible to conclude that there is something over which the speaker both is and is not quantifying, and so no threat of a contradiction.

In virtue of this fact, the generality relativist has an easy response to Williamson's paradox: reject his initial assumption that the domain of quantification associated with *everything* is completely unrestricted. Denying this claim would not only block the generation of the paradox, but undermine one of Williamson's key pieces of evidence for his main critique of the generality relativist's position. Williamson is aware of this temptation but responds unequivocally that it is not an option for the generality relativist.⁴ According to him, the interpretation of a domain, whether restricted or unrestricted, does not depend on the desires of the audience, but the intentions of the speaker, and since Williamson intends the domain of quantification to be interpreted without restrictions, then the domain of quantification must be interpreted without restrictions.

The manner in which Williamson blocks the response of the generality relativist makes essential use of the relation between the speaker's intentions and the domain of quantification of the quantifier phrase in an utterance. But the question of whether speaker's intentions are sufficient to fix the domain of quantification *in an utterance* isn't directly relevant to the problem at hand; the disagreement between Williamson and the generality relativist is not about the domain of quantification in the utterance, but in what the utterance expresses: the proposition. In the case of propositions, however, it is far from clear that speaker's intentions alone are sufficient to determine the domain of

⁴ Williamson, 2003; 416

quantification of whatever is the correlate of a quantifier phrase.

Gauker (2003) demonstrates nicely the shortcomings of Williamson's explanation in the case of propositions with the following thought experiment. He asks us to suppose that there is a very isolated village in which a rather unimaginative Goatherd lives. Being unimaginative, he is not given to much reflection and has never considered the question of whether anyone exists outside of his village. One night, the whole village witnesses a falling star. The Goatherd describes his thoughts about this event with the following sentence:

15. Everyone saw the falling star.

A few days later, we are asked to imagine another conversation between the Goatherd and his friend. His friend, who is more contemplative, asks the Goatherd whether he thinks anyone lives beyond the hills of their village. The Goatherd reflects on this question and in a fit of insight thinks 'Yes. There must be others who live beyond this village'. He reports this particular thought with the following sentence:

16. Not everyone lives in the village.

Now how are we to interpret the propositional content of these two sentences? According to Gauker, there appears to be a clear difference in the interpretation of the quantifier phrase. (15) is about all the people in the Goatherd's village while (16) is about all the people in the universe.

There are two manners in which we could explain this difference in the relevant propositional content of the two sentences. The first would be to claim that in each case the quantifier phrase receives an unrestricted interpretation, i.e. *everyone in the universe*, but that the relative extension of this domain is relativized to the Goatherd's

understanding of this domain. The Goatherd, after all, lacked the relevant distinction between a village and the universe when he uttered (15), and therefore, from his point of view, the two restrictions are equivalent. Relativized to his understanding of the relevant domains of quantification, the quantifier phrase in (15) could be interpreted exactly the same as that in (16). There is, however, no obvious reason to relativize the interpretation of either proposition to the Goatherd; it is unnecessary and would raise the very thorny problem of how the audience manages to understand the Goatherd's utterance if only he has access to the correct interpretation.

A more straightforward explanation of this difference in interpretation is that the quantifier phrase in (15) receives a restricted interpretation to those in the village, while the quantifier phrase in (16) does not. If this is indeed the case, then Williamson's explanation of how domains of quantification are determined is in trouble in so far as it applies to propositions. Speaker's intentions alone cannot explain the restricted interpretation of the quantifier phrase in (15). The Goatherd, after all, lacked the crucial distinction between the village and the universe at the time of utterance of his first sentence. It, therefore, would be impossible for him to restrict the domain of quantification of the first quantifier phrase to just those in his village.

Faced with this failure of speaker's intentions, the generality absolutist could simply reject the initial claim that the Goatherd said something true in (15). By failing to restrict the domain of quantification to just those in the village, the domain of quantification associated with the quantifier phrase *everyone* includes all the people in the universe. Since everyone in the universe did not see the falling star, (15) is false. As attractive as this explanation may look, it faces a serious problem: it would leave the Goatherd unable to assert what he is thinking about the falling star. Since the act of assertion requires that what is asserted be true, and the Goatherd is completely unaware (at the time of utterance) of the need to restrict the domain of quantification to just those in the village, he would be unable to make an assertion that expresses his thoughts.

Suggesting that the Goatherd is so deficient in his ability to communicate seems not only uncharitable, but rather implausible too.

A better explanation of this scenario is that speaker's intentions cannot be the sole determinant of the domain of quantification associated with the correlate of a quantifier phrase in a proposition. The interpretation is, in certain cases, influenced by the context of utterance. Context must also play a role in any explanation of what determines the domain of quantification of the correlate of a quantifier phrase in a proposition.

So, Williamson's insistence that speaker's intentions are enough to guarantee an unrestricted interpretation of the quantifier phrase in the generality relativist's statement of her position is simply not enough. Context must also be countenanced. What is and is not part of the context of utterance⁵ and how context interacts with meaning is far from a settled matter. There is neither an intuitive understanding nor a functioning model of how context influences meaning, and therefore, no way to know whether a particular context is necessary for a proposition to have a completely unrestricted interpretation.

1.1 The Cost of the Generality Relativist's Position

The generality relativist is thus in a very good position to reject Williamson's assurances that any statement of her position commits her to unrestricted quantification. He simply cannot guarantee that the quantifier phrase receives the interpretation that he intends. The fact that he can't guarantee this is enough for the generality relativist to remain skeptical that she is in fact as confused as he maintains. And so, at least from the point of view of the generality relativist, Williamson has neither proved that her position leads to a paradox nor that it carries with it any particularly heavy metalinguistic costs.

⁵ So, for example, the speaker's intentions are part of some theories of what constitutes the context of utterance (see Bach 1999 for one such approach) and not others (see Perry (1998) and his discussion of *narrow context*). Nothing stated here precludes the possibility that speaker's intentions are part of the context; they simply can't be constitutive of the whole context of an utterance.

With this conclusion comes a different and perhaps, equally heavy cost: the generality relativist cannot state her position. As a generality relativist, she is committed to the claim that all uses of quantifier phrases in natural language are restricted. This claim extends to the statement of her own position. The quantifier phrase *everything* in (12) is restricted, and therefore does not carry the meaning necessary to express her position. She must, in the words of Fine (2006), remain silent.

And this is the real cost of the generality relativist's victory: silence. Silence is not a small price to pay for a commitment to restricted quantification.⁶ But it is a good bargain if the cost of maintaining unrestricted quantification is even higher. Deciding whether this is indeed the case is the focus of the next section. Because the natural home of the generality absolutist is formal languages such as first-order and second-order logic, we will leave the fertile ground of natural language for their more austere offerings. As we shall see, the haven of formal languages will allow Williamson to present a new, but nevertheless very familiar argument for his position: that the manner in which the meaning of quantifiers – terms that are related but not identical to quantifier phrases in natural language – is determined guarantees the possibility of an unrestricted interpretation. But this time, unlike his previous attempt, his argument succeeds. With the case for unrestricted quantification reconfirmed, we can then turn to the key question: what is the cost of this victory?

2. Unrestricted Quantification in Formal Languages

There is a very similar problem to the one posed by Williamson's paradox in first-order logic: the Löwenheim-Skolem theorem. This theorem demonstrates that given a

⁶ Fine (2006) provides one route out of this dilemma, but it requires the adoption of a non-standard type of modality. Because I am not fully convinced by the cogency of the modality he introduces, I will not address his solution here.

model with an “all-inclusive” domain, there will be a countable set that is a sub-model that is indistinguishable from the given model:

Suppose, for *reduction ad absurdum*, that our usage picks out a unique intended model for our language, and that this model has an all-inclusive domain. The Löwenheim-Skolem theorem tells us that there is a countable set S such that we get an elementary submodel of the intended model when we restrict the domain to S . There isn’t anything in our thoughts and practices in virtue of which the so-called intended model fits our intentions in using the language better than the countable sub-model, so that there isn’t anything that makes unrestricted quantification, rather than quantification over S , the intended meaning of the quantifiers.⁷

Thus, although we may intend that an interpretation be relative to a model in which the domain is completely unrestricted, we cannot guarantee that it is. There is always the possibility that our interpretation is in fact relative to the restricted, but indistinguishable sub-model. Thus, in first-order logic, just as in natural language, it is not possible to guarantee that a statement containing a universal quantifier is interpreted relative to an unrestricted domain.

The challenge posed by the Löwenheim-Skolem theorem is just a formal variation of the same epistemological problem that animated the discussion in the previous section: how can we guarantee that our words mean what we think they mean? In the case of the interpretation of quantifier phrases in natural language, the answer that Williamson pursued was a theory of meaning that depended solely on the speaker’s intentions. If it were the case that the speaker’s intentions were sufficient to determine the meaning of a given quantifier phrase, then Williamson would have been able to guarantee that the phrase in (1) received the interpretation that he wanted. But as we saw, this was not to be. The domain of quantification associated with a quantifier phrase cannot be

⁷ McGee, 2006; 185

determined by intentions alone.

Although Williamson's response fails, his strategy is sound. With a better theory of how meaning is determined, he would have been able to defend his paradox and bring the argument with the generality relativist to a sudden end. It is not surprising to see Williamson reprise this strategy in a related, but later paper, Williamson (2006). A key difference this time is that his discussion of unrestricted quantification is limited to the confines of formal languages such as first-order logic and second-order logic – languages that have the distinct advantage of being substantially less complex than natural language. Accordingly, they place fewer demands on explanations of how the meaning of a term is determined. Williamson takes advantages of this feature of formal languages and argues that it is harmless to assume that the meaning of a term is just its extension. Such an assumption would be unwarranted in the case of natural language because a purely extensional theory of meaning is unable to distinguish between terms with the same extension but different senses. Williamson illustrates this problem with the rather whimsical examples of *cat who licks all and only those cats who do not lick themselves* and *mouse who is not a mouse*.⁸ Both of these expressions have the same extension, viz. the empty set, but clearly different senses. Even if we were to restrict our attention to terms in natural language that are plausible correlates to the logical constants of a formal language, it is clear that an extensional theory of meaning would still be inadequate to capture certain aspects of their meaning. One example is the connective *if* in English. It often appears to imply a causal connection between the antecedent and consequent – a connection that could not be explained in a purely extensional theory.⁹ The more limited

⁸ Williamson, 2006; 370

⁹ A more appropriate example of this problem may be the differences in meaning of the terms *each*, *any*, *every* and *all* in English. Although all of these expressions are plausibly correlates of the universal quantifier in a formal language, and hence candidates for an interpretation that relies on similar rules of inference that Williamson identifies for the first-order logic symbol \forall , there are aspects of their meaning that cannot be captured solely in virtue of their extension (for a discussion of the differences in meaning of these terms, please see Vendler (1962)). Thus, the different requirements that a theory of meaning must fulfill for universal quantifiers in English and that for formal languages means that the arguments presented

vocabulary of a formal language makes these problems easier to contain, and so, easier to ignore. With this caveat in place, Williamson is in a much better position to execute his strategy and as advertised, end his argument with the generality relativist.

Williamson claims that a good candidate to explain what logical terms mean is our inferential practice with them.¹⁰ In the case of quantifiers, whether first-order or higher, the rules of inference that determine their use are well delineated. Because our interest is primarily universal quantification, it will be the only quantifier that is discussed. For concreteness, Williamson provides the two rules of inference that uniquely characterize our use of the universal quantifier in first-order logic:

- \forall -Introduction Given a deduction of A from some premises, one may deduce $\forall vA(v/t)$ from the same premises, where $A(v/t)$ is the result of replacing all the occurrences of the individual constant t in the formula A by the individual variable v , provided that no such occurrence of v is bound in $A(v/t)$ and that t occurs in none of the premises.
- \forall -Elimination From $\forall vA$ one may deduce $A(t/v)$, where $A(t/v)$ is the result of replacing all free occurrences of the individual variable v in the formula A by the individual constant t .¹¹

What distinguishes our pattern of use of these rules is our “open-ended commitment” to them. We have, in the words of Williamson, a general disposition to accept these rules both in our current language, but more importantly, in any extension of that language.¹²

in this section cannot be used to establish the possibility of unrestricted quantification in natural language, and hence do not affect the conclusions of the previous section.

¹⁰ Although Williamson does not specify exactly what aspect of the meaning of a logical constant our inferential patterns determine, he appears to be making a relatively modest claim. Our inferential practice is an important, but perhaps not the unique determinant of the meaning of these terms. As he points out, co-extensive terms may not be synonymous, but “even simply coextensiveness excludes by far the worst forms of misunderstanding” (Williamson, 2006; 370). Because it is not central to the question here, I treat inferential patterns as the unique determinant of a logical constants meaning.

¹¹ Williamson, 2006; 380

¹² Williamson, 2006; 376

This final point is really the crux of Williamson’s argument. To demonstrate that it is indeed the case, he offers a formal proof. Suppose we have two first order languages L and L^* . The first language, L , contains the universal quantifier, \forall , while the other language, L^* , contains the universal quantifier \forall^* . The meaning of \forall is determined by the two above rules of inference. The meaning of \forall^* is determined by two similar, but perhaps not identical rules of inference. Now suppose that we were interested in knowing whether the term \forall has *exactly* the same meaning as the term \forall^* . The best manner to do this would be to take advantage of the fact that we have an open-ended commitment to the rules that determine the meaning of each of these terms. If we can find a language that is both an extension of language L and an extension of language L^* , and demonstrate that \forall and \forall^* have the same meaning in this extension, then we can conclude that it must have been the case that they had the same meaning in each of their respective languages, i.e. L and L^* . And this is exactly what Williamson does.¹³ By combining the syntactic resources of L and L^* he creates a new language, $L + L^*$. In $L + L^*$, the meanings of \forall and \forall^* are interderivable, and hence identical. Since their meaning is identical in the extended language, it must have been the case that they were identical in L and L^* separately. Thus, not only is the meaning of the universal quantifier determined in virtue of our inferential practice with this expression, but our commitment to this practice is open-ended.

If our commitment to the inferential practice that determines the meaning of universal quantifiers is open-ended, it must also be the case that the domain of

¹³ The proof is as follows: Consider a universal quantifier \forall in a language L governed by those rules and another universal quantifier \forall^* in a language L^* governed by exactly parallel rules, \forall^* -Introduction and \forall^* -Elimination...Merge L and L^* into a single $L+L^*$, whose primitive vocabulary is the union of the primitive vocabularies of L and L^* . Let A be a formula of $L+L^*$ in which the individual constant t does not occur and no variable except v occurs free. We reason in $L+L^*$. From $\forall vA$ we can deduce $A(t/v)$ by \forall -Elimination. Therefore, since t does not occur in the premise and A is the result of replacing all occurrences of t in $A(t/v)$ by v , and no such occurrence of v thereby becomes bound in A , from $\forall vA$ we can deduce \forall^*vA by \forall^* -Introduction. Conversely, from \forall^*vA we can deduce $A(t/v)$ by \forall^* -Elimination, and therefore $\forall vA$ by \forall -Introduction. Thus, given the pooled commitments of speakers of L and L^* , the two quantifiers are logically equivalent. (Williamson, 2006; 381).

quantification associated with these terms is unrestricted. Without an unrestricted interpretation, we would be unable to extend the interpretation of this term in a given language to any extension of that language – the defining condition of an open-ended commitment to this inferential practice. Thus, we must conclude along with Williamson that universal quantifiers in first-order logic have an unrestricted interpretation.¹⁴

A particularly nice feature of this argument is that it is not limited to first-order logics alone; with suitable inferential rules, it can be extended to any order of logic, making it general enough to respond to the question of whether quantification is unrestricted in formal languages. In sum, if we accept that the meaning of universal quantifiers is determined in virtue of an open-ended commitment to our inferential practice with them, we must also accept that they have an unrestricted interpretation regardless of the order of language in which they are found.

Williamson's explanation of how the meaning of universal quantifiers in first-order logic is determined responds nicely to the skeptical concerns raised by the Löwenheim-Skolem theorem.¹⁵ Although we are still committed to the conclusion that any model with an unrestricted domain will be indistinguishable from a (countable) sub-model, this fact in and of itself is no longer grounds to doubt the possibility of unrestricted quantification. With the addition of the observation that this argument can be extended to higher-order logics and the assumption that not only is unrestricted quantification possible, but the preferred interpretation of universal quantifiers in formal languages, we can ratchet up the strength of this response to the generality relativist even

¹⁴ Williamson raises the point that it may appear that his argument does not actually establish absolutely unrestricted quantification as the interpretation of \forall in first-order logic is always carried out in relation to a model, which by definition, has a restricted domain of quantification. Such a complaint, according to him, is unconvincing as it misses the nature of what it is to have an open-ended commitment. A far more challenging problem to his approach, however, is never addressed. Namely, how a language learner could acquire knowledge of the denotation of a logical constant such as \forall in virtue of the patterns of use that characterize its use (Gómez-Torrente, 2002). Since I ultimately reject the position of the generality absolutist, I will not address this concern about his approach and extend Williamson the benefit of the doubt in this section.

¹⁵ This point is due to McGee (2006). For further discussion of both the Löwenheim-Skolem theorem and the solution that an approach such as Williamson's offers please refer to his article.

further. Faced with any particular universal statement in a suitable logic, an unrestricted interpretation is assumed. With this addition, skepticism about unrestricted quantification both in the abstract and in the concrete is roundly rebutted.

This proof of the existence of an unrestricted interpretation of universal quantifiers carries with it one important drawback: Russell's paradox. A completely unrestricted interpretation of the universal quantifier will admit an interpretation that both does and does not apply to some predicate, generating a paradox. Solving the crisis caused by the existence of this paradox is paramount if the generality absolutist is to maintain the superiority of his position to that of his opponent's. For the remainder of the paper, I will focus on two of the best solutions: Williamson (2003) and Rayo (2006).

2.2 Williamson (2003)

Recall that Williamson introduced a version of Russell's paradox that makes essential use of the concept of an interpretation:

17. For everything o , $I(F)$ is an interpretation under which P applies to o if and only if o F s.
18. For everything o , o R s if and only if o is not an interpretation under which P applies to o .
19. For everything o , $I(R)$ is an interpretation under which P applies to o if and only if o is not an interpretation under which P applies to o .
20. $I(R)$ is an interpretation under which P applies to $I(R)$ if and only if $I(R)$ is not an interpretation under which P applies to $I(R)$.

According to the generality relativist, it is the assumption of unrestricted quantification that leads to the contradiction. The solution that she advocates is to restrict the domain of

quantification associated with the fused quantifier phrase *everything*. A restricted domain of quantification that excludes interpretations would make the substitution of an interpretation for the variable *o* in the second and third premise of the paradox unacceptable.¹⁶ Thus the generality relativist is able to solve the paradox, but only at the cost of unrestricted quantification.

The generality absolutist must pursue other solutions. Williamson favours one in which the real culprit of the paradox is not unrestricted quantification, but the assumption that interpretations are objects. This, at first glance, is not a particularly obvious line of attack to pursue. After all, the naturalness of Williamson's version of Russell's paradox depends in part on the intuitive appeal of classifying interpretations as objects. Although intuitive, this impetus is nevertheless misguided.

Objects (or things) are defined by Williamson as follows:

Whatever is is a thing...Whatever is basic or derived, simple or complex, is a thing. Whatever can be named is a thing; so too is whatever cannot be named. Any value of a variable is a thing, and everything is the value of a variable under at least one assignment.¹⁷

A language in which the variables only range over objects is a first-order language. For a term to be part of a first-order language, and hence be first-order definable, it must refer to an object. According to Williamson, interpretations are not first-order definable. They are not the name of something, but a type of predicate. Predicates do not refer to objects, and therefore, predicate variables do not range over objects. They are part of a second or higher-order language. As terms that do not denote objects, interpretations are not an acceptable value for the variable *o* in the second and third premise of Williamson's version of the paradox. As before, the paradox is averted, but this time the assumption of unrestricted quantification is left untouched.

¹⁶ Williamson, 2003; 427

¹⁷ Williamson, 1003; 420

Although Williamson provides an alternative solution to Russell's paradox, it incorporates the rather surprising claim that interpretations are predicates. This classification is the source of some debate. His justification for it is the role that these expressions play in defining logical consequence:

The paradox-inducing argument of [examples 17-20] assumes that there are such things as interpretations, in particular the interpretations of predicate letters. That assumption was justified by the need to generalize over such interpretations in a Tarskian definition of logical consequence. Suppose, for example, that we are interested in whether $\exists xPx$ is a logical consequence of $\forall xPx$. We might stipulate that *the predicate letter P applies_I to something if and only if it brays...*¹⁸

The condition that Williamson stipulates for the interpretation of the predicate letter P would yield a conditional of the following kind:

21. If $\forall xPx$ is true_I then $\exists xPx$ is true_I.

The question that this conditional raises is how should the subscript *I* be understood? According to Williamson, there is an obvious impulse to treat it as a referring expression because of the need to generalize into this position. Generalizations require us to quantify over something and as natural language has a strong preference for quantification over things, *I* must denote a thing.¹⁹

Although the impulse is there, it must be resisted according to Williamson. A closer look at the function of *I* in an example such as (21) reveals an expression that is more closely associated with predicates than nominals; the function of *I* is to identify the

¹⁸ Williamson, 2003; 452: italics added

¹⁹ Williamson also frames this decision in terms of a mistaken belief that all quantification is first-order in nature. I don't think that this is directly relevant to the case at hand. It has already been established that it is very natural to classify interpretations as objects. Faced with the question of how to classify them in a new context, it is hardly surprising that we assume that they are referring expressions. No prior philosophical commitment about the nature of quantification is necessary to reach this decision.

interpretative predicate necessary for the truth of (21). In this case, the interpretative predicate identified by the subscript *I* is *brays*. If we were to introduce another interpretative predicate, then a different subscript would be necessary to identify its contribution to a definition of logical consequence. For example, suppose in addition to *brays*, we admit the further condition on the interpretation of the predicate *P* such that it applies_J to something if and only if it is red. The resulting conditional would be,

22. If $\forall xPx$ is true_J then $\exists xPx$ is true_J.

In this case, as in (21), the contribution of the interpretative subscript to the definition of logical consequence is predicative, not nominal in character. Thus, asked to provide an interpretation of *P* in our metalanguage, the given condition would be the following:

23. *P* *I*s an object *o* if and only if it brays.

24. *P* *J*s an object if and only if it is red.²⁰

Thus the natural conclusion is that we are not generalizing into a nominal position, but a predicative one. Interpretations are not first-order definable, and consequently, are not objects.

But is Williamson's conclusion really as natural as he claims? Williamson begins his argument with the admonishment to ignore the conventions of English within this context; our impulse to quantify into name position is misleading in the case of interpretations. Presumably, this is because although formal languages such as first-order logic or its metalanguage are expressed in English, they are not English. The conventions of English do not necessarily apply, and so, should not be automatically assumed. It is for this reason that Williamson counsels a different methodology to establish what

²⁰ Williamson, 2003; 453

category interpretations belong to: a careful analysis of their function.

The core of Williamson's analysis of the function of interpretations is the two carefully constructed example sentences, (21) and (22). On the basis of these two examples, he identifies the function of the targeted term within the example sentences: to distinguish different interpretative predicates. Since natural language generally distinguishes between different predicates by assigning a different phonetic expression to them, this too must be the manner in which interpretative predicates are distinguished. Thus, the best paraphrase of the contribution of the subscript *I* or *J* to the definition of logical consequence is one in which it is used predicatively: *P Is an object...* or *P Js an object...* Hence, the classification of interpretations as predicates.

But a question can be asked about this argument: why does Williamson assume that it is natural to classify expressions with the function of *I* and *J* as predicates? There is nothing inherent in the function of *I* or *J* that grounds this assumption. It is perfectly possible to imagine a language in which this function is uniformly assigned to expressions that are a member of a different category. The response appears to be its intuitive plausibility – an intuition that is most certainly grounded in our own experience with the conventions of English.

So, on the one hand, Williamson counsels us to avoid the dangers of applying the conventions of English too rigorously in the new context of a formal language, and yet, helps himself to a dollop of those same conventions to show that interpretations should be classified as predicates. He can't have it both ways. Either the conventions of English are a plausible guide to the correct classification of interpretations, robbing him of his initial justification for finding a new grammatical classification for interpretations, or the conventions of English are not to be trusted, leaving him with the motivation he needs for a new classification of interpretations, but with no evidence for their status as predicates.

Williamson would be much better served by attempting to establish the second-order status of interpretations in virtue of the properties of formal languages directly

without any detours into the wilderness of natural language – an approach that does in fact have a champion, Rayo (2006).

2.3 Rayo (2006)

Rayo also believes that it is possible to quantify over absolutely everything. This commitment to unrestricted quantification, however, brings with it some consequences both for the structure of formal languages and for our semantic theorizing about these languages. The first important consequence of our commitment to unrestricted quantification is that the reference of a predicate in our formal language cannot be a set; an unrestricted domain of quantification precludes the formation of certain sets, and so, some standard predicates such as *is self-identical* would lack a reference. A similar problem also exists for certain first-order terms. If we assume that sets are the reference of plural terms, then expressions such as *the self-identical things* will also lack a reference. This lack of reference can be solved if we assume that the reference of predicates and first-order terms is *a plurality*. A plurality is not a set; it is the individuals that have the property in question. So, for example, the reference of *is an elephant* is not the set of elephants, but the elephants themselves.²¹

Formally, Rayo's proposal for the condition on the interpretation of a predicate *is an elephant* can be expressed as follows:

25. $\exists xx(\forall y(y < xx \leftrightarrow \text{ELEPHANT}(y)) \wedge \text{REF}(\text{'...is an elephant'}, xx))$
which is read:

There are some thing – the xxs – such that: (a) for every y, y is one of the xxs if and only if y is an elephant, and (b) '...is an elephant' refers to the

²¹ Rayo, 2006; 225

The formal description of the reference of *is an elephant* requires the use of second-order quantifiers, i.e. quantifiers that range over pluralities, and second-order predicates, in this case REF, that takes a plurality as one of its arguments. Thus, the introduction of pluralities appears to entail a commitment to second-order terms – at least in our metalanguage.

But are the second-order terms in the above interpretation a *legitimate* addition to our metalanguage? Not all philosophers, after all, accept the validity of second-order formal languages.²³ Legitimacy, according to Rayo, can be defined in relation to the semantic properties of the language that a given expression is part of. If we assume that all (legitimate) languages have a semantic structure in which each category of expression receives a semantic interpretation via a categorical semantics²⁴, then the legitimacy of a category is guaranteed if it is part of a language “whose semantic properties are accurately described by a categorical semantics employing [that category]”.²⁵ In other words, the category of expression under discussion must be part of a language that makes sense. Rayo eschews an intuitive understanding of the concept of sense in favour of one that relies on the possibility of evidence of understanding on the part of an individual or linguistic community. He provides three examples of abilities that might constitute this type of evidence:

26. that speakers have the ability to use assertions of sentences containing the disputed vocabulary to update their beliefs about the world;

²² Rayo, 2006; 225. Subscripted numerals on predicates that indicate the type of variable in an argument place have been suppressed in order to improve readability.

²³ See Quine, 1986.

²⁴ Rayo defines a categorical semantics as: Every meaningful sentence has a semantic structure, which may be represented as a certain kind of tree. Each node of the tree falls under a particular semantic category (e.g. ‘sentence’, ‘quantifier’, ‘sentential connective’), and has an intension that is appropriate for that category. The semantic category and intension of each non-terminal node in the tree is determined by the semantic categories and intensions of nodes below it. (Rayo, 2006; 220-21)

²⁵ Rayo, 2006; 222

27. that speakers have the ability to use their beliefs about the world to regulate their assertions of sentences containing the disputed vocabulary;

28. that speakers have the ability to use sentences involving the disputed vocabulary as part of a robust and consistence inferential practice.²⁶

Thus, what is required of a defender of the interpretation of *is an elephant* in (25) in particular and of second-order logics in general, is evidence of understanding.

Certainly, it is possible to provide a vocabulary, interpretative rules and a deductive system for a second-order language. In addition to the many examples that exist in the philosophical literature, Rayo provides one that is particularly well-suited for reference to pluralities: Limit_ω Languages. Limit_ω Languages are rather unremarkable, except of course that the interpretative rules and deductive axioms have been adapted (or omitted) to handle pluralities.²⁷ Is it plausible to assume that an individual could exhibit

²⁶ Faced with an outright skeptic of the claim that a language category is part of a language that makes sense, evidence of linguistic understanding is the best response. A weaker skeptical concern can be raised, however. An individual may accept that a given language category is part of a language that makes sense, but claim that its semantic contribution is that of another semantic category. For example, a skeptic may reject the semantic category of first-order universal quantifier in favour of an infinite conjunction of terms. Rayo thinks that the best way to respond to this type of skeptic is with an appeal to such concerns as theoretical parsimony and coherency (Rayo, 2006; 239).

²⁷ Both the symbols and interpretive rules are as expected with the addition of a saturation operator σ whose role is to transform a monadic first-level predicate into a first-level term, i.e. a term that is somewhat like a plural definite description:

$$29. \forall xx (\text{REF} ('P(\dots)', xx) \leftrightarrow \text{REF} ('\sigma[P(\dots)]', xx))$$

where P is a predicate.

Limit_ω Languages also lack primitive quantifiers. The predicate EXISTS and a negated counterpart replace the existential and universal quantifier respectively:

$$30. \exists v(\phi) \equiv_{\text{df}} \text{EX} (\sigma [\phi])$$

where v is an arbitrary variable, ϕ an arbitrary formula

$$31. \forall v(\phi) \equiv_{\text{df}} \neg \exists v(\neg \phi)$$

The deductive system associated with Limit_ω Languages is as mentioned above unremarkable except for the caveat that this system lacks the axiom of identity. This axiom is dropped because of the manner in which Rayo's deductive system interacts with first-level terms that lack a reference. When a first-level term is empty, this system "makes any sentence of the form "P(t)" false (and its negation true), for "P" atomic. It makes, for instance, 'Zeus = Zeus' false (and its negation true)". For a complete description of Limit_ω Languages please see Rayo (2006), 233-236.

understanding of this language? Of course. There is nothing to prevent us from assuming that these languages make sense.

But if Limit_0 Language makes sense, then it must be the case that the deductive system associated with it is consistent. If it were not consistent, then our imagined individual would not demonstrate evidence of linguistic understanding in the form of “robust and consistent inferential practice” with this language. For this reason, it must be the case that this Limit_0 Language does not fall prey to Russell’s paradox. Since Rayo assumes unrestricted quantification, and therefore cannot adopt the solution of the generality relativist, he argues that it must be the case that for any linguistic category whose interpretation in a language of the same order would result in a paradox belongs to a language of a higher order.

If we apply this reasoning to Williamson’s version of Russell’s paradox²⁸, it is possible to reach the conclusion that Williamson sought. Assuming interpretations are part of a language that makes sense, it must be the case that they belong to a semantic category of a higher order language. If they did not, then the deductive system associated with the language of which they are a part would not be consistent, and the language would not make sense. There is nothing inherent in interpretations that allows us to conclude this; rather, it is the fact that they are a semantic category that is part of a language that makes sense, and hence is legitimate.

So the concept of legitimacy offers a solution to the generality absolutist for Russell’s paradox. It is a solution, however, that comes at a cost: an ever ascending hierarchy of languages. The decision to avoid the charge of inconsistency by classifying a term as part of a language of a higher order requires that the newly classified term belong to a category that is legitimate. If it is not legitimate, then the language to which it belongs will not make sense, and the reclassification will fail to respond to the original

²⁸ Rayo uses a version of Russell’s paradox that is different than Williamson’s. In this case, the offending term is the predicate MEMBER. Please see below for further discussion.

charge of inconsistency. But if the language makes sense and includes a domain of quantification that is completely unrestricted, it too will require a solution to Russell's paradox. If we further assume, as the generality absolutist must, that there is no 'final' language, then there will be no end to the introduction of languages of higher and higher order.

The possibility of an ever ascending hierarchy of languages is not welcome news for the generality absolutist, especially one who is interested in the project of semantic theorizing. Suppose that a particularly intransigent opponent of the generality absolutist sought to test the viability of a semantic theory, such as a Limit_ω Language, that assumes unrestricted quantification. Her request would be simple: the meaning of the predicate *is a member*, or in the terminology of Rayo, MEMBER. The generality absolutist can oblige her request and provide an interpretation using the resources of a Limit_ω Language, but only on the condition that this predicate is classified as part of a higher order language than the terms to which it applies. This is because the interpretation of MEMBER must be in a language of a higher order than the terms to which it applies or it will generate a version of Russell's paradox in a Limit_ω Language.²⁹ So, for example, if the generality absolutist were to offer an interpretation of MEMBER that applies to first-order terms, it would be necessary for him to classify it as a second-order predicate. As the generality absolutist's answer includes a second-order predicate, it is clear that he assumes a second-order language – a language that also includes the term MEMBER. However, the generality absolutist's interpretation does not include the term MEMBER

²⁹ Rayo demonstrates that if this predicate were to fall under the semantic category of a first-order predicate that applied to first-level terms, it would be possible to derive the following contradiction:

$$32. \exists v_1 \forall v_2 (\neg \text{MEMBER}(v_2, v_2) \leftrightarrow \text{MEMBER}(v_2, v_1))$$

where v_1 and v_2 are variables that range over first-level terms

(Rayo, 2006; 240)

A first-level term is the member of a first-order language that lacks non-logical vocabulary. Please see Rayo (2006) for the complete derivation of this contradiction.

when it applies to second-order terms. A second and different interpretation would be necessary to cover this particular meaning of MEMBER. Consequently, the generality relativist may not be fully satisfied with this response of the generality absolutist. From her point of view, it is incomplete. After all, the generality relativist's request was not limited to a first-order language; it was a request for the meaning of the MEMBER tout court, i.e. irrespective of the order language in which it is found.

The generality absolutist is left with two options. The first is to simply reject the further demand of the generality relativist and limit the scope of his response. The problem with this approach is that it leaves at least one term, MEMBER, uninterpreted in some arbitrary order of language. Because of this omission, it will impossible to provide the truth conditions of a sentence that contains this uninterpreted term. This failure leaves the generality absolutist just as open to the charge of threatening the project of semantic theorizing as the generality relativist was for her (alleged) inability to provide homophonic truth conditions for sentences in certain contexts. Given the singular role that semantic theorizing plays in deciding the relative merit of restricted and unrestricted quantification, this does not appear to be the route that the generality absolutist should take.

The other possibility is to give into the request of the generality relativist and continue the process of interpretation ad infinitum. This option does not threaten the project of semantic theorizing in an overt manner like the previous one, but it does raise its own serious concern. The fact that the generality absolutist will be unable to complete the task of interpreting a term means that he will be also unable to complete the project of semantic theorizing. The possibility of an incomplete semantic theory was precisely the threat that the generality relativist's position posed to the project of semantic theorizing. Thus, it appears that incorporating an infinite interpretative loop into the generality absolutist's theory will offer him little respite from the problem that an ever ascending hierarchy of metalanguages poses to his position.

In short, regardless of which choice the generality absolutist makes, he will be forced to cede the metalinguistic high ground to the generality relativist as long as his position commits him to a hierarchy of ever ascending metalanguages. Consequently, even though a response to Russell's paradox is possible, it has a rather dramatic drawback: it is the generality absolutist and not the generality relativist who threatens the project of semantic theorizing.

3. Conclusion

Williamson attempted to turn the standard debate about the viability of unrestricted quantification on its head by introducing his own paradox that not only illustrated the deeply conflicted nature of his opponent's position, but also revealed the deep metalinguistic costs of it – a strategy that is usually associated with the generality relativists. As was argued at length, it is a strategy that ultimately fails. Williamson's paradox incorporates the untenable assumption that the meaning of a term can be determined solely in virtue of the speaker's intentions. This explanation of how the domain of a quantifier is determined is too simplistic for natural language; natural language requires a theory that incorporates other factors such as context. Without a better defense of this key assumption, Williamson's paradox unravels as too does his claim that the generality relativist's position carries with it serious metalinguistic costs.

But even without generating a paradox, the generality relativist still runs into problems stating her position. There is a deep, internal conflict between what the generality relativist is capable of saying and what she needs to say. She is silenced.

The generality absolutist is faced with a similarly threatening paradox: Russell's paradox. Unlike Williamson's paradox, however, this paradox does not rest on any obviously disputable assumptions. It must be dealt with head-on. In responding to the problem raised by Russell's paradox, advocates of unrestricted quantification

demonstrate a strong preference for formal languages over natural languages. Although formal languages carry with them a more relaxed standard of how the meaning of a term is determined, this advantage offers Williamson little help in his attempt to solve the paradox. His simultaneous rejection and acceptance of the conventions of English within this formal context leaves him without any motivation for a much needed second-order interpretation of the offending category of expression within his version of the paradox – interpretations.

Rayo resolves this tension by motivating a solution to the paradox on the basis of the properties of formal languages alone. The legitimacy of a given semantic category depends solely on it being part of a language that makes sense. As a language that includes such terms as interpretations appears to make sense, the semantic category that interpretations belong to must be legitimate. For this reason, we can conclude that interpretations are second, not first-order terms.

Consequently, there is a simple response to Russell's paradox available to the generality absolutist, but it does not come for free. Rayo's argument is so powerful that it generates a hierarchy of formal languages that is infinite. This ever ascending hierarchy of languages entails a never-ending process of interpretation in certain cases. Regardless of whether he chooses to end this interpretative loop at some arbitrary point or carry it forth indefinitely, the generality absolutist will be unable to escape the threat of undermining the project of semantic theorizing. If we heed the advice of Williamson, and make our decision between these two positions on the narrow grounds he suggests, then restricted quantification has the edge. This reversal of fortune may surprise the advocate of unrestricted quantification, but it shouldn't. As Williamson points out, the case for restricted quantification has always been built on metalinguistic grounds. The fact that it retains the advantage in this arena is to be expected, and if the generality relativist is correct, nurtured as the surest defense against unrestricted quantification.

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