האגודה הישראלית לבלשנות תאורטית

THE ISRAEL ASSOCIATION FOR THEORETICAL LINGUISTICS

IATL 7

The Proceedings of the

Fifteenth Annual Conference

The University of Haifa 1999

edited by

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Contents

Plurals, Negation and Plural Definites.

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1. Introduction

This paper considers the readings of plural definite noun phrases in construction with negation and argues that a treatment in terms of scope and distributivity is inadequate in certain cases. An alternative approach on which certain readings are attributed to an underspecification in plural predications is also considered and found to be wanting. It will be proposed that the readings in question should rather be attributed to the underspecification in the meaning of plural definites with regards to whether they are understood maximally or not.

2. Background

Like most noun phrases, when plural definites are found in negative constructions, more than one interpretative possibility arises. In (1), we find some examples of sentences containing non-definites in negative constructions:

(1) a. In the exam, John couldn't answer two questions on syntax.
b. John couldn't find two people who agreed with him.
c. Many people don't trust every politician.
d. John didn't see Bill and Mary at the party.

Looking at (1a), one can imagine circumstances where it is used and understood in such a way that what is said would be true if John answered three questions, so long as there are two he did not

answer. Alternatively, one could imagine circumstances where it is understood in such a way that it would only be true if John answered no more than one question. (Perhaps this construal would be highlighted by the insertion of "even" into the sentence). This second kind of construal is perhaps prominent in (1b). Similarly with (1c,d), one can imagine distinct situations where, possibly with the appropriate stress, they are used to express distinct propositions.

With plural definites, one can similarly construct examples which show that two construals are available in the presence of negation.

(2) a. The children didn't leave.
b. Mary didn't kiss the children.

(3) a. John didn't answer the questions in the time allotted.
b. John couldn't afford to vaccinate the donkeys he bought.
c. If John doesn't answer the judge's questions, he will be held in contempt of court.

It is most often the case that a certain construal of sentences involving plural definites and negation is most prominent, as in (2). One most naturally understands (2b) according to the gloss, "Mary didn't kiss any of the children". However a different kind of construal is also possible. For example, hearing (3c) one would expect to find John being held in contempt if he fails to answer just one of the judges questions. Similarly, if one hears (3a) in a circumstance where John had to answer all of the questions in the allotted time to pass a test, then one would most naturally take it as meaning that he didn't answer all of the questions.

Considering the examples in (1-3), there are a variety possible accounts that one might propose for the multiple construals. Perhaps the most obvious line would involve some kind of scope interaction. Another possibility, at least in the case of plural definites, would be to suppose that there is some kind of collective/distributive alternation involved. In order to evaluate these possibilities we need to consider how they would be spelt out and then some more data.

3. The scope analysis

A typical analysis for plural definites treats them as terms which denote collections. The aim generally has been to account for examples such as in (4), where noun phrases combine with predicates which express properties of collections:

(4) a. The girls gathered.
b. The girls built a raft.

Interpretations of such predicates can be modelled in terms of sets of collections (sets), and definites are treated as in (5) below, taken from Link (1991)[1]. So (4a,b) would be analysed along the lines of (6a,b):

(5) a. $\sigma XP(X) = \iota X[{}^*P(X) \wedge \forall Y[{}^*P(Y) \rightarrow Y \subseteq X]]$
b. ${}^* = \lambda X \lambda Y.Y \subseteq X \wedge Y \neq \varnothing$

(6) a. gathered'(σXgirl'(X))
b. built_a_raft'(σXgirl'(X))

It is also agreed that certain conjoined noun phrases require a special treatment in order to account for (7). This kind of data suggests that "and" can be interpreted as in (8a) so that (7b) is understood according to (8b):

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[1]Note that (5a) is the non-strictly plural version: there is no implication that there is more than one P. To build strict plurality into the translation, Link introduces the properly plural sum operator, defined as in (ia) below. I will pass over this difference in what follows:

(i) a. $\sigma {}^*XP(X) = \sigma X \bigstar P(X)$
b. $\bigstar = \lambda X \lambda Y.Y \subseteq X \wedge |Y| \geq 2$

(7) a. John, Bill and Mary gathered.

b. John, Bill and Mary built a raft.

(8) a. $[\![a\&b]\!] = \bigcup\{[\![a]\!], [\![b]\!]\}$

b. built_a_raft'((j&b)&m)

Note that (8b) only captures the collective reading of (7b). (7b) can also be understood as "The girls each built a raft". To capture this reading, it is agreed, that a distributivity operator, (9a), is attached to the predicate (Link 1987, Roberts 1987), giving (9c)[2]:

(9) a. $\delta = \lambda\mathbf{Y}\lambda\mathbf{X}.AT(\mathbf{X}) \subseteq \mathbf{Y}$

b. $AT(\mathbf{X}) = \{\{d\}: d \in \mathbf{X}\}$

c. δ(built_a_raft')(σXgirl'(X))

More recently, Lasersohn (1998) has proposed a generalised distributivity operator for distributable types, ^{D}, based on a generalised conjunction operator, $\sqcap$. The definitions in (10-12) are taken from Lasersohn (1998: 85)[3]:

(10) a. If $X \subseteq D_t$, then $\sqcap X = 1$ if $X = \{X\}$; $\sqcap X = 0$ otherwise.

b. If $X \subseteq D_{<a,b>}$ (where <a,b> is a conjoinable type), then $\sqcap X$ is that function $f \in D_{<a,b>}$ such that for all a, $f(a) = \sqcap\{f'(a) | f' \in X\}$ (where a conjoinable type is a type ending in t)

(11) If a is a conjoinable type, then <<e,t>,a> is a distributable type.

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[2] In what follows, upper-case variables and constants in bold express properties of, and relations between, sets. Upper-case variables are set variables. Also I follow Schwarzschild's (1996) proposal to treat a and {a} as identical if a is an individual.

[3] With a slight modification to Lasersohn's (6) and (7) ((11) and (12) above respectively) as we are using sets here.

(12) Where α is an expression of some distributable type <<e,t>,a> and X is any collection:
$[\![^{D}\alpha]\!]_{Mg}(X) = \sqcap\{[\![\alpha]\!]_{Mg}(Y) |\ Y \in AT(X)\}$

This generalised distributivity operator produces a distributive reading for the argument with which its operand combines first. So for (13a) it will produce a distributive reading for the subject; and for (13b) a distributive reading for the object:

(13) a. The students ^{D}[took an exam].
b. John ^{D}[summarised] the articles.

We can see that an analysis using distributivity operators provides for potential scope interaction with negation, as in (14):

(14) a. The children didn't each build a raft.
b. The children each didn't build a raft.

For an analysis of (2a) above, to obtain the "none of the children left"-construal, it seems that we would need the scope combination in (14b). This is indicated in (15):

(15) $^{D}(\lambda X.\neg(*\text{leave'})(X))(\sigma X\text{child'}(X))$

Note, I assume that the plural of "leave" is rendered as **leave'* here since leaving is a property of singletons - thus the complement of the extension of (the logical form of) the singular "leaves" would include collections which contain members all of which individually left.

In as far as a sentence of the form, "the Fs didn't G", can obtain a 'not all' construal, one can derive this, where *G* is an essentially distributive predicate like "leave", by reversing the scope relation

between negation and distributivity.[4]

With regards (2b) above, it is possible to account for the reading discussed according to the relative scope of distributivity and negation. The plural version of "kiss" needs to be such that one can account for the cumulative readings noted by Scha (1981). This reading is evident in (16) which we could take to be true if John just kissed Mary and Bill just kissed Sue. The spirit of Scha's meaning postulate for plurals can be captured in (17), taking into account the criticisms of Lonning (1987) that the original formulation was incorrectly purely distributive:

(16) John and Bill kissed Mary and Sue.

(17) $^{pl}\mathbf{R} = \lambda Y \lambda X.\exists \mathbf{C}_1[\mathbf{C}_1 \text{ covers } X \wedge \forall U \in \mathbf{C}_1 \exists V \subseteq Y[\mathbf{R}(V)(U)] \wedge \exists \mathbf{C}_2[\mathbf{C}_2 \text{ covers } Y \wedge \forall V \in \mathbf{C}_2 \exists U \subseteq X[\mathbf{R}(V)(U)]$

However we can assume that "kiss" is an essentially distributive predicate in the sense that kissing is a relation that can really only hold between two singletons[5]. So that $^{pl}kiss'$ can normally be understood as a relation between collections such that each member of the first kisses some member of the second and each member of the second is kissed by some member of the first.

The reading of "Mary didn't kiss the children" can then be derived by ensuring that the generalised distributivity operator takes scope over negation:

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[4] Note that for distributive predicates, one can capture the two readings without the involvement of distributivity at all with the simple interplay of negation and *. I pass over this possibility here since the former alternative is in any case required for the many non-distributive predicates ("the children didn't eat a pizza") and because it is not clear whether the linguistic correlate of * should be thought of as part of the verb's morphology or as some kind of structurally defined operator.

[5] At a pinch, one could imagine the relation holding between on the one hand John and on the other Mary and Sue collectively, if, say, the latter place their lips in close proximity and John has big lips.

(18) $^{D}(\lambda Y \lambda X \neg^{pl}\text{kiss}'(Y)(X))(\sigma X\text{child}'(X))(\text{mary}')$

For this simpler example, the 'not all' reading could be derived by either dropping distributivity from (18) or inverting the scope of distributivity and negation.

The analysis of the 'not any' readings of (2a,b) just sketched is not the only possibility. A notable alternative involves locating distributivity in general in the noun phrase. Verkuyl & van der Does' (1995) quantificational treatment of definites incorporates the appealing idea that the distributive/collective/neutral distinction is not grammatically encoded. However, as distributivity would be a function of the noun phrase interpretation, it would be necessary for the object noun phrase in (2b) to take scope over negation in order to get the 'not any' construal. More generally, this stronger reading seems to be obtainable so long as the bearer of distributivity takes scope over negation. This being the case, we now turn to some problematic examples.

4. Problems for the scope analysis

It seems that the 'not any' reading of plural definites is favoured more generally than one might expect given the kinds of analyses sketched in section 3. For instance, there are some cases, such as (19a,b) where it would seem that the definite noun phrase must take syntactic scope over the negative element in order that distributivity can intervene. (19c,d) demonstrate that the kind of account we have been considering implies that plural definites are impervious to the kinds of syntactic constraints on scope that apply to other noun phrases[6].

[6] (19b) points to an interesting parallel phenomenon concerning wh-elements. (b) is most naturally understood as, "Mary does not worry about any of the people that her children date", which of course is understood as, "Mary does not worry about any of the people that any of her children date". Wh-elements can also get 'not all' readings as in "John cannot name who played in Arsenal's cup winning side".

(19) a. It's not the case that the students on John's course have complained.
b. No one saw the students.
c. Mary doesn't worry about who her children date.
d. Sergeant Exley could not find a witness who could identify the suspects.

However, the scope of plural definites does seem to be limited by such things as the complex-NP constraint. To see this, consider that plural definites, like universal noun phrases, can have scope interactions with indefinites, (20a,b). Just like the universal noun phrases, the reverse scope possibility is blocked when plural definites are embedded in noun phrases, (21a,b):

(20) a. A red cross flag hung outside every hospital.
b. A red cross flag hung outside the hospitals.
(21) a. A red cross flag which hung outside every hospital was torn up by vandals.
b. A red cross flag which hung outside the hospitals was torn up by vandals.

Note that plural definites can get the 'not all' construal in these constructions as well:

(22) a. It's not the case that the windows were locked.
b. John isn't worried about how he can afford to vaccinate the donkeys he bought.
c. Sergeant Bilko did not find a cadet who performed the allotted tasks in an hour.

Another problematic fact has to do with plural definites which are dependent on negative quantifiers. Such dependent definites still favour the stronger construal, in spite of the fact that the kind of scope arrangement required to derive this reading would be difficult to justify in these cases:

(23) a. No teacher praised his students.
b. Few teachers praised their students.

One might argue that the 'not any' construal is derivable in (23a) by assuming that the negative quantifier is decomposed into a quantificational element and negation, so that the plural definite can take intermediate scope. However, this seems like a less plausible analysis for (23b) which just as readily admits of an 'any' reading. Also, such a proposal would predict that other noun phrases dependent on "no N'" should be able to get an intermediate scope reading. But this does not seem to be so. Consider that (24) does not seem to be able to be understood as "Every teacher didn't praise three of his students" on its intermediate scope reading. Similarly, though perhaps (25a) favours an intermediate reading, this is not available in (25b):

(24) No teacher praised three of his students.

(25) a. Every poet doesn't like a few of his early works.

b. No poet likes a few of his early works.

Again, it is worth noting that, in the right context, it is possible that plural definites dependent on negative quantifiers are open to 'not all' readings:

(26) a. No farmer who owns a million or more sheep can afford to vaccinate them.

b. No customer used their free samples in the first week.

c. Few guests at the hotel realised that the windows to their room lock automatically when they go out.

The data reviewed in this section suggests that the kind of analysis sketched in 3 is lacking in certain respects. This is somewhat disappointing since the elements in that analysis are independently required. That is, whatever is said about these interactions with negation, a distributivity operator is required to account for certain alternations in positive contexts. Moreover, it was shown that distributivity does in fact interact with negation, as in (14a,b), and the interaction of these elements could be shown to produce the required effects in many cases. In the next section I will consider the possibility that another independently motivated aspect of the behaviour of plurals can be brought

in to account for the pattern of readings. This concerns the often mentioned vagueness or underspecification of plural predications. An explicit proposal to deal with the data in this current section by appealing to this phenomenon has been made in Krifka (1996). I will then argue that this kind of alternative is not so plausible.

5. First underspecification analysis

5.1 Partiality in plural predications?

By and large, the analysis of plural definites incorporates the idea that they somehow exhaust the range of the (usually implicitly contextually restricted) descriptive material. However, it has often been observed that sentences involving plural definites are not always understood in this way. That is, plural definites are often understood 'non-maximally' in non-negative constructions[7]:

(27) a. Mary cannot come to work because her children are sick.
b. Johnny was naughty because he fed the monkeys at the zoo chocolate.
c. After the press conference, the reporters asked the president questions.
d. The students in 5c have been cheating on their tests again.

This non-maximality phenomenon is usually mentioned in passing in the literature on plurals. The consensus seems to be that there is some kind of vagueness or underspecification in plural predications regarding how many of the individuals in the extension of the term the predicate actually applies to. These thoughts are perhaps expressed in the following quotes from Link (1981) and Schwarzschild (1996):

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[7] (27a) is adapted from Krifka (1996), (27b) is from Breheny (1999), (27c) is from Dowty (1987) cited in Schwarzschild (1996), (27d) is from Kamp and Reyle (1993).

> It seems to me that in *All the children built the raft* it is claimed that every child took part in the action whereas in *The children built the raft* it is only said that the children somehow managed to build the raft collectively without presupposing an active role for every single child. (Link 1981/1998 p.20)

> The conclusion that many have reached based on the foregoing examples, and with which I concur, is that even predicates which are applicable to individuals can have a simple collective reading. On this reading, we should not, indeed can not, specify in the grammar how many of the singularities that make up a plurality must satisfy the predicate in order for that plurality to satisfy it. (Schwarzschild 1996 p. 90)

With these observations in mind and with an eye to accounting for the kind of problematic data reviewed in the last section, Krifka (1996) introduces a rule of predication which explicitly encodes this underspecification:

> "Grammar has to specify truth-conditions for P(x) if x is an atomic individual. Furthermore, it is natural to assume that the truth of P(y), y being a sum [plural] individual, will somehow depend on whether P applies to the parts of y. Now if nothing indicates any particular proportion to which P should apply to the parts of y, then the two natural extreme options are the universal interpretation and the existential interpretation." (Krifka 1996 p147)

These considerations are encoded in the rule given in (28):

(28) If a predicate P applies to a sum individual x, grammar does not fix whether the predication is universal ($\forall y[y \subseteq x \rightarrow P(y)]$) or rather existential ($\exists y[y \subseteq x \wedge P(y)]$), except if there is explicit information that enforces one or the other interpretation. (p146)

Of course we need some way of stopping (29) being judged true if just Mary contested the final:

(29) a. John and Mary contested the final.
b. Two students left.

To this end, Krifka introduces a pragmatic rule:

(30) If grammar allows for a stronger or weaker interpretation of a structure, choose the one that results in the stronger interpretation of the sentence, if consistent with background assumptions! (p146)

These rules are meant to account for the fact that plural definites seem to default to an exhaustive reading, whilst sometimes giving rise to a non-maximal reading in non-negative contexts. They also give a way of accounting for the problematic data in section 4 without requiring any movement. Recall that plural definites in the scope negative elements tend to favour the 'not any' reading (31a-c), though the 'not all' reading is possible in the right contexts (32a-b):

(31) a. No one saw the students.
b. No teacher praised the students in his class.
c. Sergeant Exley could not find a witness who could identify the suspects.
(32) a. No guests at the hotel realised that the windows to their room lock automatically when they go out.
b. Sergeant Bilko did not find a cadet who performed the allotted tasks in an hour.

Thus the problematic data could be handled by appeal to an independently motivated underspecification in plural predications.

5.2 Problems with the predication analysis

In this section I will argue that there is no underspecification in plural predications - although there

is a little vagueness. The non-maximal readings in positive contexts is not found with plural noun phrases generally, but only with plural definites. This causes problems for an account based on the rules in (28,30).

There are a variety of noun phrases involved in plural predications. At a minimum, it seems, one would have to count conjoined noun phrases, indefinites and definites among these:

(33) a. Two boys built that raft.
b. John and Bill built that raft.
c. The boys built that raft.

The underspecification hypothesis under consideration says that (33a) could be true even if just one boy built the raft, that (33b) could be true even if just Bill built the raft, and that (33c) could be true if some collection of the boys built the raft. Similarly, for (34a-c) regarding asking the president questions:

(34) a. At the end of the press conference, two journalists asked the President questions.
b. At the end of the press conference, John and Mary asked the President questions.
c. At the end of the press conference, the journalists asked the President questions.

Although this interpretation of the underspecification hypothesis could be clarified in a number of ways, I would claim that it is correct on no clarification.

On one construal of Schwarzschild's remarks above, it could be that the underspecification hypothesis just says that when a plural predicate is combined with a plural noun phrase, the sentence would be true so long as some part of the noun phrase's denotation satisfies the predicate. That is, the predication is 'partial' irrespective of utterance circumstance. It is doubtful that this is what was meant for the simple reason that it would be impossible to account for the fact that, in the case of

non-definites at least, the predication is understood as total, under any 'reading'. Certainly, no pragmatic theory which presumes that speakers are rational could account for this.

Perhaps Schwarzschild has it in mind that such predications are semantically vague in some way. But this clearly cannot be. If I utter "John and Bill left" under any circumstances, then anyone who understands English will have no hesitation in judging it false if just John left and so on. Similarly for "Mary saw two students".

Perhaps the most natural reading of the underspecification hypothesis is that the grammar does not specify determinate truth conditions for sentences of the form [[plNP][plVP]] in the relevant respects. It seems fairly clear that this is what Krifka intends.[8] It also seems clear, at least from Krifka, that it is left to pragmatics to specify a determinate interpretation for utterances of sentences involving plural predications.

This last version of the underspecification hypothesis strikes one as prima facie misguided. It does not seem that there could be a context, no matter how outlandish in which, "John and Bill contested the final", could be understood to say something which would be true if just John contested the final. If anything is certain in semantics, then it is certain that both John and Bill have to have contested the final for any utterance of the sentence to be true.

With regards Krifka's proposal, it seems that it predicts that the favoured understanding of "No one saw two students" should be that no one saw any students, assuming, as seems reasonable in at least some cases, that "two" is a predicate modifier rather than a determiner (see Link 1987).

I would suggest that this underspecification hypothesis is motivated by the fact that sentences

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[8] It seems doubtful that we are to understand Krifka as meaning that the grammar in fact specifies a determinate interpretation relative to some kind of indexing which fixes the quantificational force.

involving plural definites are taken to be the paradigm of plural predications and that the exhaustivity assumption about plural definites remains unquestioned. In the next section I will suggest that there is a contrast between the behaviour of definites and non-definites with regard underspecification and that the correct hypothesis is more likely that the quantificational force of plural definites is not specified by the grammar.

6. Asymmetry between definites and non-definites

It is true that the meaning of collective plural predicates is often a little bit vague when it comes to deciding what counts as participation in the eventuality they describe. It is also true that for cumulative readings it is not specified exactly how the individuals are involved in the relation in question. Let us consider these facts in more detail.

It was mentioned in section 3 that a sentence such as in (35) can be understood in such a way that it is not known what combinations of people actually danced with each other:

(35) John, Bill and Max danced with Mary, Jane and Sue.

What is known from (35), however, is that each of John, Bill and Max did some dancing with one or more of Mary, Jane and Sue and vice versa. This is captured in ^{pl} above. So if it is discovered that Max sat out the dancing with a broken leg, then (35) is clearly false, no matter how collectively one thinks of the three boys. Similarly, for (36) to be true, there has to be at least one collection of three boys and a collection of three girls such that each of the boys danced with some or other of the girls and vice versa:

(36) Three boys danced with three girls.

There are, however, circumstances in which one could utter (37a) and where it would not be

understood as saying that each of the boys danced with one or other of the girls and vice versa. (37b) might suggest such a reading:

(37) a. The boys danced with the girls.
b. At the wedding I was pleasantly surprised to find that the boys actually danced with the girls.

This is of course another example of the underspecification phenomenon. I am suggesting that this phenomenon only manifests itself in the case of definites and also that it is best described in terms of underspecification at the level of linguistic meaning which is resolved at the level of pragmatics.

Link's comments above focuses more on genuinely collective predicates, like "build a raft". According to Link (1991), the logical form of (38a) is (38b):

(38) a. The children built a raft.
b. build_a_raft'(σXchild'(X))

The above remarks can be taken in one of two ways. Firstly, one can understand them to be suggesting something like what Schwarzschild suggests. That is, the predicate "build a raft" applies to collections even if not all of the individuals in the collection participated in the eventuality described. If this is the case, then the same problem arises as above. Consider a scenario where John, Bill and Mary are left to their own devices for the day. John and Bill build a raft and Mary constructs an elaborate sandcastle. Their parents spend the day lying in the sun. When someone asks, "Who built that fine raft?", one would probably accept (39b), but not (39a), despite the fact that the noun phrases denote the same collection in this context:

(39) a. John, Bill and Mary did.
b. The children did.

It is also possible that Link has in mind the vagueness of the meaning of plural predicates with regards what counts as participation in the eventuality described. It is clear that in the scenario just described, Mary does not participate in building the raft and so it is easy to judge (39a) false. But different scenarios which put Mary more in the penumbra of the predicate are not so easy to judge as true or false. Consider for instance a case where the children agree in principle to build the raft, but Mary spends the day in a hammock, reading a book, occasionally offering not very helpful advice. In this case, it is more difficult to judge whether (39a) is true or false, independent of the context of utterance. If one is inclined to say that (39a) is true in this scenario, then it is not difficult to imagine other circumstances which fall in the truth-value gap for this sentence. So, it is possible that Link has in mind cases which are close to the border of the truth-value gap. But if that is so, then both (39a) and (40) should still be regarded as true, along with (39b):

(40) All the children built that raft.

The point is that if John, Bill and Mary build the raft collectively, even without each one taking an active role, then (40) is true. The contrast between (40) and (39b) lies in the fact that with the plural definite, not every child has to be part of the collection to which the predicate applies. This can be brought home more clearly if we return to negative contexts. (41a-c) are all true in the scenario originally described, while (41d) is false:

(41) a. No raft was built by John, Bill and Mary.
b. No raft was built by all the children.
c. No raft was built by three children.
d. No raft was built by the children.

Another point to note about this example is that, because the predicate is understood collectively, there can be no distributivity operator involved, so there can be no way of deriving the 'not any' reading for the plural definite here. This is confirmed by the example with the conjoined noun phrase

and the other examples.

In conclusion, there is an asymmetry between plural definites and other plural noun phrases with regard to exhaustive/non-exhaustive predications. Given this asymmetry, supposing that there is an underspecification in plural predications themselves is not well motivated. At best, one can justify a certain vagueness in the meaning of plural predicates with regard what counts as participation, but to do so does not account for the extraordinary ability of plural definites to give rise to 'not any' construals in negative environments. In section 8, it will be suggested that there is good motivation for supposing that plural definites are open to be interpreted according to a maximal (universal) or non-maximal (existential) interpretation. In the next section, some loose ends concerning co-ordinate constructions and specific indefinites will be addressed.

7. Extraordinary scopal properties of co-ordinating constructions and specific indefinites

While the evidence presented above, particularly in (41), argues strongly for the current proposal that there is an asymmetry in the behaviour of definites with regards the partiality of predication, there are some facts about the interpretation of co-ordinate constructions, on the one hand, and specific indefinites, on the other, which apparently dilute the claimed asymmetry. I will consider these now.

It was argued in section 4 that the basic scope account was problematic in that it predicted that definites were not subject to the usual syntactic constraints on scope, contrary to fact. It was also demonstrated that the scope account required dependent plural definites to take scope intermediate between the quantificational and the negative component of "no", "few" etc, contrary to the behaviour of other plural noun phrases. While considering Krifka's account of the 'not any'/'not all' alternation of plural definites in negative constructions, it was argued that there is an asymmetry between plural definites and conjoined noun phrases when it comes to partial predications. However, the example in (42) below might suggest that this conclusion is a little hasty, since it can be understood as saying that every agent debriefed by Smith or Jones was disinformed (supposing Smith

and Jones are spies operating for the other side):

(42) Every agent who was debriefed by Smith and Jones was disinformed.

Perhaps Krifka's proposal based on underspecification of plural predications is on the right track after all. But then that leaves us without an account of the very pronounced asymmetry evident in (41) above. Instead, we can account for the reading of (42) as being due to the fact that co-ordinate constructions really do have extraordinary scope potential, which seems to be genuinely unobstructed by the usual constraints. This has been long recognised in cases such as (43) which is not usually understood as saying that every hermaphrodite received a present:

(43) Every boy and girl received a present.

The analysis of (43) suggested in Partee and Rooth (1983) obtains the widest-scope-conjunction interpretation by type shifting conjunction. Although this may be reasonable for (43), it will be seen briefly that this account cannot be straightforwardly generalised. However, whatever the proper account of (42) and (43) turns out to be, it would have to include co-ordinate constructions involving "or" as well as "and". To see this, consider that (44) can be understood with the disjunction taking widest scope. Similarly, consider (45):

(44) John didn't invite Mary or Bill, I can't remember which.

(45) Every agent debriefed by Smith or Jones was disinformed; but I can't remember which.

The extraordinary scope potential of co-ordinate constructions seems to be unimpaired even in cases where the elements of the co-ordination are dependent on a quantificational element. Consider

(46a,b)[9]:

(46) a. No boy was allowed to bring his mother and his father to the game.

c. No boy was allowed to bring his mother or his father to the game; but I can't remember which.

That the relevant reading of (46a,b) is a product of extraordinary scope and not a partiality of predication can be seen if we consider a case where the scope of conjunction makes no interpretive difference. That is, when the conjunction is contained in a monotonic increasing construction. Compare the oddness of (47a) versus the unremarkable existential reading of (47b):

(47) a. On his business trip, John took some cash, a Visa card and a MasterCard. However, he payed every bill with his Visa card and his MasterCard.

b. On his business trip, John took some cash and credit cards. However, he payed every bill with his credit cards.

Another area of apparent concern relates to specific indefinites. Consider (48a):

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[9] In the presentation at IATL, I suggested that (46a) lacks the wide-scope conjunction reading. This claim was challenged by members of the audience. Personally, I find these readings marginal and requiring the kind of work involved in getting the wide-scope disjunction reading in (42,43). To this end, I offer the contrast in (ia,b) where the context should favor the widest scope conjunction construal but where (ia) is decidedly odd:

(i) The manager of a women's health club addresses the club's cashier:

a. The computer links to the banks are down tonight, so no customers can use their MasterCard and their Visa card to pay their bill.

b. The computer links to the banks are down tonight, so no customers can use their credit cards to pay their bill.

However, informants have accepted (ia) on the wide-scope conjunction reading, while agreeing that it is a little odd.

(48) a. Every agent who was debriefed by certain operatives was disinformed.

b. Every agent who was debriefed by the traitors was disinformed.

The most natural reading of (48a) is an 'any'-reading and can be glossed as, "Every agent who was debriefed by any of certain operatives was disinformed". The same effect can be had with plural definites, (48b), as we would expect. As with the case of definites, in order to derive the prominent reading of (48a), one would have to suppose that the plural specific indefinite would have to take scope outside of the NP-island (and the distributivity operator) or suppose that some kind of partiality is allowable in situ. As has often been noted, indefinites can be specific without being marked with "certain" etc. Indeed, Kratzer (1996) argues that the apparent exceptional scope properties of indefinites can be accounted for if they are treated as if they were modified by "certain". This can be seen if one considers that (49) below can be understood 'specifically' if we imagine that the speaker has two particular kinds of tasks in mind, which each candidate attempted and failed. However, if (49) is uttered in a circumstance where each candidate was allocated sets of different tasks and where there is no sense in which the speaker could have two kinds of task in mind, then only the narrow scope indefinite reading (which entails that no two tasks were completed by a candidate) is available.

(49) No candidate completed two of his tasks.

I would argue that indefinites overtly or covertly modified by 'certain' should be treated like definites when it comes to the maximal/non-maximal alternation. I will sketch this analysis below.

8. The underspecification of plural definites.

One difference between plural definites on the one hand and indefinites and conjoined noun phrases on the other lies in the context dependence of the former as against the latter. What this amounts to depends somewhat on one's theory of context dependence. In this section, I will sketch a view of

context dependence, based on Breheny (1999), in which the meaning of definites can be left underspecified in a manner appropriate to the alternation in construal.

It is a relatively straightforward matter to describe the meaning of plural definites in a representational framework in such a way as to leave maximality an open issue. In discourse representational approaches to context dependence such as Asher & Lascarides (1998) it is supposed that linguistic forms determine a mapping to interpreting structures leaving unspecified certain aspects of the interpretation. These are left to be determined by discourse or pragmatic principles (coherence, relevance etc). In Breheny (1999), it is proposed that this process basically constitutes a definition of the context dependent form in the utterance circumstance. The 'novel' concept which serves as the interpretation of a context dependent form is constrained by the linguistic meaning of the form in question.

I will suppose that definites, like indefinites, are treated quantificationally and that, like indefinite arguments, definite noun phrase arguments are headed by a null existential determiner, $\varnothing_{\exists}$, whose interpretation is represented as $det_{\exists}$, defined in (50):

(50) $\det_{\exists}(\mathbf{A})(\mathbf{B}) \leftrightarrow \{X: \mathbf{A}(X) \wedge \mathbf{B}(X)\} \neq \varnothing$

A plural definite noun phrase then has the structure, $[_{NP}\varnothing_{\exists}[_{N'}[_{art}the]\ [As]]]$. However, unlike with indefinites, the restrictor of $det_{\exists}$ will be a definite concept, ***the_As'***. Thus, $[_{NP}\varnothing_{\exists}[_{N'}[_{art}the]\ [As]]]$ will be translated as $\lambda X.det_{\exists}(\textbf{\textit{the\_As'}})(X)$. If we suppose that A is the compositional interpretation of A then ***the_As'*** will be constrained as per the meaning postulate in (51a). In addition, definites are associated with issues as to their definition (51b):

(51) a. $\forall X\Box[\textbf{the\_As}'(X) \rightarrow \mathbf{A}(X)]$

b. $?\lambda P\forall X\Box[\textbf{the\_As}'(X) \rightarrow \check{}P(X)]$

In a language game where context contains issues as well as data (cf Groenendijk 1998), utterances containing context dependent expressions such as definites introduce more issues into the context. However, a relevance principle ensures that issues relating to what is said are resolvable:

> Relevance: (after Sperber & Wilson 1986)[10]
> Consider audience's mental state in terms of a set of issues (characterised by questions) as well as data. The issues are partitioned (and ordered) by salience. Information is relevant to an individual if it resolves issues. The more resolutions, the more relevant; the more salient the more relevant (i.e. the more effort, the less relevant).
> Building a Gricean presumption from this idea, we could say that the common expectation is that what the speaker says is optimally relevant - it will resolve some salient issues and the more the better.

When it is warranted by the relevance principle in the context, ***the_As'*** applies just to the maximal set of contextually defined As and the maximal reading is obtained. For the non-maximal construal, it applies to collections of contextually defined Fs in general. Often there is no choice of reading due to plausibility. For example world knowledge dictates a non-maximal reading for (52a) and a maximal reading for (52b):

(52) a. Every farmer who abused the donkeys in his care was prosecuted.

b. Every farmer who vaccinated his donkeys received a clean bill of health from the EC agricultural commission.

Generally, if there is just one salient issue in the context and it can be resolved on a weaker reading

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[10] This type of kinematic characterization of relevance (in terms of questions) is well known and known to be less than satisfactory. However, an issue based approach to meaning would be compatible with a richer more dynamic characterization of information states (closer to Sperber & Wilson's view) since any such state would contain issues.

of the plural definite (i.e. non-maximal in positive contexts), then there will be a non-maximal reading. For example, in (27b) above, the first sentence in the discourse raises the issue of justification (or reason) for the evaluation "naughty". Resolving the issue raised by the definite such that the form is understood as maximal resolves no more salient issues than the non-maximal resolution. Thus, one is not justified in supposing that anything stronger is meant, given the relevance presumption.

However, these non-maximal cases are special in that there are specific expectations in the circumstances of utterance. In the general case, eg (53) below, it is felt that the maximal reading is obtained. This is so since there are no specific expectations. The issue of what happened to all of the donkeys is just as salient as any other (including what happened to any of the donkeys). In this case, as the stronger reading makes the utterance a little more relevant, and given that the speaker has used a form which is open to this reading, the audience can feel justified in assuming that this had been foreseen by the speaker and therefore is intended. In negative environments, the non-maximal construal is the apparent default since the issues of whether any is often just as salient as any other.

(53) John bought some donkeys. Harry vaccinated them.

When indefinites are interpreted specifically, they are treated as definites except that they are defined using *certain*$_i$', a predicate which is implicitly indexed to an agent (usually the speaker) and which applies to collections which the agent has in mind. In Breheny (1999) the analysis of definites generally is extended to account for dependent definites (whether containing bound variable pronouns or implicitly so).

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Poetic meter and constraint-based theories*

Nila Friedberg

Let us find, if we must be *constrained*,
Sandals more interwoven and complete
To fit the naked foot of Poesy
John Keats, 'On the Sonnet'[1]

Speakers of a language often have intuitions that some poets' meter sounds more complex than others'. I propose a theory that measures this complexity and apply it to the omission of stress in Russian iambic tetrameter using two explicit parameters—the number and type of constraints actively employed by the poet, and the number of ways a poet's hierarchy of preferences can be achieved. Looking across poets and times, two types of patterns emerge--simple *patterns are generated by four constraints;* complex *patterns, such as Pushkin's, are generated by five. Simple patterns can be derived by ordering constraints in several distinct ways. Complex patterns can be derived in just one way.*

0. Introduction

In recent work in generative phonology there have appeared many analyses of poetic meter employing constraints (Golston & Riad 1995, Hayes & MacEachern 1996, 1998; Getty 1999). The question that has occupied researchers in this field is how to incorporate poets' statistical preferences into Generative Metrics (Halle & Keyser 1971; Kiparsky 1975, 1977), a theory that traditionally focused on categorical restrictions. The fact that metrical tendencies are relevant for verse theory has been argued for already in Jakobson (1930). While in the English literary tradition, it is possible to differentiate Shakespeare, Milton and Donne by referring to the absolute restrictions that they employ (Kiparsky 1977), the absolute restrictions employed by Russian poets are often the same; thus what differentiates the meter of different poets is statistical tendencies (Bely 1910, Taranovsky 1953, Gasparov 1974).

What is the best way to represent metrical tendencies? In the Russian Quantitative approach to verse, tendencies are modeled in terms of exact numbers (Bely 1910, Tomashevsky 1923, Taranovsky 1953, Gasparov 1974, Bailey 1975, Tarlinskaja 1976). Similarly, in recent work in GM, Hayes & MacEachern (1998) assign numerical values to the

constraints in order to predict the probability of occurrence of a certain metrical form. In this paper, I argue for an alternative way of modeling tendencies. Focusing on Taranovsky's (1953) statistics about stress omission in the eighteenth and nineteenth century Russian iambic tetrameter, I show that the exact numbers often change from sample to sample, yet what remains constant is a hierarchy of poet's preferences. I model hierarchies of preferences of major Russian poets with the help of **Preference constraints**, arranged into a scale of relative strength.

The introduction of preference constraints allows us to gain new insights into the issue of the complexity of meter. It is well-known that readers often have intuitions that some poets' meter sounds more complex than others'. For instance, most Russian speakers feel that Pushkin's meter sounds 'complex'; however, such intuitions about style remain largely unexplained by GM. I measure metrical complexity using two explicit parameters—the number and type of preference constraints actively employed by the poet, and the number of ways a hierarchy of poet's preferences can be achieved. Metrical grammars that are felt to be 'simple' are typically generated by four preference constraints, whereas 'complex' grammars are generated by five. In addition, simple grammars are typically derived by several solutions in constraint ordering, whereas complex grammars are derived by just one solution.

From a theoretical point of view, this paper argues for a theory that combines aspects of the Generative and Quantitative (Bely 1910, Tomashevsky 1923, Taranovsky 1953, Gasparov 1974, Bailey 1975, Tarlinskaja 1976) approaches to verse in that I view preferences as categorical rather than numerical, and demonstrate that it is the combination of the two approaches that allows us to advance our understanding of what metrical complexity is.

1. Stress omission in the Russian iambic tetrameter

A line of iambic meter can be defined as a sequence of weak (W) and strong (S) metrical positions, where every odd metrical position is weak, and every even position is strong. In English and Russian poetry, weak positions ideally correspond to unstressed syllables whereas strong positions correspond to stressed syllables. An ideal iambic template is exemplified by the following line from Donne (capitalized W and S refer to metrical positions, accents mark stress):

(1) Thy fírm-ness mákes my cír-cle júst "Valediction: Forbidding Mourning"
W S W S W S W S

However, poets rarely follow the ideal template. One of the most common deviations from meter in English poetry is inserting stressed syllables into weak positions, such as *bát-ter* in (2):

(2) Bát-ter my heárt three pér-soned Gód for thée — Donne, "Holy Sonnets"
W S W S W S W S W S

On the other hand, the most common type of deviation in Russian poetry is inserting weak syllables into stressed positions (for more on the difference between English and Russian versification see Tarlinskaja (1987)):

(3) Na-po-mi-ná-jut mné o-n é — Pushkin, in Bely 1910
W S W S W S W S
remind me they
'They remind me of'

The difference between Russian and English has to do with the differences in word forms: the majority of Russian words are polysyllables which typically lack rhythmic secondary stress; the majority of English words are monosyllabic. Scherr (1980) states that in Russian literary language, monosyllables constitute only 33 percent of the words; on the other hand, in English literary language, monosyllables constitute 78 percent of words. If Russian poets intend to utilize as many words of different prosodic shapes as possible, they cannot compose a line of iambic verse without omitting stresses on strong positions.

In terms of stress omission, the lines of iambic tetrameter can be classified into a number of logical possibilities, or 'rhythmical forms' (Taranovsky 1953). In this paper, the foot bearing stress is indicated by a small *s*, whereas a foot with omitted stress is indicated by a small *w*:

(4) a. no omissions of stress: ssss
b. omission on the first foot wsss
c. omission on the second foot swss
d. omission on the third foot ssws
e. omission on the first and third foot wsws
f. omission on the second and third foot swws
g. omission on the first and second foot *wwss (non-occurring)
h. omission on the first three feet *wwws (non-occurring)
i. different types of omission on the last foot, i.e.
sssw, sssww, swsw, etc (non-occurring)

According to Taranovsky (1953), no Russian poets omit stress on the last foot, as in (4i)[2] In addition, most of them, except Pavlova (Bely 1910) avoid a line type as in (4g). The rest of the patterns of omission (*i.e.* 4a – f) are well formed. Which of these patterns are the most preferred and the least preferred among poets?

Following the work of Bely (1910) and Tomashevsky (1928), Taranovsky (1953) provides exact statistics about the frequency of each rhythmical form in the works of various poets .What makes the data especially valuable is that Taranovsky shows the preferences of poets on a year-by-year basis and on a poem-by-poem basis as well as over a long period of time. For example, (5) shows Pushkin's metrical preferences in different samples of verse:

(5)

rhythmical form	1823-30 'Eugene Onegin'	1822-23 'The Bakhchisaraj ' Fountain	1814-20
ssws	47.5	49.9	53.7
ssss	26.6	28.9	27.3
swss	9.7	10.5	9.2
wsws	9	6.7	5.2
wsss	6.6	3.8	4.3
swws	0.5	0.2	0.3

Note that even though the difference between the frequency of occurrence of *swss* (9.7%) and *wsws* (9%) in 'Eugene Onegin' may seem insignificant, the same preference pattern emerges in both small and large samples of Pushkin's verse, such as in 1822-23 and 1814-1820 samples. Thus, we may conclude that it was important for Pushkin to preserve the hierarchy in (6):

(6) ssws >>ssss >>swss >>wsws >>wsss >>swws

What this fact suggests is that while poets may not be aware of numbers per se (e.g. Pushkin may not have known he was using the form *swss* 9.7% of the time), their relative preferences for different types are a real part of their poetical grammars. The exact numbers change from sample to sample; what remains constant is the hierarchy of preferences.

The hierarchy in (6) is not specific to Pushkin; it was used by many other poets at different stages of their careers. If we restate Taranovsky's data in terms of relative frequency,

the majority of Russian poets will consistently fall into one of the six preference patterns in (7). Representatives of each pattern are listed in appendix II. The numbers of rhythmical forms are the same as the ones used by Taranovsky:

(7)

pattern type	pattern 1	pattern 2	pattern 3
most preferred	ssws 4	ssws 4	ssws 4
	ssss 1	ssss 1	ssss 1
	swss 3	wsws 6	swss 3
↓	wsws 6	wsss 2	wsss 2
	wsss 2	swss 3	wsws 6
	swws 5	swws 5	swws 5
least preferred			

pattern 4	pattern 5	pattern 6
ssws 4	ssss 1	ssws 4
ssss 1	ssws 4	ssss 1
swss 3	swss 3	wsss 2
wsss 2	wsss 2	wsws 6
swws 5	swws 5	swss 3
wsws 6	wsws 6	swws 5

In proposing these patterns I adopted the following approach: if the same poet uses the same hierarchy in more than one verse sample, his hierarchy is treated as a pattern. Conversely, if a poet employs a certain hierarchy in only one sample, I treated it as accidental, and did not consider it a pattern. Accidental hierarchies are shown in appendix II.

My goal is to suggest a mechanism that would generate the hierarchies in (7). In section 2, I provide a review of the traditional theory of Generative Metrics, which did not address the issue of corpus frequency; in section 3, I turn to recent developments in the field (Hayes & MacEachern 1998), which model statistical preferences with the help of constraints.

2. Generative Metrics

The question that traditional GM seeks to answer is which deviations from meter are allowed and which are unmetrical. As argued in Kiparsky (1975), the allowable deviations from the ideal cannot be simply memorized by a poet. Rather, poets acquire a feel for what is or is not a metrical line in the same way as native speakers of a particular language have intuitions about what is grammatical and what is not.

According to Halle & Keyser (1971), the most severe violation of metricality is the violation of the Stress Maximum Principle, which states that Stress Maximum (*i.e.* a stressed syllable surrounded by unstressed syllables) cannot occur in a weak metrical position. Such violation is exemplified by the word 'disorder' in George Herbert's "Denial" , in which the poet consciously constructs an unmetrical line in order to express the idea of chaos:

(8) When my devótions cóuld not pierce
Thy sílent éars
Thén was my héart bró-ken, as wás my vérse
My bréast was fúll of féars
And dis-ór-der

In addition to focusing on absolute restrictions in meter, generative metricists acknowledge variation among well-formed lines. Some attested lines deviate from the ideal template more than others. Metrical complexity (Halle & Keyser 1971) - or metrical tension (Kiparsky 1975) - is measured by counting the total number of deviations from the metrical template. For example the line in (1) has no deviations from meter, whereas the line in (2) has one deviation; thus (2) is more complex than (1).

There are two problems posed by the traditional theories of Generative metrics. The first problem is corpus frequency. Although the theory is able to measure the metrical tension of well-formed lines, it nevertheless has no means to predict which well-formed line type a poet prefers to use. While in the English tradition, it is possible to distinguish between many poets by examining the absolute restrictions that they employ (Kiparsky 1977), this is not the case in Russian. Many Russian poets use exactly the same restrictions and differ only in terms of statistical preferences. Thus the reason to incorporate preferences into GM is in order to provide an adequate account of the differences between poets and literary periods. The second problem posed by Generative Metrics, or at least by Halle and Keyser's theory, is the use of the term 'metrical complexity'. For Halle & Keyser (1971) the term refers to the degree that a line deviates from the metrical template. Yet an alternative way to interpret this phrase is

'how complex a certain grammar is from a cognitive point of view, i.e. how hard it is to construct'. I will use the term in the latter sense.

3. Constraint-based approaches to meter

A significant advance in modeling metrical tendencies came with the emergence of constraint-based approaches to meter (Golston & Riad 1995, Hayes & MacEachern 1996, 1998), originally inspired by Optimality theory (OT - Prince & Smolensky 1993) in generative phonology. OT suggests that Universal Grammar consists of a set of violable constraints, which are arranged into a hierarchy on a language-specific basis. The input candidate competes with a number of other logically possible forms. The grammatical form is the one that wins the competition, *i.e.* satisfies the given hierarchy of constraints better than other candidates. Although OT can generate more than one winner in the competition by simply not ranking certain constraints with respect to each other, it makes no quantitative predictions about the frequency of winning candidates.

There are a number of ways one could model the frequencies of attested metrical types within OT framework. First, one may adopt the approach of Hayes and MacEachern (1996, 1998), who assign the constraints ranges of strictness, following the Variable Rule analysis in sociolinguistics (Labov 1969, Cedergren & Sankoff 1974). In Hayes & MacEachern's (1998) model, an infrequently occurring metrical type would violate a constraint with a high range of strictness. Second, one may adopt the 'partially ranked grammar' approach of Kiparsky (1993), Nagy & Reynolds (1994), Anttila (1995). According to this approach, variation arises when there is no crucial ranking of certain constraints with respect to each other; thus the grammar is characterized by a number of parallel tableaus, and the frequency of a certain candidate derives from the percentage of the tableaus in which it wins. Third, one could adopt the 'constraint-weighting' approach developed in Zubritskaya (1997). Without discussing the details of each of these approaches, we may notice that all of them have something in common, namely, all of them aim to model the *exact* numbers. However, we have seen that in case of Russian verse, the exact numbers vary from sample to sample, yet what remains constant is a sense of relations - i.e. what a poet prefers more or less. Thus, I propose an alternative way of modeling metrical tendencies by introducing the notion of **constraint strength.** More specifically, I suggest that:

I. Hierachies of poets' preferences can be generated with the help of **Preference constraints,** or P-constraints, which are different in nature from OT constraints.
II. P-constraints vary in terms of strength.
III. A form violating a strong P-constraint is rare; a form violating a weak P-constraint is frequent.
IV. P-constraints are ordered into a scale (from strongest to weakest).
V. The strength of a particular constraint may vary across poets.

How will this model accommodate the constraints responsible for absolute restrictions on the one hand, and P-constraints on the other? One solution is to follow Hayes & MacEachern (1996, 1998), who suggest that constraints may be simply divided into violable and inviolable ("undominated") families; the latter are ranked above the former. An alternative solution adopted in this paper, is to introduce a constraint *NULL PARSE which acts as a border between metrical tendencies and absolute restrictions (B. Elan Dresher, p.c.). According to this approach, the difference between tendencies and rules derives from the position of constraints in a tableau. That is, any constraint ranked above *NULL PARSE is an absolute restriction which no metrical line can violate, whereas any constraint ranked below *NULL PARSE is a metrical tendency. The advantage of the Null Parse approach is that it claims that no line type is inherently unmetrical. Many rules that GM claimed to be inviolable (such as the Stress Maximum Principle), have counterexamples (Youmans 1989); does this imply that strict rules do not exist? The Null Parse offers an answer to this question: well-formedness or ill-formedness is defined *relative* to a certain sample of verse. The same constraint can be an absolute restriction (ranked above *NULL PARSE) in one poem, but merely a tendency (ranked below *NULL PARSE) in another.

The technical details of the approach will be explained in section 5.

4. Constraints

To account for the preference patterns in (7), one may propose two groups of constraints. The inviolable constraints (or at least inviolable for many poets) which are ordered above *NULL PARSE, account for absolute restrictions in meter; whereas preference constraints, ordered below *NULL PARSE, account for metrical tendencies.

Crucial to the analysis is the assumption that a line of iambic tetrameter has a hierarchical organization as formulated in (9):

(9) A line of iambic tetrameter consists of two hemistichs.
Each hemistich consists of two feet.

The relevant constraints are formulated in (10) and (11)[3]

(10) **Absolute restrictions** - inviolable for most poets in the corpus.

LINESAL	The last strong position in a line must be stressed in order to make the line ending salient (cf. Hayes & MacEachern 1998)
HEAD	A hemistich must have one stress, which is its head.

(11) **P-Constraints** - responsible for generating preference hierarchies.

BIN	At least one hemistich must be binary, i.e. have 2 stresses (predicts that *ws-ws* and *sw-ws* are less frequent than other forms).
LINEL	Mark the left edge of a line with stress. (predicts that *ws-ws* and *ws-ss* are less frequent than other forms).
HEMSAL	Mark the right edge of a hemistich with stress. in order to make the hemistich salient (predicts that *sw-ws* and *sw-ss* are less frequent than other forms).
SYM	The hemistichs must have identical structure (predicts that *ws-ws* or *ss-ss* are more frequent than others).
*LAPSE	Avoid *ww* sequence (after Golston & Riad 1994, Hanson and Kiparsky 1996, Hayes & MacEachern 1996). (predicts that *swws* is less frequent than other forms).
FIT	A line must contain stress omissions in order to fully utilize the vocabulary of Russian (Hanson & Kiparsky 1996). The constraint predicts that *ssss* is less frequent than other forms)[4].
*MISMATCH	A strong position must be stressed (predicts that all forms are less frequent than *ss-ss*).

Following the theory of Dresher & van der Hulst (1995), I assume that a stressed foot is a head of a hemistich in the same way a stressed syllable is a head of a foot. Note also that BIN and *LAPSE are absolute restrictions for some poets shown in Appendix II.

A number of constraints (such as HEMSAL, SYM, BIN, HEAD) crucially refer to the hemistich constituent. Ironically, the hemistich was traditionally omitted from the representation of iambic tetrameter by the scholars of Russian verse, since a line of iambic tetrameter does not contain a caesura. However, surface phonetic facts, such as the presence

of a caesura, are not the only justification for postulating a hemistich. As will be shown later, certain rhythmical forms pattern as natural classes in a frequency hierarchy, suggesting that the hemistich is cognitively real.

5. Deriving frequency hierarchies

Let us derive the hierarchies of preferences of different poets using the P-constraints formulated above. A number of comments about the tableaus are in order here. The tableaus below are not Optimality theory tableaus. They show preference constraints only; absolute restrictions and *NULL PARSE are omitted, since many poets follow exactly the same strict rules. Second, violations that contribute to deriving a preference hierarchy are marked by 5, whereas other violations are marked by a star (*). The boundaries of hemistichs are marked with a dash. The ordering of constraints represents a constraint strength scale, rather than an OT ranking. As in OT formalism, a solid line represents a fixed ordering, whereas a dotted line indicates that two constraints have the same strength.

(12) Pattern 4: Lomonosov (1745-1746)

(11)

	strongest → weakest				
	constraint strength scale	BIN	LINEL	HEM SAL	FIT
most frequent	ss-ws 4				
	ss-ss 1				5
□	sw-ss 3			5	
	ws-ss 2		5		
least frequent	sw-ws 5	5		*	
	ws-ws 6	5	5		

Consider pattern 4: the two least preferred rhythmical forms have something in common: both *wsws* and *swws* have only one stress per hemistich. They are ruled out by the highest ordered BIN, which requires at least one of the Hemistichs to have two stresses. Among these two candidates, we now have to chose the least frequent. *wsws* can be ruled out by ordering LINEL (which requires the left edge of a line to bear stress) right after BIN. Note that LINEL performs two functions: on the one hand, it rules out the least frequent among candidates 5 and 6, on the other hand, it rules out the next candidate in the hierarchy, i.e. *wsss*. We are now left with candidates *ssws*, *ssss* and *swss*. What differentiates the less frequent *swss* from the

more frequent *ssss* and *ssws* is the fact that *swss* does not have stress on the right edge of the Hemistich, *i.e.* it violates HEMSAL. Once *swss* is ruled out, we have to chose the most frequent candidate among *ssss* and *swss*. *ssss* violates CONTRAST and *ssws* emerges as the most frequent rhythmical form.

An interesting fact is that in 1741 Lomonosov did not use *swws* and *wsws*. Thus in 1741 BIN was an absolute restriction, ordered above *NULL PARSE, whereas in 1742 it became a preference constraint, ordered below *NULL PARSE. In (13) I show Lomonosov's pattern in 1741 employing the Null Parse mechanism. For the purposes of demonstration, I include in the tableau not only BIN but also other absolute restrictions which we have not seen so far. Ill-formed lines are shown in parentheses; as in OT, a fatal violation is indicated by an exclamation mark. First, the absolute restrictions rule out all the ill-formed line types, namely *sssw, wwss, wsws, swws*; they also rule out any line containing stress omission on the last foot, or a line in which a hemistich contains no stress. After a form is ruled out by an absolute restriction, further computation becomes irrelevant, and the row is shaded. Once we are left with the well-formed line types *ssss, ssws, swss, wsss*, the computation of preferences proceeds.

(13) Lomonosov 1741

	Absolute restrictions				P-constraints
	LINE SAL	HEAD	BIN	*NULL PARSE	
ss-ss					
ss-ws					
sw-ss					
ws-ss					
0-parse				*!	
(sw-ws)			*!		
(ws-ws)			*!		*
(ww-ss)		*!			*
(ss-sw)	*!				

(14) Lomonosov 1742

	Absolute restrictions			P-constraints	
	LINE SAL	HEAD	*NULL PARSE	BIN	Other P-constraints
ss-ss					
ss-ws					
sw-ss					
ws-ss					
sw-ws				5	
ws-ws				5	
0-parse			*		
(ww-ss)		*!		*	
(ss-sw)	*!				

Let us now generate the other preference patterns employing the constraints BIN, LINEL, HEMSAL, *MISMATCH and FIT:

(15) Pattern 5

	BIN	LINEL	HEM SAL	*MIS-MATCH	FIT
ss-ss					*
ss-ws				5	
sw-ss			5	*	
ws-ss		5		*	
sw-ws	5		*	**	
ws-ws	5	5		**	

(16) Pattern 6

	HEM SAL	BIN	LINEL	FIT	*MIS-MATCH
ss-ws					*
ss-ss				5	
ws-ss			5		*
ws-ws		5	*		**
sw-ss	5				*
sw-ws	5	5			**

Note that in pattern 6, BIN can be ordered either right before or anywhere after LINEL, still yielding the same pattern. In addition, *LAPSE could have been inserted anywhere in the tableau without changing the results[5].

Note also that patterns 5 and 6 actively use only four constraints, i.e. they do not utilize SYM and *LAPSE, which are not included into the tableau. However, some patterns cannot be generated without SYM and *LAPSE. For example, pattern 3 cannot be generated without *LAPSE:

(17) Pattern 3

	*LAPSE	BIN	LINEL	HEM SAL	FIT
ss-ws 4					
ss-ss 1					5
sw-ss 3				5	
ws-ss 2			5		
ws-ws 6		5	*		
sw-ws 5	5	*		*	

Patterns 1 and 2 cannot be generated without actively using both SYM and *LAPSE:

(18) Pattern 2

	*LAPSE	HEM SAL	LINEL	FIT	SYM
ss-ws 4					5
ss-ss 1				5	
ws-ws 6			5		
ws-ss 2			5		5
sw-ss 3		5			
sw-ws 5	5	5			

(19) Pattern 1 (Pushkin's 'Eugene Onegin')

	*LAPSE	LINEL	HEM SAL	FIT	SYM
ss-ws 4					*
ss-ss 1				5	
sw-ss 3			5		*
ws-ws 6		5			
ws-ss 2		5			5
sw-ws 5	5		*		*

Looking across the patterns generated in (12-19), one may generalize that they differ in terms of computational complexity. Patterns 1 and 2 actively manipulate five constraints, whereas patterns 6 and 5 employ only four. Patterns 1 and 2 actively use SYM and *LAPSE, whereas patterns 5 and 6 do not. Patterns also differ in terms of the number of ways they can be generated. Different constraint orderings were tested using a computer program written in Prolog by B. Elan Dresher. The results are outlined in section 6.

6. Prolog results

The program generated 55 patterns out of which 6 are attested. The remaining patterns all have *ssws* or *ssss* as the most preferred line, similarly to the attested ones[6]. These patterns may be accidental gaps, i.e. they might be possible eighteenth or nineteenth century preference patterns.

The program also tested how many solutions there exist for each pattern; we have seen that some hierarchies can be derived in more than one way since constraint orderings can vary, or different sets of constraints can be employed. In (20) I provide the list of patterns with the number of possible solutions for each as well as the number of active constraints employed:

(20)

Pattern type	The number of ways a hierarchy can be generated	The number of constraints actively employed
Pattern 1	1	5
Pattern 2	7	5
Pattern 3	10	5
Pattern 4	10	4
Pattern 5	35	4
Pattern 6	42	4

Pushkin's metrical preferences in 'Eugene Onegin' can only be generated in one way. Recall that Pushkin employs five rather than four constraints in 'Eugene Onegin', and the constraints SYM and *LAPSE are absolutely crucial. On the other hand, in patterns generated in 53 ways, only 4 constraints are active, and SYM and *LAPSE are not crucial. Based on this correlation, I propose that metrical patterns can be classified into complex and simple. These patterns are identified on the basis of more than one characteristics:

(21) *Complex patterns* (i.e. pattern 1)
(a) Actively employ five constraints
(b) Actively employ SYM
(c) Actively employ *LAPSE
(d) Can be generated in 1 way

Simple patterns (i.e. pattern 6)
(a) Actively employ four constraints
(b) Do not actively employ either SYM or *LAPSE
(c) Can be generated in many ways.

It should be noted that 'simple' and 'complex' are merely a continuum; poets do not know that their grammar can be generated in 10 ways. The classification in (21) simply suggests that some grammars are computationally easier than others. Between the two extremes of this continuum (i.e. complex and simple) there exists a transitional area, such as patterns 2,3,4 and 5, which fulfill some of the conditions for complex patterns, but not all of these conditions.

We can further classify the P-constraints into two types: **core constraints,** actively used by all poets, and **periphery constraints**, used only by some poets. Looking across the patterns we notice that the constraints referring to edges of constituents, namely LINEL and HEMSAL are actively used by all poets, irrespective of which weighting solution is chosen. On the other hand, the SYM constraint is only actively utilized in complex grammars. A

possible explanation for this fact is that from a cognitive point of view, edge constraints are not as complex as the notion of symmetry: edge constraints merely require to mark beginnings and ends, whereas the notion of symmetry involves a comparison between two objects.

7. Examining individual poets

Consider how the metrical grammar of Lomonosov changed over the course of his career. Lomonosov represents an especially interesting example of metrical development because he was the first to use the iambic meter in Russian (Zhirmunsky 1971).

(22) Lomonosov[7]

1739 simple: 35 ways pattern 5	1741 simple: 35 ways pattern 5	1742 simple: 35 ways pattern 5	1745-1746 simple 10 ways pattern 4
SSSS	SSSS	SSSS	SSWS
SSWS	SWSS	SSWS	SSSS
SWSS	SSWS	SWSS	SWSS
WSSS	WSSS	WSSS	WSSS
		SWWS	SWWS
		WSWS	WSWS

1748-1749 transitional 10 ways pattern 3	1750 complex 1 way pattern 1	1752-1757, 1761 transitional: 10 ways pattern 3
SSWS	SSWS	SSWS
SSSS	SSSS	SSSS
SWSS	SWSS	SWSS
WSSS	WSWS	WSSS
WSWS	WSSS	WSWS
SWWS	SWWS	SWWS

At the beginning of his career Lomonosov employed a simple pattern. Note that in 1739 and 1741 not only was he using a simple grammar but he was also using more absolute restrictions: the forms *swws* and *wsws* do not occur, indicating that BIN was an absolute constraint. Gradually, however, Lomonosov started to employ rhythmical forms *swws* and

wsws, and his patterns became transitional (1748-49), and then complex (1750). Thus the increase in the number of rhythmical forms roughly correlates with the increase in the complexity of a pattern.

Consider now the patterns used by Pushkin.

(23) Pushkin

1814 transitional 10 orderings pattern 3	1814-20 complex 1 ordering pattern 1	1814-15, 1816, 1817-18, 1819-20 complex 1 ordering pattern 1	Ruslan and Liudmila 1817-1820 transitional 10 orderings pattern 3
SSWS	SSWS	SSWS	SSWS
SSSS	SSSS	SSSS	SSSS
SWSS	SWSS	SWSS	SWSS
WSSS	WSWS	WSWS	WSSS
WSWS	WSSS	WSSS	WSWS
	SWWS	SWWS	SWWS

Kavkazskij plennik 1820-1821 transitional 10 orderings pattern 3	Bratja razbojniki 1821-22 transitional 10 orderings pattern 3	The fountain of Baxchisaraj 1822-23 complex 1 ordering pattern 1	Lyrics 1823-24 transitional 7 orderings pattern 2
SSWS	SSWS	SSWS	SSWS
SSSS	SSSS	SSSS	SSSS
SWSS	SWSS	SWSS	WSWS
WSSS	WSSS	WSWS	WSSS
WSWS	WSWS	WSSS	SWSS
SWWS		SWWS	SWWS

The gypsies 1824 complex 1 ordering pattern 1	Count Nulin 1824-5 complex 1 ordering pattern 1	Lyrics 1827 transitional 7 orderings pattern 2	Poltava 1828 transitional 7 orderings pattern 2
SSWS	SSWS	SSWS	SSWS
SSSS	SSSS	SSSS	SSSS
SWSS	SWSS	WSWS	WSWS
WSWS	WSWS	WSSS	WSSS
WSSS	WSSS	SWSS	SWSS
		SWWS	

Lyrics 1828-29 transitional 7 orderings pattern 2	Eugene Onegin 1823-1830 complex 1 ordering pattern 1	Lyrics 1830-1833 transitional 7 orderings pattern 2	The copper rider 1833 transitional 7 orderings pattern 2
SSWS	SSWS	SSWS	SSWS
SSSS	SSSS	SSSS	SSSS
WSWS	SWSS	WSWS	WSWS
WSSS	WSWS	WSSS	WSSS
SWSS	WSSS	SWSS	SWSS
SWWS	SWWS	SWWS	SWWS

Out of the twenty samples of Pushkin's verse referred to in table (22), ten samples, including 'Eugene Onegin', use a complex pattern. The remaining ten samples represent a transitional pattern; that is to say, simple patterns are not used at all.

8.Conclusion

There are many issues that remain to be explored. First, I examined stress omission on strong positions, but ignored weak positions. Second, a modified version of this theory will have to explain why the form *ssws* occurs *significantly* more often than other line types. Third, it needs to be explored why poets consistently chose the given 5 patterns but avoid the remaining 49 possible patterns.

What I have demonstrated is that our intuitive statements about what sounds complex and what sounds simple are often based on very concrete parameters such as the number and the type of constraints employed and the number of ways a poet's hierarchy of preferences can be

generated. I have also shown that there are different ways of interpreting the term 'complex'. In traditional GM, 'complex' refers to the degree the poet deviates from the ideal template; 'complex' could also mean 'how many rhythmical forms a poet employs'. In the theory proposed here, 'complex' refers to the patterning of rhythmical forms in the preference hierarchy. Instead of attempting to find one 'true' definition of complexity, I suggest that all the three meanings have to be taken into account in a formal analysis of style, since a feeling of 'metrical complexity' is probably caused by a combination of different factors. Moreover, a poem may sound complex for a variety of reasons unrelated to meter, including the choice of metaphors or the poet's ideas. Last but not least, a poet may chose a simple pattern in order to sound different from the majority of poets who aim to sound complex.

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APPENDIX I

POETS EXAMINED BY TARANOVSKY

Lomonosov, Kniazhnin, Petrov, Krylov, Sumarokov, Kostrov, Kotel'nitskij, Kozodavlev, Zhukovskij, Vasilij Pushkin, Derzhavin, Nikolaev, Kheraskov, Osipov, Radishchev, Kapnist, Batiushkov, Pushkin, Del'vig, Bogdanovich, Batiushkov, Venevitinov, Ryleev, Kuxel'beker, Xomiakov, Lermontov, Viazemskij, Kozlov, Shevirev, Pletnev, Jazykov, Baratynskij, Polezhaev, Mej, Tolstoj, Fet and Tiutchev.

APPENDIX II

PATTERNS AND THEIR REPRESENTATIVES

a. Complex Patterns

Pattern 1 - given by 1 ordering 4>1>3>6>2>5

Lomonosov 1750 (i.e. poems written in 1750); *Bogdanovich* 1790-92; *Zhukovskij* 1803-1813, 1914-1832, 1814-16, 1818-19, 1821, 1823-1832; *Viazemskij* 1811-1815, 1816-1819, 1823-25, 1826-27; *Pushkin* 1814-15, 1816, 1817-18, 1819-20, 'The Bakhchisaraj fountain', 1822-23, 'Eugene Onegin' (written 1823-30), 1814-1820, 'The Gypsies' (written in 1824, no swws used), 'Count Nulin' (written in 1824-5, no swws used); *Del'vig* 1817-1819; *Kozlov* 1821; *Vasilii Pushkin* 1828; *Shevirev* 1825; *Lermontov* 1839-40

This hierarchy is also characteristic of different epochs:

Eighteenth century (all poets) -

wsws and wsss are equally frequent, i.e. Symmetry is inactive.

1814-1820 (all poets)

Beginning of the twentieth century (all poets)

b. Transitional Patterns

Pattern 2 - given by 7 orderings 4>1>6>2>3>5

Jazykov 1825-28, 1829-31; Baratynskij, poems 1828; Polezhaev 1825-26, 1827-31, 1834-38; Pushkin lyrics 1823-24, lyrics 1827, lyrics 1828-29, 'Poltava' 1828 (no swws), lyrics 1830-1833, 'Mednyj Vsadnik' 1833;Viazemskij 1831; Lermontov, poems 1833-34, poems1836.

This hierarchy is also characteristic of the nineteenth century (younger and older generation).

Pattern 3 - given by 10 orderings 4>1>3>2>6>5

Lomonosov 1752-1757, 1761; Sumarokov 1767-72, Kostrov 1778, Kotel'nitski 1795; Zhukovskij 1797-1800; Pushkin 'Ruslan and Liudmila' 1817-1820, Venevitinov, Ryleev 'Dumy' 1821-23; Kuxelbeker 1818-20, 1821-24, 1832-35; Xomiakov 1826-27; Lermontov 1828, lyrics 1830; Pushkin, 'Kavkazskij plennik'1820-21, 'Bratja razbojniki' 1821-22 (no swws)

c) Simple patterns

Pattern 4 - given by 10 orderings 4>1>3>2>5>6

Lomonosov 1745-46

The same hierarhcy of preferences emerges from Bely's (1910) calculations, suggesting that the pattern is statistically significant.

Pattern 5 - given by 35 orderings 1>4>3>2>5>6

Lomonosov 1739, 1741 (no wsws or swws), 1742

Pattern 6 - given by 42 orderings 4>1>2>6>3>5

Pletnev 1822-25, Baratynskij lyrics 1819-20, Baratynskij lyics 1821-1828, narrative poems 1826, Kozlov 1827, Shevirev 1827, Lermontov 'Izmail bei'1832, B.Orsha 1835, Mtsyri 1840

Accidental Patterns given by single samples:

Lomonosov 1747	4>1>3>5>6>2
Lomonosov 1762-1764, Del'vig 1814	4>3>1>6>2>5
Kniazhnin (till 1791), Petrov 1766, Krylov 1793	1>4>3>2>6>5
Xomiakov 1828-39; Lermontov long poems 1829	4>1>2>3>6>5
Kapnist 1792	1>4>3>6>2>5
Pushkin 1821-1822	4>1>6>3>2>5
Lermontov 'Daemon'	
Nekrasov	
Polezhaev	4>1>6>5>2>3
Lomonosov 1759	4>1>3>6>5>2
Nikolaev	1>4>3>6>5>2

APPENDIX III: PROLOG RESULTS

The numbers correspond to Taranovsky's numbers assigned to each rhythmical form:

(4) ssws (2) wsss (6) wsws (1) ssss (3) swss (5) swws

Hierarchy of preferences	Attested patterns	Given by N constraint rankings	Pattern number
1 6 4 2 3 5		112	
1 4 2 3 6 5		77	
1 4 2 6 3 5		77	
1 4 3 5 6 2		66	
1 4 3 5 2 6		66	
1 4 3 2 6 5		53	
6 1 4 2 3 5		49	
1 6 4 3 2 5		44	
4 1 2 6 3 5	4	42	Pattern 6
1 6 4 3 5 2		40	
4 1 3 5 2 6		36	
1 4 3 2 5 6	4	35	Pattern 5
4 2 6 1 3 5		35	
6 4 2 3 5 1		30	
4 2 6 3 5 1		30	
4 2 3 1 6 5		28	
4 3 5 1 2 6		25	
4 3 5 2 6 1		25	
4 2 3 6 5 1		24	
4 3 1 5 2 6		23	
1 4 6 2 3 5		21	
4 2 1 3 6 5		21	
4 2 1 6 3 5		21	
4 3 2 6 5 1		17	
4 3 2 1 6 5		16	
4 3 5 1 6 2		15	
4 3 5 6 2 1		15	
4 3 1 2 5 6		15	
6 4 2 1 3 5		14	
4 3 1 2 6 5		14	
4 1 2 3 6 5		14	
6 1 4 3 2 5		13	
4 3 2 5 6 1		12	
4 3 2 1 6 5		12	
1 4 3 6 2 5		11	
6 4 3 2 5 1		10	
4 1 3 2 5 6	4	10	Pattern 4
4 1 3 2 6 5	4	10	Pattern 3
4 3 2 6 1 5		9	
6 1 4 3 5 2		8	
6 4 3 5 2 1		8	
4 1 6 2 3 5	4	7	Pattern 2
4 6 2 1 3 5		7	
4 1 3 5 6 2		6	
4 6 2 3 5 1		6	
6 4 2 3 1 5		5	
4 2 6 3 1 5		5	
4 2 3 6 1 5		4	
6 4 3 2 1 5		3	
4 3 1 5 6 2		3	
4 3 1 6 2 5		3	
4 3 6 2 5 1		3	
4 3 6 2 1 5		3	
4 1 3 6 2 5	4	1	Pattern 1
4 6 2 3 1 5		1	

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[1]Thanks to Daniel Hall for the quote.

[2]M.Shapir (p.c.) pointed out to me that there are counterexamples to this statement.

[3]The question is how do we motivate the given constraints, since the results outlined in the paper crucially depend on the choice of constraints. One motivation has to do with the patterning of rhythmical forms on preference hierarchies: forms that violate a certain constraint tend to occur as neighbours on frequency hierarchies, i.e. they pattern as a natural class. Second, many of the constraints are not specific to Russian poetry, and occur cross-linguistically either in verse or in natural language, e.g. constraints on Binarity (Prince and Smolensky 1993), Symmetry (Ghini 1993), Headedness (Dresher and van der Hulst 1995), NoLapse (Hanson and Kiparsky 1996), Saliency (Hayes and MacEachern 1998).

[4]The original name of the constraint was Contrast. Thanks to Brian McHugh, who brought to my attention that this constraint directly relates to the prosodic shape of Russian words.

[5]The question that remains to be answered is whether poets would ever pick a non-economical solution employing five constraints if the same pattern can be derived by four constraints.

[6]The program was constrained in the following way. *MISMATCH is ordered below LINEL, HEMSAL and BIN by Kiparsky's (1982) Elsewhere Condition which states that specific rules should apply before general ones. *MISMATCH is a general principle which requires the stressing of every strong position in a line. On the other hand the other three constraints refer to the stressing of specific constituents, such as the foot or hemistich.

[7]I have omitted accidental patterns from the table.

Stress Assignment in the Nominal System of Modern Hebrew (MH)

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Abstract

The nominal system of MH displays a lexical accent system, where main stress assignment is a result of the interaction between lexical properties of the stem and lexical properties of the affix. In the case that no lexical properties are specified for stem and/or suffix, a general stress rule is activated, which assigns stress to the rightmost accentable syllable. In other words, final stress is the phonological "default" stress. The lexical accent properties of morphemes are taken to be marked by lexical prosodic structure, or more specifically, by the association of a syllable with a position in a strong foot (=head-foot).

The stress patterns presented in the data will be accounted for by an OT-analysis, in which the inherent conflicts of the nominal system will be solved due to the interaction between prosodic faithfulness constraints and alignment constraints.

1. Introduction

The data concerning stress assignment for the MH nominal system indicate that stress assignment in MH nominals depends crucially on lexical specifications rather than on phonological demands, thus, the nominal system of MH is lexically-controlled (lexical accent) system. Additionally, the system has a rhythmically determined default pattern, which is found where none of the morphemes of the words asserts its own aaccentual preferences.

This categorization of the MH-stress-system implies that it consists of two independent parts which stand in correlation: the phonological pattern and the morphological/lexical pattern. The phonological pattern, or the so called "rhythmical default pattern", is predictable and therefore can be accounted for by phonological demands in the grammar. In the morphological/lexical pattern, word stress is not predictable, but rather the result of an interaction between the lexically marked properties of different types of morphemes. The proposal advanced here is that the idiosyncratic properties of morphemes are specified in the lexicon in terms of prosodic structure.

The analysis of a system of this type will be consequently carried through in two steps. A short exploration of the phonological pattern will set the parameters for foot-form and foot-parsing. The resulting metrical structure will be used as a component in the analysis of the morphological/lexical pattern, which will be shown to be a consequent of constraint interaction in an Optimality Theory (OT) framework.

2. Organizing the Data

2.1 Preliminaries

MH is taken to be ***quantity-insensitive***. This assumption is reflected in the fact that stress assignment does not distinguish between open and closed syllables. A slight complication for the insensitivity-assumption is the observation that the language as a whole prefers to have a CVC syllable in the final position in the word, a fact which can be explained diachronically. In a synchronic view, however, no conclusive arguments can be found to classify the final syllable as heavy (Graf 1999), such that all syllables can be treated in the same manner, independently of their position and/or internal structure. Main stress is assigned to the final syllable (if no lexical prespecifications intervene) and secondary stress alternates rhythmically and is assigned leftwards (Bolozky 1982). The assignment of iterative secondary stress, where the implementation of the principle 'No Clash' is demonstrated, is assumed to be the consequence of metrical feet construction. In the nominal system of MH only suffixes, as opposed to prefixes, are relevant for stress assignment.

2.2. Stems

Noun-stems in MH need to be classified into three lexically distinct groups[1]. The distinction between these groups is based on the surface correlation of the position of stress in the base form and the position of stress in the corresponding suffixed form. The three groups are as follows:

a. **Plain stems**: stress is ultimate in the base and ultimate in the suffixed form.

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[1] This classification goes back to Bat-El (1989) and Rosen (1977). Examples were partly taken from Bat-El (1989, 1993).

b. **Accented stems**: stress remains in the same position when a suffix is attached.

c. **Penultimate stems**: stress is penultimate in the base and ultimate in the suffixed form (mostly Segolates).

(1)

a. Plain stems		
gamád	gàmad-ím	*'dwarf'* (sg.-pl.)
tavlín	tàvlin-ím	*'spice'* (sg.-pl.)
xatúl	xàtul-á	*'cat'* (masc.-fem.)
gorál	gòral-í	*'fate-fateful'*
b. Accented stems		
méter	métr-im	*'meter'* (sg.-pl.)
tíras	tíras-im	*'corn'* (sg.-pl.)
dóktor	dóktor-it	*'doctor'* (masc.-fem.)
c. Penultimates		
délet	dlat-ót	*'door'* (sg.-pl.)
jéled	jald-á	*'child'* (masc.-fem.)
xódeʃ	xodʃ-í	*'month-monthly'*
rakévet	ràkav-ót	*'train'* (sg.-pl.)

Group (b) as opposed to both (a) and (c) illustrates fixed stress, a fact which indicates lexically marked stress. Group (a) as well as group (c) illustrate variable stress, as evidenced by the final stress in the suffixed forms. Under the assumption that the language-specific phonological pattern assigns final stress to nouns if they are not marked otherwise, the stress pattern for isolated as well as for suffixed forms in group (a) of Plain stems is totally predictable. The assignment of penultimate stress to the isolated penultimate (especially Segolate) forms in group (c) is unpredictable and will have to be accounted for.

2.3. Suffixes

The suffixes of the nominal system must be categorized in different classes according to their inherent stress properties, similar to the categorization of stems. I suggest the following categorization: **accented** suffixes, **prestressing** suffixes and **variable** suffixes.

• **Variable suffixes** are not necessarily stressed but may carry stress assigned by the default stress pattern, and as such are supposed to have no lexical specification for stress. Variable suffixes include the plural-formation-suffixes *-im* and *-ot*, the feminine-suffixes *-a*, *-it*, *-at* and *-ut* and the adjectival suffix *-i*. These suffixes build the major part of the suffixes attached to nominals. The examples below involve the feminine and adjectival formations:

(2)			
	a. ACCENTED STEM:	optími *'hopeful'*	optímij-ut *'hopefulness'*
	b. PLAIN STEM:	mahír *'fast'*	mehir-út *'speed'*
	c. ACCENTED STEM:	demokrát *'democrat'*	demokrát-i *'democratic'*
	d. PLAIN STEM:	israél *'Israel'*	israel-í *'Israeli'*

The examples in (2) are construed in pairs. In (2a) the suffix *–ut* is attached to an Accented stem and stress stays on the stem. In (2b) the same suffix is attached to a Plain stem and stress falls on the suffix. The same behavior can be observed with the suffix *–i* in (2c) and (2d).

• **Accented suffixes** are characterized by inherent stress which stays put whatever stem they are attached to, i.e. they are obligatorily stressed. When attached to stems with lexical stress (Accented stems), such as were chosen for the examples, the lexical specification of the suffix wins the overhand over the specification of the stem. The examples below illustrate the stress patterns of nouns with an accented suffix as compared to the same nouns with a variable plural suffix:

(3)		accented suff.	variable suff.
	a. miljón *'million'*	miljon-ér *'millionaire'*	miljón-im *'millions'*
	b. tráktor *'tractor'*	traktor-íst *'tractor driver'*	tráktor-im *'tractors'*

• **Prestressing suffixes** - these are suffixes which require main stress on the syllable that precedes them. This 'prestressing' effect holds also in the case when an additional suffix is attached:

(4)		prestressing suff.	prestress.+variable suff.
	a. dʒób *'job'*	dʒób-nik *'shirker'*	dʒób-nik-it (fem.)
	b. kibúts *'Kibbutz'*	kibúts-nik *'a Kibbutz-member'*	kibúts-nik-im (pl.)
	(compare sg.-pl.: *kibúts → kibuts-ím*)		

A special case of a prestressing suffix is the feminine suffix *-et*, used for both participle- and nominal-formation. The suffix *-et* not only demands main stress on the preceding syllable, it also lays supplementary conditions on the segmental and prosodic structure of that syllable. The preceding syllable must be open and must contain an */e/* or an */o/* as the nucleus, depending on the stem. Additionally, the suffix *-et* cannot be attached to every stem, but only to such that fulfill certain prosodic and phonological conditions. Otherwise a different feminine suffix will be attached[2]:

(5)	a. arnáv *'hare'*	arnév-et *'fem. hare'*
	b. rakáv *VERB-STEM 'to ride'*	rakév-et *'train'*
	c. tarnegól *'cock'*	tarnegól-et *'hen'*

3. The phonological pattern

The rhythmical default pattern is responsible for the assignment of word stress in the cases where no morpheme in the word possesses a lexically specified accentuation. According to my classification of morphemes in MH the default pattern is active for words consisting of Plain or Penultimate stems and combinations of those stems with variable suffixes. The data show that the system assigns main stress to *each* final syllable; secondary stress is iterative and depends on the location of main stress. Following Hayes (1995), I assume that stress assignment is construed as the parsing of a word into metrical feet. The construction of feet is determined by setting the parameters i) DIRECTION OF PARSING (Right-to-Left or Left-to-Right); ii) MANNER OF PARSING (top-down or bottom-up); iii) FOOT TYPE (syllabic vs. moraic); iv) PROMINENCE (iambic vs. trochaic).

In the setting of the parameters for MH we come up with a disyllabic foot template, parsed from Right-to-Left. Setting the prominence-parameter right (iambic) or left (trochaic) will be determined on theoretical grounds. The appropriate value of MANNER OF PARSING (top-down or bottom-up) will be set according to the foot type in the relevant analysis. Having the

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[2] The suffix *–et* shares some properties with the Segolate nouns, as can be inferred form the final disyllabic sequence CéCeC. There are various possibilities for the analysis of *–et* (such as a suffix *–t* and an epenthetic /e/), which must be further looked into.

parameters set, it is yet necessary to determine the assignment of main versus secondary stress. In the case of MH, **End Rule Right** will guarantee final main stress.

Under the presumption that MH is quantity-insensitive (stress counts syllables and not moras), and under consideration of the wide acceptable notion that surface syllabic iambs are not supposed to exist (Hayes 1995, Kager 1993), the only possibility for a metrical analysis is to assume construction of syllabic trochees.[3]

A trochaic analysis shows it necessary to assume two types of degenerate feet: i) On an edge syllable due to high priority of End Rule Right (Top-Down parsing); ii) On the only available syllable after extrametricality. Degenerate Feet are allowed only in strong metrical positions, but not in weak positions. The case of a degenerate foot on the final syllable is a result of assigning main stress by an End-Rule, before footing licenses the final syllable as a foot. The second type of degenerate foot is obligatory in order to render the Segolates 'stressable'. Extrametricality of the last syllable for Segolates is a plausible assumption considering stress assignment when a suffix is attached. Given the default stress rule, Segolates should have been assigned final main stress, which is not the case. However, when a variable suffix is attached to a Segolate stem, the default stress rule becomes active and assigns final main stress: *mélex*$_{SG.}$ → *melaxím*$_{PL.}$ 'king' This case falls under the label known in the literature as *stress shift*, for which it is not possible to assume lexically marked stress or lexical foot structure. Assigning Segolates the structure σ<σ> leaves us with the only option for a metrical structure, that is, a degenerate foot.

A trochaic analysis captures the data according to the principles of metrical theory, even though the system displays an untypical property for trochaic systems, that is, final stress.

4. OT-Analysis

The following analysis will present the stress patterns that arise by lexically conditioned properties, assuming that stems and suffixes must be lexically specified for stress. The account given here argues in favor of marking morphemes in the lexicon for a role in a foot.

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[3] Contrasting a trochaic with an iambic analysis in the frame of metrical theory is presented in detail in Graf (1999).

The categorization of the data suggests that every stem and every suffix are either lexically specified or lexically unspecified for stress, such that ***Plain stems*** and ***variable suffixes*** are lexically unmarked; ***Accented stems*** and ***accented suffixes*** are specified for the head-role in a foot; and ***Prestressing suffixes*** are specified for the tail-role in a foot. The final syllable of ***Penultimate stems*** is assumed to be extrametrical, such that penultimate stress in the unsuffixed form is a result of the default stress pattern (stress the rightmost accentable syllable): *sé<fer>* 'book'. In the suffixed form, the extrametrical syllable is no longer peripheral and loses its extrametricality. Here, again, stress is assigned by the phonological default pattern: *sfarim* 'books'. Penultimate stems are thus unspecified for a prosodic role and are assigned stress in the same manner as Plain stems.

I will concentrate on the stress patterns emerging from the concatenation of one stem with *one* suffix, though concatenations of a stem with more than one suffix are possible as well. Under the assumption of lexical specification there are four logical possibilities for the combination of one stem with *one* suffix (- for unspecified and + for specified):

a) –/– cases are assigned the "default" phonological stress.

b) +/– cases: stem is specified for prosodic role.

c) –/+ cases: suffix is specified for prosodic role.

d) +/+ cases: "Multiple stress conflict".

The cases, where neither stem nor suffix are lexically specified for stress, i.e. the –/– cases, are exactly the combinations that are assigned the "default" phonological stress. These consist of the combinations of a Plain stem or a Penultimate stem with a variable suffix. In all other cases either the stem or the suffix or both are specified for stress. In the +/– and –/+ cases, only one formative is lexically specified, so that there is no lexical stress conflict, whereby two distinct cases have to be accounted for: suffixes specified for the head-role in a foot, and suffixes specified for the tail-role in a foot. The basic assumption for such cases is that ordinary stress rules cannot override the lexically specified structure, known in the metrical theory literature as the Free Element Condition, as formulated by Hayes (1995:115) after Prince (1985):

(6) **Free Element Condition**: Rules of primary metrical analysis apply only to free elements.

In other words, lexically specified metrical structure has priority over phonologically assigned structure, the latter able to apply only to elements which are not specified otherwise. The remaining cases (+/+) are the ones where a "multiple stress conflict" arises, since both formatives are specified for stress. It will be demonstrated that in the case of a conflict the properties of the rightmost element 'win'.

I will present a somewhat schematic OT-analysis of the lexically-conditioned stress conflicts. I take OT to offer the best stage for an analysis of the data, since the theory is based on constraint interaction, which is designed to select the output representation by a set of well-formedness constraints that are ranked in a hierarchy of relevance. The constraints are requirements of well-formedness that *may* but *must not* be realized in the optimal output, i.e. they are violable. Since most requirements in a stress system are not absolute, constraint interaction allows us to solve conflicting demands without repair strategies. The ranking of the constraints (the grammar) represents both the conflicting requirements themselves as well as the priorities the language sets to them. The interaction of constraints designates the strategy the language uses for solving inevitable conflicts. In short, OT can account for interaction of concurring principles. For MH this property will be of use for resolving conflicts inherent to the lexical-marking system, as well as conflicts between lexical specifications and phonological demands.

The basic assumptions of the following analysis are based on the setting of parameters concerning foot structure, which were discussed in the previous section. In an OT analysis the construction of feet and the manner of foot-parsing is designated by constraints, which may compete with each other. The following constraints form a relevant subset of the constraints required for foot construction:

(7) **FT-BIN** (McCarthy&Prince 1993)
Feet must be binary under syllabic or moraic analysis [σσ]

(8) **PARSE-SYLL** (McCarthy&Prince 1993)
Every syllable must be parsed by a foot.

The assumed disyllabic, trochaic foot will be accounted for in the following fashion:

(9) **FT-FORM (TROCHAIC)** (McCarthy&Prince 1993)

$[\sigma_s\ \sigma_w]_{Ft} > [\sigma_s]_{Ft}$

The constraint on foot-form is built in the form of a hierarchy, where the canonical trochee (strong syllable followed by a weak syllable) ranges higher than the non-canonical trochee, which is monosyllabic. For a quantity-insensitive language, such as MH, this hierarchy enables the construction of degenerate feet, which in their turn must be licensed (to use the metrical theoretical formulation) as the head foot of the prosodic word. The existence of degenerate feet under a trochaic analysis cannot be ignored in MH. The licensing of such feet in terms of constraint interaction will occur due to the ranking of ALIGN-HEAD higher than the constraints on foot-structure, similar to the effect of top-down parsing.

ALIGN-HEAD is an alignment constraint, which is the equivalent of End-Rule-Right and which accounts for the assignment of main stress to a foot at the right edge of the prosodic word:

(10) **ALIGN-HEAD (PrWd, R, H(PrWd), R)** (McCarthy&Prince 1993)
align the right edge of every prosodic word with the right edge of the head of the prosodic word. (every $\acute{\sigma}$ is in final position in the PrWd)

An important part of the constructed grammar is a constraint which demands the prosodic matching of input and output. Since we assume a lexical specification of prosodic structure (role in a foot) in the input, we require faithfulness of the output to the input in this respect, in terms of correspondence theory. I suggest the following faithfulness-constraint:

(11) **MAX-HEAD-FT (MAX-HDFT)**
Every head-foot of the input has a correspondent head-foot in the output.

It should be noticed that this constraint expresses faithfulness to an abstract prosodic construct (the foot). In order to associate the foot with its segmental content, a further constraint is necessary, demanding faithfulness to the edgemost *position* of a correspondent segment in a prosodic/morphological category, which was formulated in the Correspondence Theory (CT) literature as a constraint of the ANCHOR-family (Benua 1997, McCarthy 1997). For the case at hand, I propose an anchor-constraint which demands correspondence of a segment(s) at the initial/final position of a foot in the input to a segment in the initial/final

position of a foot in the output: **ANCHOR-POS$_{IO}$ (FT, FT, INITIAL/FINAL)**. The constraint ANCHOR-POS$_{IO}$ does not compete with MAX-HDFT, but rather complement it. Thus, it will not be integrated in the tableaus, rather, MAX-HDFT will be taken to incorporate ANCHOR-POS$_{IO}$ for sake of simplicity.

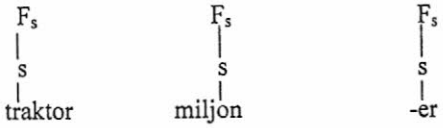
The evaluations presented below demonstrate the interactions between the constraints on faithfulness to lexical accents in terms of prosodic roles (MAX-HDFT) and the constraint on the location of primary stress (ALIGN-HEAD). The tableaus are simplified with respect to foot structure constraints. The constraints on foot construction and parsing are not significant for the resolution of lexical stress conflicts. Nevertheless, the assumed foot structure is crucial for the treatment of the phonological regular stress assignment, as well as for the assignment of secondary stress. In the treatment of the lexically unmarked cases, some of the constraints on foot-structure will play a role, whereby the exact positioning of these constraints in the hierarchy must be examined in a complete analysis of the data, as well as the role of supplementary foot-structure constraints.

An important notice at this point is that polysyllabic words can only be exhaustively footed, if a degenerate foot is 'licensed' to bear main stress (due to ALIGN-HEAD). In all other cases, polysyllabic words cannot be exhaustively footed, thus leaving a syllable unparsed. This observation leads to the ranking **FT-BIN > PARSE-SYLL**, which is not manifested in the tableaus. Further it should be noticed that the construction of trochaic feet, as already mentioned, is taken for granted although it is necessary in the interaction. I assume that the construction of trochaic feet follows from the interaction of constraints on foot structure, such that the best possible trochees are built. The constraint FT-FORM, which also allows degenerate feet, is operating in the background, except for the illustration of phonologically assigned stress, where it will be discussed separately.

The operation of the suggested grammar depends on the assumed lexical representations of the involved morphemes. Following is a graphic representation of the assumptions made beforehand:

- Accented stem and accented suffixes: (F_s stands for a strong foot=head-foot)

(12)



- prestressing suffixes:

(13)

-et

- -tʃik

The morphemes in (12) are assumed to be accented in the sense that a syllable is associated with the strong position (=head) of a strong foot (=head-foot). For the morpheme *traktor* the penultimate syllable is associated with a strong position, whereby for the morpheme *miljon* it is the ultimate syllable which is associated with the strong position. The monosyllabic prestressing suffixes, presented in (13), are assumed to be associated with the weak position of a head-foot in a fully specified, binary trochee.

4.1. Specified stem + unspecified suffix

This combination consists of only one case, that is an Accented stem followed by a variable suffix. Since the stem is lexically marked for stress and the suffix is not, the suffixed form is expected to carry stress on the prespecified syllable of the stem. In terms of OT that means that prosodic faithfulness constrains must be higher ranked than the constraints on the metrical structure of the prosodic word.

(14) Accented stem + variable suffix (*tiras* 'corn' + *-im* PLURAL)

Fs s tiras + im	MAX-HDFT	ALIGN-HEAD
☞a. [tíra]sim		**
b. ti[rásim]	!*	*
c. [tira][sím]	!*	

Candidate (b) and candidate (c) are not faithful to the lexical specifications in terms of association to segments, where candidate (b) fails to parse the syllable *ti*, and in terms of association in a head-foot, where candidate (c) fails to parse the syllable *ti* in a head-foot. Only candidate (a) is faithful to the prosody of the input at the cost of violating ALIGN-HEAD twice (ALIGN-HEAD is a gradient constraint which counts syllables). This case provides us with the ranking MAX-HDFT >> ALIGN-HEAD.

4.2. Unspecified stem + specified suffix

In these cases, like the one described above, there arises no conflict between two lexically marked formatives, since only one of them is marked; however, the lexically marked prosodic structure for suffixes involves two different cases: the suffixes marked for a head-role (=accented suffixes) and for a tail-role in a foot (=prestressing suffixes). The following tableaus (15) and (16) evaluate the combination of Plain/Penultimate stems with an accented suffix, tableau (17) evaluates the combination of a Plain stem with a prestressing suffix. One combination is missing, though, that is the combination of a Penultimate stem with a prestressing suffix (concretely, a Segolate stem to which either *–et* or *–nik/-tʃik* are attached). According to my knowledge, this combination is not attested in the language, a fact which might be an accidental gap, but may also implicate that Segolates have some properties which are not compatible with the demands imposed on the stem by prestressing suffixes. For short of space I will leave this issue for future investigation.

4.2.1. Accented suffix

(15) Plain stem + accented suffix (*ʃirjon* 'armored forces' + *-er* 'member of')

Fs ʃirjon + er	MAX-HDFT	ALIGN-HEAD
☞a. [ʃirjo][nér]		
b. ʃir[jóner]	*!	*
c. [ʃírjo]ner	*!	**

Here the demands of both MAX-HDFT and ALIGN-HEAD fall together for candidate (a), which is the most harmonic output possible under this ranking. It is faithful to the prosodic structure of the input (suffix) and fulfills the demand to stress the rightmost syllable. Candidates (b) and (c) are not faithful to the input in terms of associating the specified segments to the head-foot in the output.

(16) Penultimate stem + accented suffix *([séfer]* 'book' + *-on* DIMINUTIVE)

F_s | s | si<fer>+ on	MAX-HDFT	ALIGN-HEAD
☞a. sif[rón]		
b. [sífron]	*!	*

The evaluation of this combination runs in exactly the same manner as the evaluation for a Plain Stem in (15). No candidate can be more harmonic than (a), under the assumption that an extrametrical syllable loses its extrametricality when in non-peripheral position. The comparison between both evaluations in (15) and (16) justifies treating Penultimate stems as lexically unspecified for a prosodic role and classifying them together with Plain stems.

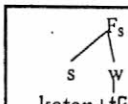
It should be noticed here shortly that both candidates (a) and (b) fail to parse the vowel /e/, specified in the input. The vocalic alternation of stems in MH is a matter which will not concern us here in detail, except for the observation that the deletion of a stem vowel represents a violation of MAX I-O. That makes it obvious that MAX I-O must be lower ranked than the prosodic faithfulness constraints at least. For the presented cases it seems plausible to assume a sort of a templatic effect which is higher ranked than MAX I-O, demanding a disyllabic outcome ([σ σ]). This however, will not hold for all stems, but only for those having /e/ as their second stem vowel. Similar effects can be observed with stems having /a/ as their first stem vowel: this vowel is reduced to a schwa or to nil when a suffix is attached. For all other stems, faithfulness to the input is kept at the costs of generating a trisyllabic output (e.g., */sidur/+im* → *sidurim* and not **sidrim* or **sdurim* 'arrangments'). It must thus be concluded that a disyllabic 'template' is not the only decisive factor when stem vowels delete, but that there are some constraints specific for stems containing /a/ or /e/. Importantly, whatever constraints might be proposed for generating the correct segmental content of the

output, this does not have influence on the correct *stress-pattern*, which is our issue here. The proposed prosodic-faithfulness constraints must be higher ranked (or maybe even undominated) than the constraints governing faithfulness to segments.

4.2.2 Prestressing suffix

The following tableau evaluates the combination of a Plain Stem with a prestressing suffix:

(17) Plain stem + prestressing suffix (*katan* 'small' + *ʧik* DIM)

 katan+ʧik	MAX-HDFT	ALIGN-HEAD
☞a. ka[tántʃik]		*
b.[kátan]tʃik	!*	*!*
c.[kàtan][tʃík]	!*	

Here the suffix specifies a binary foot. Candidate (c) violates MAX-HDFT, since the binary trochee over the syllables *ka.tan* is not the head-foot in the word. The head-foot over the syllable *ʧik*, on the other hand, is not a binary trochee, and additionally, the suffix stands in the strong (only) position in that foot. Thus there is no possible faithful correspondent to the foot specified in the input. Candidate (b) builds a binary trochee, which is also the head-foot of the word, and as such violates MAX-HDFT in terms of associating the specified segments of the input to the head-foot in the output. Candidate (a) is faithful to the prosodic structure of the input, having a binary trochee as the head-foot in the word, which is also associated with the segments specified in the input. The placement of that trochee one syllable to the right, compared with candidate (b), has the advantage of generating penultimate stress and thus violating ALIGN-HEAD only once.

The evaluation of this case has manifested the ranking MAX-HDFT >> ALIGN-HEAD.

4.3. Specified stem + specified suffix

The most interesting cases for understanding the lexical-marking system are those combining two lexically specified formatives. In concrete terms, two combinations are possible: an Accented stem with an accented suffix and an Accented stem with a prestressing

suffix. Indeed, both cases are attested. Such combinations arise the question of a "multiple-stress-conflict": since every word allows for only *one* main stress, it is clear that the output can only be faithful to the prosodic structure of *one* of its input formatives, inevitably being unfaithful to the prosodic structure of the other input formative. The evaluation in (18) demonstrates the fact that the constraint hierarchy used so far is sufficient, in order to account for the "multiple-stress-conflict" cases:

(18) Accented stem + accented suffix (*traktor* 'tractor' + *-on* DIM)

Fs Fs | | s s | | traktor+ ist	MAX-HDFT	ALIGN-HEAD
☞a. [tràkto][ríst]	*	
b. [trákto]rist	*	*!*
c. trak[tórist]	*	!*

Two lexical accents compete for the assignment of primary stress, which can only be assigned once in the prosodic word. Hence, MAX-HDFT will be inevitably violated and the decision about the optimal candidate is transferred to the lower-ranking constraint ALIGN-HEAD. Candidate (c) violates MAX-HDFT, being unfaithful to both stem and suffix specifications. Candidate (b) fails to parse the specification of the suffix, and candidate (a) fails to parse that of the stem. Here ALIGN-HEAD, demanding stress on the rightmost syllable, becomes decisive. The rightmost syllable is, per definition, the syllable of the suffix, as manifested in the winning candidate (a).

(19) Accented stem + prestressing suffix (*ʤob* 'job' + *-nik* 'AGENT)

Fs Fs | / s s w | ʤob + nik	MAX-HDFT	ALIGN-HEAD
☞a. [ʤóbnik]		*
b. ʤob [ník]	!*	

This specific combination does not implicate a "multiple-stress-conflict", because faithfulness to both lexical specifications can be achieved, as demonstrated by candidate (a). This candidate builds a trochee over the two available syllables and so stays faithful to both specifications of the stem and of the suffix, at the cost of violating ALIGN-HEAD once. Candidate (b), with final stress, violates both specifications and is thus ruled out. However, candidate (a) is able to remain faithful to both specifications due to the fact that the accented stem in this case is monosyllabic. A disyllabic Accented stem with stress on the penultimate syllable would have probably shown a different result, namely, that *stress shifts* to the syllable preceding the suffix (the final syllable of the stem), thus demonstrating faithfulness to the demands of the suffix and not to those of the stem. Relying on Bat-El (1993) and according to my own research, there are no forms where a prestressing suffix is attached to such an Accented stem. The prediction of the analysis is, however, in accord with the native speaker's intuition that if we attach *–nik* to a stem like *tráktor* we will get *traktórnik* and not **tráktornik*. In that case, the combination of an Accented Stem with a prestressing suffix will indeed present a "multiple-stress-conflict", parallel to the case presented in (18). And again parallel, MAX-HDFT will be inevitably violated, and the decision about the optimal output will be transferred to the lower-ranking ALIGN-HEAD, designating the output with the rightmost accented syllable as the 'winner' *(traktórnik)*.

4.4 Unspecified stem + unspecified suffix

In the combinations where neither stem nor suffix are lexically specified for stress, the "default" phonological pattern becomes active, for which lexical marking is obviously irrelevant, as well as the constraints demanding faithfulness to prosodic structure. For these cases we focus the attention on the constraints on foot-structure and foot-parsing, which are constantly active in the grammar, as mentioned above. The main observation is that final stress will be generated due to the ranking of ALIGN-HEAD above the constraints on foot structure such as FT-BIN, PARSE-SYLL and FT-FORM. Under the assumption that a degenerate foot is a well-formed foot (a non-canonical trochee), the hierarchical constraint FT-FORM as formulated above will not be violated. However, the generation of a monosyllabic trochee is costly, expressed by the violation of FT-BIN. That makes the ranking of FT-BIN crucial for the issue at hand.

To put it in different words, the cases at hand demonstrate in the first place a top-down parsing of trochaic feet, to use the terms of metrical analysis. We are concerned here with the assignment of word stress to the final syllable prior to the construction of (ideally) binary feet. This mode of parsing forces the generation of a degenerate foot on the last syllable, even if the prosodic word is made of two syllables only. The subsequent parsing of the word into adequate constituents is a matter which will not concern us here further, although of course a complete analysis must account for it in order to generate (at least) secondary stress. In terms of OT, the following evaluations are concerned with the interaction between ALIGN-HEAD and FT-BIN.

(20) Plain stem + variable suffix (*xatul* 'cat' + *-im* PLURAL)

xatul+ im	ALIGN-HEAD	FT-BIN	PARSE-SYLL
☞a. [xàtu]$_F$[lím]$_F$		*	
b. xa[túlim]$_F$	*!		*

The postulation of FT-BIN ranking higher than PARSE-SYLL was motivated at the beginning of section 4. All the same, PARSE-SYLL and its relative ranking are not crucial for the evaluation in (20). As candidate (b) shows, the construction of a canonical trochee and thus penultimate stress, which might be a standard strategy for many trochaic languages, manifests a violation of ALIGN-HEAD. Hence, ALIGN-HEAD must be highest-ranking in order to avoid the standard strategy and to force stress on the final syllable. Candidate (a) demonstrates that evasive strategy, where a degenerate foot is parsed over the final syllable at the cost of violating FT-BIN. That way, the language prefers to fulfill the demand of ALIGN-HEAD (=final stress) at the cost of violating foot binarity.

Final ranking:

(21) MAX-HDFT >> ALIGN-HEAD >> FT-BIN >> PARSE-SYLL

5. Conclusion

Under the assumption that diacritic stress properties are marked in the lexicon by *means of prosodic structure*, the following generalizations can be accounted for in an OT-analysis:

a. If no morpheme is lexically specified for stress, the phonological pattern will assign final stress.

b. Lexical stress applies before phonological stress, due to the ranking MAX-HDFT >> ALIGN-HEAD.

c. When both morphemes are specified for stress, a multiple-stress-conflict emerges, in which case the right-most element wins.

The analysis was simplified with respect to the interaction of constraints on foot-structure, which play a role in the parsing of the prosodic word into feet and the assignment of secondary stress. This simplification aimed to show that there is no need to distinguish between different stress assignment mechanisms – the lexical and the phonological – and there is no need for special rules. The constraints MAX-HDFT and ALIGN-HEAD and their interaction demonstrate two major properties of a lexical accent system from the sort of MH. On the one hand, faithfulness to lexically specified prosodic roles must be preserved; on the other hand, each word form should be assigned final stress. The conflicts arising in the system when trying to fulfill both demands were shown to be solved in an OT-frame by way of ranking MAX-HDFT above ALIGN-HEAD. Ranking the prosodic faithfulness constraint MAX-HDFT higher than the head-alignment constraint ensures that lexical stress is always preserved and takes precedence over the phonologically assigned stress. The alignment constraint ALIGN-R (PRWD, PRHD) has a double function: when lexical specifications are involved, it ensures that the properties of the right-most element (suffix) 'win'; in the phonological pattern, it interacts with the foot-structure constraints and guarantees the assignment of final stress. The proposed constrains compose a constraint-hierarchy which is able to generate the correct outputs for the combinations of one stem and one suffix.

A central property of the proposed analysis is the marking of diacritic properties of stems and suffixes in the lexicon. Indeed, it is this property which enables a simple constraint-hierarchy to be established in the first place. Lexical marking is not an obvious matter, but an issue for controversies, not only between competing theories but within the framework of OT as well. Potentially, OT provides the means to mark diacritic features either in the lexicon in the form of prosodic structure in the input, or in the grammar in the form of Morpheme-Structure-Constraints. The decision as to which representation is the adequate one, relies on theoretical and not on technical considerations. In her analysis of Turkish exceptional stress,

Inkelas (1994) has proposed two contrasting OT-analyses of the data. One analysis made use of Morpheme-Structure-Constraints and contained consequently a relatively complicated grammar and a simple lexicon. The other analysis made use of prespecification in the lexicon in form of prosodic structure, such that the representations in the lexicon possessed relatively rich structure, with the result of a simple grammar. Inkelas has shown that both analyses were descriptively adequate. Thus, the decision as to the 'correct' analysis was made on explanatory grounds. The lexical account provided a better generalization of the data, on the one hand, and a unitary representation for all exceptions, on the other hand. This is true for the MH case as well. Using prespecified representations leads to a simple grammar which, nonetheless, encompasses the generalizations evident from the data. This is especially true for the cases of a multiple-stress-conflict, where the generalization 'rightmost wins' is accounted for by a single constraint ALIGN-HEAD and its interaction with the other constraints. Should the exceptional properties of suffixes be represented in the grammar as Morpheme-Structure-Constraints, this generalization would not have been visible. A further positive effect of this approach is the fact that the grammar can account for the phonological 'default' stress by means of the same constraint interaction, since also in this case the generalization holds 'rightmost wins'. The proposed marking of roles in a lexically specified foot has the advantage of referring to trochees, which are the basic foot-form in the language in any case, and of keeping any idiosyncratic information from being reflected in the grammar. This form of lexical representation was shown to be adequate for the data of MH.

I believe that the analysis of the MH data presented here can contribute a small part in the controversy over the issue of lexical vs. grammatical marking, in demonstrating the advantages of prespecified representations for a system, where diacritic features of morphemes are not an exception, but the rule.

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any and *(-)ever:* Free choice and free relatives

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I. How many any's? *Unitarians and universalists*

In this study I will seek to defend and reinforce the arguments for a unified analysis of *any* as an indefinite (Lee & Horn 1994; cf. Kadmon & Landman 1993), to reply to some recent critiques of this approach, and to extend the free-choice indefinite line on *any* to its cousin, the *wh-ever* free relative. Our point of departure is the relation between the occurrences of *any* as a negative polarity item (NPI) in the downward-entailing environments of (1) (cf. Ladusaw 1979, 1996) and the so-called free-choice (FC) *any* occurring in the environments of (2).

(1) I didn't see any pigs. (Negative polarity item [NPI] *any*)
Can any pigs fly?

(2) I can catch any raven. (Free-Choice [FC] *any*)
Can ᵛANY raven fly?

One classical approach, advanced by Reichenbach (1947) and Quine (1960), assumes a unified account of *any* as a wide-scope universal (see also Horn 1972, Lasnik 1972):

(3) The (extended) Quine line: Both NPI *any* and FC *any* are universals taking wide scope with respect to their licenser (~, ◊, GEN, etc.)
a. ∀x, x ∈ {pigs}: ~ (I saw x)
b. ∀x, x ∈ {ravens}: ◊ (I catch x)

While admirably parsimonious, this position, subscribed to in one guise or another by the gang in (4), had the unfortunate flaw of empirical disconfirmation,

(4) The UNIVOCAL WIDE-SCOPE-UNIVERSALISTS

Reichenbach (1947: §21)	Lasnik (1972)	Eisner (1994)
Quine (1960: §29)	Kroch (1974)	
Horn (1972: Chapter 3)	LeGrand (1975)	

ranging from Fauconnier's observation (1979: 297-98) that (5) cannot be understood as (5a) but only as (5b),

(5) I wonder if Susan married anybody.
a. ≠ ∀x (I wonder if Susan married x)
b. = I wonder if (∃x)(Susan married x)

to the distribution of the A-adverbs *absolutely* and *almost,* which elsewhere consort largely with universals, while excluding existentials (Dahl 1970, Lakoff 1972, Horn 1972, LeGrand 1975, Carlson 1981, Hoeksema 1983),

(6) a. Absolutely {everybody/nobody/*somebody} can win.
b. Absolutely {all/none/*some/*many/*few} of your friends can come.
c. Almost {everybody/nobody/*somebody} made it on time.

and which, as seen in (7) and (8), modify free-choice but not NPI *any:*

(7) a. Absolutely anyone can cook Peking duck.
Can absolutely anybody swim the Channel? (FC *any* reading only)
b. *Sam didn't see absolutely anyone.
*If absolutely anyone leaves, Sam will commit suicide. [but see below]

(8) a. I could solve almost {all/none/any/*some} of the problems.
b. Nearly anyone can ride a bicycle.
c. *Did almost anyone just walk into the room?
d. They didn't talk to (*almost) anyone.

At the same time, *there*-insertion, notorious for its affinity with existentials and indefinites, and its antipathy toward universals and definites, smiles on NPI *any* while spurning FC *any,* as seen in (9) and (10) (sentences from Horn 1972):

(9) a. There is {somebody/*everybody} that can swim the Channel.
b. There isn't anybody that can swim the Channel.
c. *There is anybody that can swim the Channel.

(10) a. If anybody can swim the Channel, I can do it. (NPI or FC)
b. If there is anybody that can swim the Channel, I can do it. (NPI only)
c. If absolutely anybody can swim the Channel, I can do it. (FC only)
d. *If there is absolutely anybody that can swim the Channel, I can do it.

The distribution of the A-adverbs and existential *there* served as scripture for the ambiguist sect, on which there are two distinct operators—existential NPI *any* vs. universal FC *any.* Subscribers to this creed include those in (11):

(11) The AMBIGUISTS:

De Morgan (1861)	Ladusaw (1979)
Lees (1960) [implicitly]	Carlson (1980, 1981)
Klima (1964) [implicitly]	Linebarger (1981)
Horn (1972: Chapter 2)	

The burden of proof borne by the ambiguists (cf. the Modified Occam's Razor of Grice (1989: 47): "Senses are not to be multiplied beyond necessity") is traditionally shouldered by an annotated display of lexico-grammatical diagnostics favoring one *any* or the other (see Dahl 1970, Horn 1972, Lakoff 1972, LeGrand 1974, 1975, Carlson 1981), beginning with the "A-adverb" data sets in (6)-(10). Based on such data, it is standardly assumed and occasionally argued that the *any* of (2), however its relation to the NPI *any* of (1) is characterized, is itself a universal:

> In its Free Choice (FC) incarnation, *[any]* is licensed in modal and characterizing statements where it is interpreted as a wide scope universal. (Dayal 1998: 434)

> As pointed out by Horn (1972), free choice *any*, LIKE OTHER UNIVERSAL DETERMINERS, may be modified by adverbs like *almost* or *nearly*.
>
> (Hoeksema 1983: 409, emphasis added)

Unfortunately, the full range of evidence has tended to point in various directions at the same time, leading one authority to the desperate move of endorsing a two-*any* theory in one chapter of his UCLA dissertation only to embrace a unified analysis in the very next chapter.

This perennial how-many-*any*s debate first flared up over a century ago as one of many fronts (see Horn 1990) in the global philosophical conflict between Sir William Hamilton of Edinburgh and Augustus De Morgan:

> Our English *"any"* (aenig, anig, Ang.-Sax.) is of a similar origin and signification with the Latin *"ullus"* (unulus), and means, primarily and literally *(even) one, even the least or fewest.* But now...it is **of quodlibetic application**, ranging from the least to greatest; and (to say nothing of extra-logical modes of speech, as interrogation, doubt, conditioning, extenuation, intension, &c.) is exclusively adapted to *negation.*
>
> (Hamilton 1858: 615, emphasis added)

> The word 'any' is affirmed by Hamilton to be exclusively adapted to negatives. This cannot mean that *any* is unfit to be used in an affirmative: surely *any* one knows better than that...The word *any,* when used in a negative, may have either a universal or a particular meaning...A person who has just dined heartily need not take *any* food

(universal): a convalescent ought not to take *any* food (particular: beef tea, but not pickled salmon). Some will perhaps make it depend upon the verb used...some will make it a question of emphasis...: but the ambiguity is there, let the grammarian and rhetorician treat it as they will... Hamilton implicitly maintained that *any* is always universal. Accordingly, he asserted that 'No X is Y' is properly expressed by 'any X is not any Y'... 'Any fish is not any fish' is false or true, according as the second *any* is universal or particular. Choose what fish you please, it is not *any* fish: turbot is not trout. (De Morgan 1862: 275)

There is a prime ambiguity, it strikes one, about the meaning of any: is-not-any fish and is-not any-fish mean to differ in meaning. (De Morgan 1861: 88-89)

(11') A whale [is-not- **any**] fish (is no fish) vs. (11") A trout [is-not] [**any** -fish]
NPI FC

Contra De Morgan, Horn, Hoeksema, Dayal, and their cronies, however, there is evidence from other diagnostics than the distribution of A-adverbs that suggests FC *any* may not be as universal as it first appears. It has been recognized for some time (see Horn 1972, Le Grand 1974, Carlson 1981, among others) that *any* occurs in free-choice imperatives without universal force:

(12) a. Pick any card.
b. Promise her anything, but give her Arpège.

These instances of imperative-licensed *any* are requests rather than commands and fail to map directly onto a true universal or a simple existential; (12a) is not a request to pick EVERY card, but it is more generous than a command to pick SOME card.[1] As for the vintage commercial directive in (12b), my intuition is that the viewer could have complied with the suggestion without actually making ANY promises; the sense is close to "It doesn't matter what, if anything, you promise her, so long as you fork over the Arpège." Both the not-mattering and the lack of existential commitment are crucial to the understanding of FC *any*.

Secondly, FC *any*, like NPI *any* but unlike true universals, has never learned to float. What we can call A-class determiners *(all, both,* sometimes *each)* float off object or subject

[1]Unlike Quine's (1960: 138) celebrated minimal pairs invoked as evidence for his universalist wide-scope analysis of *any*,

(i) I do not know {any/every} poem.

(ii) If {any/every} member contributes, I'll be surprised.

there is no obvious operator in (12a) whose scope can naturally be taken to vary with respect to that of the determiner.

NPs, while E-class determiners *(some, either, many,* and cardinals) do not; both *any*'s pattern with the E-class operators:[2]

(i) OBJECT POSITION: I {didn't/can} see [DET of them] _____:
└_____/

(13) a. I didn't see them {all/both}.
b. *I didn't see them {some/any/either/six}.

(14) a. I can see them {all/both}.
b. *I can see them {some/any/either/six}.

(ii) SUBJECT POSITION: [DET of them] ___ {didn't/can} ___ see me:
└_____/_____/

(15) a. They didn't {all/each/both} see me.
b. *They didn't {some/any/either/six} see me.

(16) a. They can {all/each/both} see me.
b. *They can {some/any/either/six} see me.

(17) a. They {all/each/both} can see me.
b. *They {some/any/either/six} can see me.

Even more significantly, as shown in (18), post-nominal modifiers *at all* and *whatsoever* reinforce both NPI and FC *any,* but (save *no,* the neg-incorporated alter ego of *any*) no other operator, universal or existential (cf. Horn 1972, Zwartz 1995) can be so modified:

(18) a. I didn't see {anybody/*everybody/*somebody} whatsoever.
b. I saw {*everyone/*someone/no one} at all.
c. {Anybody/*Everybody/*Somebody} whatsoever can come to the party.
d. If {anybody [NPI or FC!]/*everybody/*somebody} at all can swim the channel, I can.

II. The indefinite analysis

But if FC *any* is NOT a universal after all, what is it? And whither then the NPI/FC "ambiguity"? In recent years, a number of scholars have converged on the suggestion that both *any*'s must be regarded as indefinites (cf. Heim 1982; Haspelmath 1993, 1997) of one sort or another. In particular, given the data in (18), there must be some semantic property unifying the two *any*'s while distinguishing them from other operators that lack this property.

[2]Other factors, including syntactic ones, are involved here; note that the undisputed champion of the universals, *every,* is also a non-floater, and that the quasi-parenthetical phrase *Det of them* is often available regardless of the semantics of the determiner: *They can, {all/some/any/every one} of them, come to the party.*

We can take *whatsoever* and *at all* to favor QUODLIBETIC contexts à la Hamilton, explicating this in terms of Vendler's (1967) notion of a blank warranty, Kadmon & Landman's (1993) operation of widening, Fine's arbitrariness (cf. Tovena & Jayez, to appear), or a related notion. Following Fauconnier (1975a,b, 1979), I have argued elsewhere in joint work with Young-Suk Lee (Y. S. Lee & Horn 1994, Horn & Y. S. Lee 1995a) that both *any*'s are end-of-scale indefinites (= 'a ___, even the Xest'), where indefiniteness is treated non-quantificationally as in Heim (1982). NPI *any* is a minimal element on a quantity scale, FC *any* a generic indefinite associated with a kind scale.[3] The impossibility of appending *whatsoever* or *at all* to a simple indefinite generic *({Any/*A} linguist whatsoever can follow this argument)* is attributable to the non-quodlibetic character of ordinary generics that lack the *even*-like properties of scalar endpoints. Similarly, we can take *{absolutely/almost} any man* (vs. **{absolutely/almost} a man*) as representing *a man, it {absolutely/almost} doesn't matter which.*

The indefinite analysis of FC *any,* however it is to be implemented, is not precisely novel. For Jespersen (1924: 203), the generic singular indefinite *a* ('A cat is not as vigilant as a dog') is 'a weaker *any*', in which 'one ("a") dog is taken as representative of the whole class'. Perlmutter (1970) independently proposes to co-derive *any* and generic *a,* and while Burton-Roberts (1976: §4) correctly rejects his argument in the light of the different distribution of the two determiners, the key point is that *any* cannot be EQUATED to generic *a* precisely because it is a STRONGER *a,* one incorporating the end-of-scale meaning paraphrasable by *even.*

The *there*-insertion pattern, revisited in (19), can now be seen as excluding as excluding FC *any* not because it's universal but because it's generic; while NPI *any* patterns with other existentials and indefinites in allowing *there,* FC *any* patterns with other generic indefinites in excluding it.

(19) a. There isn't {a cat/any cat} that eats peaches.
There isn't {a thing/anything} you can do about it.
(≠ 'You can't do just anything about it')

b. There is a cat that eats meat. (≠ generic 'A cat eats meat')
There are beavers that build dams. (≠ generic 'Beavers build dams')
*There is any cat that eats meat. (cf. 'Any cat eats meat')
*There are any beavers that (can) build dams.
*There is anything you can do around here.

---

[3]See now Israel (1999) for a parallel treatment of indefinite *some* in terms of quantity and kind scales. Israel convincingly defends a "responsible polysemy" for both *some* and *any.*

On the other hand, exceptive clauses introduced with *but, save, except,* and their analogues can only be hosted by universals:

(20) {everybody/nobody/*somebody} but Kim
{all/*most/*many/*three/*some/none} of my friends but Chris...
everything but the kitchen sink
No man but a blockhead ever wrote except for money. (Dr. Johnson)

This constraint on exceptives has in fact been recognized since the Middle Ages:

> An exceptive word [e.g. *prœter*] indicates a relationship of a part actually existing in a whole to its whole.
> (Peter of Spain, *Syncategoreumata,* Tract. IV, 7; de Rijk 1992: 171)
> An exceptive proposition is never properly formed unless its non-exceptive counterpart is a universal proposition. Hence, 'A man except Socrates is running' is not properly formed. (Ockham 1980: 144-5: Summa Logica, II:18)

But both *any*s host well-formed exceptives—suggesting that (contrary to the results derived from the other diagnostics surveyed here) not only FC *any* but NPI *any* is a universal!

(21) a. I'll vote for anyone but Bill. (FC *any*)
b. I wouldn't vote for anyone but Bill. (NPI *any*)

Dayal (1998) has recently cited the participation of (21a) in the pattern of (20) as evidence for the universal status of FC *any,* without acknowledging the fact that NPI *any* would also have to be reckoned as a universal by the evidence of (21b).

I would maintain, however, that what renders (21a) acceptable is the fact that the assertion of a free-choice predication of this type typically conveys the truth of the corresponding universal. That this is not an ad hoc stipulation to rescue a particular analysis of *any* is demonstrated by the observation (cf. Horn 1989: 346) that *but*-clauses, excluded from ordinary wh-questions, are at home in rhetorical "queclaratives" (Sadock 1971), i.e. interrogatives standardly used to convey universal negatives. Thus (22a) is impossible, but (22b) is fine, since it induces a short-circuited implicature that nobody else could have pulled off this feat.

(22) a. #Who but Bill is supporting Al's candidacy?
b. Who but Al Gore could have delivered such a boring speech?
(+>$_{SCI}$ Nobody but Al Gore...)

Another class of examples in which exceptives are hosted by semantic non-universals is illustrated by the thousands of annual hits Nexis provides for constructions of the form *little but...* or *little except...;* the sense is essentially that of 'nothing but/except...' A sampler appears in (23):

(23) Landowners could do little but accept their fate.
We are achieving little but the increased and forced evacuation of the ethnic Albanians.
With little except morbid thoughts to occupy his time,...
...leaving little but mangled bodies in his wake.
...while bank and building society deposit accounts offer little except safety.
...an artful yet provocative cover for her all-Bach CD in which she appears to be wearing little except her violin.

The appropriate generalization, pace Ockham and Dayal, is that an exceptive proposition is never properly formed unless its non-exceptive counterpart is CONVENTIONALLY USED TO EXPRESS a universal proposition. This also explains why (21b) is well-formed, given its conventional use as a means for signalling a universal negative.[4]

(24) I would**n't** vote for **anyone** but Bill = I would vote for **no one** but Bill.

Another potential argument for the universal character of FC *any* is worth heading off at the pass here. FC *any*-headed NPs line up with universals in introducing downward entailing contexts that host NPIs:[5]

(25) a. {Any/Every/*Some} dog that has any self-respect never befriends a cat.
b. {Any/All/*Many} modern linguists who have ever read any Jespersen will be familiar with this argument.

But, as we would expect, the same property is shared by non-scalar generic (but not specific) indefinites[6]; (26b) expresses a true proposition, but not one that can be expressed that way:

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[4]Another instance of a universal-negative-implicating host is the attested example in (i), where the reader is to draw the inference that no Western leader other than the Italian Prime Minister would shmooze Brecht with the President of Iran.

(i) I wonder whether any Western political leader but Romano Prodi would discuss the works of Bertolt Brecht with Persident Khatami.
(Anthony Lewis, "In the Premier League", New York Times op-ed piece, 13 July 1998, A17)

[5]As discussed by LeGrand (1975), Dayal (1995, 1998), the appearance of a relative clause in an *any* nominal will often tend to increase the acceptability of FC *any* in a context lacking an overt modal, a phenomenon LeGrand dubbed SUBTRIGGING. Cf. also Giannakidou & Horn (in prep.) for a different approach to the subtrigging effect.

(26) a. A dog that has any self-respect never befriends a cat.
b. *A dog I once owned that had any self-respect befriended my cat.
c. Linguists who have ever read any Jespersen will will be familiar with this argument.
d. Persons who have ever had a surgical implant may be affected by the Dow Chemical Bankruptcy. (Public service announcement, 9/243/96)

It is thus not the putative universal character of *any*-NPs that is responsible for their DE-ness and NPI licensing but rather their status as generic or characterizing nominals (cf. Krifka et al. 1995: 13-14).

We have secured a location squarely within the camp of what we can label the QUASI-UNIVOCAL EXISTENTIALISTS, or more accurately (if less colorfully) the INDEFINITISTS. On this view, *any* is an indefinite-plus, whose use is bound up with some aspect of hearer's unrestricted freedom to choose from a set of alternatives in identifying referents or witnesses to fill out the proposition.[7] While Vendler is the patron saint of this sect, some of its other adherents appear in (27), annotated in brutally truncated form in the hope that interested readers will hunt down the original sources for the insightful details.

(27) (QUASI-)UNIVOCAL EXISTENTIALISTS:

Hamilton (1858) (*any* is a "QUODLIBETIC" operator that "means, primarily and literally *(even) one, even the least or fewest*")

Jespersen (1933) (*any* "indicates one or more, no matter which")

Bolinger (1960), (1977) (across the board, *any* expresses 'whatsoever, no matter which'; modifying clauses may serve to "restrict THE 'WHATEVERNESS' OF *ANY*")

Vendler (1967) (*any* as signal of non-presuppositional context, indicating CHOICE or "a BLANK WARRANTY FOR CONDITIONAL PREDICTIONS")

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[6]Anastasia Giannakidou points out that generic indefinites like (26a) also share with *any* nominals the lack of the veridical or existential premise associated with specific indefinites like (26b), viz. that a dog with the identified property does in fact exist.

[7]As noted above, the "plus" component in Y. S. Lee & Horn (1994) is the end-of-scale semantics associated with *even;* in Kadmon & Landman (1993) it is a combination of their notions of contextual widening and logical strengthening. More recently, Rullmann (1996) has noted that these two proposals, while conceptually related, are crucially distinct; he suggests that they are appropriate for characterizing what he terms *even*-NPIs and *wh*-NPIs respectively. Space precludes a more detailed consideration of Rullmann's provocative paper here, for the purposes of this paper the similarity between the Kadmon & Lee & Horn (1994)

Fauconnier (1975a,b, 1979) (*any* is a marker of endpoints on contextually derived pragmatic scales; NPI *any* defined via scale-reversal)

Davison (1980) (*any* is a univocal existential that may convey a generic meaning through conversational implicature)

Sommers (1982) ("*any* is not a word of quantity in its own right but a distribution indicator that goes proxy for either 'some' or 'every'")

Haspelmath (1993) (*any* patterns with cross-linguistic free-choice indefinites)

Kadmon & Landman (1993) (*any* is a Kamp-Heim indefinite [cf. Heim 1982] lacking quantificational force that triggers widening/strengthening)

Jennings (1994) (*any* is essentially non-quantificational and non-specific, carrying "the warrant or expectation that a certain sort of challenge will receive the reply 'even that one'"; Jennings refers to Fauconnier 1979's scalar analysis)

Lee & Horn (1994), Horn & Lee (1995a), Horn (to appear) (similar to above, but with NPI-*any* and FC-*any* "ordinary" and generic indefinites, respectively, that incorporate a scalar endpoint, i.e. *any* = *a* + *even*)

Dayal (1995) (*any* basically an indefinite à la K&L, but may have inherent quantificational force; requires non-existence and contextual vagueness à la Vendler)

Zwarts (1995) (*any* as non-veridical operator: NPI *any* occurs in those non-veridical contexts that are DE, FC *any* in those that are UE or non-monotonic)

C. Lee (1996) (In a unified account of negative polarity and free choice expressed by Kor. *amu* and Eng. *any*, the key notion is concession by arbitrary or disjunctive choice, based in turn on the notion of indefiniteness and the triggering of a scale, à la Fauconnier 1975b)

Haspelmath (1997) (*any* as marker of low point on scale, à la Fauconnier: a non-reversed scale for FC *any* and a reversed scale for NPI *any*)

Lahiri (1998) (The compositional semantics of a class of polarity sensitive items in Hindi, consisting of a weak indefinite + the scalar particle *bhii* 'even', motivates the behavior of such expressions as both NPIs and FC items; the analysis is 'very similar in its essentials' to that of Lee & Horn 1994)

Tovena (1998), Tovena & Jayez (to appear) (*any* in both NPI and FC uses is an abstract scalar item that is neither indefinite nor quantificational as such, but corresponds to the notion of arbitrary objects)

To this tableau we can assimilate traditional lexicographic statements of the distribution of *any*, such as that of the OED, which contains a single entry, including both NPI and FC occurrences, emphasizes the central semantic role of 'indifference as to the particular one or ones that may be selected', and provides such glosses as the following:

Has any Englishman seen it?	'...an Englishman—I care not which'
If it do any harm	'...harm, no matter of what kind'

III. A-adverbs revisited: almost a useful diagnostic?

Not everyone has succumbed to the indefinist intifada. In recent work, Tovena & Jayez (to appear) and Dayal (1998) have argued against the indefinite family of analyses of FC *any* on a variety of grounds, of which I shall concentrate here on two. (See Giannakidou & Horn in prep. for a more comprehensive evaluation of Dayal's evidence.) While endorsing the end-of-scale character of *any* depicted in Lee & Horn (1994), Tovena & Jayez (to appear; cf. Tovena 1998) argue that the FC *any* of (28a)

(28) a. Mary read any book which was on the reading list.
b. ??Mary read any book which happened to be on her desk.

cannot be an indefinite because

(i) 'It is unexpected that non-accidental modification [as in (28a) vs. (28b)] definitely improves this type of example', where 'the modification of a noun is accidental whenever it refers to a contingent property of the entities which make up the denotation of the noun.'

(ii) We can insert *almost/practically* in (28a): 'These adverbs are considered universal quantifier modifiers, and their acceptability in this context does not square well with a characterization of *any* as an indefinite.'

On (i), the putative restriction of *any* statements to non-accidental modification (see also Dayal 1998), the facts are less clear than they may appear. I don't find (29a,b)—with future time reference—particularly implausible,

(29) a. I {will/promise to} read any book which happens to be on my desk.
b. I'll eat any food you {happen to/decide to} cook for me.

and I would suggest that any feeling of restriction attaching to (28) can be reduced to the well-known implicature of causal connectedness for conditionals, given that *any*-statements characteristically represent lawlike generalizations with conditional—and often specifically counterfactual—force that survive sporadic counterexemplification (cf. Vendler 1967, as well

as Horn 1997 and references cited therein), so that the *any*-statements of (28a, b) are understood as the corresponding conditionals in (30):

(30) a. If a book was on the reading list, Mary read it. (LAWLIKE)
b. If a book is on Mary's desk, she will read it. (NON-LAWLIKE)

More significant, at least historically, is the claim in (ii). Like Tovena & Jayez, Dayal (1998: 449) echoes legions of scholars dating back to Horn (1972) and his fellow-travelers in taking the modifiability of FC *any* but not NPI *any* by *almost* and *absolutely* as evidence for an actual universal quantifier in the representation of the former (see (7), (8) above). But just how reliable is this evidence? With Young-Suk Lee (Lee & Horn 1994, Horn & Lee 1995a), I have proposed an intervention constraint ruling out (certain) sequences of [NPI licenser... A-adverb...any_{NPI}], on the model of similar constructs advanced for different purposes by LeGrand (1974) and, independently, Linebarger (1980). In its most recent version (with revisions necessitated by some observations of Jack Hoeksema; cf. Horn, to appear), this constraint has the following form:

[IC'] No adverb with quantificational force may intervene between a polarity item and its trigger if it semantically combines with the NPI in question.

Essentially (although see the above work for details), the constraint is designed to distinguish (31a,b).

(31) a. *I don't like {absolutely/almost} anyone here.
b. I like {absolutely/almost} no one here.

It correctly predicts that if NPI *any* is licensed by an approximative adverb with negative force, such an item must be interpreted with the approximative element taking wide scope with respect to negation. Thus (32a) is possible because *hardly* is analyzable as *almost NEG*, not as *NEG almost*. (see the related analysis of Partee 1986, which makes the same point).

(32) a. I like hardly anyone here. (= 'I like almost no one here')
b. %I don't like hardly anyone here.

Note also that while some speakers accept the negative concord-type structure in (32b), this is crucially not the contradictory negation of standard (32a), but rather its logical equivalent. Since it is the *hardly (=almost not)* that licenses negative polarity *any* here, the intervention constraint is not violated as it is in (31a).

But even with this modification it is by no means obvious that the usual understanding of *almost* and *absolutely* as diagnostics for FC (and against NPI) *any* can survive.[8] Nor are these two adverbs on all fours. Notice first that (as Partee 1986 has observed) the actual restriction on the occurrence of *almost* and *nearly* is that the modified determiner be interpretable as a precise value, either in a relative set-inclusion sense (as in the case with universals and other 'exact' partitions) or in a more absolute sense (as with cardinals):

(33) a. I could solve almost {all/any/half/none/50/*many/*most/*few}
of the problems.
b. Coors Extra Gold is brewed for nearly 52 days. [radio commercial]

In this respect, *virtually* might be a better choice for an approximative diagnostic, although speakers differ with respect to its cooccurrence properties in non-universal contexts like those of (33).

As for *absolutely*, it modifies not just the universals of (34a,b) but scalar endpoints in general, as seen in (34c-f) (and discussed in Lakoff 1972: 632-33 and Horn 1972 §2.3):

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[8]Doubts about the reliability of the *almost/absolutely* diagnostics in fact creep into the work of the card-carrying ambiguist Greg Carlson, who—after trotting out the usual suspects in (i) which permit dual readings modulo the intonation contour

(i) a. If anyone can move that stone, I'll be amazed.
b. Does anyone like Bob?
c. I doubt that anyone could be at the door.
(Carlson 1981: 13; cf. De Morgan 1861, Jespersen 1933, Bolinger 1960, Horn 1972)

—calls attention to the examples in (ii),

(ii) a. For (almost) anyone to leave the room now would be a disaster.
a'. For anyone to (ever) leave this room (yet) would be a disaster.
b. Bob is unlikely to kick anyone.
c. Shooting at anyone ought to be illegal.
d. For Bob to eat anything now would be impossible.

commenting that while these contexts appear to be existential, licensing the presence of NPI *ever* and *yet*, they are also curiously compatible with *absolutely/almost* and yield 'no detectable ambiguity' between NPI/FC senses (Carlson 1981: 13).

(34) a. Absolutely {everybody/nobody/*somebody} can win.
b. Absolutely {all/no(ne)/*some/*many/*few} of them can go.
c. It's absolutely {necessary/certain/impossible/*possible/*likely}.
d. You absolutely {must/can't/mustn't/*may/*can} go.
e. He absolutely {always/never/*sometimes/*often/*seldom} eats meat.
f. I absolutely {adore/love/loathe/*like/*dislike} you.

Ditto for its adjectival base: (35a) is possible only if Sam is an overhuge human, not an actual pachyderm, while the modifier in (35b) disambiguates the description of Gloucester's illegitimate son in favor of the evaluative end-of-scale reading.

(35) a. Sam is an absolute elephant.
b. Edmund is an absolute bastard.

Similarly, the contrast in (36) only makes sense if you know that the Kinsey scale of sexual orientation extendes from 0 for a hide-bound heterosexual to a 6 for the exclusively gay.

(36) a. Chris is an absolute {Kinsey 0/Kinsey 6}.
b. #Robin is an absolute {Kinsey 2/3/4/5/3.5/3.14159/...}.

As we have seen, FC *any* lacking universal force occurs in imperative contexts; when it does it may be modified by *absolutely, almost,* or *virtually,* as in the "Pick any number" cases:

(37) a. Take almost any member of Congress. You're likely to find an adulterous, amoral perjuror.
b. Pick up almost any article on polarity. You'll find grammaticality judgments with which no sane English speaker will agree.
c. Go into {absolutely/almost/virtually} any restaurant in San Francisco. A "Thank You For Not Smoking" sign will be on display.

Such apparent imperatives may lend themselves to an analysis as protases of implicit conditionals, so that e.g. (37c) is read as (38):

(38) If you go into {absolutely/almost/virtually} any restaurant in San Francisco, a "Thank You For Not Smoking" sign will be on display.

If so, we would appear to have a case of NPI *any* (licensed by the limited DE-hood of such protases; cf. Heim 1984), where A-adverb modification is nevertheless quite at home. Indeed, with true imperatives like those of (39), where the conditional paraphrase is impossible, modification by *absolutely* is still possible (despite the lack of universal force) but—as noted

by Hoeksema (1983: 409), citing J. McCawley—approximatives tend to be ruled out on pragmatic grounds.[9]

(39) a. Pick a card, {absolutely/#almost} any card.
b. Take absolutely any number from 1 to 100. Multiply it by 2,...

Indeed, the initial assumption that A-adverbs are excluded from NPI *any* neighborhoods has been directly challenged on occasion, as early as the claim of LeGrand (1974: 394) that "contrary to Horn's predictions", the sentences of (40) are accepted by "most speakers".

(40) a. %If there's absolutely any noise, I'll clear the courtroom.
b. %If almost anyone has a cold, I catch it.

Supporting this observation are the sentences of (41), where (as in (40a)) the existential *there* rules out any free choice, much less universal, interpretation.

(41) a. "You let me know if there's absolutely anything I can do, OK?"
—from television situation comedy, "Seventh Heaven", spring 1998
b. If there's absolutely anything you need, please don't hesitate to ask.

Along the same lines, notice that the A-adverb *absolutely* is possible in both (42a) and (42b), although predictably only the former allows a *there*-inserted paraphrase:

(42) a. If you eat absolutely `ANY meat, you're not a vegetarian. (NPI any)
b. If you eat absolutely ᵛANY meat, you're not a kosher Jew. (FC any)

(43) a. If there is absolutely `ANY meat you eat, you're not a vegetarian.
b. *If there is absolutely ᵛANY meat you eat, you're not a kosher Jew.

The same possibilities can be found with approximative modifiers like *almost* or *virtually:*

(44) a. If you go to bed with almost `ANYone$_{NPI}$, you should use a condom.
b. If you go to bed with almost ᵛANYone$_{FC}$, you better use two.

In the examples of (40)-(44), the NPI licenser is the protasis of a conditional. What is crucial, though, is that it is not an adjacent negation. Thus consider (45a), contributed by

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[9]Even this mild restriction may be too strong as it stands, judging from the following suggestion from Tom Ferrell's "Eat Streets" column on how to transport oneself to the international culinary cornucopia that is Brooklyn's Montague Street:

To dine on Montague, take almost any train to Borough Hall station: 2, 3, 4, 5, M, N or R.

(New York Times, Sophisticated Traveler Magazine, p. 10, 10 Nov. 1996)

Senator Hatch, where it's the distance of the neg-raised licenser from NPI *any* that favors the appearance of the A-adverb; compare the less acceptable (45b).

(45) a. I don't think there's a jury **almost anywhere** in this country that would convict the President on this if he would come clean...
(Sen. Orrin Hatch [R-Utah] interviewed on Larry King Live, CNN, 12/11/98, on why Clinton should feel free to acknowledge having lied to the grand jury)
b. There's no jury (?*almost) anywhere in this country...

Similarly, in the attested example in (46), the licenser is a sentential negation outside the PP environment containing the NPI and its A-adverbial modifier.

(46) I've never been a part of anything like this. I am **not** a rabid fan of **almost anything**.
(Jennifer Watson, Channel 3 News, Hartford, covering celebration for University of Connecticut's NCAA men's college basketball championship, March , 1999)

Besides remoteness (as in (45a) and (46)) and covertness (as in the conditionals of (40)-(44)), another variable conducive to the *[not almost any]* sequence is partitivity. Speakers I have surveyed agree in finding (47a,b) far preferable to (47c,d), although perhaps not entirely impeccable.

(47) a. It was so windy, the quarterbacks couldn't complete almost any of their passes.
b. She doesn't like almost any of her teachers.
c. *He doesn't have almost any friends.
d. *She hasn't taken almost any syntax.

Downward entailing environments introduced by negative predicates also freely co-occur with *almost* or *absolutely any,* as seen in the examples of (48):

(48) a. Ken Starr **lacks absolutely any** sense of {fairness/proportion/humor/...}.
b. [Supreme Court nominee] Ginsburg is the perfect spite nominee—a man whose foremost qualification is his **lack of almost any**.
(Washington Post , 4 Nov. 1987, A23)
c. Muresan is a polished offensive player who **lacks almost any** defensive dexterity. (Sacramento Bee , 23 Feb. 1994, C1)
d. As if to demonstrate once and for all that the lower the fat content, the lower the gastronomic appeal of a product, the new 5% Symphonia **lacks almost any** trace of charm. So lacking in firmness that I found it almost liquidy, and with an

absolute minimum of flavor, I frankly cannot understand why anyone would waste a good bagel and a fine slice of salmon by combining it with this cheese.

(Jerusalem Post , 17 July 1997, Features, p. 9)

e. The islands are not that cheap and they have **lost almost any** natural West Indian feel, but... (Financial Times London , 16 Oct. 1993, Travel XII)

f. A highlight of David's City is the so-called "stepped structure" uncovered by Yigal Shiloh in the 1980s. The late archeologist believed that the structure was the underpinning of the citadel built by David in the 10th century BCE. It was a sensational finding in an area which previous archeologists had declared to be **bereft of virtually any remains at all** from David's City, let alone a monumental structure. (Jerusalem Post , 1 Sept. 1995, Features, p. 14)

We are dealing here with NPI *any* in well-behaved DE contexts; if Muresan lacks dexterity he lacks defensive dexterity but not vice versa. Notice also that the substitution of *have, retain,* or *blessed with* for *lack, lose,* or *bereft of* renders these *any*'s impossible. Further, Hoeksema & Klein (1995) point out that the corresponding negative predicates in Dutch license *enig,* a cognate of *any* that lacks any free choice occurrences; cf. Krifka (1995), Horn & Lee (1995b) for more on licensing by negative predicates.

We conclude, then, that it is not NPI *any* that bars either *absolutely* or *almost* and its approximative mates, but adjacent negation per se. This conclusion is buttressed by the evidence from Nexis hits summarized in (49), demonstrating that instances in which overt negation immediately precedes *almost* and *absolutely* are vanishingly rare; in the terminology of van der Wouden (1996), the A-adverbs are weak positive polarity items. (See Klein 1997: 87 for a similar observation and a proposed explanation.)

(49) Nexis cites of structures with negated A-adverbs and *any:*

not almost any: 0
not virtually any: 0
not absolutely any: 1 (in a statement of the President of Honduras)
vs. **not just any:** 100/month (e.g. in Oct. 1998)
wasn't almost any: 0
vs. **wasn't just any:** 765
wasn't almost: 79 (but see explanation below)
(cf. **wasn't exactly**: 175-200/month (e.g. 187 in Oct. 1998))

While *almost* does indeed occur in the apparent scope of negation, as attested by the 79 instances of *wasn't almost* (and comparable figures for *didn't almost* and parallel

constructions), almost all of the somewhat relevant examples—ignoring those in which the negation ends one sentence and the approximative begins the next—involve contexts of double and/or metalinguistic negation, thus exhibiting a characteristic property of PPIs (cf. Baker 1970, Horn 1989: 494-99). A few illustrations will suffice:

(49') Plymouth Canton Coach Dan Young knew his Chiefs had to be almost perfect Wednesday if they were to upset the best team in the state. Canton (22-2) played well, but it **wasn't almost** perfect as top-ranked Detroit Pershing defeated No. 76 Canton, 73-57. (Detroit News, 3/14/96)

"The game was almost secondary to the moment that was the end of the Hartford Whalers," coach Paul Maurice said. "Actually, it **wasn't almost** secondary—it was completely secondary. (Hartford Courant, 4/14/97)

[Review of "Almost Acoustic" pop music concert:]
Furthermore, depite the presence of a couple of acoustic guitars, Beck's harmonica and the trumpter in Cake, this show **wasn't almost** acoustic—it wasn't acoustic at all. (Los Angeles Times, 12/16/96)

Someone should wake Wilkinson up to the fact that he **didn't almost** win that match, but rather Boris Becker almost lost it by very obviously playing below-par tennis. (New York Times, 9/6/87)

Last year I had $10 on Scott Goodyear to win the Indy 500 and darned if he **didn't almost** do it.. (Toronto Star, 5/30/98)

"I feel different now. I feel new," [tennis player Mary] Pierce said. "It's almost like an overnight thing, but at the same time it's been gradual. I really do think that whatever doesn't kill you makes you stronger." Not that it **didn't almost** come to that. For too long, Pierce has been defined by her abusive father.

(Los Angeles Times, 5/25/97)

Thus if *not almost any* is ruled out, this tells us less about the incompatibility of *almost* and NPI *any* or that of negation and FC *any* (cf. Partee 1986 and Dayal 1998) than about the incompatibility of *not* and *almost* .

Especially striking in the data in (49) is the contrast between the freely occurring *not just any* and the virtually non-occurring *[not* A-adv *any]* sequences, where A-adv = a member of the now familiar set *{almost, practically, virtually; absolutely}*. This contrast is particularly clear in subject position:

(50) Not ᵛANYbody could have done this.
Not just anybody could have done this.
*Not absolutely anybody could have done this.
*Not {almost/virtually/practically} anybody could have done this.

It is to the *not just any* construction and its implications that we shall now turn, after presenting a tabular summary of our revisionist views on the diagnostics:

Construction	∃	***any*NPI**	∀	***any*FC**	**comments/codicils**
there-insertion	√	√	*	*	diagnostic for weak/indefinite values; generic *a* also * here
Quantifier-floating	*	*	√	*	diagnostic for true universals only
exceptives *(Q but/except NP)*	*	√	√	√	OK if prop. conventionally used to convey universal
heads with DE restrictors (Det N wh...NPI...)	*	*	√	√	generic indefinite heads also license NPIs
whatsoever; at all	*	√	*	√	diagnostic for indiscriminacy (end-of-scale indefinites)
absolutely	*	(*)	√	√	diagnostic for end-of-scale predications; blocked by adjacent overt negation
almost, virtually	*	(*)	√	√	diagnostic for end-of-scale or (with *almost)* exact values; blocked by adjacent negation

Table 1

IV. Free choice and the indiscriminative: not just any *indefinite*

On the account defended here, and more fully in Lee & Horn 1994 and other work cited above, FC *any* is neither an existential nor a universal quantifier/determiner; it is a non-specific scalar indefinite whose semantics involves not only ATTRIBUTIVITY or NON-EPISODICITY (cf. Giannakidou 1998) but also a quality I have called INDISCRIMINACY (cf. Vendler 1967, Haspelmath 1993, Jennings 1994, Horn to appear). This notion of indiscriminacy is reinforced by *just* , especially in the context of the anti-indiscriminative *not just any* construction where it often serves as a disambiguator. Note that (contra the claim of Carlson 1981) the *any* appears here in its free choice incarnation; thus, reprising De Morgan's minimal pair of fishes (cf. (11', 11") above), only the free-choice version supports a *just* intervention.

(51) a. A whale [is-not- **any**] fish vs. A trout [is-not] [**any** -fish]
NPI FC

b. A whale [is-not-(*just)-any_{NPI}-fish] vs. A trout [is-not] just [any_{FC}-fish]

For a more contemporary example of a disambiguating interventionist *just,* consider (52a), where the absence of *just* would turn Marta's free choice manifesto into the NPI credo of celibacy in (52b).

(52) a. I don't want to go to bed with just anyone anymore. I have to be attracted to them sexually.
(Marta, in 1994 Whit Stillman film "Barcelona")

b. I don't want to go to bed with anyone anymore.

Along the same lines, compare the significantly distinct contents of the renunciations in (53):

(53) a. I wouldn't marry anyone. [renounces CONNUBIALITY]

b. I wouldn't marry everyone. [renounces POLYGAMY]

c. I wouldn't marry just anyone. [renounces INDISCRIMINACY]

In these examples, an unnegated *(just) any* would emphasizes 'not-mattering', as in the French series of *n'importe* forms *(n'importe qui/quoi/comment/...}).*[10]

[10]LeGrand (1975: 32) takes all instances of untriggered, obligatorily stressed *any* to derive from a special lexical item, a separate quantifier *just any* with an optionally deleted *just*, but I see no compelling evidence for this arrant violation of the Modified Occam's Razor principle.

Some additional attested examples of what Haspelmath (1993: 187; 1997: 189-92) calls anti-depreciatives, reconstructed in Horn (to appear) as anti-indiscriminatives, are given below. Note that a paraphrase of the form 'any old X' is frequently available; cf. Horn (to appear) for additional discussion and examples.[11] While a disambiguating *just* is useful in the vicinity of a DE licenser to clarify the orientation of the relevant scale, it is not obligatory, especially when prosody or diacritics (as in (57) or (58)) can accomplish the same effect; where no disambiguator is present, the result is the garden path NPI reading induced in (59) and (60).

(54) This isn't just ANY sport utility vehicle. [from Acura commercial]
(= *not just any old...;* neither universal nor existential)

(55) When our spirits most need a lift, just any old frock won't do.
(Yale Herald, 26 Jan. 1996, courtesy Ton van der Wouden)

(56) He disapproves that I allow just anyone to come into my building.
(Susanna Moore (1995), *In the Cut,* p. 100)

(57) A: I'm not supposed to be talking to anybody about this case.
B: First of all, I'm not ᵛanyone. I'm a licensed dealer in celebrity collectibles.
(dialogue from episode of ABC television series "Murder One", Dec. 1996)

(58) I use "coke" to mean any cola-based soft drink (coca cola, pepsi cola, RC), but I would never use it to refer to *any* soft drink (coke = 7-up). I'm amazed that anyone would say coke, when they mean 7-up.
(posting on American Dialect Society e-mail list, Re: pop and soda, 6 Dec. 1995)

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[11] In Modern Greek, one language not included in Haspelmath's roster of anti-depreciatives, Anastasia Giannakidou points out (p.c.) that the *(not) just any* reading is brought out either by *aplos* 'simply' modifying a FC (but not NPI) item or by the combination of the indefinite *enas* 'a, one' with a free choice nominal, as in (i).

(i) Dhen thelo na penderfto enan opjondhipote.
not want..2SG SUBJUNC *marry*.1SG *a* FC-*person*
'I don't want to marry just anybody'

Crucially, the sequence *kathe(nan) opjondhipote* 'just every(body)' is ruled out with universal *kathe* 'every'/*kathenan* 'everybody'.

(59) Q: May striking employees picket or demonstrate anywhere?

A: No. Striking employeees and their supporters may picket or otherwise demonstrate peacefully on City sidewalks...No picketing, demonstrating, congregating or otherwise gathering inside a University building will be permitted at any time.

[Yale adminstrator Peter Vallone, "Questions and Answers For Yale University Employees", memo to Yale university employees concerning response to imminent strike, 25 Jan. 1996]

(60) Don't labor under the impression that money can buy anything.

(Horoscope for Taurus in San Francisco Chronicle, 23 May 1974)

The indiscriminacy of FC *any* that *not just any* serves to reject is especially salient in an unusual construction that Jennings terms SUPPLEMENTARY *any*. Citing the examples in (61),

(61) a. I think she went to Lake Chapala deliberately to find a man. Any man.

(from Ross MacDonald)

b. Suddenly she hoped that someone, anyone—man or woman—would see her...

(from Joseph Wambaugh)

c. I am standing here only until a policeman, *any* policeman, turns up.

d. I am looking for a bicycle, *any* bicycle, that works.

Jennings (1994: 191) describes this construction within the scalar framework developed by Fauconnier (1975a,b, 1979) and exploited in the Lee & Horn (1994) treatment of FC *any:*

> What this use illustrates...is a general feature of 'any', not brought out in Vendler's account, that to use it is to warrant an expectation that a certain sort of challenge will receive the reply 'even that one'. Consider whatever scale you please (some scale may have been situationally suggested) on which to place policemen: slovenliness, fastidiousness, brutality, ineffectualness, dishonesty, scrupulousness. Consider the policeman that you would place at the extreme of the chosen scale. That one will do... A bicycle howsoever rickety? What about this penny farthing that I'm taking to the museum? That will do...

Supplementary *any* illustrates that the apparent universal qualities of FC *any,* if they are present at all, are clearly epiphenomenal:[12]

[12]Cf. the on-line OED entry for *any,* I.1.c.:

> The universality of 'any'...does not always entail representation as a universal quantifier and is derivative in character, deriving by monotonicity along all chosen scales. If even the oldest (least comfortable, most perilous, etc.) bicycle will do, then a bicycle in less extreme position (newer, more comfortable, safer) will also do. (Jennings 1994: 191-2)

The crucial character of such cases is that a particularizing indefinite—*a* or *some*—primes the generalizing *any* in a veridical (non-modal and non-DE) context, while no priming by a universal *(*everyone...someone)* is possible. Additional examples (from a larger inventory in Horn, to appear) are given in (62), with relevant operators highlighted:

(62) Caudell hoped someone, anyone would speak up and greet her by her right name.
(Harry Turtledove (1992), *Guns of the South*, p. 436)

> The graffiti was intense, and brilliant; an angry, aggressive plaint of garish color on almost every surface. Somebody see me! Anybody!
(Robert B. Parker (1995), *Thin Air*)

> Since early summer...Bob Dole has been trying to do something, anything, to alter the shape of a Presidential campaign whose basic configuration has not changed since the end of the primary elections.
("No Easy Explanations for Dole's Perot Gambit", New York Times, 25 Aug. 1996)

Especially striking as a model of indiscriminacy is an example in which the scalar endpoint (the 'even that one will do' of Jennings 1994) is overtly instantiated rather than just tacitly invoked:

> All she could think was that she would rather be someone, anyone, else: the skinny Oriental woman rocked to a nap across from her, or the woman further down dressed in dirty animal skins and reeking of urine.
(from *Anagrams*, a novel by Lorrie Moore, 1998, p. 215)

While these cases of supplementary *any* are normally characterized by the fact that a bare *any* in the same frame would be either ill-formed or wrongly interpreted, we do occasionally encounter cases of what we might call auto-supplementary *any*, although the effect is often a self-conscious one of metalinguistic game-playing. The result in each case is a heightened

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In affirmative sentences *[any]* asserts concerning a being or thing of the sort named, without limitation as to which, and thus constructively of *every* one of them, since every one may in turn be taken as a representative: thus 'any chemist will tell you'...

indiscriminacy; in the *any CN* couple of the first example below, for instance, the narrator's wife might (as well) have been *n'importe quelle femme* to him, and he *n'importe quelle homme* to her.

(63) We made love, fiercely, in the dark, out of our estrangement, as strangers. She was faceless to me, she closed her eyes and masked her face, so that she seemed any woman, nameless and multitude. And I knew she closed her eyes so that I was any man, in the dark,...

(Marilyn Sides (1996), "Kites!", from *The Island of the Mapmaker's Wife and Other Tales*, p. 63)

Where "Girls Town" captures the hysterical pitch and hyperkinetic rhythm of actual teen-age conversation, the voices in "Foxfire" are generic teenage suburban, without accent or personal inflection. We are in Anywhere, U.S.A., which is really the same place as nowhere on earth.

("Revenge of the Bad Girls and Other Fantasies", New York Times, 23 Aug. 1996)

"So what's your interest in my missing kids?"
"The family of Janice Tanner would like more information. They don't know how to get it. You aren't volunteering much, apparently. So they asked me to do something. What they asked for is anything, actually."
"Well, you're doing anything," Sergeant Bird said.

(from *Girls*, a novel by Frederick Busch, 1997, p. 97)

V. *Ambiguous* any, *ambiguous* even?

One more potential argument for a unified analysis of NPI and FC *any* involves an undesirable consequence that can be drawn from the competing ambiguist analysis. As we have seen, the two *any*'s often appear in the same grammatical frame but with a characteristic prosodic distinction. This a well-known observation and can be traced at least to Jespersen and Bolinger; cf. (64) and (65) respectively.

(64) a. I can't do anything. [= I can do nothing.]
b. I can't do ᵛANything ["pronounced emphatically and with... falling-rising intonation" = There are some things which I can't do] (Jespersen 1933: §17.9$_2$)

(65) a. I don't want to go anywhere.
b. I don't want to go anywhere. ["with rise-fall-rise pitch accent on the last word, meaning 'I don't want to go just anywhere"] (Bolinger 1960: 379)

On our account, the two *any*'s will be distinguished by reference to which scalar endpoint they invoke. Thus consider the superficially ambiguous sentences in (66) and (67).

(66) Can anyone pass that test?

a. (existential/NPI reading) ≈ Is there anyone who can pass that test?

b. (universal/FC reading) ≈ Can everyone pass that test?

(67) If she can solve any problem, she'll get a prize.

a. ('existential') If there is any problem she can solve...

b. ('universal') If she can solve every problem...

Invoking Fauconnier (1975a,b, 1979), Haspelmath (1997: 117) explicates the "ambiguity" of (67) as follows:

> *Any* each time expresses the low endpoint on a scale: the low endpoint of the non-reversed scale in [(67b)] (= 'the most difficult problem'), and the low endpoint of the reversed scale, i.e. the opposite endpoint, in [(67a)] (= 'the simplest problem'). Thus we can capture both the insight of the univocal universal *any* theory that the two uses of *any* are closely related, and at the same time account for the ambiguity of sentences like [(67)] which motivated the two-*any* theory.

While this treatment is quite close to ours[13], we should also recognize (with Jespersen and Bolinger) the role intonation plays, along with the discourse context, in determining which of these understandings is more plausible in a given utterance of (66) or (67).

But sentences with *even* potentially allow the same two scalar readings, associated with the same two contours, subject to contextual modification as explored in Horn (1971: 128-29). Thus we normally take (68a) to ask whether the test is so easy that even an ignoramus can pass it and (68b) to ask whether it's so hard that even a genius can't, while (68c) allows both understandings depending on what is assumed about gnomes; the pattern of (69) follows from the same assumptions.

(68) a. Can even an ignoramus pass that test?

b. Can even a genius pass that test?

c. Can even a gnome pass that test?

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[13]In the earlier version of his monograph, Haspelmath remarks that "one is well advised to be skeptical that universal quantification in the standard logical sense is involved in free-choice indefinites at all" (Haspelmath 1993: 91). He notes (1993: 52-55) that free-choice indefinites tend to be prosodically prominent and are invariably (as opposed to the corresponding ordinary *some*-series indefinites) non-specific; it is when the non-specifics are contextually ruled out (as in past perfectives or present progressives) that FC *any* and its cross-linguistic analogues are impossible.

(69) a. Even an ignoramus {can/#can't} pass that test.
b. Even a genius {#can/can't} pass that test.
c. Even a gnome {can/can't} pass that test.

But, as (70) shows, not (just) ANY contour is compatible with each reading:

(70) a. I don't believe that even an ignoramus can pass that test.
(i) I don't beLIEVE [(the claim) that even an igno$^{\vee}$RAmus can pass it]
(ii) #I don't believe (*the claim) that even an igno`RAmus can pass it
b. I don't believe that even a genius can pass that test.
(i) #I don't beLIEVE [(the claim) that even a $^{\vee}$GENius can pass that test]
(ii) I don't believe (*the claim) that even a `GENius can pass that test
c. I don't believe that even a gnome can pass that test.
(i) I don't beLIEVE [(the claim) that even a $^{\vee}$GNOME can pass that test]
(ii) I don't believe (*the claim) that even a `GNOME can pass that test

The same is true, of course, for the "two *any's*", or the two ways of associating *any* with a scalar endpoint:

(71) a. I don't believe that anyone$_{FC}$ can pass that test.
(i) I don't beLIEVE [(the claim) that $^{\vee}$ANYone can pass that test]
I don't believe that anyone—even an ignoramus—can pass that test.
I believe that not just anyone can pass the test.
(ii) #I don't believe (*the claim) that `ANYone can pass that test
I don't believe that anyone— (not) even a genius—can pass that test.
I believe that no one can pass that test.
b. I don't believe that anyone$_{NPI}$ can pass that test.
(i) #I don't beLIEVE [(the claim) that $^{\vee}$ANYone can pass that test]
I don't believe that anyone—even an ignoramus—can pass that test.
I believe that not just anyone can pass the test.
(ii) I don't believe (*the claim) that `ANYone can pass that test
I don't believe that anyone—(not) even a genius—can pass that test.
I believe that no one can pass that test.

Note the close parallel between the (70a) and (71a) on the one hand, both presupposing an easy test (even if one not easy enough for even an ignoramus to pass) and that between (70b) and (71b) (both presupposing a hard test (one so hard that even a genius might not pass it).

Now if we are to treat an *any* sentence allowing both NPI and FC understandings as lexically ambiguous, consistency would seem to demand the same lexical ambiguity for *even.* While such an ambiguity as between ordinary and NPI readings has indeed been proposed for *even,* most prominently by Rooth (1985), this line is open to challenge on both conceptual and empirical grounds (see e.g. Wilkinson 1993) for a dissenting view), and the parallelism observed above tends to cast doubt on any account which treats the *even* and *any* facts as stemming from unrelated lexical ambiguities.

VI. any, ever, *and polysemy: The D-NPI/A-NPI distinction*

Rebutting various remarks in the literature stressing the typological tendency to distinguish free-choice from negative polarity items (in particular the unsupported assertion in Horn 1972: 131 trumpeting "the isolation of...English from the usual trend encountered in the languages of the world to separate the two cases morphologically"), Haspelmath (1993, 1997) observes that almost half the sampled languages in his exhaustive survey of indefinites do contain *any*-like operators that frequent both free-choice and overtly negative habitats. He regards this convergence as an instance of MULTIFUNCTIONALITY rather than polysemy (much less ambiguity or homonymy) for the indefinites in question. As he explains,

> The majority of the series of indefinite pronouns are used to express more than one of the functions...A more traditional term for such a situation is *polysemy,* but in many cases there is no obvious meaning difference between the different functions—these often seem to be just different CONTEXTS rather than different MEANINGS...Moreover, even when an indefinite series clearly expresses more than one distinguishable function, one could maintain that from the point of view of the individual language, there only is one general meaning *(Gesamtbedeutung)* that happens to correspond to several more specific meanings in other languages. Haspelmath (1997: 58-59)

On other accounts, even those abjuring any full ambiguity or homonymy, some form of polysemy is indeed invoked, and even a relative ambiguist like Dayal (1998: 473), who distinguishes an indefinite NPI *any* from a universal FC *any,* portrays herself as an advocate of a "quasi-univocal account of the phenomenon."

On our [less quasi-]univocal account, the link between NPI and free choice *any* is the close relation between the ordinary and generic indefinite end-of-scale determiner *(any CN)* and quantifier *(anyone, anything,...).* Just as non-scalar GENERIC indefinites *(a tiger eats meat)* are akin but not identical to non-scalar ORDINARY indefinites *(a tiger is in the garden),* so too are NPI and FC *any* closely related but not identical. This unified approach

has recently been challenged by Israel (1998), who argues that *any* shares the out-of-the-closet polysemy of its fellow-indefinite *ever*.

As Israel points out, *ever* occurs as a true universal element in a variety of non-NPI contexts, chiefly as a temporal universal akin to 'always'. It shows up in relic contexts or collocations *('Twas ever thus, for ever and ever, for ever and a day)*, or before other temporal adverbs *(happily ever after, ever since)*. The flavor imparted by temporal *ever* is often that of an archaizing variant of *always:*

> There is a slight slenderness to the later [Neanderthal] fossils that some paleoanthropologists take as evidence of interbreeding with *Homo sapiens.* Fat chance, say other paleoanthropologists; it was **ever nothing** but war, mutual abhorrence, and murder between the races.
>
> (John Updike (1997), *Toward the End of Time,* pp. 27-28)

Ever appears in appositives *(ever the diplomat, ever the optimist)* and as the first element of lexicalized compounds with the sense of 'forever, always' *(evergreen; ever-popular; ever-changing, everlasting, ever-lovin')*. As a modifier of comparatives, *ever* conveys the sense of 'increasingly' *(ever closer, ever more confusing).*[14] Non-NPI *ever* also functions as a nontemporal intensifier, usually with *so (Be it ever so humble, there's no place like home)* or in inverted exclamatives *(Was my face ever red!).*

In its polarity guise, *ever* is a distributional doppelgänger of *any* as a weak/liberal/trigger-happy NPI, occurring in environments where minimizers like *lift a finger* or *drink a drop*, or other restricted NPIs like the predicates*bother* or *budge* are blocked (cf. van der Wouden 1996), and occurring neutrally in questions like (72a,b) when stricter items allow only the "conducive" readings of (72c,d) (see Heim 1984: 106, inter al.) .

(72) a. Has she ever helped you with any of your work?
b. Which of these people has {fixed any of your cars/ever fixed your car}?
c. Would she have so much as lifted a finger to help you?
d. Which of these people has {the least bit of taste/so much as a dime}?

But while *ever*—unlike *any*—can be a bona fide (if somewhat archaic or marked) UNIVERSAL, there is no FREE CHOICE *ever* alongside free choice *any.* The contrast is especially striking when *ever* is contrasted with FC *at any time,* its virtual NPI twin:

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[14]Compare the quite distinct NPI *ever* as post-superlative domain-widener: *the nicest gift ever, the best World War II movie ever, the most damaging scandal ever.*

(73) a. Anything can happen at any time.
b. *{Anything/Something} can ever happen.

(74) a. You can leave the organization at any time.
b. *You can ever leave the organization.
c. Michael can score any time (he wants).
d. *Michael can ever score. (≠ Can Michael ever score!)

As we would predict, there is no *not just ever* parallel to the necessarily free choice *not just any* construction we have investigated here; the first pair below is from Israel (1998: 14):

(75) a. Glinda won't kiss just ANY linguist. (unambiguously FC)
b. *Glinda won't just EVER kiss a linguist. (Israel 1998: 14)

(76) a. Glinda won't kiss {ANY$_{NPI}$/ANY$_{FC}$} linguist.
b. Glinda won't {EVER/*EVER} kiss a linguist.

(77) a. You can't drop in just ANY time.
b. *You can't just EVER drop in.

(78) a. Not just anyone can do that.
b. *Not just ever can you do that.

Indeed, this asymmetry between *any* and *ever* has been recognized for some time: "Although *possible* triggers *any*, it is manifestly not the case that a ◊ is for *ever*" (Horn 1972: 145, with "blame and/or credit" for the pun assigned to Emily Pope). But what conclusions should we draw therefrom?

Israel's central point cannot be challenged: the "patterns of polysemy" relating *ever*, with its existential/NPI and universal functions, to *any*, with its existential/NPI and free-choice functions, are real—but I would argue misleading. In particular, his challenge to the unified analyses of (28), on the grounds that the two *any*s can no more be unified than the two *ever*s, is unconvincing. In fact, a scalar indefinite with the morphosyntax of a temporal adverbial like *ever*, as opposed to a determiner like *any* or a pronoun like *anyone*, cannot have an extended free choice meaning because there is no (non-scalar) generic indefinite to sponsor it.

This crucial distinction between pronominal or DETERMINER-based "D-NPIs" and ADVERBIAL "A-NPIs" is especially salient when we look at two crossover cases. Consider first the A-NPI use of *any* that the OED (s.v. **any**, 7) glosses as 'in any degree, at all', which occurs VP-finally and preceding comparatives, some vanilla adjectives, and selected nouns. This A-*any*, on display in (79), is barred from free choice contexts in the same way—and, I would argue, for the same reason—as *ever*.

(79) a. This doesn't help us any.
b. If it's any better (worse, bigger),...
c. Is it any good (any use/*any bad/*any blue)?
It isn't any good (any use/*any bad/*any blue).
If it's any good (any use/*any bad/*any blue)...
d. It isn't any different (*any similar).

(80) a. *This {may/could/might} help us any.
b. *He could be any better.
c. *"The Phantom Menace" might be any good, for all I know.
d. *Any good (at all) can come of this.

On the other side of the coin, as Israel (1998: 5-6, 13) observes, *ever* can incorporate as a quasi-determiner on *wh*-words to yield the arguably free-choice indefinite pro-forms shown in (81) and (82):

(81) a. Drop in {any time/*ever/whenever (you like)}.
b. {Whoever/Anyone who} wants some can have some.
c. {Who(so)ever/Anyone who} can pull the sword from this stone is the true king.

(82) a. *You can't just EVER drop in. (= (77b))
b. You can't drop in just whenEVer.
c. %You can't drop in just ANYwhen.
("rare in literature but common in southern [England] dialects"—OED)

And of course, there's always the holophrastic

(83) Whatever...,

the all-purpose je m'en foutiste indiscriminative that marks the fin-de-siècle argot of late and post-adolescents.[15]

Now I don't want to overstate the difference between my proposal and that of my target; after all, if Arafat can agree to a rapprochement with Israel, far be it from me to demur. *Any* remains polysemous or multifunctional, particularly (as Israel (p.c.) points out) given the

[15]The bodiless indiscriminative *whatever* also appears as in argument positions, where it (not surprisingly) functions like *anything:* Here is Latrell Sprewell, the star basketball player, responding to the possibility that the Knicks would ask him to come off the bench rather than start after his recovery from injury: "I'll do whatever. I just want to win." (New York Times 2/19/99).

categorial and behavioral distinctions I draw here between D-*any* and A-*any*. Even for the non-adverbial instances of NPI and FC *any*, I can no more claim that there is precisely one *any* than that there is precisely one indefinite article in English. But I do think that it's worth focusing on the evidence for a contrast between the two *ever*'s and the one-plus *any*, as well as for the key distinction between D-NPIs and A-NPIs—evidence that shows why the essential unity of *any* is clearer than *ever*.

The full range of *any* and *ever* constructions thus combines to ADVANCE rather than DERAIL the quest for an essentially unified account of determiner/quantifier *any*. It is just D-NPI indefinites that lend themselves to the free choice uses of generic indefinites. But is Israel correct in taking *-ever* -headed free relatives to constitute free choice items, as opposed to definites or universals?

VII. wh-ever *free relatives as free choice indefinites*

As it happens, there has been a healthy and as yet unresolved debate in the recent literature on the semantic properties of free relatives (FRs) with both plain *wh-* and *wh-ever* heads; cf. inter alia Larson (1987), Jacobson (1995), Grosu (1996), Dayal (1997), Larson (1999). I shall focus here on the range of diagnostics that distinguish FC *any* from true universals, and that tend to demonstrate that *wh-ever* constructions (FRs with *-ever*) often seem to pattern more like the former.[16]

We begin with existential import: It has been clear at least since Vendler (1967) that universals with *all* and especially with *every* are much more likely to be read as strongly implicating or presupposing a non-null membership of the set they quantify over than are their *any* counterparts, which can be read as law-like conditionals. (In fact, as he observes, the standard conditional analysis of universal statements, which Larson persuasively argues for turning into a biconditional for *-ever* FRs and free comparatives, is more appropriate for *any* than *every* statements, although the situation is more far complex than can be detailed here; cf. Horn 1997 for some of the relevant issues.) It appears that *wh-ever* patterns with *any* nominals in this respect rather than with *every*.

In particular, *wh-ever* clearly lines up with *any* as an indiscriminative rather than a true universal with respect to being satisfied by just ONE end-of-scale examplar in paradigms like

(83) I'll marry whoever I want.
= I'll marry anyone I want.
≠ I'll marry everyone I want.

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[16] I am grateful to Anastasia Giannakidou, Richard Larson, and John Richardson for discussion of some of the issues and problems surveyed in the section on free relatives. Needless to say...

(84) Whoever I marry will be Jewish
= Anyone I marry will be Jewish.
≠ Everyone I marry will be Jewish.

The bodiless indiscriminative free relatives of (82b) and (83), which only occur in the *wh-ever* versions, also alternate with *any* rather than with*every* nominals:

(85) a. I'll sleep with {whoever/*who}, and you're not gonna stop me!
= I'll sleep with anyone.
≠ I'll sleep with everyone.
b. I'm not gonna marry (just) {whoEVer/ANyone/#EVeryone/*who}.

The non-universal FC imperatives of (12) have their *wh-ever* equivalents as well:

(86) a. Pick whatever card you want. (=any card, ≠ every card)
b. Promise her {anything/whatever (you want)}, but give her Arpège.

Note that with either *any* or *whatever*, (86b) is import-free, amounting to 'it doesn't matter what (if anything) you promise her...', and that again there is no paraphrase with true universals ('Promise her everything...'). If an 'any' statement is a conditional warranty (Vendler 1967), a 'whatever' statement is too, but in each case the warranty entitles the bearer to a free ride on any single attraction; whether it's renewable depends on the rules of the park.

The import-free nature of both *any*-headed relatives and *wh-ever* FRs emerges in other environments, e.g. (from Grosu 1996: 271) *{Any beer/Whatever beer} there is in the refrigerator is mine.* But it is especially striking to find paradigms like that in (87) that show how *-ever* FRs and *any* relatives are import-free in contexts where universals and definites aren't, and where the universal brings in another reading entirely:[17]

(87) She may never marry, but
a. whoever she does marry will be Jewish.
b. anyone she does marry will be Jewish.
c. #the person she does marry will be Jewish.
d. #everyone she does marry will be Jewish.

Not only are (87c, d) both inconsistent with the existence-suspending disclaimer, but the universal here introduces a polygamy absent from the FC versions.

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[17]The correlation between *any*-headed and *wh-ever* relatives is especially clear in languages like Greek in which the distinction is morphologically neutralized; cf. Giannakidou (1998) for discussion.

Next, we come to the *almost* diagnostic. As has been widely noted, *almost* doesn't always co-exist too peacefully with *wh-ever* FRs, unlike both *any* nominals and true universals. Jacobson (1995: 480) and Dayal (1997: ex. 7), for example, find (88b) ungrammatical.

(88) a. I did {nearly/almost} anything/everything you told me to do.
b. *I did {nearly/almost} whatever you told me to do.

But, as Larson (1999: fn. 10) points out, we are not dealing with absolute distinctions here, but a cline or continuum. His paradigm and judgments are given in (89):

(89) a. Max gave Alice almost {everything/anything} she asked for.
b. ?Max gave Alice almost whatever she asked for.
c. *Max gave Alice almost the thing(s) she asked for.

Indeed, empirical evidence from Nexis citations suggests that even Larson's hesitation with respect to sentences like (89b)—let alone Jacobson's and Dayal's arrant rejection of them—is overstated.

(90) Titanic's demise can mean **almost whatever** one wants it to mean.
(Tom Shales in the Buffalo News, 4/19/99, Lifestyles 9B)

The English version of the Michel Montignac diet book, Dine Out and Lose Weight, has hit town and it's selling like hotcakes. He swears that with the right food combinations, you can lose weight and still eat **almost whatever** you want, even in fancy French restaurants. (Montreal Gazette, 3/26/99, Living D14)

Although most of the reports have suggested that only a small minority of the I.O.C.'s 114 delegates may have received direct financial benefits from local organizers, the overwhelming message is that **almost whatever** a delegate asked for could not be denied...
(New York Times, 1/24/99, Sports p. 1, re International Olympic Committee scandal)

'The longer vision is to help people buy **almost whatever** it is that they want to buy on the Net.'
(Spokesman for amazon.com quoted in Seattle Times, 12/7/98, Business C2)

Jospin might admire le Blairisme, but Old Labour will be triumphant in Paris **almost whoever** forms a government on Monday. (The Observer, 6/1/97, p. 27)[18]

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[18]Notice that the modified *wh-ever* in this case defines an adjunct clause rather than an argument. Two points should be noted about such expressions: no paraphrase with *any*-headed relatives is possible here, but the indiscriminative *no matter wh-* sense is clearly retained:

Mukhamedov's utter involvement in every role, and his subjection of his impressive personality to the style and needs of each appearance, ensure that **almost whoever** dances with him looks her best. (The [London] Times, 1/21/99)

Other A-adverbs also modify *wh-ever* (but not plain *ever*-less) FRs:

(91) Cutting weight doesn't just make a wrestler weaker physically. Lawrence Central coach Sam Ruff noted it could affect him mentally. Instead of worrying about eating, O'Dell now eats **virtually whatever** he wants every day.

(Indianapolis Star, 2/13/99, Sports D7)

"I'll do **absolutely whatever** it takes," Walton said. "A place like Helix High School changes your life, so it excites me to be here."

(San Diego Union Tribune, 1/24/99, B2, on Helix graduate and Hall of Fame basketball player Bill Walton, returning for a scrub-down reunion day)

For some speakers, modification of *wh-ever* FRs is somewhat more natural with other approximatives than *almost,* as in (92a); once again, *wh-ever* relatives pattern with indefinites, while plain *wh*-relatives pattern with definites, whence the ungrammaticality of (92b,c).

(92) a. His parents give him {just about/virtually} whatever he asks for.
b. *His parents give him {just about/virtually} what he asks for.
c. *His parents give him {just about/virtually} the stuff he asks for.

Besides the argument for the definiteness of *wh-ever* FRs based on the purported (but, as we have seen, not actual) non-cooccurrence of *almost wh-ever* sequences, Jacobson and others have pointed to the diagnostic of polarity licensing. We have seen that *any*-headed NPs trigger NPIs, although on our argument not because they are universals. If *wh-ever* FRs fail to trigger NPIs, this would seem to weigh against their status as either universals or indefinites. Jacobson (1995: 480) does indeed take NPIs to be ruled out in the scope of (even) *wh-ever* FRs, citing the contrast between (93a,b) as an instance of this generalization.

(93) a. I can read everything/anything that Bill ever read.
b. *I can read whatever (books) Bill ever read.

(i) Whatever you think of him, he's my man.

(ii) *Anything you think of him, he's my man.

(iii) {No matter what/It doesn't matter what} you think of him, he's my man.

But both this datum and the conclusion based on it can be challenged—and indeed, have been. Dayal (1997: ex. (11)) notes that the *wh-ever* versions of (94a,b) are much better than their plain FR counterparts,

(94) a. He got into trouble for {whatever/*what} he ever did to anyone.
b. I will go {wherever/*where} the hell you go.

while Larson (1999: 11-12) suggests that any marginality of (93b) stems from "*ever*-doubling" and cites other cases of straightforward NPI licensing by *wh-ever*—but not plain *wh*—free relatives (citing earlier work by Iatridou and Varlacosta):

(95) a. [Whatever anyone buys for her] Phyllis objects to.
b. [Whoever takes anything from my refrigerator] is in trouble.
c. I'll do [{whatever/*what} anyone suggests].

I share Dayal's judgment on (94a)[19] and Larson's on (95) and would simply add that not just weak NPIs *(anyone, ever)* but minimizers are licensed by *wh-ever* heads:

(96) a. Whoever touches (so much as) a drop of my scotch is in trouble.
b. I'll give a prize to whoever sleeps a wink with all this racket.

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[19]The polarity item *the hell* that Dayal uses as a diagnostic for licensing in (94b) is not a straightforward NPI, but what I've called a negative-epistemic polarity item (Horn 1972: §3.2), restricted (more or less) to contexts in which the speaker is professing ignorance or in which there has been a change in her state of ignorance/knowledge:

I wish {I knew/#I didn't know} what the hell (the fuck, etc.) I was doing.

(cf. true NPIs: I wish {I didn't know/#I knew} anyone here.)

I {asked her/#told her} what the hell I was doing.

{Can you tell me/#Shall I tell you} what the hell is going on?

{I just realized/#I realize} what the hell is going on.

{I've forgotten/I just remembered/#I remember} what the hell we're supposed to do next.

What the hell he thinks he's doing I have {no/#a good} idea.

Thus the distribution of *wh-hell* (and its less printable ilk) is not directly relevant to the quantificational force of FRs, but is instead linked to the lack of knowledge that accompanies all instances of *wh-ever* FRs (cf. Jacobson 1995) and, as seen here, some instances of plain FRs as well.

In any event, the premise of the debate—that any licensing of NPIs in such contexts confirms the status of *wh-ever* FRs as universals or free-choice elements, and in any case as non-definites—is itself open to question, since non-importing generic definites (especially plurals, but sometimes even singulars) may license NPIs in clauses with negative affect. Consider, for example, the contrast in (97) and the attested example in (98):

(97) a. I'll read {whatever/any/*the} books you've ever asked me to read.
b. I'll read {the/those} dissertations that include {any discussion of/ so much as a subsubsection on} free relatives (but I won't read anything on non-restrictives).
c. The student who lifts a finger to help him {will go straight to hell/ #will be rewarded in heaven}.
d The student who so much as touches a drop of the single malt in my drawer {is in mortal peril/#will appreciate the smoky peat}.

(98) Shame on Murray Chass for his whitewash job on George Steinbrenner. I became sick to my stomach reading the excuses and apologies for the awful things the Yankees' principal owner has ever done.

(letter to the editor, New York Times, 1/28/98)

One additional piece of evidence for linking *wh-ever* FRs with *any*-type FC indiscriminatives rather than with either definites or true universals is provided by the distribution of *namely* cited by Dayal (1997: §2). Here again, *wh-ever* FRs pattern with FC *any* nominals, while plain FRs pattern with universals and definites. (99a,b) are from Dayal's paper; (100a,b) are herewith added to the stew:

(99) a. *Whatever Mary is cooking, namely ratatouille, uses onions.
b. What Mary is cooking, namely ratatouille, uses onions.

(100) a. {Everything/The things} Mary is cooking—namely ratatouille, latkes, and goulash--use(s) onions.
b. *Anything Mary cooks—namely ratatouille, latkes, and goulash—uses onions.

Plain FRs, like universals, definites, and pseudo-clefts, allow conjoint parentheticals, while *wh-ever* FRs, like indirect questions, allow only disjoint ones. (100b) becomes much better if namely is replaced by *be it* (or its analogues) and the *and* is replaced by *or*, and *wh-ever* FRs are similar:

(101) a. Anything Mary cooks—be it ratatouille, latkes, or goulash—uses onions.
b. Whatever Mary {cooks/is cooking}—(whether it's) ratatouille, latkes, or goulash—uses onions.

And as John Richardson (p.c.) points out, we can freely mix and match our indiscriminatives:

(102) Anything Mary cooks—ratatouille, latkes, whatever—uses onions.

The evidence we have surveyed in this section indicates that *wh-ever* functions not as a definite or universal but as an indiscriminative or quodlibetic free-choice marker closely akin to *any*. It should be noted as well that while many instances of plain *wh* free relatives do indeed pattern with definites (cf. Jacobson 1995) or as true universals, other occurrences appear to function as free (or grammatically determined) alternants of *wh-ever*. This is illustrated in a particularly eloquent example of what I like to think of as free-part harmony, appearing on the Rolling Stones' classic *December's Children:*

> I'm FREE, to CHOOSE WHOM I please, ANY OLD time.
> I'm FREE, to please WHO I CHOOSE, ANY OLD time.
> ("I'm free", M. Jagger & K. Richard (1965) , emphasis added)

While the constructive portion of the arguments presented here tends toward the establishment of both free choice *any* and *wh-ever* FRs as scalar indefinites, I have not sought to represent these properties explicitly; for a formalization of the semantic properties of *any* in the spirit of the present paper, see Giannakidou (1998) and Giannakidou & Horn (in prep.). I hope that by illustrating the difficulties inevitably encountered by competing approaches currently on the market, and by casting additional doubt on the conceptual and empirical advantages of ambiguist and universalist treatments of *any*, I have in any case provided some of the essential destructive energy needed to clear the field for subsequent research.

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Against Lexical Decomposition in Syntax*

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1 Introduction

This article is concerned with the ambiguity that arises if a resultative predicate is modified by the adverb *again*. Intuitively, the semantics of the adverb either operates on the event type expressed by the main predicate, or on its result state type. This effect is illustrated in (1):

(1) John opened the window again

In its *repetitive* reading, (1) presupposes that Peter had already opened the window once before. In the *restitutive* reading, it is only presupposed that the window was open at some time before the described event. In several languages, this ambiguity can be partially resolved by means of word order or intonation.

This paper consists of two parts. In the first part, we will briefly review existing accounts of this ambiguity. It will be demonstrated that it cannot be reduced to a scope ambiguity on some

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abstract level of representation. Instead we will propose a treatment that assumes syntactic integrity of lexical items. It makes crucial use of a Davidsonian semantics both of eventive and stative predicates.

The second part deals with the partial resolution of the ambiguity by means of word order and intonation in German. We will argue that this is the result of a process of pragmatic strengthening, a mechanism that selects optimal candidates from a highly underspecified relation between form and meaning. It makes use of the evaluation mechanism of Optimality Theory but differs from the standard picture in taking both the hearer perspective and the speaker perspective into account.

2 The problem

As was mentioned in the beginning, the adverb *again* triggers a characteristic ambiguity between a repetitive and a restitutive reading if it co-occurs with a resultative predicate. Let us take (2) as an example.

(2) Henry cleaned the kitchen again

In its repetitive reading, it is presupposed that it wasn't the first time that Henry cleaned the kitchen. This may be paraphrased as in (3).[1] The relation "$<$" expresses temporal precedence. Material behind the colon represents presuppositions, so "$\phi : \psi$" asserts ϕ and presupposes ψ.

(3) $\lambda i.\text{CLEAN}(i, \text{H}, \text{THE\_KITCHEN}) : \exists j < i(\text{CLEAN}(j, \text{H}, \text{THE\_KITCHEN}))$

Besides, (2) has a restitutive reading where it is only presupposed that the kitchen had been clean before:

(4) $\lambda i.\text{CLEAN}(i, \text{H}, \text{THE\_KITCHEN}) : \exists j < i(\text{IS\_CLEAN}(j, \text{THE\_KITCHEN}))$

The same kind of ambiguity arises with an achievement predicate like *to reach the surface*. Sentence (5a) has the readings (5b) and (5c).

[1] Throughout the paper, we use "$i, j, \ldots$" as variables over time intervals, "$e, e', e_1, e_2, \ldots$" as variables over events, and "$s, s', s_1, s_2, \ldots$" as variables over states.

(5) a. The diver reached the surface again

b. $\lambda i.\text{REACH}(i, \text{DIVER}, \text{SURFACE}) : \exists j < i(\text{REACH}(j, \text{DIVER}, \text{SURFACE}))$

c. $\lambda i.\text{REACH}(i, \text{DIVER}, \text{SURFACE}) : \exists j < i(\text{IS\_AT}(j, \text{DIVER}, \text{SURFACE}))$

In German, word order and intonation may be exploited to disambiguate these constructions. There is a general agreement that the underlying word order in German is SOV, which is reflected in the surface structure of embedded clauses, while this pattern is blurred in main clauses by V2. So we will restrict attention to embedded clauses. In the German counterpart of a sentence like (1), the adverb *wieder* ("again") may occur either between subject and object (as in (6a) and (6b)) or between object and verb (cf. (6c) and (6d)). In the unmarked intonation, the main stress usually falls on the object if it is adjacent to the verb (cf. (6a)) and on the verb otherwise (cf. (6c)). The sentence accent may be shifted to the adverb *wieder* however, resulting in de-accenting of both object and verb (6b,d)).

(6) a. ? (weil) Hans wieder das **Fenster** öffnete
HANS AGAIN THE **WINDOW** OPENED

b. (weil) Hans **wieder** das Fenster öffnete
HANS **AGAIN** THE WINDOW OPENED (repetitive)

c. (weil) Hans das Fenster wieder **öffnete**
HANS THE WINDOW AGAIN **OPENED** (restitutive)

d. (weil) Hans das Fenster **wieder** öffnete
HANS THE WINDOW **AGAIN** OPENED (repetitive)
'Hans opened the window again'

None of the fours patterns given in (6) is ambiguous. Without a specific contextual setting, (6a) is deviant. In (6b,d), the repetitive reading is clearly preferred, while (6c) only admits the restitutive reading.[2] So the patterns that arises may be summarized by the following descriptive generalizations:

[2]These facts were first discussed in Fabricius-Hansen 1983.

1. Unmarked intonation goes with the restitutive reading, while main accent on *wieder* leads to the repetitive interpretation.

2. The restitutive reading obtains if the adverb precedes the object. If the object precedes the adverb, the repetitive reading is preferred.

3 Decomposition approaches

In Generative Semantics, the ambiguity in question was used as an argument for lexical decomposition of achievements at an underlying of syntactic representation (cf. McCawley 1971 and Morgan 1969). According to this view, the underlying representation of (7a) and (b) is (7c) and (d) respectively.

(7) a. John opened the window again

b. The diver reached the surface again

c. [$_S$ [$_{NP}$ John] [$_{VP}$ CAUSE [$_S$ BECOME [$_S$ [$_{NP}$ the window] be_open]]]]

d. [$_S$ BECOME [$_S$ [$_{NP}$ the diver] [$_{VP}$ be_at [$_{NP}$ the surface]]]]

If we assume that *again* may attach both to the matrix S-node and to embedded S-nodes, the two readings of (1) naturally correspond to two different underlying scope positions of the adverb.

(8) a. [$_S$ Again [$_S$ [$_{NP}$ John] [$_{VP}$ CAUSE [$_S$ BECOME [$_S$[$_{NP}$ the window] be_open]]]]]

b. [$_S$ [$_{NP}$ John] [$_{VP}$ CAUSE [$_S$ BECOME [$_S$ again [$_S$ [$_{NP}$ the window] be_open]]]]]

A similar story can be told about (5), where *again* may be attached either above or below *BECOME*.

With this syntactic background, the desired readings can easily be derived in a compositional way if we assume that the meaning of *again* is as in (9), i.e. *again* does not affect the assertion of the sentence, and it triggers a presupposition that the proposition in its scope has been true at some time before the evaluation time.[3]

[3]We have to add the unproblematic assumption that *CAUSE* and *BECOME* are transparent for presupposition projection.

(9) $\lambda p \lambda i.p(i) : \exists j < i(p(j))$

In sum, lexical decomposition of resultative predicates into "BECOME + result state" or "CAUSE + BECOME + result state" allows us to reduce the ambiguity of *again* to a mundane scope ambiguity—if *BECOME* takes scope over *again*, we get the restitutive reading, otherwise the repetitive one. We thus expect that no ambiguity arises if such a decomposition is impossible, for instance in the case of stative predicates. This is in fact born out; the only reading of (10a) is the one in (10b), as one would expect given the lexical meaning (9) for *again*.

(10) a. John is in Israel again.

b. $\lambda i.\text{IS\_IN}(i, \text{J}, \text{ISRAEL}) : \exists j < i(\text{IS\_IN}(j, \text{J}, \text{ISRAEL}))$

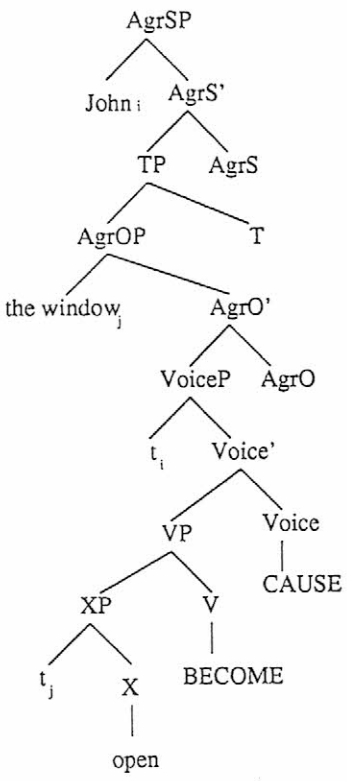
The basic idea of the Generative Semantics style explanation was revived in von Stechow 1996, where it is combined with a modern syntactic analysis. Since it is impossible to do full justice to the merits of von Stechow's overall program within the limits of this paper, we restrict discussion to those aspects that are of immediate relevance to the issues discussed here. Simplifying somewhat, von Stechow analyzes the semantic building blocks of Generative Semantics as lexical or functional heads in the sense of X-bar theory. *BECOME* is syntactically realized as Verb and the predicate of the result state (BE_OPEN in (7a)) as some lexical head X^0, while—following a proposal from Kratzer 1994—*CAUSE* is a possible interpretation of the head of a projection called "VoiceP" that embeds the highest VP shell. VoiceP in turn is dominated by AgrOP, TP and AgrSP. Crucially, von Stechow assumes that both subject and object are moved to their respective SpecAgr positions on S-structure. Furthermore, *CAUSE*, *BECOME* and the result predicate are composed to a lexical unit via head movement on S-structure. Ignoring the latter part as inessential for our discussion, the S-structure for (11) is as in the figure on the next page.

(11) (weil) John das Fenster öffnete

JOHN THE WINDOW OPENED

The adverb *wieder* ("again") may be adjoined to any maximal projection in this structure. So as in the structures assumed by generative semanticists, we expect a scope ambiguity depending on whether the adverb is attached higher or lower than *BECOME*. If

wieder ("again") is attached to AgrSP, TP, AgrOP or VoiceP, we expect the repetitive reading, while adjunction to XP leads to the restitutive interpretation.



Since the object moves obligatorily to SpecAgrO, the scope of *wieder* may partially read off from the surface word order. If the adverb occurs between subject and object, it must be adjoined either to TP or to AgrOP. Both structures lead to the repetitive reading. A surface position of the adverb between object and verb, on the other hand, corresponds either to adjunction to VoiceP (repetitive reading) or to XP (restitutive reading). So the latter word order is predicted to be ambiguous. In other words, von Stechow's analysis is able to derive the second generalization given above concerning disambiguation by word order in German.

To summarize so far, lexical decomposition in the style of Generative Semantics has three advantages for the analysis of the behavior of *again*: It gives a principled explanation for the repetitive/restitutive ambiguity which is easily incorporated into a general framework of compositional interpretation, it can do so without stipulating a lexical ambiguity of *again*, and it is able to account for disambiguating word order effects. These merits have to be contrasted with some shortcomings, however, that will ultimately lead us to reject it *in toto*.

To start with, an analysis of *again* in terms of scope leads to over-generation. As the careful reader probably already noticed, both the classical Generative Semantics analysis and von Stechow's modified version do not predict a twofold but a threefold ambiguity of sentences like (1): the adverb may take scope both *CAUSE* and *BECOME* (repetitive reading), it may be scoped out by both operators (restitutive reading), but it should also be able to take scope between *CAUSE* and *BECOME*. The GS-style structure is given below:

(12) [$_S$ John CAUSE [$_S$ again [$_S$ BECOME [$_S$ the window open]]]]

So (1) should have a reading where it is presupposed that the window opened before, but not necessarily due to an action by John. This interpretation does not exist though.
This over-generation can possibly be dealt with by means of additional restrictions. By taking the interaction *again* with indefinites under consideration, we will find a case of under-generation that is less easily accommodated.
Let us start to look at indefinite objects. Here the prediction of the decomposition analysis are borne out. Consider the sentence

(13) John opened a window again

If we grant that the position between *CAUSE* and *BECOME* is not a possible attachment site, we expect six readings since the sentence contains three scope inducing elements, *CAUSE/BECOME*, *again* and *a window*. The ambiguity arising from different relative scopes of *CAUSE/BECOME* and *a window* is hard to detect though, so we are left with four readings:

(14) a. $[_S$ John CAUSE $[_S$ BECOME $[_S$ again $[_S$ a window open]]]]

b. $[_S$ [a window]$_x$ $[_S$ John CAUSE $[_S$ BECOME $[_S$ again $[_S\ x$ open]]]]]

c. $[_S$ again $[_S$ John CAUSE $[_S$ BECOME $[_S$ a window open]]]]

d. $[_S$ [a window]$_x$ $[_S$ again $[_S$ John CAUSE $[_S$ BECOME $[_S\ x$ open]]]]]

These four readings do in fact exist. The object *a window* may be either specific (as in (14b,d)) or unspecific (14a,c), and *again* may be repetitive (c,d) or restitutive (a,b). Note that in those readings where *again* takes scope over the indefinite ((14a) and (c)), the presupposition of the sentence is "about" another window than the assertion. In (14a) it is presupposed that some window was open in the past, and (14c) requires that John opened some window before. In either case, it need not be the window of which it is asserted that John opened it.
Now let us turn attention to indefinite subjects. In this connection, those causative verbs where the agent is a component of the result state deserve special attention. Examples of this verb class are *to settle* or *to enter*. Under the decomposition analysis, constructions headed by these verbs have a subject control structure, i.e. the subjects of the main clause and of the most embedded clause are coreferent.

(15) a. John settled in New Jersey

b. John entered the stage

c. [$_S$ John CAUSE [$_S$ BECOME [$_S$ John [$_{VP}$ live in New Jersey]]]]

d. [$_S$ John CAUSE [$_S$ BECOME [$_S$ John [$_{VP}$ be on the stage]]]]

Now let us add *again* and replace the subject by an indefinite:

(16) a. A Delaware settled in New Jersey again

b. [$_S$ again [$_S$ [$_{NP}$ a Delaware]$_x$ [$_S$ x CAUSE BECOME [$_S$ x live in New Jersey]]]]

c. [$_S$ [$_{NP}$ a Delaware]$_x$ [$_S$ again [$_S$ x CAUSE BECOME [$_S$ x live in New Jersey]]]]

d. [$_S$ [$_{NP}$ a Delaware]$_x$ [$_S$ x CAUSE BECOME [$_S$ again [$_S$ x live in New Jersey]]]]

Since the indefinite *a Delaware* binds the subject argument place of *CAUSE*, it must take scope over *CAUSE*, and thus also over *BECOME*. So while lexical decomposition correctly predicts four readings for (13), it only admits the three readings for (16a) that are given in (b), (c) and (d). There should be no reading corresponding to (14a) for (16a), i.e. a restitutive reading where the presupposition is about another Delaware than the assertion. Its meaning representation is given in (17).

(17) $\lambda i.\exists x(\text{DELAWARE}(x) \wedge \text{SETTLE\_IN}(i, x, \text{NJ})) :$
$\exists j < i \exists y(\text{DELAWARE}(y) \wedge \text{LIVE\_IN}(j, y, \text{NJ}))$

All our informants agree that this reading does in fact exist though. Imagine the following scenario: The Delaware tribe was created in the area of New Jersey at the beginning of time. They never left the area until 200 years ago when they were forced into a reservation in Oklahoma. Recently, a member of the tribe moved to the home of his ancestors. In this setup, (16a) would be true and its presupposition fulfilled even though no Delaware settled in New Jersey before, and no Delaware lived there twice.

Under the decomposition approach, this reading poses a scope paradox since 1. the indefinite must take scope over *CAUSE/BECOME* because it binds an argument place of *CAUSE*, 2. *BECOME* must take scope over *again* since we are dealing with a restitutive reading, and 3. *again*

must take scope over the indefinite since presupposition and assertion are about different individuals.

There are two possible strategies how this reading can be accommodated in a decompositional framework. First, one might wonder whether *to settle* is in fact causative. If it is only to be decomposed into *BECOME* and *live in*, the scope paradox does not arise. If this were the case, however, the forced deportation of the Delawares to Oklahoma 200 years ago could be truthfully described by *The Delawares settled in Oklahoma.* According to our intuitions, this is not the case.

Alternatively, one might argue that the source of the existential quantifier(s) is not the indefinite article but some operation of existential closure that binds all free variables in its scope. This is how existential indefinites are treated in DRT. Under this perspective, the reading in (17) might be taken as an indication that existential closure applies to presupposition and assertion separately. However, the latter hypothesis is falsified by readings like (14b) or (d) where a single existential quantifier binds variables occurrences both in the assertion and in the presupposition. These considerations lead us to the conclusion that the scope paradox problem is in fact inherent to the decomposition approach as such and does not depend on further particular assumptions about the syntax-semantics interface. An alternative analysis has to be found.

4 A Davidsonian analysis

Two of the three steps that led to the scope paradox above seem impeccable:

1. In the reading (17) the indefinite subject takes scope over the whole verb—no matter whether it is decomposed or not. Otherwise it could not fill the subject argument place.

2. The adverb *again* takes scope over the subject. This is the only conceivable way how the separate existential quantification in assertion and presupposition can be derived compositionally.

This in mind, there is no choice but to give up the third step, namely the assumption that a restitutive reading arise iff *again* is in the scope of *BECOME*. Rather, the scope relations in the reading in question are like

(18) AGAIN($\exists x$(DELAWARE(x) $\wedge$ SETTLE_IN(x, NJ))))

This is exactly as in the repetitive reading (16b). So we are forced to assume that *again* is in fact lexically ambiguous between a repetitive and a restitutive reading which are not distinguished scopally.

So next to the repetitive reading of *again* that was given in (9) and is repeated in (19a), we have to assume a lexically restitutive reading that is sketched in (b).

(19) a. $\lambda p \lambda i.p(i) : \exists j < i(p(j))$

b. $\lambda p \lambda i.p(i) : \exists j < i(\text{RESULT}(p)(j))$

The function constant RESULT is assumed to be interpreted as a function *result*. What are the properties of this function? The first idea that comes to mind is roughly the following: *result* is a function from propositions (i.e. sets of world/time-interval pairs) to propositions, and *result*(p) is the most specific proposition that is always true after in an interval immediately following an interval where p was true. This first attempt will not do, however. To derive the restitutive reading of (1) correctly, we have to demand that the result of "John opening the window" is "the window being open". After an event of John opening the window, it is certainly true that the window is open, but it is also true that the window has been been opened by John. So in the restitutive reading, (1) would presuppose that the window is open as a result of John opening it before, and thus the restitutive reading would coincide with the repetitive one.[4] We take this problem as an indication that an analysis of actions, states etc. in terms of world/time pairs is too extensional in a sense: even if two event types are extensionally equivalent at all indices, their result states might still differ.

A Davidsonian semantics seems more promising since there intensionally equivalent event types might still be distinct. Following Davidson 1967, we assume that all eventive predicates have an event argument, and we extend this strategy to stative predicates. Furthermore we postulate a relation R between event and states that holds between an event e and a state s iff s is a potential result state of e. Another paraphrase might be "the postconditions of e hold in s". Note that

[4]This objection can be raised against the model theoretic approaches of Dowty 1979 and Fabricius-Hansen 1983 too.

we do not demand that s is in fact a result of e or that s follows e temporally. To return to the example, we postulate that R relates *any* event of the type "John opening the window" to one state of the type "the window being open", and any state of the latter type is related to one event of the former type by R. The interpretation of RESULT may now be construed as[5]

(20) $s \in \|\text{RESULT}(\phi)\|$ iff $\exists e R s : e \in \|\phi\|$

The two lexical entries for *again* in (17) remain unchanged except that i, j have to be replaced by variables over eventualities.

If we adopt Davidson's conception of events whereas "$\exists e.Pe$" is to be interpreted as "An event of type P **occurs**", this definition of the result function is still inappropriate, for the following reason. Take example (13) in its restitutive reading (the indefinite having narrow scope). Its logical form is

(21) $\lambda e.\exists x(\text{WINDOW}(x) \wedge \text{OPEN}(e, \text{J}, x))$:
$\exists s < e(\text{RESULT}(\lambda e.\exists x(\text{WINDOW}(x) \wedge \text{OPEN}(e, \text{J}, x)))(s))$

According to Theorem 1 (given in the appendix), the RESULT function commutes with restricted existential quantifiers, so the presupposition part is equivalent to

(22) $\exists s < e \exists x(\text{WINDOW}(x) \wedge \text{RESULT}(\text{OPEN}(\text{J}, x))(s))$

The relation between "John opening the window" and "the window being open" is formalized as a meaning postulate

(MP1) $\forall x \forall x \forall s(\text{IS\_OPEN}(s, y) \leftrightarrow \text{RESULT}(\text{OPEN}(x, y))(s))$

Applying this to (22) yields the desired

(23) $\exists s < e \exists x(\text{WINDOW}(x) \wedge \text{IS\_OPEN}(s, x))$

This far everything works out properly. But now consider the presupposition part of (21) again. By simple first order reasoning, it is equivalent to

[5]The technical details of the model theory and the syntax of the representation language are deferred to the appendix A.

(24) $\exists s < e(\text{RESULT}(\lambda e.\exists x(\exists e'(\text{WINDOW}(x) \wedge \text{OPEN}(e', \text{J}, x)) \wedge \text{OPEN}(e, \text{J}, x)))(s))$

Applying Theorem 1 and MP1 here yields

(25) $\exists s < e(\exists x(\exists e'(\text{WINDOW}(x) \wedge \text{OPEN}(e', \text{J}, x)) \wedge \text{IS\_OPEN}(s, \text{J}, x)))$

Under the Davidsonian interpretation, this says that a window that was opened, is opened or will be opened is open—a much stronger proposition than the one we are looking for. Even worse, by the same kind of reasoning it can be shown that a window is open iff there is an event of it being opened.

This problem can be overcome if we adopt a more abstract notion of "event". According to Davidson, events are entities that occur in the world. Instead we propose to view events as pieces of pure information like states of affairs in Situation Semantics. They have participants, possibly temporal and local parameters and so on, but they may or may not obtain in reality. (A better term than just "event" might be "conceivable event"). Under this abstraction notion of event, nothing is wrong with the claim that for every open window there is an event of this window being opened. Events that do take place in the real world form a proper subset of the set of abstract events. They are the extension of a predicate constant OBTAINS. (The same holds *ceteris paribus* for states). This in mind, the two lexical entries for *again* have to modified to

(26) a. $\lambda p \lambda e.p(e) : \exists e' < e(\text{OBTAINS}(e) \wedge p(e'))$ (repetitive)

b. $\lambda p \lambda e.p(e) : \exists s < e(\text{OBTAINS}(s) \wedge \text{RESULT}(p)(s))$ (restitutive)

Now (skipping over inessential features like tense) the logical form of the two readings of (1) will come out as

(27) a. John opened the window again

b. $\exists e(\text{OBTAINS}(e) \wedge \text{OPEN}(e, \text{J}, \text{THE\_WINDOW}) :$
$\left\{ \begin{array}{l} \exists e' < e(\text{OBTAINS}(e') \wedge \text{OPEN}(e', \text{J}, \text{THE\_WINDOW})) \\ \exists s < e(\text{OBTAINS}(s) \wedge \text{RESULT}(\text{OPEN}(\text{J}, \text{THE\_WINDOW}))(s)) \end{array} \right\}$

(We leave the issue open where exactly the conjunct "OBTAINS(e)" comes in and where the event argument is bound. In a GB-style setup, C^0 would be a plausible candidate for this

function.) By the reasoning given above, the presupposition of the second, restitutive reading can be simplified by using MP1 to

(28) $\exists s < e(\text{OBTAINS}(s) \wedge \text{IS\_OPEN}(s, \text{THE\_WINDOW}))$

Next we consider example (13). The two readings where the indefinite object has scope over *again* are analogous to the previous example, so we restrict ourselves to the two readings where *a window* has narrow scope:

(29) a. John opened a window again

b. $\exists e(\text{OBTAINS}(e) \wedge \exists x(\text{WINDOW}(x) \wedge \text{OPEN}(e, \text{J}, x)) :$
$\left\{ \begin{array}{l} \exists e' < e(\text{OBTAINS}(e') \wedge \exists x(\text{WINDOW}(x) \wedge \text{OPEN}(e', \text{J}, x)) : \\ \exists s < e(\text{OBTAINS}(s) \wedge \text{RESULT}(\lambda e.\exists x(\text{WINDOW}(x) \wedge \text{OPEN}(e, \text{J}, x)))(s)) \end{array} \right\}$

As in the previous example, the presupposition of the restitutive reading can be simplified further (using MP1 and Theorem 1). It turns out to be equivalent with

(30) $\exists s < e(\text{OBTAINS}(s) \wedge \exists x(\text{WINDOW}(x) \wedge \text{IS\_OPEN}(s, x)))$

So we correctly predict the restitutive non-specific reading to presuppose that some window was open in the past.

We conclude this discussion with example (16a), the construction that proved difficult for the decomposition approach. Again we only consider the readings where *again* takes scope over the indefinite. Quite similar to the previous example, the two logical forms for the repetitive and the restitutive readings are

(31) a. A Delaware settled in New Jersey again

b. $\exists e(\text{OBTAINS}(e) \wedge \exists x(\text{DELAWARE}(x) \wedge \text{SETTLE\_IN}(e, x, \text{NJ}))) :$
$\left\{ \begin{array}{l} \exists e' < e(\text{OBTAINS}(e') \wedge \exists x(\text{DELAWARE}(x) \wedge \text{SETTLE\_IN}(e', x, \text{NJ}))) \\ \exists s < e(\text{OBTAINS}(s) \wedge \text{RESULT}(\lambda e.\exists x(\text{DELAWARE}(x) \wedge \text{SETTLE\_IN}(e, x, \text{NJ})))(s)) \end{array} \right\}$

Analogously to MP1, we assume a meaning postulate that guarantees that the result of settling somewhere is living there.

(MP2) $\forall x \forall x \forall s(\text{LIVE\_IN}(s, x, y) \leftrightarrow \text{RESULT}(\text{SETTLE\_IN}(x, y))(s))$

Using MP2 and Theorem 1, the presupposition of the restitutive reading may equivalently be written as

(32) $\exists s < e(\text{OBTAINS}(s) \wedge \exists x(\text{DELAWARE}(x) \wedge \text{LIVE\_IN}(s, x, \text{NJ})))$

i.e. in the critical reading, the sentence presupposes that some Delaware used to live in New Jersey before.

To conclude this discussion, our main conclusions up to this point can be summarized as follows: 1. The ambiguity of *again* can not be reduced to a structural ambiguity, since this assumption leads to a scope paradox. In both readings, *again* takes scope over the entire matrix verb and its arguments. 2. Since the two readings of *again* occupy the same structural positions, the assumption of a lexical ambiguity (or underspecification) is inevitable. While this is compatible with a decompositional view, it undermines one of the prime motivations for this strategy. 3. Neither Montagovian/Dowtyan possible-world semantics nor Davidsonian event semantics employs a notion of meaning that is fine-grained enough to derive the restitutive reading in all cases in a compositional way. This goal can be achieved though if Davidsonian events are interpreted in an information based manner, as pieces of information that may or may not be realized by actual events.

5 German word order effects

A major advantage of a structural/decompositional analysis of the behavior of *again* is the fact that it offers a principled explanation of the German word order effects illustrated in (6). If the ambiguity in question is a lexical one—as we assume here—this disambiguating effect of syntactic patterns seems mysterious.

A closer inspection of the data reveals, however, that the connection between word order and intonation on the one hand and interpretation on the other hand is less tied than one would expect if it were a consequence of the mechanics of the syntax/semantics interface in the narrow sense. Recall that von Stechow's framework predicts that a word order "subject > again > object > verb" in German invariably results in the repetitive reading of *again*. But this is true only if the

object is definite. With an indefinite object, both readings are possible. Disambiguation is done only by intonation.

(33) a. (weil) Hans wieder ein **Fenster** öffnete
HANS AGAIN A WINDOW OPENED (restitutive, AGAIN > ∃)

b. (weil) Hans **wieder** ein Fenster öffnete
HANS AGAIN A WINDOW OPENED (repetitive, AGAIN > ∃)
'Hans opened a window again'

Both readings of *again* are possible in this word order, but in either case, *again* takes scope over the indefinite object. To express the readings where the object takes scope over *again*, the order of object and adverb have to be reversed.

(34) a. (weil) Hans ein Fenster wieder **öffnete**
HANS A WINDOW AGAIN OPENED (restitutive, ∃ > AGAIN)

b. (weil) Hans ein Fenster **wieder** öffnete
HANS A WINDOW AGAIN OPENED (repetitive, ∃ > AGAIN)
'Hans opened a window again'

So it seems that the relative scope of adverb and object is always made transparent by overt word order. Word order can be utilized to disambiguate *again* only if no scope ambiguity is pending.

So the picture that arises is this: Anything else being equal, the word order "again > object" has a preference for the repetitive reading. This preference can be ignored if other factors are not equal; if word order can be used to make scope transparent, it has to.

6 Bi-directional optimality

In the previous section we have shown that word order in German is subject to different constraints that may be in conflict with each other. In this case, one of the constraints can be violated. Since this conception of competing and violable constraints is the brand mark of Optimality Theory, this framework seems promising to account for the disambiguating effects of

formal grammatical parameters in German. Before we attempt an analysis in this way, some general remarks about the application of Optimality Theory ("OT" henceforth) are in order. Generally speaking, OT provides a mechanism to select a set of optimal candidates from a larger set of candidates. In phonological theory, where OT was initially applied to, this set of candidates are potential surface realizations of a single underlying form. In other words, in phonological applications OT is considered to be part of the generation function. Applying this perspective to syntax/semantics, this means that the OT mechanism selects among the possible verbalizations of a given meaning. A certain form/meaning pair $\langle \pi, \lambda \rangle$ is blocked iff there is a form π' such that the pairing $\langle \pi', \lambda \rangle$ is more economical than $\langle \pi, \lambda \rangle$ (provided both pairings obey the hard constraints posed by the grammar). The ranking of candidates is calculated from the number and rank of constraints that are violated. This kind of blocking is arguably pervasive in natural language. A typical example is given below.

(35) a. John ate chicken

b. ?John ate pig

c. John ate pork

As (35a) illustrates, there is a general lexical rule operative in English shifting the meaning of names of animals to meat from such animals. This rule must not be applied though if there is a lexicalized expression for the meat of an animal (like *pork* for the meat of pigs). This falls out in an OT like treatment if we assume that the application of the meaning shift comes with a cost, i.e. violates a constraint. Both (35a) and (b) violate this constraint, but only for (b) there is a form alternative that avoids this violation. So (a) is optimal, but (b) isn't.

With equal right one can argue that such an optimization strategy is used in the parsing direction. If an expression is potentially ambiguous but one reading is more economical/coherent/informative than the other, then the more expensive interpretation is blocked. A typical example is the interpretation of local presupposition. Consider the following example:

(36) If Peter has a cat, then his cat is grey

Structurally, this sentence is ambiguous, depending on whether the existential presupposition triggered by *his cat* is bound by the protasis of the conditional or accommodated globally. In

the latter reading, the sentence would mean *Peter has a cat x, and if Peter has a cat, then x is gray*. Since binding of presuppositions is arguably preferable to accommodation (cf. van der Sandt 1992; Blutner 1999), the latter reading is blocked and the sentence is perceived as non-ambiguous.

So to apply OT to the syntax/semantics interface, both speaker direction and hearer direction should be taken into account. A grammatically licit form/meaning pair $\langle \pi, \lambda \rangle$ may be blocked both by a more economical form alternative and a more economical meaning alternative. It should be added that a blocking expression should itself be optimal. So we arrive at the following definition of bi-directional optimality (where **GEN** is the set of grammatically licit form/meaning pairs):

Definition 1 (Optimality)

$\langle \pi, \lambda \rangle$ is optimal iff

1. $\langle \pi, \lambda \rangle \in \mathbf{GEN}$,
2. there is no optimal $\langle \pi', \lambda \rangle \in \mathbf{GEN}$ such that $\langle \pi', \lambda \rangle < \langle \pi, \lambda \rangle$, and
3. there is no optimal $\langle \pi, \lambda' \rangle \in \mathbf{GEN}$ such that $\langle \pi, \lambda' \rangle < \langle \pi, \lambda \rangle$.

For a more detailed discussion of the formal properties and further applications of this notion of optimality, the reader is referred to Blutner 1998, 1999. The definition given there is conceptually somewhat different but provably equivalent to the one used here (cf. Appendix B).

7 Application to *wieder*

In this section we will propose an optimality-based account for the syntax/semantics map in the German examples with *wieder* ("again") and either a definite or an indefinite object, i.e. (6a-d), (33a,b), and (34a,b).

We follow standard assumptions about German syntax in assuming that there are two s-structural positions for objects: a base position inside VP, and a target position for scrambling. Sentence adverbials are placed between these two positions and may thus be used as indicator for scrambling (cf. Diesing 1992 and much subsequent work). We take it that *wieder* behaves like other

adverbials in this respect. So the effects under considerations should fall out from general constraints on scrambling in German.

To start with, definiteness plays a prominent role as a trigger for scrambling (cf. Lenerz 1977; Reis 1987; Müller 1998 and many others). This may be formulated as the following constraint:[6]

DS: Definites scramble!

This constraint is violated by (6a,b) in both readings.

Furthermore, scrambling is exploited to make scope relations transparent. We assume a corresponding constraint

SC: Surface word order mirrors scope relations!

Again, this is likely to be a corollary of more fundamental constraints, but it will do for the purposes of this discussion. It is violated by the object-wide-scope readings of (33a,b) and the object-narrow-scope readings of (34a,b).

Finally, we assume that the interaction of intonation and interpretation is due to anaphoric de-accenting. Roughly, a constituent is to be de-accented if and only if it is given in the context (for a precise definition of "givenness" see Schwarzschild 1999). We restrict attention here to empty contexts, so one might expect that every stressed constituent violates this requirement. However, an empty context requires accommodation of the presupposition induced by *again*, and the accommodated material is to be considered as given.

Strictly speaking, there are two constraints at work here. First, it is required that given constituents are de-accented. This is an instance of a more general constraint—proposed by Williams 1997— to the effect that anaphoric possibilities must be seized.

DOAP: Don't overlook anaphoric possibilities!

To figure out which form/meaning pairs violate it, we have to look at each constituent separately. First of all, in all examples under consideration, the object (*the window* or *a window*) is given by the presupposition, no matter whether we take the repetitive or the restitutive reading.

[6]This does not exclude the possibility that it can be reduced to more fundamental constraints, cf. Reinhart 1995.

Thus DOAP is violated wherever the object is accented, i.e. (6a) and (33a) in all their possible readings. Further, the verb *opened* is always given in the repetitive reading, but never in the restitutive reading. So DOAP is violated by all candidates with a repetitive reading and an accent on the verb ((6c), (34a), the latter in both scope readings). Finally, the constituent "object+verb" too is given in all repetitive but in no restitutive reading. There are two way how this may lead to a violation of DOAP; either the object carries an accent (as in all repetitive readings of (6a) and (33a)), or the complex "object+verb" does not form a constituent at all since the object is scrambled (as in (6c,d) and in (34a,b)).

Last but not least, anaphoric de-accenting of new material is prohibited as well. Modifying Schwarzschild's 1999 formulation somewhat, the corresponding constraint is

GIVEN: De-accented constituents are given!

It is violated whenever de-accenting is not licensed by the presupposition. In our sample, this is the case in all restitutive readings of examples where 1. the verb is de-accented ((6b,d),[7] (33b) and (34b)) or where 2. "object+verb" form a de-accented constituent ((6b) and (33b)).

These four constraints are ranked as

SC >> DOAP ≡ DS >> GIVEN

The sign ≡ indicates that violations of DOAP and of DS have equal weight. The pattern of constraint violations is summarized in the tableaus below.

- Definite object

Repetitive reading

		SC	DOAP	DS	GIVEN
	(6a)		**	*	
☞	(6b)			*	
	(6c)		**		
☞	(6d)		*		

Restitutive reading

	SC	DOAP	DS	GIVEN
		*	*	
			*	**
☞				
				*

[7] De-accenting of the verb in (6a) is due to the general rules of focus projection. Space does not permit a more in-depth discussion of this point.

- Indefinite object, object has narrow scope

Repetitive reading

	SC	DOAP	DS	GIVEN
(33a)		**		
☞ (33b)				
(34a)	*	**		
(34b)	*	*		

Restitutive reading

	SC	DOAP	DS	GIVEN
☞		*		
				**
	*			
	*			*

- Indefinite object, object has wide scope

Repetitive reading

	SC	DOAP	DS	GIVEN
(33a)	*	**		
(33b)	*			
(34a)		**		
☞ (34b)		*		

Restitutive reading

	SC	DOAP	DS	GIVEN
	*	*		
	*			**
☞				
				*

Due to the bi-directional interpretation of OT, the evaluation procedure is somewhat different from standard OT. To simplify discussion somewhat, we uses abbreviations like (33a,rest,ns) for the restitutive object-narrow-scope reading of (33) etc.

First note that (6c,rest), (33b,rep,ns) and (34a,rest,ws) do not violate any constraint. Thus these three form/meaning pairs cannot be blocked by any other candidate and are therefore optimal. As a consequence of this, all other readings of the forms involved are blocked, i.e. (6c,rep), (33b,rest,ns), (33b,rep,ws), (33b,rest,ws), (34a,rep,ws), (34a,rep,ns), and (34a,rest,ns).

Now consider the remaining candidates with a definite object. (6b,rest) is blocked by (6c, rest), and neither (6a,rep) nor (6d,rep) violates fewer constraints than (6b,rep)—recall that DOAP and SC have equal weight. Thus (6b,rep) is not blocked and thus optimal. The same holds for (6d,rep). Finally, (6a,rep) is blocked both by (b) and (d).

Now we move on to (33) and (34). Next to the optimal (33b, rep, ns) and (34a, rest, ws), (34b,rest,ws) seems to be optimal since it only violates the lowest ranked constraint GIVEN. It

shares its meaning with (34a,rest,ws) though and is hence blocked. Likewise, (33b,rest,ns) is blocked by (33b,rep,ns). Of the remaining candidates, (34b,rep,ws) is among the best ones since it only violates DOAP once. All its form- or meaning alternatives are either already shown to be blocked or are more expensive. Thus (34b,rep,ws) is optimal. This blocks all other (rep,ws) candidates. The same holds for (33a,rest,ns). Its only better alternative, (33b,rest,ns), is blocked by (33b,rep,ns). So (33a,rest,ns) is optimal too. All other candidates either share the form or the meaning with one optimal candidate and thus blocked, so this list of optimal form/meaning pairs in our sample is exhaustive.

To summarize informally, SC is the strongest constraint, and all optimal candidates obey it. If, as in (6), scope issues do not arise, two competing forces are at work. On the one hand, definite objects are required to scramble. On the other hand, in the repetitive reading scrambling leads to a violation of DOAP. Since both forces are equally strong, both outcomes are optimal ((6b) and (d)). In case of the restitutive reading, there is no reason to avoid scrambling, so it is obligatory ((6a) vs. (c)).

As for intonation, in the repetitive reading virtually everything in the sentence except the adverb is given, so DOAP requires that the sentence accent ends up on the *again*. So this intonation pattern is reserved for the repetitive reading and the restitutive interpretation is restricted to the unmarked intonation.

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Appendix A

We assume a three-sorted extensional type theory as representation language, the basic types being t, e, s, ev (for truth values, individuals, states and events respectively). A model contains three domains D, S, E (individuals, states and events). Time can be constructed from events and thus need not be assumed to be ontologically basic[8]. Possible worlds are omitted for simplicity since intensionality does not play any role for the issues discussed.

Next to these domains, the standard relations between events and states $<$ (temporal precedence), $\bigcirc$ (temporal overlap), $\asymp$ (abut), $\subseteq$ (temporal inclusion) etc. and an interpretation function F, a model contains a relation $R \subseteq E \times S$ obeying the restrictions that

$$\forall e \exists s(e \asymp s \wedge eRs)$$

Intuitively eRs may be read as "the post-conditions of the event e hold in state s". So the postulate says that every event is followed by a state where its post-conditions hold.

The representation language is extended with a logical constant RESULT with the following syntax and semantics:

- If ϕ has type $\langle ev, t\rangle$, then RESULTϕ has type $\langle s, t\rangle$.
- $s \in \|\text{RESULT}(\phi)\|$ iff $\exists eRs : e \in \|\phi\|$.

Given this model-theoretic background, the following holds:

Theorem 1

$$\models \exists x(P_{\langle e,t\rangle}(x) \wedge \text{RESULT}(Q_{\langle e,\langle ev,t\rangle\rangle}(x))(s)) \leftrightarrow \text{RESULT}(\lambda e \exists x(P(x) \wedge Q(x)(e)))(s)$$

Proof: Suppose that $\|\exists x(P(x) \wedge \text{RESULT}(Q(x))(s))\| = 1$ and $\|s\| = \mathbf{s}$. Then there is an individual $\mathbf{d} \in \|P\|$ such that $\mathbf{s} \in \|\text{RESULT}(Q(x))\|^{\mathbf{d}}_x$. Thus there is an event $\mathbf{e}$ with $\mathbf{e}R\mathbf{s}$ and $\mathbf{e} \in \|Q(x)\|^{\mathbf{d}}_x$. From this we infer that $\|P(x) \wedge Q(x)(e)\|^{\mathbf{d},\mathbf{e}}_{x,e} = 1$. So $\|\exists x(P(x) \wedge Q(x)(e))\|^{\mathbf{e}}_e = 1$ too, and thus $\mathbf{e} \in \|\lambda e.\exists x(P(x) \wedge Q(x)(e))\|$. Since $\mathbf{e}R\mathbf{s}$ by assumption,

[8] See for instance Kamp and Reyle 1993:667pp

$\mathbf{s} \in \|\textsc{result}(\lambda e.\exists x(P(x) \wedge Q(x)(e)))\|$, hence $\|\textsc{result}(\lambda e.\exists x(P(x) \wedge Q(x)(e)))(s)\| = 1$.

Now suppose that $\|\textsc{result}(\lambda e \exists x(P(x) \wedge Q(x)(e)))(s)\| = 1$, and that $\|s\| = \mathbf{s}$. This means that $\mathbf{s} \in \|\textsc{result}(\lambda e \exists x(P(x) \wedge Q(x)(e)))\|$. Then there is an event $\mathbf{e}$ with $\mathbf{e}R\mathbf{s}$ and $\mathbf{e} \in \|\lambda e \exists x(P(x) \wedge Q(x)(e)))\|$. Therefore $\|\exists x(P(x) \wedge Q(x)(e)))\|^{\mathbf{e}} = 1$. Thus there is an individual $\mathbf{d} \in \|P\|$ such that $\|Q(x)(e))\|^{\mathbf{e},\mathbf{d}}_{e,x} = 1$. This entails that $\mathbf{e} \in \|Q(x))\|^{\mathbf{e},\mathbf{d}}_{e,x}$. Since e is not free in $Q(x)$, $\mathbf{e} \in \|Q(x))\|^{\mathbf{d}}_{x}$. By assumption $\mathbf{e}R\mathbf{s}$, thus $\mathbf{s} \in \|\textsc{result}(Q(x))\|^{\mathbf{d}}_{x}$. From this we conclude that $\|\textsc{result}(Q(x))(s)\|^{\mathbf{d}}_{x} = 1$, so $\|\exists x(P(x) \wedge \textsc{result}(Q(x))(s))\| = 1$ as well.

⊣

Appendix B

Blutner 1999 gives the following definition of an optimal syntax-semantics map ("Super-optimality"), which is inspired by work of Atlas and Levinson 1981 and Horn 1984:

Definition 2 (Super-optimality)

1. $\langle \pi, \lambda \rangle$ satisfies the Q-principle iff $\langle \pi, \lambda \rangle \in$ **GEN** and there is no other pair $\langle \pi', \lambda \rangle < \langle \pi, \lambda \rangle$ satisfying the I-principle.

2. $\langle \pi, \lambda \rangle$ satisfies the I-principle iff $\langle \pi, \lambda \rangle \in$ **GEN** and there is no other pair $\langle \pi, \lambda' \rangle < \langle \pi, \lambda \rangle$ satisfying the Q-principle.

3. $\langle \pi, \lambda \rangle$ is super-optimal iff it satisfies both the Q-principle and the I-principle.

This is to be compared with the definition of optimality given in the text (Definition 1).

Theorem 2

If "$<$" is irreflexive, transitive and well-founded, then

1. there is a unique optimality relation

2. $\langle \pi, \lambda \rangle$ is optimal iff it is super-optimal

Proof: Part 1 is a straightforward application of the recursion theorem. As for part 2, suppose $\langle \pi, \lambda \rangle$ is optimal but not super-optimal. This means that it either violates the I-principle or the Q-principle. Suppose it violates the I-principle. Then there is a λ' with $\langle \pi, \lambda' \rangle < \langle \pi, \lambda \rangle$ such that $\langle \pi, \lambda' \rangle$ satisfies the Q-principle. Since $\langle \pi, \lambda \rangle$ is optimal, $\langle \pi, \lambda' \rangle$ cannot be optimal. Thus there is either an optimal $\langle \pi, \lambda'' \rangle < \langle \pi, \lambda' \rangle$ or an optimal $\langle \pi', \lambda' \rangle < \langle \pi, \lambda' \rangle$. The first option is excluded since if it were the case, by transitivity, $\langle \pi, \lambda'' \rangle < \langle \pi, \lambda \rangle$, thus contradicting the assumption that $\langle \pi, \lambda \rangle$ is optimal. So there is an optimal $\langle \pi', \lambda' \rangle < \langle \pi, \lambda' \rangle < \langle \pi, \lambda \rangle$. Since $\langle \pi, \lambda' \rangle$ satisfies the Q-principle, $\langle \pi', \lambda' \rangle$ does not satisfy the I-principle. By repeated application of this argument, we can construct an infinite chain $\ldots < \langle \pi''', \lambda''' \rangle < \langle \pi'', \lambda'' \rangle < \langle \pi', \lambda' \rangle < \langle \pi, \lambda \rangle$, all members being optimal and violating the I-principle. This is excluded by the assumption that "$<$" well-founded, so $\langle \pi, \lambda \rangle$ cannot violate the I-principle if it is optimal. By a symmetric argument, we conclude that it cannot violate the Q-principle either, so it is super-optimal.

As for the other direction, suppose $\langle \pi, \lambda \rangle$ is super-optimal but not optimal. Then there is either an optimal $\langle \pi', \lambda \rangle < \langle \pi, \lambda \rangle$ or an optimal $\langle \pi, \lambda' \rangle < \langle \pi, \lambda \rangle$. Suppose the former is the case. From the previous paragraph we know that any optimal candidate satisfies the Q-principle, so $\langle \pi', \lambda \rangle$ satisfies the Q-principle since it is optimal. This is excluded though since by assumption, $\langle \pi, \lambda \rangle$ satisfies the I-principle. By the same kind of reasoning, we also derive a contradiction if $\langle \pi, \lambda \rangle$ is blocked by some $\langle \pi, \lambda' \rangle$. ⊣

It is easy to see that the ordering of candidates that is induced by ranked constraints in the sense of Optimality theory is irreflexive, transitive and well-founded. Thus our notion of optimality is well-defined, and it coincides with Blutner's 1999 notion of Super-optimality.

AN INTENSIONAL PARAMETRIC SEMANTICS FOR VAGUE QUANTIFIERS[1]

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1. INTRODUCTION

The determiners *many* and *few* are problematic for generalized quantifier theory because, as has frequently been noted, their interpretations are radically context dependent and under-determined.[2] While other quantificational determiners are also partially dependent upon contextual factors, it is generally possible to specify the context-independent component of their interpretations in a precise way. This is not the case with *many* and *few*, where there is wide disagreement on how to express the membership condition for the set of sets denoted by an NP of the form *many/few*(*A*).

Cooper (1996) introduces situation parameters into the representation of generalized quantifiers (GQ's) to capture the contribution of context to the specification of a GQ relation.[3] He uses a resource situation parameter to encode the role of context in identifying the domain restriction argument of a GQ. So, for example, the resource situation r determines the set of people that

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[2]For the basic concepts of generalized quantifier theory see Barwise and Cooper (1981), van Benthem (1986), Keenan and Stavi (1986), Westerstahl (1989), Keenan (1996), and Keenan and Westerstahl (1997).

[3]For an earlier situation theoretic version of GQ theory see Gawron and Peters (1990).

provides the first argument of binary ||every|| in 1.

1. Every person spoke to John.

This situation is, in general, distinct from the quantificational situation q relative to which the assertion of the quantificational relation is evaluated. In 1 the resource situation r relative to which the restriction set ||person|| is determined need not include John, but the situation q in which 1 is evaluated does.

However, it is possible to identify a single context-independent interpretation for generalized quantifiers (GQ's) like binary ||every|| that holds relative to specified values for situational parameters like r and q.

2. $B \in$ ||every||(||person||^r) iff $B \subseteq$ ||person||^r in q

By contrast ||many|| and ||few|| allow a large number of distinct interpretations whose specification involves essential reference to contextual parameters. In fact, these quantifiers seem to be vague in a way that GQ's like ||every|| are not.

Extensional treatments of ||many|| and ||few|| generally involve characterizing their interpretations as assertions concerning either the cardinality value of the intersection of the subject N' and VP sets, or the relation of this cardinality value to that of another set, where one of these values depends upon a contextual parameter. So, for example, Barwise and Cooper (1981) (B&C) suggest the proportional reading of *many* in 3, where the values of both n and i are given in context.

3. $B \in$ ||many||(A) iff $|A \cap B| \geq n\%|A|$ & $|A \cap B| \geq i$

3 implies that 4 is true iff the number of computational linguists who use Prolog is n% (n fixed in context) of the number of computational linguists, and the number of computational linguists who use Prolog is at least i (i fixed in context).

4. Many computational linguists use Prolog.

In addition to B&C, Westerstahl (1985), and Lappin (1988) and (1993) propose extensional accounts of ||many||.

Intensional analyses posit a norm of comparison which involves explicit or indirect reference to alternative possible worlds (or situations). Keenan and Stavi (1986) (K&S) and Keenan (1987) argue that the interpretation of *many* consists of (i) the statement that the cardinality of the intersection of the subject N' and VP sets has the cardinality value k, and (ii) the assertion that k is large. One plausible way of understanding the statement that k is large is to take it as asserting that k is equal to or larger than the cardinality of the relevant set intersection in some normative situation. Fernando and Kamp (1996) (F&K) develop an intensional treatment of ||many|| which requires computing the probability value of the set of possible worlds in which the cardinality of the intersection of the subject N' and VP sets has a cardinality less than the value of this intersection in the actual world and given context.

Both types of analysis are problematic in that either they do not allow for certain readings of *many* (*few*), or they generate multiple ambiguity with no apparent upper bound on the set of possible interpretations for these determiners. In Section 2 I present a different sort of intensional account of vague quantifiers which avoids these difficulties. It covers the range of readings for these determiners that have been identified while subsuming them as specific instances of a single underspecified parameteric interpretation. Section 3 examines the formal properties of ||many|| and ||few|| implied by this analysis. In Section 4 I briefly indicate how the parameteric intensional interpretation yields an explanation for the fact that an NP with *many* or *few* as its determiner can occur in the postal verbal complement position of an existential *there* construction. Finally, section 4 compares the proposed account with alternative treatments of ||many|| that have been suggested in the literature.

2. AN INTENSIONAL PARAMETRIC ACCOUNT

Let sa be an actual situation (a situation that supports a factual state of affairs) and S a set of

normative situations sn. 5 defines an intensional parametric interpretation of ||many||.[4]

5. $||B||^{sa} \in ||many||(||A||^{sa})$ iff, for every $sn \in S$, $| ||A||^{sa} \cap ||B||^{sa} | \geq | ||A||^{sn} \cap ||B||^{sn} |$

The particular readings which 5 generates for ||many|| depend upon (i) the value of the actual situation parameter sa, and (ii) the conditions that specify the value of the parameter S, the set of normative situations. The specification of S determines the way in which the cardinality of the intersection of $||A||^{sn}$ and $||B||^{sn}$ is identified.[5]

The choice of S depends, in part, on the intensions of the *A* and *B* predicates. The normative situations one selects in order to identify the set intersection which serves as the standard of comparison against which to evaluate the cardinality of the intersection of ||A|| and ||B|| in the actual situation will be partially determined by the meanings of the two predicates. Given 5, it is likely that one would assign different values to S when evaluating 6a and 6b, even if $||musicians\ at\ the\ concert||^{sa} = ||violinists\ at\ the\ concert||^{sa}$ and $||women||^{sa} = ||Italian||^{sa}$.

6a. Many musicians at the concert are women.

b. Many violinists at the concert are Italian.

2.1. Two Cases from K&S

K&S discuss two cases which can both be accommodated in a natural way on the interpretation of ||many|| given in 5. In the first case, we assume that, for the meeting of a medical association, all of the doctors who attended are also lawyers, and 500 doctor-lawyers were at the conference this year. This is in contrast to previous meetings, where less than 20 lawyers participated. We also assume that general attendance at the meeting this year is lower than at previous conferences

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[4]A corresponding interpretation for ||few|| is obtained by substituting ||*few*|| for ||*many*|| and '<' for '≥' in 5.

[5]If Φ is a predicate of the form λx[...x...], then $||\Phi||^s = \{a: s \models \Phi(a)\}$. For the basic ideas and the model theory of situation semantics see Barwise and Perry (1983), Barwise and Etchemendy (1990), and Seligman and Moss (1997).

of the association. In this situation it is plausible to claim that 7a is true and 7b is false, despite the fact that when sa = this year's medical association meeting, $||\text{lawyers}||^{sa} = ||\text{doctors}||^{sa}$.

7a. Many lawyers attended the meeting this year.

b. Many doctors attended the meeting this year.

5 sustains these judgements with the selection of appropriate values for S for determining $|\ ||\text{lawyers}||^{sn} \cap ||\text{people who attended the meeting this year}||^{sn}\ |$ and $|\ ||\text{doctors}||^{sn} \cap ||\text{people who attended the meeting this year}||^{sn}\ |$, respectively. So, for example, for 7a S can be taken to be the set of situations in which the number of lawyers attending the meeting of the medical association is higher than the average number present at prior meetings, and for 7b it can be characterized as the set of situations where the number of doctors at the meeting is identical to the number that attended last year, as in 8a and 8b, respectively.

8a. $S = \{sn: |\ ||\text{lawyers}||^{sn} \cap ||\text{people who attended the meeting this year}||^{sn}\ | > k$, where k = average{n:{s: s was actual prior to sa & $|\ ||\text{lawyers}||^{s} \cap ||\text{people who attended the meeting this year}||^{s}\ | = n\}\}$

b. $S = \{sn: |\ ||\text{doctors}||^{sn} \cap ||\text{people who attended the meeting this year}||^{sn}\ | =$ $|\ ||\text{doctors}||^{s} \cap ||\text{people who attended the meeting this year}||^{s}\ |$, where s = the situation in which the meeting of the medical association took place in the year immediately preceding sa}

In the second case that K&S consider, the number of tourists who visited the zoo on a particular rainy day, which is also a national holiday, is large compared to the usual number of visitors for rainy days, but small when taken against the number who come on sunny national holidays. Therefore, the truth-value of 9 depends upon both the actual day on which one considers the number of visitors to the zoo and the type of day one selects for comparison.

9. Many tourists visited the zoo today.

This effect is directly modeled by the possibility of selecting different values for the sa and S parameters. These values determine the set intersections whose cardinalities give the values of $|\,||\text{tourists}||^{sa} \cap ||\text{people who visited the zoo today}||^{sa}\,|$ and $|\,||\text{tourists}||^{sn} \cap ||\text{people who visited the zoo today}||^{sn}\,|$.

2.2. Representing Extensional Readings

In addition to intensional readings like those indicated for 7 and 9, it is possible to derive from 5 the full range of extensional readings which have been proposed on alternative accounts of *many* by extensionalising S through the requirement that the elements of S = sa. One then specifies particular extensional readings by placing additional constraints on S. We can obtain B&C's 3 from 5 by characterizing S as in 10.

10. $S = \{sn: sn = sa \;\&\; |\,||A||^{sn} \cap ||B||^{sn}\,| \geq n\%|\,||A||^{sn}\,| \;\&\; |\,||A||^{sn} \cap ||B||^{sn}\,| \geq i\}$

The four readings that Westerstahl (1985) considers are obtained by using, in turn, the constraints in 11 to define S.

11a. $S = \{sn: sn = sa \;\&\; |\,||A||^{sn} \cap ||B||^{sn}\,| \geq i \cdot |\,||A||^{sn}\,|$, with $0 < i < 1$ and fixed for sn$\}$

b. $S = \{sn: sn = sa \;\&\; |\,||A||^{sn} \cap ||B||^{sn}\,| \geq |\,||B||^{sn}|/|D_{sn}| \cdot |\,||A||^{sn}\,|$, where D_{sn} is the domain of objects for sn$\}$

c. $S = \{sn: sn = sa \;\&\; |\,||A||^{sn} \cap ||B||^{sn}\,| \geq f(|D_{sn}|)$, where f assigns a positive integer to the cardinality of the domain of sn$\}$

d. $S = \{sn: sn = sa \;\&\; |\,||A||^{sn} \cap ||B||^{sn}\,| \geq i \cdot |\,||B||^{sn}\,|$, with $0 < i < 1$ and fixed for sn$\}$

11a requires that the number of A's that are B be at least as large as a contextually determined percentage of the number of A's. It corresponds to the first conjunct of the B&C interpretation in 10. Assume that there are 100 computational linguists in sa and 60 of them use prolog. If the value we assign to i in sa does not exceed 60%, then 4 is true in sa on 11a.

11b implies that the number of A's that are B is at least as large as the number of A's defined by the frequency of B's in the domain of sa. Let the domain of sa be a set of 100 computer scientists, and assume that 20 are computational linguists. Assume also that 40 computer scientists, among them 10 computational linguists in sa use Prolog. On 11b, 4 is true in sa iff the number of computational linguists who use Prolog (10) is greater than or equal to the the number obtained by multiplying the number of computational linguists (20) by the proportion of Prolog users for the entire domain (40/100), which yields 8. As the right hand side of this condition is satisfied, 4 is true is sa under 11b.

11a compares the number of A's that are B to a standard of comparison specified as a percentage of the total number of A's. 11b compares this number to a percentage of A's which depends upon the distribution of B's in the domain. 11c, by contrast, gives a non-comparative reading of *many* on which many A's are B's iff the number of A's is at least as large as a certain cardinal value which is fixed relative to the size of the domain. So, for example, one may decide that 4 is true if 15 computational linguists use Prolog in a situation with 20 objects in the domain because $f(20) = 10$, but not in a situation with a domain of 500 objects because $f(500) = 300$, where each object in both domains is a potential Prolog user.

11d is the counterpart of 11a in which a percentage of B's rather than of A's serves as the standard of comparison. Assume that in sa there are 30 computational linguists who use Prolog, 100 Prolog users, and i = 20%. 4 is true in sa for 11d.

The comparative extensional readings that Lappin (1988) and (1993) identifies correspond to the constraints in 12, where C is a comparison set determined in sa, and i and j are fixed in sa.

12a. $S = \{sn: sn = sa \ \& \ | \ ||A||^{sn} \cap ||B||^{sn} | \geq | \ ||A||^{sn} \cap ||C||^{sn} | \}$

b. $S = \{sn: sn = sa \ \& \ | \ ||A||^{sn} \cap ||B||^{sn} | \geq | \ ||B||^{sn} \cap ||C||^{sn} | \}$

c. $S = \{sn: sn = sa \ \& \ | \ ||A||^{sn} \cap ||B||^{sn} | \geq | \ ||C||^{sn} | \}$

d. $S = \{sn: sn = sa \ \& \ | \ ||A||^{sn} \cap ||B||^{sn} | \geq j\% | \ ||A||^{sn} | \ \& \ | \ ||B||^{sn} \cap ||C||^{sn} | = i\% | \ ||C||^{sn} | \ \& \ j \geq i \}$

Each of the interpretations in 12 specifies a distinct comparative reading of ||many||. For 12a, let $||C||^{sn}$ be the set of Lisp users in sn. 4 is true iff the number of computational linguists who use Prolog in sa is greater than the number of computational linguists who use Lisp in sa.

For 12b, let $\|C\|^{sn}$ be the set of non-monotonic logicians in sn. Then 4 is true iff the number of computational linguists who use Prolog in sa is greater than the number of non-monotonic logicians who use Prolog in sa.

Let $\|C\|^{sn}$ be the set of non-monotonic logicians who use Lisp in sn for 12c. 4 is true iff the number of computational linguists who use Prolog in sa is greater than the number of non-monotonic logicians who use Lisp in sa.

12d is a comparison of proportions reading. Let $\|C\|^{sn}$ be as for 12b. 4 is true iff the proportion of computational linguists who use Prolog in sa to the total number of computational linguists in sa is greater than or equal to the proportion of non-monotonic logicians who use Prolog in sa to the total number of non-monotonic logicians in sa.

3. FORMAL PROPERTIES OF ||MANY||

3.1. The Symmetry, Intersection, and Existential Conditions

B&C and K&S observe that one-place Conservative cardinal determiner functions satisfy the Symmetry, Intersection, and Existential Conditions, but strong determiner functions do not. These three conditions are given in 13, 15, and 17, respectively. 14, 16, and 18 provide examples of the relevant equivalences and non-equivalences.

The Symmetry Condition

13. For all $A,B \subseteq E$, $B \in Det(A)$ iff $A \in Det(B)$.

14a. Five students are radicals. <=> Five radicals are students.

b. Every student is a radical. <≠> Every radical is a student.

The Intersection Condition

15. For all $A,B \subseteq E$, $B \in Det(A)$ iff $B \in Det(A \cap B)$.

16a. Five students are radicals. <=> Five students who are radicals are radicals.

b. Every student is a radical. <≠> Every student who is a radical is a radical.

The Existential Condition

17. For all A,B ⊆ E, B ∈ Det(A) iff E ∈ Det(A ∩ B).

18a. Five students are radicals. <=> Five students who are radicals exist.

b. Every student is a radical. <≠> Every student who is a radical exists.

B&C and Lappin (1988) show that for Conservative one-place determiner functions the Symmetry, Intersection, and Existential conditions are equivalent. Lappin (1988) and (1993) points out that the Symmetry, Intersection, and Existential conditions do not, in general, hold for *many/few*, as 19-21 indicate.

19. Many students are radicals. <≠> Many radicals are students.

20. Many students are radicals. <≠> Many students who are radicals are radical.

21. Many students are radicals. <≠> Many students who are radicals exists.

These observations are sustained by the proposed analysis. It is possible to specify the value of S by constraints like those in 12a, 12b, and 12d, which generate readings that do not satisfy the Symmetry, Intersection, or Existential conditions. So, for example, Symmetry does not hold for 5 when S is specified as in 12a because it is not, in general, the case that $|\,\|A\|^{sn} \cap \|C\|^{sn}\,| = |\,\|B\|^{sn} \cap \|C\|^{sn}\,|$, and similarly for 12b.

3.2. Persistence and Monotonicity

B&C characterize a persistent (left monotone increasing) determiner function as in 22.

22. For any A,B,C ⊆ E, if B ∈ Det(A) and A ⊆ C, then B ∈ Det(C).

As we see in 23, weak positive determiners are persistent, while strong positive determiners are not.[6]

23a. Five poets arrived. => Five writers arrived.

b. Every poet arrived. ≠> Every writer arrived.

Following B&C, we define a (right) monotone increasing determiner function as in 24.

24. For any A,B,C ⊆ E, if B ∈ Det(A) and B⊆ C, then C ∈ Det(A).

25 indicates that positive strong determiners are monotone increasing, while negative weak determiners are not.

25a. Every student arrived early. => Every student arrived.

b. No student arrived early. ≠> No student arrived.

F&K cite 26 and 27 to show that *Many* is neither persistent nor monotone increasing.

26. Many beach front houses were flooded last year. ≠>
Many houses were flooded last year.

27. Many students came to the talk and asked questions. ≠>
Many students came to the talk.

Given the intensional parametric interpretation of ||many|| in 5, neither persistence nor monotonicity holds, by virtue of the fact that substituting a different predicate for either *A* or *B* in $| \|A\|^{sa} \cap \|B\|^{sa} |$ could alter the choice of value for the set of normative situations S, and so change the cardinalities of the set intersection $| \|A\|^{sn} \cap \|B\|^{sn} |$ for the elements of S.

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[6]See B&C, Keenan (1987), and Lappin (1988) and (1993) for different accounts of the distinction between weak and strong determiners.

It is, of course, possible to select constraints on S which do support any subset of the properties discussed here in order to capture the readings in which they apply. However, they do not, in general, hold of the interpretation given in 5.

3.3 Conservativity

B&C and K&S define Conservativity for one-place determiner functions as in 28.

28. A one-place determiner function Det is Conservative iff for all A,B $\subseteq$ E, B $\in$ Det(A) iff (A$\cap$ B) $\in$ Det(A).

Keenan (1996) points out that 28 is equivalent to 29.

29. A one-place determiner function Det is Conservative iff for all A,B,C $\subseteq$ E, if (A$\cap$ B) = (A$\cap$ C), then B $\in$ Det(A) iff C $\in$ Det(A).

K&S suggest that Conservativity is a universal condition on all natural language determiner functions. At first glance, it does seem that ||many|| and ||few|| are Conservative, as equivalences like the one in 30 seem to hold.

30. Many/Few students are radicals. <=> Many/Few students are students who are radical.

However, Westerstahl (1985) constructs a convincing counter-example to the claim that these determiners are Conservative. Consider a case in which ten out of thirty students in a class received the highest grade in an exam, and exactly these students are the right-handed ones in the class. In this situation 31a is true, but 31b is false.

31a. Many students in the class got the highest mark on the exam.
b. Many students in the class are right-handed.

The two VP's denote the same set in the relevant situation. Therefore, if the interpretation of ||many|| is held constant for 31a and 31b and yields opposite truth-values for this situation, it does not satisfy Conservativity. This follows from 32, where A = the set of students in the class, B = the set of people who got the highest mark on the exam, and C = the set of right handed people.

32a. $B \in$ ||many||(A)

b. $A \cap B = A \cap C$

c. $C \notin$ ||many||(A)

As Westerstahl observes, in order to preserve Conservativity it is necessary to treat *many* as ambiguous between two distinct interpretations in 31, but there are no clear grounds for claiming ambiguity here. This case is similar to K&S's examples 7 and 9. 32 is clearly compatible with the intensional parametric interpretation given in 5. Conservativity does not hold for 5 for the same reason that persistence and monotonicity do not. Substituting predicates with different intensions for either *A* or *B* in $|\, \|A\|^{sa} \cap \|B\|^{sa} \,|$ could change the selection of the norm of comparison encoded in the specification of S, and so affect $|\, \|A\|^{sn} \cap \|B\|^{sn} \,|$.

Herburger (1997) argues that it is possible to sustain the Conservativity of ||many|| by treating cases in which it appears to break down as instances of a "focus-affected" (f-a) reading, where the subject N' is the focus. She claims that the f-a N' reading of a sentence of the form *Many A are B* involves two main elements: (i) the permutation of the A and B arguments of ||many||, and (ii) a proportional interpretation corresponding to 33, in which the original the subject N' and VP set arguments of ||many|| are permuted..

33. $A \in$ ||many||(B) iff $|A \cap B| \geq i \cdot |B|$

On Herburger's approach, if *students in the class* is focused in 31a, the sentence is paraphrased as 34.

34. Many of the people who received the highest mark on the exam are students in the class.

If an f-a reading of the subject N's is assigned to 31a,b, then 32 is replaced by 35, which is not a counter-example to Conservativity.

35a. $A \in \|many\|(B)$

b. $A \cap B = B \cap C$

c. $A \notin \|many\|(C)$

There are at least three problems with Herburger's proposal. First, an f-a subject N' reading is not required for 31a,b. Both sentences could be asserted, without emphatic or contrastive stress on *students in the class*, in response to the question *What does the report say about the class*? In this case, it seems reasonable to take the entire sentence as focused. But if the subject N' f-a is not invoked, then there is no reason to assume permutation of the arguments of $\|many\|$. Therefore, 32 holds for such a non-permuted reading.

Second, even if the subject N' is focused, it is not the case that 33 is the only reading available for the sentence. So, for example, a non-proportional reading corresponding to12a seems to be a possible interpretation of 36.

12a. $S = \{sn: sn = sa \ \& \ |\|A\|^{sn} \cap \|B\|^{sn}| \geq |\|A\|^{sn} \cap \|C\|^{sn}|\}$

36. Many **COMPUTATIONAL LINGUISTS**, as compared to AI people, use Prolog.

But, if 33 is not the obligatory reading for subject N' focused sentences in which the subject determiner is *many*, then permutation of the arguments of $\|many\|$ does not follow from the presence of focus in the subject. Therefore, 32 remains a counter-example to Conservativity even if one grants that 33 is a possible reading of these sentences.

Finally, Herburger's f-a subject N' reading is equivalent to Westerstahl's $\|meaning\|_4$, given in 37, which corresponds to 11d.

37. $B \in \|many\|_4(A)$ iff $|A \cap B| \geq i \cdot |B|$

11d. $S = \{sn: sn = sa \ \& \ |\|A\|^{sn} \cap \|B\|^{sn}| \geq i \cdot |\|B\|^{sn}|$, with $0 < i < 1$ and fixed for sn$\}$

In 37 the arguments of A and B are not permuted, but the relevant proportion is computed on the predicate set. Herburger suggests that the permutation of arguments in the f-a reading is motivated by general principles of focus interpretation. However, as 36 shows, focus on the subject N' does not, in general, force permutation of the N' and VP sets of ||many||.Therefore, there is no independent motivation for assuming permutation in the case of the proportional reading except the fact that it preserves Conservativity. But the Conservativity of ||many|| is the property to be demonstrated, and so it cannot, it itself, be an argument for permutation. Given that 37 expresses the proportional reading without permutation of arguments, it would seem to provide the simpler and hence preferred account of the proportional interpretation of ||many|| in these cases. I conclude that Herburger's notion of an f-a reading does not avoid Westerstahl's counter-example to Conservativity.

3.4 Non-Defeasible Restrictions on the Schematic Interpretation

5 provides an underspecified schema for the interpretation of *many/few*. However as it stands, it is excessively unconstrained. S can be defined to permit virtually any reading of these determiners. Therefore, it is necessary to impose non-defeasible constraints on 5. These define a minimal core of meaning for *many/few*, which is further specified by alternative defeasible constraints on S.

Let R be a k-ary ($1 \leq k$) relation on sets. R is a cardinality relation iff for any two k-tuples of sets K and K' such that for each $S_i \in K$ and each $S'_i \in K'$ ($i \leq k$), $|S_i| = |S'_i|$, $K \in R$ iff $K' \in R$. A cardinality relation depends only on the cardinalities of the sets for which it holds. Let a cardinality condition on sets $S_1,...,S_k$ be a condition which asserts only cardinality relations on $S_1,...,S_k$.

Both ||many|| and ||few|| denote relations between the subject N' set A and the VP set B which depend on the cardinalities of A and $A \cap B$ in an actual situation sa and a set of normative situations S, rather than upon the identity of the elements of these sets. Therefore, 38 is a plausible non-defeasible constraint on 5.

38. For every condition CD on sets that partially defines S, if the sets to which CD applies are not the ranges of situation variables in the definition of S, then CD is a cardinality condition.

The intensional definitions of S given in 8a,b, and the extensionalized definitions specified in 10-12 satisfy 38. However, 38 excludes the definitions in 39, because in each case the right conjunct is a condition on the elements of C, and C does not specify the range of a situation variable.

39a. $S = \{sn: | \|A\|^{sn} \cap \|B\|^{sn} | \geq | \|C\|^{sn} | \ \& \ \|C\|^{sn} \subseteq \|A\|^{sn} \cap \|D\|^{sn}\}$

b. $S = \{sn: | \|A\|^{sn} \cap \|B\|^{sn} | \geq | \|C\|^{sn} | \ \& \ \|C\|^{sn} = \|A\|^{sn} - \{j,m\}\}$

c. $S = \{sn: | \|A\|^{sn} \cap \|B\|^{sn} | \geq | \|C\|^{sn} | \ \& \ \|C\|^{sn} = \|B\|^{sn} \cap \|D\|^{sn}\}$

Even if $| \|C\|^{sn} | = | \|E\|^{sn} |$, it may still be the case that $\|E\|^{sn}$ cannot be substituted for $\|C\|^{sn}$ in the right conjuncts of 39. Notice, however, that 40a,b do satisify 38.

40a. $S = \{sn: | \|A\|^{sn} \cap \|B\|^{sn} | = | \|A\|^{sn} - \{j,m\} |\}$

b. $S = \{sn: | \|A\|^{sn} \cap \|B\|^{sn} | = | \|A\|^{sn} \cap \|D\|^{sn} |\}$

Let $\|C\|^{sn}$ be the set of computational linguists who work on parsing in sn, and $\|D\|^{sn}$ the set of linguists who use Unix. An interpretation of *many* that conforms to 5 where S is specified as in 39a implies that 4 is true iff, for every normative situation sn in S, the cardinality of the set of computational linguists who use Prolog in the actual situation sa is greater than or equal to that of the set of computational linguists who work on parsing in sn, and the set of computational linguists who work on parsing in sn is a subset of the set of computational linguists who use Unix in sn. 38 excludes such a reading of *many*.

It also seems reasonable to require that under any reading obtained from 5 *Many A are B* is true only if more than one A is B. We can encode this non-defeasible constraint on 5 as in 41.

41. $\|B\|^{sa} \in \|many\|(\|A\|^{sa})$ iff $|\,\|A\|^{sa} \cap \|B\|^{sa}\,| > 1$ &
for every sn $\in$ S, $|\,\|A\|^{sa} \cap \|B\|^{sa}\,| \geq |\,\|A\|^{sn} \cap \|B\|^{sn}\,|$

This constraint encodes the requirement that *many* isa plural determiner.[7]

3. 5. Logicality

van Benthem (1986) and Westerstahl (1989) observe that the set of logical determiners is partially defined by the condition of permutation invariance. A determiner satisfies this condition iff it denotes a relation R that depends solely upon the cardinality of the sets among which R holds and the cardinality of the intersections of these sets. This relation is insensitive to the identity of the elements of the sets to which it applies. Westerstahl (1989) points out that, in addition to permutation invariance for isomorphic structures defined on E (Westerstahl's condition of Quantity), logical determiner functions must also satisfy the conditions of Conservativity and Extension.

Extension (EXT)

42. A one-place determiner function Det satisfies EXT iff, for any two models M and M', and any A, if $A \subseteq E_M \subseteq E_{M'}$, then $Det_M(A) = Det_{M'}(A)$.

It is possible to characterize a logical Det as a function which satisfies the conditions of Conservativity and Extension, and maps an ordered pair of cardinality values to a truth-value. Let A be any N' set and B any VP set. If Det is logical, then it is a function from $\langle |A - B|, |A \cap B| \rangle$ to {t,f}. Let $a = |A - B|$ and $b = |A \cap B|$. Examples of cardinality definitions for logical det's are given in 43.

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[7]There is no obvious basis for imposing a comparable constraint on ||few||, as it seems to be possible for a sentence of the form *Few A are B* to be true in a situation s in which $\|A\|^s \cap \|B\|^s = 1$, or even 0.

43a. every(<a,b>) = t iff a = 0 and b = n ($0 \leq n$).

b. no(<a,b>) = t iff a = n and b = 0.

c. some(<a,b>) = t iff a = n and $b \geq 1$.

d. at least five(<a,b>) = t iff a = n and $b \geq 5$.

e. most(<a,b>) = t iff b > a.

As Westerstahl (1985) points out, on the extensionalized readings given in 11b and 11c *many* is not a logical determiner.

11b. $S = \{sn: sn = sa \ \& \ | \ ||A||^{sn} \cap ||B||^{sn} | \geq | \ ||B||^{sn} |/|D_{sn}| \cdot | \ ||A||^{sn} |$, where D_{sn} is the domain of objects for sn}

c. $S = \{sn: sn = sa \ \& \ | \ ||A||^{sn} \cap ||B||^{sn} | \geq f(|D_{sn}|)$, where *f* assigns a positive integer to the cardinality of the domain of sn}

These interpretations depend upon the size of the domain, and so they violate EXT (Constancy in Westerstahl (1985)).

In general, 5 does not satisfy logicality by virtue of the fact that it will not support Conservativity, EXT, or permutation invariance. Substituting a predicate with a different intension for either *A* or *B* in *many A are B* can alter the truth-value of the sentence by changing the specification of S, even when the domain D of objects is held constant across sa and each sn $\in$ S, and the permutation of D is the identity function, which maps each element of D into itself.

Lappin (forthcoming) proposes the Non-Logicality Thesis given in 44.

44. There are no instantiated semantic types for natural language all of whose elements satisfy the condition of logicality.

This thesis asserts that all semantic types for natural language are heterogeneous with respect to logicality. The fact that *many* and *few* are lexical quantificational determiners that do not denote logical determiner functions (they are apparently the only non-logical lexical quantificational determiners) provides support for this thesis. Proper name possessives like *Mary's* appear to be

the only other non-logical lexical determiners.[8]

4. EXISTENTIAL *THERE* CONSTRUCTIONS

Milsark (1977), B&C, Keenan (1987), Higginbotham (1987), and Lappin (1988) and (1993), and Herburger (1997) propose alternative explanations of the fact that weak but not strong NP's occur in existential *there* sentences.

45a. There are five/no/not more than ten/at least eight people in the garden.

b.*There is/are every/most/neither/both people in the garden.

5 permits us to explain the occurrence of an NP with *many* or *few* as its determiner in the post-copula position of an existential *there* sentence.

46. There are *many/few* people in the garden.

In order to determine the truth-value of a sentence like 46, it is necessary to assign appropriate instances to the sa and S parameters. Once such instances have been specified, then a particular value is defined for $|\,\|A\|^{sa} \cap \|B\|^{sa}|$, and a set of values for $|\,\|A\|^{sn} \cap \|B\|^{sn}|$ relative to the elements sn of S. Therefore, when the parameters of the schema in 5 (and the corresponding schema for ||few||) have been anchored in contextually supplied entities (situations and sets of situations, respectively) in order to yield an interpretation on which the sentence can be assigned a truth-value, *many* (*few*) denotes a cardinal determiner function of the kind that numeral determiners denote.

It is important to recognize that the status of *many* and *few* as weak determiners does not depend on the specification of a particular reading through the actual assignment of instances to the parameters of the schema that define their interpretations. Each reading specifies a set of

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[8]Exception phrase NP's like *every/no student except John* denote non-logical GQ's. See Lappin (1996b) and (forthcoming) for an analysis of exception phrases as NP modifiers which generate a set of GQ's that is heterogenous with respect to logicality.

constraints on the way in which the two cardinalities $| \|A\|^{sa} \cap \|B\|^{sa}|$ and $| \|A\|^{sn} \cap \|B\|^{sn}|$ are determined. Any such assignment for sa and S which is compatible with the non-defeasible constraints on the schema and that results in a reading on which the sentence can be evaluated for truth-value will cause the determiner to effectively denote a cardinality relation. This seems to be sufficient to secure the inclusion of *many* and *few* in the set of weak determiners.

5. COMPARISON WITH OTHER APPROACHES

5.1. Extensional Accounts

The B&C analysis in 3 expresses the context-dependent dimension of the interpretation of *many* by incorporating the parameters n and i, whose values are fixed in context.

3. $B \in \|\text{many}\|(A)$ iff $|A \cap B| \geq n\%|A| \ \& \ |A \cap B| \geq i$

However, 3 cannot generate all of the readings which can be associated with *many*, such as the various intensional, comparative, and non-conservative interpretations.

Westerstahl (1985), and Lappin (1988) and (1993) capture additional readings by treating ||many|| as ambiguous between a set of alternative interpretations. On this view, the meaning of *many* is a disjunction of specific conditions. Therefore, whenever a new condition is specified to capture another reading, it gives rise to an additional ambiguity in the interpretation of *many/few*. The problem with this approach is that these readings do not correspond to distinct context-independent interpretations, but they seem to fall under a single schematic meaning. By proliferating ambiguity the extensional approach misses this generalization.

The proposed account avoids the proliferation of ambiguities by using a single parameterized interpretation schema. It allows for the full range of readings for *many/few* through the assignment of alternative values to the parameters corresponding to the actual situation and the set of normative situations. Specifying a value for the set of normative situations does not define a distinct meaning for the determiner but imposes constraints on the way in which the schematic interpretation is applied.

5.2 Intensional Accounts

As we observed in Section 1, K&S take the interpretation of *many* to consist of (i) the statement that the cardinality of the intersection of the subject N' and VP sets has the cardinality value k, and (ii) the assertion that k is large. This interpretation implies that ||many|| should satisfy the Symmetry condition given in 13. However, as 19 indicates, this is not generally the case.

19. Many students are radicals. <≠> Many radicals are students.

The proposed parametric intensional account captures non-symmetric readings through the use of conditions like 12a and 12b to specify the value of the S parameter.

F&K suggest an intensionalized probability treatment of ||many|| according to which many A's are B iff $|A \cap B| = n$, and the probability that $|A \cap B|$ could have been less than n is above a specified threshold c. The interpretation of ||many|| as an intensional probability-based property of $|A \cap B|$ is given in 47.

47. $B \in ||many||(A)$ iff $|A \cap B| \geq n_{|A \cap B|}$
where $n_{|A \cap B|} = \min\{n: p(\{w: |A \cap B|_w < n\}) > c\}$ if $\exists n\ p(\{w: |A \cap B|_w < n\}) > c$.
$= \infty$ otherwise.

Notice that the Symmetry condition holds for 47. F&K suggest an alternative treatment of ||many|| as a binary relation where Symmetry is avoided. On this interpretation the relevant probability value is conditional upon A having the cardinality which it does in the actual world.

48. $B \in ||many||(A)$ iff $|A \cap B| = n$ & $p(\{w: |A \cap B|_w < n\} | \{w: |A|_w = |A|\}) > c$

49. Many students are studying logic.

48 specifies a reading on which 49 is true iff it is likely (above the probability value of c) that, given the actual number of students, fewer students would have studied logic than are, in fact, doing so. Presumably it is necessary to restrict the elements of the set of possible worlds for which

the relevant probability values are determined to those which bear appropriate accessibility and similarity relations to the actual world.

There are at least three problems with F&K's analysis. First, it is not obvious how to compute the probability value of a set of possible worlds. In general, we can assign conditional probability values to possible events, given certain conditions, as a function of the frequency with which similar events have occurred under the same sorts of conditions in a finite set of actual cases. However, F&K's analysis requires that probability values be computed for sets of entire possible worlds (or situations) rather than individual events, and they do not indicate how these values are to be determined in a non-arbitrary way.

Second, 47 and 48 exclude acceptable readings of ||many||. Assume, for example, that we are evaluating 49 relative to a given university, and that the set of alternative situations for which we consider the likelihood that the number of students studying logic is lower than in the actual situation includes previous years where the number of students enroled at the university is the same as it is in the current year. Assume also that in each of these previous years the number of students studying logic was, in fact, the same as the number doing so this year. Given these conditions, 48 implies that 49 is false. However, if we assert 49 on the basis of a comparison between the number of students studying logic this year and the number of students studying physics this year, then 49 might still be true. A comparative extensionalized reading like 12a captures this interpretation of ||many||, while 47 and 48 do not.

12a. $S = \{sn: sn = sa \ \& \ | \ ||A||^{sn} \cap ||B||^{sn} \ | \geq | \ ||A||^{sn} \cap ||C||^{sn} \ |\}$

Finally, 47 and 48 produce counterintuitive results concerning probability values for sets of possible worlds. The probability value of a set of possible worlds defined as containing those worlds in which a given set C has a cardinality less than k should depend, in part, on the elements of C. Assume that $\{w: | \ ||A||^{w} \cap ||B||^{w} \ | < k\} = \{w: | \ ||A||^{w} \cap ||C||^{w} \ | < k\} = \{w: | \ ||A||^{w} \cap ||B||^{w} \ | = | \ ||A||^{w} \cap ||C||^{w} \ |\}$. Take $||A||^{w} \cap ||B||^{w}$ to be the set of students who study logic in w and $||A||^{w} \cap ||C||^{w}$ to be the set of students who study physics in w, and the relevant set of worlds W to be those w in which the intersections of these two sets have a cardinality less than k, where k is the number of students who study logic in the actual world. The elements of W are also the worlds in which the

number of students who study logic is identical to the number of students who study physics. But then it would seem that $p(\{w': | \|\|A\|\|^{w'} \cap \|\|B\|\|^{w'} | < k\} | \{w': | \|\|A\|\|^{w'} | = | \|\|A\|\|^{w} | \})$ must be identical to $p(\{w': | \|\|A\|\|^{w'} \cap \|\|C\|\|^{w'} | < k\} | \{w': | \|\|A\|\|^{w'} | = | \|\|A\|\|^{w} | \})$, which is counter-intuitive. Even on the assumptions of this example, it may well be the case that the likelihood of the number of students studying logic being lower than it is in the actual world is different than the likelihood of the number of students studying physics being lower than it is in the actual world.

It is possible to capture a probability interpretation of *many* similar in spirit to 47 on the proposed account by characterizing S in a manner analogous to 8a.

50. $S = \{sn: | \|\|\text{students}\|\|^{sn} \cap \|\|\text{people who are studying logic this year}\|\|^{sn} | > k$, where $k =$ average$\{n:\{s:$ s was actual prior to sa & $| \|\|\text{students}\|\|^{s} \cap \|\|\text{people who are studying logic this year}\|\|^{s} | = n\}\}\}$

When we define S as in 50, then, given 5, 49 is true iff the number of students who are studying logic this year is higher than the average number who studied logic in previous years. If we identify the average number of students who studied logic in previous years with the number of students that has a relatively high probability value of studying logic, then 5 and 50 imply that 49 is true iff the number of students who are studying logic this year is above the probability threshold determined by the expected number of logic students.

6. CONCLUSION

The intensional parametric account captures the radical vagueness of ||many|| and ||few|| by expressing the minimal core meaning of these quantifier relations through a parameterized schematic interpretation with a small number of indefeasible conditions. The constraints on the values of the parameters are left otherwise unspecified. This account allows for the full range of extensional, as well as intensional readings while avoiding the proliferation of ambiguities that characterizes the extensional analyses of Westerstahl (1995), and Lappin (1988) and (1993).

The account also escapes the difficulties of the intensional treatments suggested in K&S and F&K. The former implies that Symmetry should hold for ||many|| and ||few||. The latter requires

the assignment of probability values to sets of possible worlds, and it is not at all clear how one could compute these values in a precise and non-arbitrary way.

Moreover, both the extensional and intensional perspectives are overly restrictive in that they exclude a variety of plausible readings, all of which can be derived from the parametric interpretation schema of the proposed account.

The approach developed here is similar in spirit to that pursued in Reyle (1993), Crouch and van Genabith (1997), Richter and Sailer (1997), and Pollard (1999). On this view semantic interpretations consist of underspecified formal structures, and specific readings are generated by imposing additional constraints on the values of parametric variables in these structures.

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On Accusative Adverbials in Russian and Finnish *

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1. Introduction

In this paper, I investigate semantic and syntactic properties of Accusative adverbials, concentrating mainly on Russian and Finnish. In both languages, Case-marked nominal phrases are frequently used as adverbials, as shown in (1) and (2) below. The (a) examples illustrate Accusative adverbials, while (b) examples illustrate other nominal adverbials.[1]

(1) a. My rabotali nad etim projektom celyj god. RUSSIAN
we worked on this project.INSTR whole.ACC year.ACC
'We worked on this project for almost a whole year.'

b. On el ikru pudami / dorogoj / utrom / greshnym delom...
he ate caviar pood.INST / road.INST / morning.INST / sinful business.INST
'He ate caviar by the pood / on his way / in the morning / to our regret...' (Jakobson 1958:157)

(2) a. Hän asui siellä yhden vuoden. FINNISH
s/he.NOM lived there one.ACC year.ACC
'S/he lived there one year.' (Mitchell 1991:206, (27))[2]

b. Sirkku saapui vauhdilla.
Sirkku.NOM arrived speed.ADESS
'Sirkku arrived quickly.' (Manninen 1999, (2a))

Two main issues are addressed in this paper. First, I address the question of what makes Accusative adverbials pattern with direct objects and what makes them different from other nominal adverbials. Second, I explore the nature of Accusative Case of such Accusative adverbials. With respect to the first question, I propose that the similarity between Accusative adverbials and direct objects lies in their ability to interact with the aspectual properties of the

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[1] The following abbreviations are used in the glosses: ACC = Accusative Case, ADESS = Adessive Case, DAT = Dative Case, DISTR = distributive preposition, EMPH = emphatic particle, ESS = Essive Case, GEN = Genitive Case, IMPER = imperative, IMPRF = imperfective aspect, INST = Instrumental Case, NOM = Nominative Case, PL = plural, PRF = perfective aspect, PRT = Partitive Case, PST = past tense, SG = singular.

predicate. In particular, Accusative adverbials and (some) direct objects constitute a natural class of situation delimiters (Wechsler and Lee 1996). As regards the issue of Case assignment to adverbials, I argue for a purely configurational analysis of adverbial Case and against the approach that takes the Case marking on adverbials to be radically different from argument Case marking (cf. Fowler and Yadroff 1993:252). More specifically, I propose that Accusative adverbials bear Structural rather than Inherent or Semantic Case, and claim that Structural Accusative Case is checked in Inner Aspect Phrase, the projection of boundedness features (see Travis 1992). Thus, I provide a further development of the idea that Structural Accusative Case is related to Aspect (Travis 1992, Borer 1994, 1996, Sanz 1996). Finally, this research emphasizes that even though aspectual properties are important in defining argumenthood, they do not necessarily correlate with other characteristic argument properties, such as selection, obligatoriness, θ-role assignment and referentiality (cf. Macfarland 1995).

More specifically, I claim that there are three kinds of Cases available for objects: Inherent Case, Structural Accusative Case and default objective Case. I concentrate mainly on the Structural Accusative Case and the default objective Case and claim that these two kinds of Cases are checked in two distinct structural positions. These positions are the Specifier of VP position, in which objects are base-generated and get default objective Case, and the Specifier of Aspect Phrase, a derived object position in which Structural Accusative Case is checked. Moreover, I claim that movement of an object from the Specifier of VP into the Specifier of AspP is motivated by the need to check [+B(ounded)] feature. Accusative adverbials, on the other hand, are base-generated in the Specifier of AspP, thus blocking the movement of the object into this position. This creates certain interactions between objects and Accusative adverbials to be described and analyzed in this paper.

The paper is organized as follows: in section 2, I give a semantic analysis of Accusative adverbials, showing that they constitute a natural class of situation delimiting adverbials (Wechsler and Lee 1996; Haspelmath 1997, calls them 'atelic extent adverbials'). The main part of the paper (sections 3-4) addresses the syntactic issues of the structural

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[2] Mitchell (1991) glosses Finnish Genitive-Accusative Case forms as Genitive. For consistency's sake, here and below I will gloss them as Accusative Case, which is a more common practice in Finnish linguistic literature.

position and the nature of Case of Accusative adverbials. In section 3, I outline the analysis and explain how it works for direct objects, whereas in section 4 I present the data involving the interactions of objects and adverbials and show how to account for them. Section 5 concludes the paper by presenting some of the implications of the analysis for a broader linguistic theory.

2. Semantics of Accusative Adverbials

In this section, I will show that Accusative Adverbials are a natural class semantically in that they affect the aspectual properties of the predicate. This characteristic of Accusative adverbials makes them similar to (some) direct objects and distinguishes them from other nominal adverbials (Instrumentals, Essives, Adessives, Illatives, Abessives, etc.). For the sake of exposition, only Russian examples are used in this section.

It has long been noted that Accusative Adverbials are similar to direct objects in their behavior; yet, there are some crucial differences between Accusative adverbials and direct objects. For example, Accusative Adverbials are not thematic, that is, they are not selected by their verbs. Moreover, Accusative adverbials do not receive a θ-role. In this paper, I will argue that the property that makes Accusative Adverbials similar to direct objects is their ability to affect the aspectual properties of their predicates. This goes against the claim made by Arad (1998:70) that "only direct objects may measure out the event"; yet, I agree with her that "not all direct objects are measurers" and that "all measurers are (universally) marked with Accusative Case" (p. 73). As I show below, Accusative adverbials are extensive measure functions. Moreover, they behave like situation delimiters in that only one such adverbial is possible in a clause. In addition, Accusative adverbials appear to be functions that take non-delimited situations and produce delimited situations. Last but not least, Accusative adverbials are distinct from PP extent adverbials in that the former but not the latter affect the aspectual properties of their predicates.

First of all, consider the interpretations that Accusative Adverbials can have.

(3) a. DURATIONAL
Tom begal dva chasa.
Tom ran two.ACC hour.GEN
'Tom ran for two hours.'

b. DISTANCE MEASURE
Tom bezhal dve mili.
Tom ran two.ACC mile.GEN
'Tom ran two miles.'

According to Fowler and Yadroff (1993:251), "these measure nominals delimit either temporal or spatial aspects of the predicate...".[3] Wechsler and Lee (1996:630) unify all three interpretations under the heading of a situation delimiter, defined as "an extensive measure function which temporarily quantifies the event or state depicted in the clause". An extensive measure function is defined as a measure function that has the property of additivity; a measure function is a function from objects to numbers (points on a scale) that is transitive. The definitions of transitivity and additivity are given below.

(4) A function f is *transitive* iff:
if $f(x)>f(y)$ and $f(y)>f(z)$, then $f(x)>f(z)$.
A function f is *additive* iff:
$f(x) \oplus f(y) = f(x \oplus y)$

Let me illustrate that Accusative adverbials are indeed extensive measure functions, while other nominal adverbials (for example, Instrumental adverbials) are not.

(5) Masha begala polchasa utrom i polchasa vecherom.
Mary ran half-hour.ACC morning.INST and half-hour.ACC evening.INST
'Mary ran half an hour in the morning and half an hour in the evening.'

The two Accusative adverbials in (5) denote the extent of time Mary spent running on each occasion. The sentence as a whole entails that Mary ran for an hour; in other words, the two separate events of running for half an hour each add up to give an event of running for an hour. Thus, the Accusative adverbials denote an extensive measure function. However, the same cannot be said of Instrumental adverbials. The Instrumental adverbials used in (5) denote temporal location of the event, and as such are not measure functions at all (Wechsler and Lee 1996:646). Instrumental adverbials of the other major type have a manner interpretation. As shown below, manner adverbials denote a measure function, but not an extensive measure function.

(6) a. Kim laughed half-heartedly in the morning and half-heartedly in the afternoon.
b. Kim laughed whole-heartedly.

The sentence in (6a) does not entail the sentence in (6b); two events of half-hearted laughing do not add up to one bigger event of whole-hearted laughing. To sum up so far, I

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[3] Accusative adverbials can also have Locational Measure interpretation (See Wechsler and Lee 1996). Most examples in this paper illustrate durational Accusative adverbials.

have shown that Accusative adverbials have the semantics of extensive measure functions. As such, Accusative adverbials serve "to quantize an event ..." (Wechsler and Lee 1996:647) just like incremental themes do. According to Tenny (1987:148), "... there may be only one 'delimiting' associated with a verb phrase". Since Accusative adverbials quantize a situation, there can be only one Accusative adverbial per clause, as illustrated below. Otherwise, the distributive *po*-construction must be used.[4]

(7) * On begal kazhdyj den' dva chasa.
he ran every.ACC day.ACC two.ACC hour.GEN
'He ran every day for two hours.'

Furthermore, since Accusative adverbials serve to quantize a situation, they impose certain restrictions as to what kind of situation they can appear with. First, just like for-durationals in English, Accusative adverbials cannot appear with situations that are already quantized. In particular, Accusative adverbials cannot occur with achievement verbs. (Note that by changing the aspect of the verb its Aktionsart category is changed accordingly. Thus, *umirat'* 'die.IMPRF' is not an achievement verb, but a stative one.)

(8) a. Korol' umer (* dva dnja).
king died.PRF two.ACC day.GEN
'* The king died for two days.'

b. Korol' umiral dva dnja.
king died.IMPRF two.ACC day.GEN
'The king was dying for two days.'

In addition, Accusative adverbials are possible with some statives but not others. More specifically, Accusative adverbials are compatible with stage-level but not with individual-level predicates (for some discussion of this distinction, see Carlson 1977, Kratzer 1989, Chierchia 1995).

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[4] Fowler and Yadroff (1993:263) cite examples like (i) as grammatical. However, to me such sentences are highly unacceptable. Only if a distributive *po* phrase is used with the first temporal phrase, is such sentence grammatical for me. The stacking of *kazhdyju noch'* 'every night' and *vsju proshluju osen'* 'all last fall' can be explained if the latter is taken to be a scene-setting temporal locative (which is discussed below in section 4, as well as in Fowler and Yadroff, 1993).

(i) On chital *Plennicu* dva chasa kazhduju noch' vsju
he read:IMPRF:PST *La Prisonnière* two:ACC hour:GEN every:ACC night:ACC all:ACC
proshluju osen'.
last:ACC fall:ACC
'He read *La Prisonnière* for two hours every night all last fall.'

(9) a. Kardinal byl bolen dva goda.
cardinal was ill two.ACC year.GEN
'The cardinal was ill for two years.'

b. # Kardinal byl umen dva goda.
cardinal was intelligent two.ACC year.GEN
'# The cardinal was intelligent for two years.'

Furthermore, if a predicate can have either a stage-level or an individual-level interpretation, an Accusative adverbial forces the stage-level interpretation. Moreover, it has been noted that the stage-level interpretation correlates with Instrumental Case on the predicative NP or AP, whereas the individual-level interpretation correlates with Nominative Case. Note that if an Accusative adverbial is present only Instrumental Case is possible for the predicative NP/AP.

(10) a. Ona byla blondinkoj / blondinka.
she was blond.INSTR / blond.NOM
'She was blond.'

b. Ona byla blondinkoj / * blondinka dva goda.
she was blond.INSTR / * blond.NOM two.ACC year.GEN
'She was blond for two years.' [i.e., she dyed her hair after two years]

This restriction in terms of stage-level vs. individual-level predicates can be explained as follows. Since Accusative adverbials serve to quantize the situation, they must occur with a situation that is not otherwise quantized. An individual-level predicate is quantized by the life span of the individual it is predicated of. Thus, by definition an individual-level predicate is true of the individual as long as that individual exists. To conclude, an Accusative adverbial forces a stage-level interpretation where possible, and where not possible, it causes the sentence to be uninterpretable.

More distributional evidence can be brought to show that Accusative adverbials affect the aspectual properties of the predicate. First, the *in*-adverbial test shows the contrast between sentences with and without Accusative adverbials.

(11) a. * On begal za odnu minutu.
he ran.IMPRF in one minute
'* He ran in one minute.'

b. On begal petdesjat metrov za odnu minutu.
he ran.IMPRF fifty meters in one minute
'He ran fifty meters in one minute.'

Thus, a sentence with an imperfective verb and without an Accusative adverbial is ungrammatical with an *in*-adverbial, whereas an addition of an Accusative adverbial delimits the situation, thus, making the *in*-adverbial acceptable.

To summarize so far, I have shown that Accusative Adverbials play a role in determining the aspectual properties of the predicate. It should be noted here that there is an alternative way of expressing *for*-durational adverbials in Russian, using a PP headed by a complex preposition *na protjazhenii* 'on the extent of'.

(12) a. DURATIONAL
Tom begal dva chasa / na protjazhenii dvux chasov.
Tom ran two.ACC hour.GEN / on extent two.GEN hour.GEN
'Tom ran for / during two hours.'

b. DISTANCE MEASURE
Tom bezhal dve mili / na protjazhenii dvux mil'.
Tom ran two.ACC miles.GEN / on extent two.GEN miles.GEN
'Tom ran two miles / for two miles.'

As shown in (12) above, the two types of expressions are largely synonymous; however, further tests show that unlike Accusative adverbials, extent PPs do not act as situation delimiters. Thus, extent PPs fail the *in*-test. Moreover, extent PPs cannot be (quasi-) arguments of perfective verbs with *pro-* (for more discussion of quasi-argument extent phrases, see Fowler and Yadroff 1993).

(13) a. * On begal na protjazhenii dvux mil' za pjat' minut.
he ran on extent two.GEN miles.GEN in five minutes
'He ran two miles in five minutes.'

b. * On probegal na protjazhenii dvux chasov.
he *pro*-run.PST on extent two.GEN hours.GEN
'He ran for two hours / He spent two hours running.'

This shows that there is a contrast between Accusative adverbial NPs and extent adverbial PPs. As is argued in this paper, this contrast correlates with Structural Accusative Case assignment that occurs in Accusative adverbial NPs but not in extent adverbial PPs. To sum up so far, Accusative adverbials pattern with direct object (and not with other nominal or PP adverbials) in that they have the ability to affect the aspectual properties of the predicate.

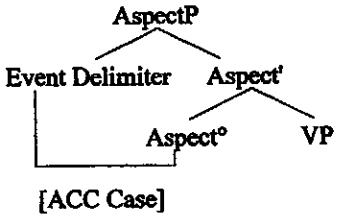
In the next two sections, I provide arguments for the claim that Accusative adverbial NPs bear Structural Accusative Case rather than Semantic or Inherent Case.

3. Analysis: verbs and objects

In this section, I will present my development of Kiparsky's (1998) analysis of Case assignment to objects in Finnish. While Kiparsky argues for a correlation between boundedness and Case, I propose that the correlation holds between three factors: boundedness, structural position and Case. Even though the addition of the third factor may seem superfluous, the distinction in structural position between Partitive and Accusative objects is crucial for my analysis of Accusative adverbials, as will become clear in the next section. Furthermore, I propose that the same structural analysis applies for both Finnish and Russian. Thus, the syntactic representations proposed for Russian and Finnish are exactly the same; the differences in Case patterns observable at PF (which are described in detail below) will be shown to be related to morphological differences between the two languages.

The crucial claim of this analysis is that Structural Accusative Case is related to Aspect, or more specifically, that Structural Accusative Case is associated with the Specifier of an Aspect projection. The kind of aspect relevant for this analysis is the Inner Aspect of Travis (1992). Semantically, it is the lexical or situation aspect (Aktionsart). I will use the term Aspect to refer to the Inner Aspect, unless otherwise indicated. The noun phrase that plays a role of a situation delimiter appear in the Specifier of Aspect Phrase, where it receives Structural Accusative Case, as illustrated in (14).

(14)



In addition, there are other ways for an object NP to get Case, in particular, when it stays in its base-generated position, which I take to be the Specifier of VP. In this position, an object NP can be assigned Inherent Case if the verb is such that assigns Inherent Case (for

instance, in Russian *upravljat'* 'manage', which assigns Instrumental, or *kasat'sja* 'touch', which assigns Genitive). If the verb does not assign Inherent Case, its object in Spec, VP can receive default objective Case (for similar but not equivalent proposals, see de Hoop 1992, on 'weak structural Case' and Vainikka 1989, on 'structural default case'). Furthermore, I propose that the morphological realization of this default objective Case depends on the particular language. For instance, in Russian it is realized as Accusative Case, whereas in Finnish it is realized as Partitive. Thus, I claim that the different realizations of the default objective Case are not part of the syntax per se, but rather a part of the morphological component of the grammar. It should also be noted here that under this analysis, there are (at least) two potential sources for morphological Accusative Case in Russian.

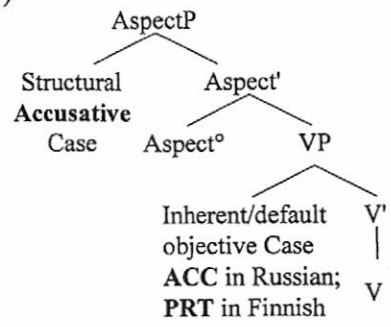
To summarize so far, I propose that an object can get one of the three kinds of Case: Structural Accusative Case, default objective Case or Inherent Case (note that in Russian the former two are realized morphologically as accusative). The properties of these three kinds of Case are summarized in the Table 1.

Table 1. Three kinds of Case available for an object NP

my terminology	Structural Accusative Case	default objective Case	Inherent Case
de Hoop's (1992) terminology	strong Structural Case	weak structural Case	Inherent Case
licensed at	S-structure	S-structure	D-structure
position	Spec, AspP	Spec, VP	Spec, VP
determined by	UG (universal)	language-by-language	verb-by-verb
possible morphological realizations	accusative	accusative (in Russian); partitive (in Finnish)	instrumental, genitive, dative, etc.

As noted in the table, these three kinds of Cases correspond to two positions: Specifier of AspP and Specifier of VP. This is illustrated in (15) below. Note that this analysis predicts that verbs that assign Inherent Case never take situation-delimiting objects. This prediction is borne out, to the best of my knowledge. For example, verbs *upravljat'* 'manage' and *kasat'sja* 'touch' take non-delimiting objects.

(15)



The next issue to be considered is what determines whether the object receives both the θ-role and the default objective Case in the Specifier of VP or moves into the Specifier of AspP, where it receives Structural Accusative Case. Since the Aspect projection hosts the boundedness feature, only NPs that have the appropriate feature can appear in this position. I propose that the movement of an object NP from the Specifier of VP into the Specifier of AspP is motivated by checking [+B(ounded)] feature. Thus, in order for an object NP to be licensed in the Specifier of AspP, both the NP and the verb (i.e., Asp°) have to be [+B(ounded)]. Here, I adopt the theory of boundedness developed by Kiparsky (1998:280-288), which applies in both nominal and verbal domains. The definitions from Kiparsky (1998:284) are given below.

(16) A predicate P is *unbounded* iff it is divisive and cumulative and not diverse.
a. P is *divisive* iff $\forall x\ [P(x) \wedge \neg atom(x) \rightarrow \exists y\ [y \leq x \wedge P(y)]]$
b. P is *cumulative* iff $\forall x\ [P(x) \wedge \neg sup\ (x, P) \rightarrow \exists y\ [x \leq y \wedge P(y)]]$
c. P is *diverse* iff $\forall x \forall y\ [P(x) \wedge P(y) \wedge x \neq y \rightarrow \neg x \leq y \wedge \neg\ y \leq x]$

According to these definitions, "quantatively indeterminate plurals and mass nouns" are unbounded, whereas "quantatively indeterminate count nouns and indefinite nouns with a cardinality predicate are bounded" (Kiparsky 1998:285). Some illustrative examples are given in (17) below.

(17) from Kiparsky (1998:285, (37))

Unbounded predicates:
bombs, food, shoot at, look for, touch, love, want, contemplate, doubt, use, expect

Bounded predicates:
a. divisive but not cumulative: *few bombs, a little food*
b. cumulative but not divisive: *many bombs, a lot of food*

c. neither cumulative nor divisive: *a bomb*, *the food*, *drop*, *find*, *kill*, *lose*, *marry*, *own*

Note that in the verbal domain boundedness does not correlate nicely with either telicity or stativity distinction. For instance, atelic stative verbs such as *own* and *contain* are bounded. This is very important since the Case distinctions on objects seem to correlate with boundedness rather than stativity or telicity, which has been a problem for approaches that took telicity as the relevant notion for determining the Case of the object.

To recapitulate how boundedness is related to the position of the NP, only if both the verb (that is, the Asp°) and the NP are bounded, does the NP raise into Spec of AspP, as illustrated in Table 2.

Table 2. NP position depending on boundedness

	[+B] object	[-B] object
[+B] verb	object NP moves into [Spec, Asp]	object NP stays in [Spec, VP]
[-B] verb	object NP stays in [Spec, VP]	object NP stays in [Spec, VP]

According to the proposal of this paper, an object NP that stays in the Specifier of VP receives default objective Case which is realized in Russian as accusative and in Finnish - as partitive. An object that moves into Specifier of AspP receives Structural Accusative Case. Thus, in Finnish (but not in Russian) the difference in position is manifested through different overt Case marking on the object. This is illustrated in Table 3.

Table 3. Case of the object NP in Finnish depending on the boundedness (Kiparsky 1998:286)

	[+B] object	[-B] object
[+B] verb	kirjoitti kirjeet (Acc) 'wrote the letters'	kirjoitti kirjeitä (Prt) 'wrote letters'
[-B] verb	kirjoitti kirjeitä (Prt) 'was writing the letters'	kirjoitti kirjeitä (Prt) 'was writing letters'

Furthermore, Kiparsky makes a distinction between three kinds of verbs: (i) verbs that are unambiguously [+B] (for example, *ostaa* 'buy' and *ottaa* 'take'); (ii) verbs that are unambiguously [-B] (for instance, *ihailla* 'admire' and *huvittaa* 'amuse'), and (iii) aspectually ambiguous verbs, such as *kirjoittaa* 'write'. While [-B] verbs always take Partitive objects

regardless of the NP's [± B] specification, [+B] verbs take Partitive objects only if the object itself is [-B]. Kiparsky (1998:267) calls this use of Partitive "NP-related function of the Partitive Case". With [±B] verbs both Partitive and Accusative objects are possible; a verb with a Partitive object denotes an activity, whereas a verb with an Accusative object denotes an accomplishment (for data, see Kiparsky 1998).

To sum up, the analysis described in this section accounts for the distribution of Partitive and Accusative objects in Finnish. Furthermore, I propose that the same analysis applies to Russian. Even though the difference between objects in [Spec, VP] and objects in [Spec, AspP] is obscured by morphology in Russian (both being realized overtly as accusative NPs), this difference becomes important once Accusative adverbials are considered.

4. Analysis: adverbials

In this section, I will show that Accusative Adverbials in Russian and Finnish bear Structural (not Inherent, or Lexical, or Semantic) Case. In fact, the analysis developed in the previous section with no new machinery is sufficient to describe the distribution and the Case alternations of Accusative adverbials.

Consider first that Accusative adverbials are always [+B] NPs; in particular, bare plural NPs ("quantatively indeterminate plurals") are not allowed as Accusative adverbials. For example, in Russian bare plural time NPs appear in the Instrumental Case.

(18) Maria chitala knigu chasami / * chasy.
Mary read.PST book.ACC hours.INST / * hours.ACC
'Mary read a book for hours.'

Since Accusative adverbials are always situation delimiters (see section 2 above), I propose that they are base-generated in the Specifier of AspP. Since they do not move there to check the [+B] feature, as objects do, the [± B] specification on the Asp° is irrelevant for the distribution of Accusative adverbials. In other words, Accusative adverbials can appear regardless of whether the Asp° is specified as [+B] or [-B].

Next, consider compatibility patterns of Accusative adverbials and objects. As described in the previous section, in Finnish direct objects can appear in the Partitive or

Accusative Case depending on the value of the [±B] feature on the verb and the object NP. It has long been observed (e.g., Tenny 1987:50, her (24)) that Accusative adverbials cannot appear together with Accusative objects, but they are grammatical if the object is in the Partitive Case or if no object is present at all.

(19) a. Maria kantoi kirjaa koko illan.
Mary carried book.PRT whole evening.ACC
'Mary carried a book for the whole evening.'

b. Maria kantoi kirjan (* koko illan).
Mary carried book.ACC whole evening.ACC
'Mary carried the book (to some place) for the whole evening.'

In the present analysis this is accounted for in terms of the availability of structural positions for two Accusative NPs. In (19a) the object is in the Partitive Case. Recall that Partitive is the default objective Case in Finnish, and as such is assigned in the Specifier of VP. This means that the Specifier of AspP position is available for the Accusative adverbial, thus making (19a) grammatical. Next consider (19b) with the object bearing Accusative Case. According to the proposal in (15) above, the object in this sentence has moved into the Specifier of Aspect position. But the Accusative adverbial has to appear in the Specifier of AspP as well. Thus, both Accusative NPs compete for the same position, which results in the ungrammaticality of this sentence.

Now, compare the Finnish sentence in (19b), which is ungrammatical if an Accusative adverbial is present, with its counterpart in Russian, which is fully grammatical with or without an adverbial.

(20) Maria taskala knigu ves' vecher.
Mary carried.IMPRF book.ACC all.ACC evening.ACC
'Mary carried the book for the whole evening.'

According to my analysis, the Russian sentence in (20) has the same structure as Finnish (19a) rather than (b). This is obscured, however, by the fact that in Russian default objective Case is realized morphologically as accusative, not partitive (as in Finnish). According to Kiparsky (1998:272), Russian does not need to express the unboundedness on the VP level through Accusative-Partitive Case alternation since it is expressed through the

perfective-imperfective contrast on the verb. Thus, in Russian the verb appears in the perfective if both the verb (i.e., Asp°) and the NP are bounded, as shown in Table 4 below.

Table 4. Aspectual distinction on the verb in Russian depending on the boundedness (Kiparsky 1998:286, (42))

	[+B] object	[-B] object
[+B] verb	napisal (prf) pis'ma 'wrote the letters'	pisal (imprf) pis'ma 'wrote letters'
[-B] verb	pisal (imprf) pis'ma 'was writing the letters'	pisal (imprf) pis'ma 'was writing letters'

It follows from Table 4 that if a perfective verb has an object, this object must be [+B]. From the comparison of Tables 2 and 4 we can conclude that if the verb is in the perfective, the object has to be in the Specifier of AspP position, thus, blocking the appearance of an Accusative adverbial. This predicts, again correctly, that Accusative adverbials are incompatible with transitive perfective verbs in Russian. Thus, the ungrammaticality of (21) results from the same problem as the ungrammaticality of (19b).

(21) a. * Maria pritaschila knigu ves' vecher.
Mary carried.PRF book.ACC all.ACC evening.ACC
'* Mary brought the book for the whole evening.'

b. * Maria dochitala knigu ves' vecher.
Mary read-to-the-end.PRF book.ACC all.ACC evening.ACC
'* Mary read the book to the end for the whole evening.'

However, it cannot be maintained that perfective verbs in general are incompatible with Accusative adverbials since intransitive perfective verbs can occur with such adverbials. Whether a perfective verb can be intransitive or not depends on the perfective prefix (the sentence in (22a) is acceptable only if it is elliptical).

(22) a. * Ona dochitala.
she read-to-the-end.PRF
'* She read to the end.'

b. * Ona dochitala polchasa.
she read-to-the-end.PRF half-hour.ACC
'* She read to the end for half an hour.'

c. Ona pochitala.
she read-for-a-while.PRF
'She read for a while.'

d. Ona pochitala polchasa.
she read-for-a-while.PRF half-hour.ACC
'She read for about half an hour.'

The ungrammaticality of (22b) is explained by the fact that the verb requires an object, as shown in (22a). Yet, (22d) containing a perfective verb and an Accusative adverbial is grammatical. In this sentence the verb does not require an object, as shown in (22c). Even

though the verb is perfective, the Specifier of AspP position is available for the Accusative adverbial because no object occupies it.

To sum up so far, Accusative adverbials must occupy the Specifier of AspP position. Since there is no other position in which they must occur for thematic reasons (unlike objects), I assume that Accusative adverbials are base-generated in the [Spec, AspP]. Thus, the important difference between objects and Accusative adverbials is that the latter are base-generated in [Spec, AspP], whereas the former may move there under certain conditions. As mentioned above, movement of an object from [Spec, VP] into [Spec, AspP] is motivated by the need to check [+B] feature. In other words, the object will move only if both the Asp° and the object NP itself are specified as [+B]. In contrast, Accusative adverbials may be generated in [Spec, AspP] regardless of whether the Asp° is specified as [+B] or not. In other words, Accusative adverbials may appear with [-B] verbs. Importantly, no object can appear in [Spec, AspP] simultaneously with an adverbial. This accounts for the compatibility of Accusative adverbials with different objects in Finnish and with different forms of the verb in Russian. The distinction between two structural positions associated with different kinds of Cases allows to account for the compatibility patterns between Accusative adverbials and objects. Note here that nothing in Kiparsky's original analysis explains why no two [+B] NPs can co-occur as an object and a situation delimiting adverbial. Note that [+B] NPs can co-occur in other positions in the clause, for example, a [+B] direct object can co-occur with a [+B] subject and a [+B] indirect object.

So far, we have considered simple affirmative declarative active sentences. In the rest of this section, I will consider the so-called 'object Case alternations'. The term itself is misleading since these alternations apply not only to objects but to Accusative adverbials as well (see Mitchell 1991, Maling 1992, Ernst 1996, Haspelmath 1997). More importantly, I will show that in sentences with both an object and an adverbial these alternations apply to the adverbial rather than the object.

Consider first Finnish modal constructions. If a sentence contains a modal verb, such as *täytyy* 'must', the object must appear in the Nominative Case instead of the Accusative (that is, if both the verb and the object NP are [+B], as described above). Note that the

Partitive Case is not affected by this alternation. The fact that the Case of the subject changes as well is important for determining the proper analysis of this alternation; however, it is not relevant for this paper.

(23) a. Maria luki kirjan.
Mary.NOM read.PST book.ACC
'Mary read the book.'

b. Marian täytyy lukea kirja / * kirjan.
Mary.GEN must read book.NOM/*book.ACC
'Mary must read the book.'

c. Maria luki kirjaa.
Mary.NOM read.PST book.PRT
'Mary read a book.'

d. Marian täytyy lukea kirjaa
Mary.GEN must read book.PRT
'Mary must read a book.'

Since Partitive Case is not affected by this alternation, I conclude that the alternation targets the Specifier of AspP. As expected, the same alternation applies to Accusative adverbials (examples are from Mitchell 1991:206).

(24) a. Hän asui siellä yhden vuoden.
s/he.NOM lived there one.ACC year.ACC
'S/he lived there one year.'

b. Hänen täytyy asua siellä yksi vuosi.
s/he.GEN must live there one.NOM year.NOM
'S/he must live there one year.'

Crucially, if both an object and an adverbial are present, it is the adverbial that undergoes the alternation and has to appear in the Nominative. Thus, (25) is the only combination of Cases that is grammatical, as shown in Table 5.

(25) Marian täytyy lukea kirjaa koko ilta.
Mary.GEN must read book.PRT whole evening.NOM
'Mary must read a book for the whole evening.'

Table 5. Case combinations in modal verb constructions in Finnish

grammaticality	object	adverbial
??	NOM	NOM
*	NOM	ACC
√	PRT	NOM
??	PRT	ACC
*	ACC	NOM
*	ACC	ACC

The same situation obtains with passives and imperatives in Finnish. Thus, if a simple transitive sentence is passivized, the Case of the object changes from Accusative to Nominative (once again, Partitive is not affected); of course, the verbal morphology changes

accordingly (the next set of examples are taken from Mitchell 1991:197, (14)). Once again, I assume that the passive rule targets the Specifier of AspP.

(26) a. Hän luki kirjan.
s/he read.PST book.ACC
'S/he read the book (and finished it).'

b. Kirja luettiin.
book.NOM was-read
'The book was read (and finished).'

c. Hän luki kirjaa.
s/he read.PST book.PRT
'S/he read the book (for a while).'

d. Kirjaa luettiin.
book.PRT was-read
'The book was read (for a while).'

An Accusative adverbial can passivize as well, changing Case from Accusative to Nominative.

(27) Koko ilta / * illan luettiin.
whole evening.NOM / * evening.ACC was-read
'Somebody read for the whole evening.' (lit. 'The whole evening was read.')

As with the modal verb constructions, if both an object and an adverbial are present, it is the adverbial that undergoes the passivization, making (28a) the only grammatical combination of Cases.

(28) a. Kirjaa luettiin koko ilta.
book.PRT was-read whole evening.NOM
'Somebody was reading a book for the whole evening.'
(lit. 'The whole evening was being read a book.')

b. * Kirja luettiin koko illan.
book.NOM was-read whole evening.ACC
'Somebody was reading a book for the whole evening.'
(lit. 'The whole evening was being read a book.')

Table 6. Case combinations in passive sentences in Finnish

grammaticality	object	adverbial
*	ACC	ACC
*	ACC	NOM
*	PRT	ACC
√	PRT	NOM
*	NOM	ACC
*	NOM	NOM

Next consider Finnish imperatives. In this construction, the object appears in the Nominative Case rather than in the Accusative, as in (29a), Partitive being once again unaffected, as in (29b). Thus, as with modal constructions and passives, the alternation triggered by imperatives targets the Specifier of AspP. Once again, Accusative adverbials undergo the same alternation, as in (29c).

(29) a. Lue kirja / * kirjan !
read.IMPER book.NOM / * ACC
'Read the book (and finish it)!'

b. Lue kirjaa !
read.IMPER book.PRT
'Read a book (for a while)!'

c. Lue koko ilta / * illan !
read.IMPER whole evening.NOM / * evening.ACC
'Read for the whole evening!'

And once again, if both an object and an adverbial are present, the adverbial undergoes the alternation, but the object does not.

(30) Lue kirjaa koko ilta!
read.IMPER book.PRT whole evening.NOM
'Read a book for the whole evening!'

Table 7. Case combinations in imperative sentences in Finnish

grammaticality	object	adverbial
*	ACC	ACC
*	ACC	NOM
*	PRT	ACC
√	PRT	NOM
*	NOM	ACC
*	NOM	NOM

To recapitulate so far, in Finnish modal verb constructions, passives and imperatives, both the object and the adverbial undergo a Case alternation changing the Case from Accusative to Nominative if they appear alone in the sentence. However, if both an object and an adverbial are present, only the adverbial undergoes such an alternation, whereas the object must stay in the Partitive (recall from the discussion at the beginning of this section that if a sentence contains an Accusative adverbial, the object may not appear in the Accusative Case). At this point, I will have to disappoint the reader expecting a comparison with Russian: neither modals nor imperatives induce a Case alternation, and the passive rule is lexically determined and targets Theme arguments regardless of the Case. In fact, Themes bearing oblique Case can be passivized (for a discussion of oblique passivization in Russian, see

Fowler 1987). In what follows, I will consider Case patterns under negation in Finnish and Russian.

Both Finnish and Russian exhibit the so-called Partitive/Genitive of negation phenomenon: the object marked as Accusative in the affirmative changes Case marking to Partitive in Finnish and Genitive in Russian under sentential negation. Consider Finnish negation first. The object marked with Accusative Case in the affirmative shows up as Partitive under negation.

(31) a. Hän luki kirjan.
s/he read.PST book.ACC
'S/he read the book.'

b. Hän ei lukenut kirjaa / * kirjan.
s/he not.3.SG read book.PRT/ * book.ACC
'S/he didn't read the book.' (Mitchell, 1991:197, (12))

The same alternation applies to Accusative adverbials.[5]

(32) a. Hän asui siellä yhden vuoden.
s/he.NOM lived there one.ACC year.ACC
'S/he lived there one year.'

b. Hän ei asinut siellä yhta vuotta.
s/he.NOM not.3.SG live there one.PRT year.PRT
'S/he didn't live there a single year.' (Mitchell 1991:206, (27)-(28))

The situation in Russian is very similar to that in Finnish but not exactly the same. In Russian, the form of a direct object under negation alternates between Accusative and Genitive Case (the conditions for selection of Genitive as opposed to Accusative under negation in Russian are more complex than needs to be discussed in this paper; they have been widely investigated in both the traditional and the generative literature and I will have little to say about them here; see Magner 1955, Korn 1967, Green 1979, Babby 1979, Pesetsky 1982, Babyonyshev 1996, Pereltsvaig 1998, 1999). This alternation is due to the so-called Non-Referentiality constraint (for one possible formulation, see Pereltsvaig 1998, 1999).

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[5] According to Kiparsky (1998:287-288), Partitive of negation applies to situation delimiting adverbials only optionally, with Accusative Case marking on the adverbial as the other possibility. However, all the speakers I have consulted have rejected sentences with Accusative adverbials under negation.

(33) On ne chital knigi / knig.
he not read book.PL.ACC/ book.PL.GEN
'He did not read these/any books.'

Accusative adverbials can also appear in the Genitive of negation (Babby 1979, 1991, Pesetsky 1982:63-64, Neidle 1988, Franks 1995:34).

(34) a. Ty rabotaeš u nas uzhe mesjac.
you work for us already month.ACC
'You have already been working for us for a month.'

b. Ty u nas esche i mesjaca ne rabotaeš.
you for us yet even month.GEN not work
'You haven't been working for us for even a month.' (Babby 1991:24)

To sum up so far, both Finnish and Russian exhibit the Partitive/Genitive of negation rule that applies to both objects and adverbials. Once again, the most revealing evidence comes from the sentences with both an object and an adverbial. In Finnish, such sentences are grammatical only with the Partitive-Partitive Case combination.

(35) Maria ei lukenut kirjaa koko iltaa.
Maria not.3.SG read book.PRT whole evening.PRT
'Mary didn't read a book for the whole evening.'

Table 8. Case combinations in negative sentences in Finnish

grammaticality	object	adverbial
*	ACC	ACC
*	ACC	PRT
*	PRT	ACC
√	PRT	PRT

In accounts such as that of Maling (1992), this Partitive-Partitive pattern is explained as a result of an application of the Partitive of negation rule to both the object and the adverbial, or more accurately, to the ACC Case feature that is associated with both the object and the adverbial, as illustrated below.

(36) Subject > Object > Adverbial
| |
NOM ACC ⇒ PRT

However, this is not the only possible analysis of the data. Under the analysis developed in this paper, the Partitive-Partitive pattern results from the application of the Partitive of negation rule only to the adverbial; the Partitive of the object is not the Partitive of

negation at all, but rather a default objective Case realized as Partitive (as discussed in section 3 above). In other words, if the adverbial is in the scope of negation (a necessary condition for the application of the Partitive of negation rule), only the Case of the adverbial is affected. Note also that Maling's (1992) or Wechsler and Lee's (1996) analyses cannot account for other alternations discussed in this paper since in all of them the Case of the adverbial does not match the Case of the object.

Next, compare Finnish with Russian. Since in Russian the default objective Case is realized morphologically as Accusative (see section 3 above), we predict that the structure realized in Finnish as the Partitive-Partitive pattern with be realized in Russian as an Accusative object - Genitive adverbial pattern (this correspondence is schematized in (37) below). Thus, I predict (correctly, as shown in (38)) that the Accusative object - Genitive adverbial pattern is grammatical in Russian.

(37)	object (default objective Case)	adverbial (Case of negation)
Finnish	Partitive	Partitive
Russian	Accusative	Genitive

(38) Maria ne ela eto pirozhnoe i minuty.
Mary not eat.PST this.ACC cake.ACC even minute.GEN
'Mary didn't eat this cake even for an minute.'

However, Accusative object - Genitive adverbial pattern is not the only grammatical combination of Cases under negation in Russian. It is also possible to have a Genitive object and an Accusative adverbial, as illustrated below.

(39) Maria ne ela etogo pirozhnogo celyj god.
Mary not eat.PST this.GEN cake.GEN whole.ACC year.ACC
'Mary didn't eat this (kind of) cake for a whole year.'

Note the difference in meaning between the two sentences: (38) means that Mary ate the cake in less than a minute (she outright devoured it), whereas (39) means that for a whole year Mary didn't eat such a cake. Thus, in (38) but not in (39) the adverbial is in the scope of negation. Therefore, I propose that in (39) the adverbial cannot be assigned Genitive by the Genitive of negation rule because it is outside the scope of negation. The distinction between two kinds of temporal adverbial NPs goes back to Fowler and Yadroff (1993:252, fn. 1), who claim that "temporal adverbials are semantically ambiguous; e.g., *ves' den'* 'all day'... can be

understood as durative ('for the whole day') or scene-setting temporal locative ('the whole day long')". I maintain that the semantic distinction is realized by a distinction in syntactic positions. Thus, Accusative adverbials outside the scope of negation are different semantically (apart from the scope considerations) from Accusative adverbials that are in the scope of negation. Here, I will have little to say about the higher type of Accusative adverbials apart from the fact that they have restrictions of their own that are related to the Outer Aspect projection. This is why Accusative adverbials in (21) above cannot be interpreted as scene-setting adverbials, resulting in the ungrammaticality of these sentences.

How is the structure underlying the sentence in (39) realized in Finnish? The Genitive of negation on the object will correspond to the Partitive of negation and the Accusative Case on the adverbial is realized as Essive, as shown below.

(40)	object (Case of negation)	adverbial (outside the scope of negation)
Russian	Genitive	Accusative
Finnish	Partitive	Essive

(41) Maria ei lukenut kirjaa koko iltana.
Mary not.3.SG read book.PRT whole evening.ESS
'Mary didn't read a book for the whole evening (i.e., during the whole evening she didn't do any book-reading).'

A fact unexpected a priori, is that both the direct object and the situation delimiting adverbial cannot appear in the Genitive in Russian.[6] If Genitive of negation is taken to be an instance of Negative Polarity phenomena (as in Pereltsvaig 1998, 1999), one expects it to show up on all elements in the scope of negation. Furthermore, Franks repeatedly cites examples with the Genitive object - Genitive adverbial pattern as grammatical (Franks 1990:235, his (17); 1995:196, his (172); also Franks and Dziwirek 1993:283, their (3b)). However, such sentences are judged ungrammatical by all the speakers I have consulted. The ungrammaticality of sentences such as (42) argues against the Case feature spreading analysis

[6] An interesting contrast is provided by Polish, where both the direct object and the situation delimiting adverbial can appear in the Genitive if the adverbial is under the scope of negation (even though some speakers consider such sentences marginal). For more discussion of the Genitive of negation in Polish, see Franks and Dziwirek (1993), Franks (1995) and the references cited therein.

proposed by Maling (1992). Table 9 summarizes the Case combinations for negative sentences in Russian.

(42) * On ne chital knig i dvux chasov.
he not read book.GEN.PL even two.GEN hours
'He did not read books even for two hours.'

Table 9. Case combinations in negative sentences in Russian

scope with respect to NEG	grammaticality	OBJ	ADV
both the OBJ and the ADV are outside	√	ACC	ACC
the OBJ is outside or inside, the ADV is in	√	ACC	GEN
the OBJ is in, the ADV is outside	√	GEN	ACC
	*	GEN	GEN

The ungrammaticality of the Genitive-Genitive pattern argues strongly in favor of the view that the Genitive of negation rule targets a unique structural position.[7] However, it cannot be said that it targets only the Specifier of AspP, namely, the position where Structural Accusative Case is checked. This is so because the Genitive of negation rule affects objects of [-B] verbs such as *ljubit'* 'love' and *videt'* 'see', which are in the Specifier of VP. Thus, the target of the Genitive of negation rule must be specified as the highest NP within the Aspect projection. This specification selects the NP in the Specifier of AspP position if present, and otherwise, the NP in the Specifier of VP. Crucially, the Genitive of negation rule cannot target the Specifier of VP position if the Specifier of AspP is filled. Crucially, the Genitive of negation rule cannot target both the [Spec, AspP] and the [Spec, VP] positions, which means that the Genitive - Genitive pattern is ungrammatical.

To summarize so far, the grammaticality patterns summarized in Table 9 show that whether or not the adverbial appears in the Genitive affects whether the object appears in the Genitive (thus, only one of them can appear in the Genitive, but not both). This provides a strong argument in favor of my analysis of the Genitive on the adverbials under negation as instances of the Genitive of negation, thus challenging Franks and Dziwirek's (1993) claim

[7] I assume that subjects of unaccusatives that appear in the Genitive under negation do not raise into the subject position (presumably, [Spec, TP]), but rather receive Case in the [Spec, AspP]. As discussed by Neidle (1988:68-72), Genitive subjects of unaccusatives under negation do not pass the three tests for subjecthood: (i) subject-verb agreement, (ii) control, and (iii) anaphor binding. Moreover, the unmarked word order is Neg-V-NP:GEN,

that this Genitive is an instance of the Partitive Genitive rather than the Genitive of negation. In sum, I have presented the data involving the compatibility of Accusative adverbials with various objects and their Case patterns in Case alternation constructions (such as modal constructions, passives, imperatives and negative sentences) and explained how this intricate data can be accounted for by the analysis developed in the previous section.

5. Conclusions and Implications

The analysis developed in this paper has several important implications for a syntactic theory of adverbials, as well as for Case theory. First, this research shows that Case properties of adverbial NPs can be described purely configurationally, without an appeal to notions such as Semantic Case, which has been proposed by Babby (1986). Thus, contra Babby's claims, it is not "necessary that EST [GB, Minimalist] case theory be modified and expanded to include Semantic Case" (Babby 1986:199), at least not as far as adverbial NPs and the Genitive of negation are concerned. However, an appeal to the semantics of the adverbials under investigation is necessary to determine their structural position. In other words, this paper provides support for the view that structural positions of adverbials are not primitives by themselves (as in Cinque 1999) but are rather determined by semantic considerations (in agreement with the claims made by Ernst 1997, 1999). Second, my analysis provides a basis for explaining structural similarities between situation delimiting adverbials and direct objects, which were previously observed but not explained, such as competitions for Case and passivization of situation delimiting adverbials in Finnish. Third, this research provides further evidence in support of the claim that Structural Accusative Case is related to aspect (see Travis 1992, Borer 1994, 1996). However, I argue that not all forms that are realized morphologically as Accusatives reflect abstract Structural Accusative Case. For instance, in Russian objects that receive default objective Case are realized morphologically as Accusatives. Finally, this research sheds new light on the distinction between arguments and adverbials. In particular, it necessitates a multidimensional approach to this distinction in

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rather than NP:GEN-Neg-V. For more discussion of unaccusative subjects under negation, see Babby (1979) and Franks (1995).

which a variety of factors are at play, such as selection, referentiality and relevance for aspectual composition.

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DP Structure and Flexible Semantics

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1 Introduction

Two general paradigms have influenced the study of nominals since the middle eighties. According to the syntactic *DP hypothesis* of Abney (1987), the syntactic unit that had formerly been known as *noun phrase* should in fact be analyzed as a phrase headed by a determiner, hence the label *DP*. Figure 1 gives a simple version of the DP hypothesis, without deciding here about the category of the specifier.

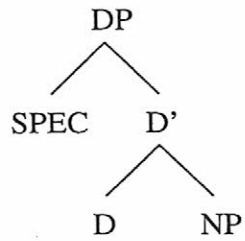

Figure 1: The DP hypothesis

Quite independently of this syntactic development, Partee (1987) proposed a *type shifting* paradigm for the semantic analysis of nominals (now called DPs). In Partee's proposal DPs are ambiguous between a referential reading of type e, a predicative reading of type $\langle e,t\rangle$ and a quantificational reading of type $\langle\langle e,t\rangle,t\rangle$. DP meanings can flexibly move between their different readings due to covert application of semantic operators.

The present paper proposes some strong relationships between these syntactic and semantic paradigms. It is argued that the structure of the DP affects its semantics in that the NP level within the DP is purely predicative and the DP level itself is purely quantificational. However, the intermediate D' level is flexible between the predicate/quantifier semantic categories, due to the covert application of semantic operators at this level. Partee's assumption, adopted from Discourse Representation Theory and more traditional approaches in philosophical logic, that some DPs need to have a (discourse) referential reading, is withdrawn. Instead of Partee's type shifting operators between the three semantic categories she assumes, two operators are used between predicates and quantifiers. The *choice function* operation of Reinhart (1997) and

Winter (1997) is used as a general operator from predicates to quantifiers. The *minimum* operator of Winter (1996) is used as a general operator from quantifiers to predicates. These two operations, referred to as *category shifting operators*, account for most of the Partee data and substantially extend the theory of flexibility to treat some intricate phenomena in the domains of coordination, plurality and scope.

Because of the proposed syntax-semantics mapping, restrictions on category shifting follow in the system from syntactic assumptions on the structure of DPs. In this way, semantic phenomena can be used as arguments for syntactic assumptions on DP structures. Some of the central syntactic claims that are made throughout this paper are the following.

- Simple coordinations of nominals using *and* and *or* can be either DPs or D's. However, complex coordinations using *both...and* and *either...or* can be DPs but not D's.
- Accusative case assignment in Hebrew using the marker *et* is at the DP level but not at the D' level.
- Verbless predicative constructions (e.g. *I consider Mary a teacher*) select for a predicative NP (e.g. *a teacher*), and not for D' (e.g. *some teacher*).
- Plural number marking of nominal conjunctions is at the D' or DP levels. Therefore, so-called "appositional" conjunctions (e.g. *an author and a teacher has passed away*) appear only with NPs but not with D's and DPs (e.g. **some author and some teacher has passed away*).

Section 2 reviews Partee's type shifting paradigm. Section 3 introduces the category shifting proposal of Winter (1998b) and its differences from Partee's system. Section 4 develops and supports the proposed hypothesis about the relationships between DP structure and flexible semantics.

2 Partee's type shifting paradigm

According to Partee, the initial interpretations of different DPs can be of different types. So-called "referential" DPs like proper names and pronouns are lexically of type e as in discourse representation theory. "Quantificational" DPs like *every student* and *no student* basically denote generalized quantifiers of type $\langle\langle e,t\rangle,t\rangle$ following the Montagovian tradition. This happens due to the lexical meaning of the words *every* and *no* as functions from noun denotations to generalized quantifiers. Whether there are also DPs that are basically of the predicative type $\langle e,t\rangle$ is not completely clear from Partee's assumptions. In any case, all DPs under Partee's proposal can have any of the three types available for DP meanings. This is achieved by virtue

of type shifting operators that cover the six possibilities to move from one type to the other.[1] Without reviewing the semantic details in the formalization of these operators, let us briefly review their applications in Partee's proposal.

One of the reasons for Partee to adopt a predicative reading of type $\langle e, t\rangle$ for DPs are *be* sentences like the following.

(1) a. This woman is Mary.

b. This woman is no friend of mine.

c. This woman is the/a teacher.

Unlike previous proposals (e.g. Quine (1960:97,114-5)), Partee does not assume any difference between "*be* of identity" and "*be* of predication". The copula can be treated as having no semantic contribution of its own (though see remark in Partee (1987:137)). In sentences like *this woman is tall*, this straightforwardly accounts for how the $\langle e, t\rangle$ adjective applies to the subject. In "identity sentences" like (1a), the copula still has no meaning, and the semantics of the sentence is derived by using a phonologically covert operator, which maps the e type meaning of the proper noun *Mary* to the $\langle e, t\rangle$ type meaning of the predicate holding only of Mary. In a similar way, Partee lets the DP following the copula in (1b) denote an $\langle e, t\rangle$ predicate. This is achieved by a lowering operation that applies to the $\langle\langle e, t\rangle, t\rangle$ meaning of the DP following the copula. In the case of the in/definite DPs in (1c) there are two possibilities to interpret Partee's proposal. One traditional possibility is to assume that the DPs in this case are basically of type $\langle e, t\rangle$ and then no type shifting operation needs to apply. Under this possibility, however, we expect type shifting to apply to in/definites in argument positions. Another possibility is to assume that in/definites are basically of the types e or $\langle\langle e, t\rangle, t\rangle$, which are suitable for argument positions, but then a type shifting operator maps them to type $\langle e, t\rangle$ in predicative positions as in (1c).

Partee does not compare her flexibility approach to the traditional analysis of the copula as ambiguous. However, one advantage of Partee's approach is that it can straightforwardly account for the interpretation of sentences like the following.

(2) The place we're looking for is either Oslo or in the north of Norway.

Under traditional assumptions, a sentence like *the place we're looking for is Oslo* must be analyzed using "*be* of identity". A sentence like *the place we're looking for is in northern Norway* must be analyzed using another "*be* of predication". This leaves cases like (2) unanalyzed, because in such cases the copula must have both functions. In Partee's system, the denotation of

[1] The six operators I refer to here are Partee's *lift, lower, ident, iota, A* and *BE*. I ignore some other operators in Partee's paper that are irrelevant for our present purposes. As mentioned below, the main results of Partee's proposal can in fact be achieved using less than six different operators.

Oslo in (2) can be predicative (type $\langle e,t\rangle$), hence it has no problem to appear in a coordination with the predicate denoted by the prepositional phrase. The copula in Partee's analysis can remain meaningless, and it does not intervene the semantic predication process.

We have seen reasons to assume mapping from types e and $\langle\langle e,t\rangle,t\rangle$ to the $\langle e,t\rangle$ type of DPs in predicate positions. Another reason for Partee to assume type flexibility is the interpretation of coordinations in the singular like *Mary or Sue* and *neither she nor every other student*. Such cases motivated the Montague treatment of DPs in type $\langle\langle e,t\rangle,t\rangle$, which allows a simple boolean analysis of the coordination (cf. Keenan and Faltz (1985), Winter (1998b:ch.1)). In Partee's system, where proper names and pronouns are basically of type e, they need to be shifted to the generalized quantifier type in such cases of coordination. This is a motivation for a type shifting operator from type e to type $\langle\langle e,t\rangle,t\rangle$. We end up with two or three type shifting operators that are strictly necessary in Partee's system.[2]

To summarize, Partee's proposal has the following important characteristics:

1. All DPs are ambiguous between types e, $\langle e,t\rangle$ and $\langle\langle e,t\rangle,t\rangle$.
2. Two or three type shifting operators between these types.
3. Coverage: singular predicative DPs, singular coordinations of DPs.
4. No distinction between *be* of identity and *be* of predication.

3 The category shifting alternative

In Winter (1998b:ch.4) I propose an alternative to Partee's view that combines ideas of previous work on the scope of indefinites and collective coordination into a system of so-called *category shifting principles*. In this proposal, unlike Partee's system, DP meanings can be of only two semantic categories: *quantificational* (+Q) and *predicative* (−Q). The quantificational/predicative distinction between DP meanings is expressed using the ±Q feature and not using semantic types. This modification is made for reasons that have to do with the semantics of plurals and are quite irrelevant for the purposes of the present paper. The referential (type e) meaning of DPs, which is not very operative in Partee's system, is withdrawn. As in classical (extensional) Montague grammar, proper names are assumed to be *lexically* quantificational

[2] If all DPs are basically of the types $\langle\langle e,t\rangle,t\rangle$ or e, then the type shifting operators that are strictly required to achieve the analyses sketched above are *lift* (from e to $\langle\langle e,t\rangle,t\rangle$) and *BE* (from $\langle\langle e,t\rangle,t\rangle$ to $\langle e,t\rangle$). The operator *ident* from e to $\langle e,t\rangle$ is derived by applying these two operators sequentially. If simple in/definites are traditionally of type $\langle e,t\rangle$ (as argued below), then at least one additional operator from type $\langle e,t\rangle$ (*A* or *iota*) is required for such DPs in argument positions.

(+Q). For instance, the proper name *Mary* denotes the set of predicates that hold of Mary, and not simply the *e* type individual for Mary herself.

There are two category shifting operations in the proposed system. One operator, from +Q meanings to −Q denotations, is based on the *choice function* (CF) approach of Reinhart (1997).[3] Roughly speaking, choice functions are functions that pick an individual from the extension of a predicate. For instance, if the extension of the predicate denoted by the noun *student* holds only of Mary, John and Sue (i.e. Mary, John and Sue are the only students), then any CF applying to the noun *student* gives one of these three entities. Since we assume now that there are no DPs with "referential" meaning, it is natural to follow the alternative implementation of CFs in Winter (1997). Under this implementation, a CF applying to a non-empty noun denotation derives the *generalized quantifier* that corresponds to an entity in this extension. This treatment allows a straightforward solution to the problem of how to define CFs for the case where the noun's denotation is empty, as it is reasonably the case with nominals like *unicorn*, *angel* and *round square*. We let CFs in such cases map the empty noun denotation to the *empty generalized quantifier*: the set that contains no sets whatsoever. This definition of CFs correctly analyzes sentences like *Mary drew a round square* as false, as in more standard techniques of quantification.

The main motivation for introducing CFs into the system is the *wide scope* (WS) interpretation of indefinite DPs. Consider for instance the following sentence, a variation on an example from Fodor and Sag (1982).

(3) Prof. Smith will rejoice if a student of mine fails on the exam.

Under the *narrow scope* (NS) reading of the indefinite in (3), Prof. Smith will rejoice if *any* student of mine fails on the exam. However, the sentence also has a wide scope interpretation under which it claims that there is a *particular* student of mine whose failure will make Prof. Smith happy. Reinhart argues that both readings should be captured using CFs, as in the following informal analyses of sentence (3).

(4) a. Prof. Smith will rejoice if $\exists f$[CF(f) $\wedge$ f(a student of mine) fails on the exam] (NS reading)

b. $\exists f$[CF(f) $\wedge$ Prof. Smith will rejoice if f(a student of mine) fails on the exam] (WS reading)

We assume that an indefinite like *a student of mine* basically denotes a predicate (−Q) that is mapped to a quantifier (+Q) using the CF variable f. *Existential closure* (EC) of this variable may apply at any compositional level. When EC applies at the subordinate clause level as in

[3] See also Egli and von Heusinger (1995) and Kratzer (1998), among others.

(4a), we obtain the NS reading. When EC applies at the matrix level, it generates the WS interpretation as in (4b). Crucially, the latter reading is derived without any syntactic mechanism that pulls the indefinite out of the adjunct island created by the conditional. Therefore, Reinhart argues that the syntactic theory of scope assignment can remain compatible with the more general theory of island-restricted movement. This retains one of the main motivations for the unified theory of scope and extraction in May (1977).

The only departure in the present work from the assumptions in Reinhart (1997) and Winter (1997) is that CFs are now treated not as a construction specific operation for indefinite DPs, but rather as a general category shifting mechanism mapping predicative DP meanings to quantificational ones. The category shift used in the opposite direction, from quantifiers to predicates, is the *minimum operator* of Winter (1996). The main motivation for the introduction of the *min* operator in that paper is the interpretation of DP conjunctions as in the following sentence.

(5) Mary and John are a good team.

As mentioned above, the proper names *Mary* and *John* are standardly assumed to denote generalized quantifiers. Conjunction between these two quantifiers is standardly obtained using the set intersection operation ($\cap$). This leads to the generalized quantifier containing all the predicates that hold of both Mary and John. To get the collective reading of (5), the minimum operator maps the resulting quantifier to a predicate holding (only) of the *collection* of Mary and John. Further application of the CF mechanism picks this collection from the predicate, and hence the sentence ends up getting the correct meaning. This two stage process of category shifting is more formally illustrated below.

(6) $\exists f$[CF(f) $\wedge$ $f(\mathit{min}(\text{Mary} \cap \text{John}))$ are a good team]

This analysis, combining the *min* operator with the CF existential operator allows us to retain the Boolean analysis of *and* (Keenan and Faltz, 1985) also for sentences like (6), which have often been claimed to show evidence for another, non-Boolean, reading of *and* (cf. Hoeksema, 1983; Link, 1983). However, the fact that no language shows a morphological distinction between Boolean conjunction and non-Boolean conjunction suggests that a unified treatment of conjunction as in Winter (1996) is advantageous.

After introducing the initial motivations for the CF and *min* category shifts, let us move on to their implementations for the constructions that motivated Partee's type shifting system. In predicative constructions like *this woman is the/a teacher* as in (1c), we explicitly assume now that the in/definite basically denotes a predicate ($-$Q), so the analysis of the whole sentence is straightforward under the common assumption that the copula *be* has no contribution to its meaning. The indefinite article *a* also has a null meaning, or denotes the identity function, so that the indefinite *a teacher* ends up synonymous to the noun *teacher*.[4] Under this analysis,

[4]The case of the English article *some* is somewhat different, as will be discussed below.

English semantically reflects a phenomenon that is overt in languages like Hebrew, which can do away with both the copula and the indefinite article in such cases (see below). The definite article *the* is analyzed as a predicate modifier: a function from predicates to predicates. The role of this modifier is to impose uniqueness by ruling in sets with exactly one member (singletons) and ruling out non-singleton sets. Under a Russellian analysis of definiteness, *the* maps any singleton to itself and every non-singleton to the empty set. Formally – for every set A: *the*(A) is defined as A itself if $|A| = 1$ and as the empty set otherwise. Because both indefinites and definites are assumed to basically denote predicates, their interpretation in predicative position is straightforward. In argument positions, interpretation is uniformly achieved using the CF category shift. For instance, the sentences in (7) get the analyses in (8) respectively.

(7) a. A teacher smiled.

b. The teacher smiled.

(8) a. $\exists f$[CF(f) $\wedge$ f(teacher) smiled]

b. $\exists f$[CF(f) $\wedge$ f(the(teacher)) smiled]

For sentences like *this woman is Mary* (=(1a)), recall our Montagovian assumption that proper names basically denote generalized quantifiers. Such sentences are analyzed using the *min* category shifting operation, which maps the quantifier denotation of *Mary* to a predicate. Using this operator, Partee's original therefore become unnecessary. Coordinations like *Mary or Sue* require no category shifting whatsoever and they are simply analyzed using generalized quantifiers as in traditional extensional Montague Grammar.

Partee allows all DPs to undergo type shifting. In the alternative developed here, however, many DPs are not allowed to undergo category shifting. This will be one of the main points of the discussion below. Specifically, sentences like *this woman is no friend of mine* (=(1b)) are left here with no straightforward analysis. The reason is that unlike Partee's line, the present system takes DPs like *no friend of mine* to denote "rigid" quantifiers, which cannot be mapped to predicative meanings. Like Doron (1983:160-1), I speculate that in cases like (1b) the function of the word *no* is to express predicate negation or sentential negation, and it does not appear in its usual determiner function. Hence, the DP does not start here with its regular quantificational meaning as in argument positions and no category shifting needs to apply. Unlike Partee, and in agreement with Williams (1983) (cf. Partee 1987, p.132), I believe that such grammatical appearances of "real quantificational" DPs in predicative positions are marked and require a more sophisticated syntactic analysis than in Partee's assumptions. For more discussion of this point see Winter (1998b:154-6).

In addition to the treatment of singular DPs as in Partee's paper, the semantic system in Winter (1998b) addresses many problems of plurality and DP interpretation. We have already

seen the analysis of plural conjunctions like *Mary and John* in (5) above. A further analysis which is relevant for the present paper is the treatment of simple numeral indefinites like *three students* and plural definites like *the students*. Like the singular in/definites *a/the student* discussed above, these plural DPs are treated as basically predicative. The numeral *three* is assumed (as in Link (1987), among others) to denote a predicate modifier. Thus, *three students* denotes the set of collections of students with exactly three members. The definite article with plural nouns is treated following Sharvy (1980) and Link (1983) as a "maximality/uniqueness inducer". Thus, *the students* denotes the predicate holding of the unique maximal collection of students, in case there is such a collection. These assumptions lead to a straightforward analysis of plural in/definites in predicate positions as in (9) below. In argument positions as in (10) the analysis using CFs is analogical to the analyses in (8) of singular in/definites.

(9) Those women over there are three/the students in my class.

(10) Three/the students smiled.

For this reason, wide scope effects with plural numeral indefinites are analyzed in an analogous way to the analysis (4) of the singular indefinite in (3). For instance, sentence (11) below has a reading, paraphrased in (12), where the plural indefinite *three students* takes existential scope over the conditional.[5]

(11) Prof. Smith will rejoice if three students of mine fail on the exam.

(12) There are three students of mine such that Prof. Smith will rejoice if they all fail on the exam.

It should be mentioned that the formal treatment of plurals in Winter (1998b:ch.4) makes use of another version of the CF operator, needed to derive distributivity at the DP level. However, this complication is quite irrelevant for our present purposes.

To summarize, in comparison to Partee's proposal as reviewed above, the present proposal has the following characteristics:

1. Some, but not all, DPs are ambiguous between the semantic categories $\pm Q$. Other DPs are unambiguously $+Q$.

2. Two category shifting operators mediate between the two semantic categories of flexible DPs:

   (a) From $-Q$ to $+Q$: the choice function mechanism.

[5]Existential scope should be distinguished from the scope of distributivity of plural DPs. For an extensive discussion of this point, elaborating on observations by Ruys (1992), see Winter (1997,1998b:ch.3).

(b) From +Q to −Q: the minimum operator.

3. Coverage: singular and plural predicative DPs, singular and plural coordinations of DPs (using only boolean coordination), scope of indefinites.

4. No distinction between *be* of identity and *be* of predication (as in Partee's proposal).

4 The flexible DP hypothesis

The first aspect mentioned above of the proposed system is one of the main modifications it introduces in Partee's conception. All DPs in the proposed analysis have a quantificational meaning. However, only some DPs have an additional predicative meaning, while others have no such interpretation and are therefore "purely quantificational". The theory has now to determine which DPs belong to which of the two classes. To get an idea of the centrality of this problem, let us review some examples of DPs that should not be given a flexible meaning and of the problems that may appear if they are.

Consider first DPs in predicate positions. The following sentences are clearly much less acceptable than the sentences in (1).

(13) a. *This woman is every teacher I know.

b. *This woman is no friend of mine except Mary.

Partee's system allows all DPs to have a predicative meaning and to appear in predicative positions. The only reason sentences like (13) may be ruled out under Partee's (1987:119) approach is pragmatic: that the interpretations her system assigns to them express "unsatisfiable or otherwise degenerate" propositions. However, this reasoning is not quite solid: in Partee's system the sentences in (13) are analyzed as equivalent to the following (acceptable) statements, respectively.

(14) a. This woman is the teacher I know.

b. This woman is Mary and she is not a friend of mine.

Sentence (13a), like (14a), is analyzed in Partee's system as contingent in case there is exactly one teacher I know, and pragmatically/semantically deviant otherwise. Sentence (13b), under virtually all analyses of *except*,[6] becomes equivalent in Partee's system to the statement in (14b). Because the sentences in (14) are pragmatically acceptable, we may conclude that in Partee's system there must be a syntactic or semantic reason for the ill-formedness of the sentences in (13), contrary to her assumptions.

[6]See Moltmann (1995) and Lappin (1996), and the references therein.

In the present proposal there are many more potential problems of this sort. Consider for instance the following contrastive pairs of sentences.

(15) a. Mary and John are a good team. (=(5))

b. *Both Mary and John are a good team.

(16) a. The teachers a good team.

b. *All the teachers are a good team.

(17) a. Three teachers I know are a good team.

b. *Exactly three teachers I know are a good team.

In sentences (16a) and (17a) we can analyze the collectivity effect by applying the same method we used in (6) for analyzing sentence (15a) (=(5)).[7] Similar collective interpretations are clearly unavailable in the *b* cases, and hence some principle must block application of category shifting in these sentences.[8]

What the examples above show is that we should impose restrictions on the class of DPs where collective interpretations are allowed, and therefore on the application of the *min* operator that derives them. A similar point holds for the phenomenon of wide scope beyond islands, which motivated the CF operation. As mentioned in previous work on the scope of indefinites,[9] complex numerals like *exactly one student* or *at least three students* seem to differ from simple indefinites (e.g. *some/a student*) and simple numerals (e.g. *three students*) in not allowing wide scope readings beyond island boundaries. Consider for example the contrasts between the following pairs.

(18) a. Prof. Smith will rejoice if a student of mine fails on the exam. (=(3))

b. Prof. Smith will rejoice if exactly one student of mine fails on the exam.

(19) a. Prof. Smith will rejoice if three students of mine fail on the exam. (=(11))

b. Prof. Smith will rejoice if exactly three students of mine fail on the exam.

While we have seen above that sentence (18a) can be interpreted with the indefinite taking scope over the conditional, this is hardly the case in (18b), with the complex numeral *exactly one*. The sentence cannot mean that there is exactly one student of mine whose failure in the

[7] In the case of (16a) and (17a) the *min* operator is even unnecessary, as we assume that *the teachers* and *three teachers* are basically predicative, so the CF mechanism can apply to them directly.

[8] The acceptability of sentences (16b) and (17b) ameliorates when the predicate is replaced by other collective predicates like *meet* or *gather*. For an extensive study of this phenomenon and the semantics of the resulting sentences see Winter (1998a,1998b:ch.5,1999).

[9] See Liu (1990), Beghelli (1995) and Corblin (1997).

exam will make Prof. Smith happy. Rather, sentence (18b) only has the narrow scope reading of the indefinite, where Prof. Smith is strangely interested in the exact number of students who fail on the exam, and will rejoice if this number is one. In a similar way, sentence (19a), but not (19b), has a wide scope reading for the indefinite over the conditional. The conclusion is that the CF mechanism should be restricted so that it does not apply to modified numeral indefinites.

In addition to these needed restrictions on category shifting, there is another central question that the theory of flexibility needs to answer, and this has to do with the "initial" semantic category of flexible DPs. We have assumed above that proper names like *Mary* and *John* are lexically quantificational as in traditional Montague Grammar, whereas simple definites and indefinites are basically predicative. This decision may seem quite arbitrary, as category shifting anyway allows all these DPs to have both a quantificational and a predicative reading, independently of their initial semantic category. As things stand, no empirical reason was shown for the assumed choice of the initial $\pm$Q value.

To summarize: we want the theory to give principled answers to the following questions:

(i) Which DPs are flexible between predicates and quantifiers and which DPs rigidly denote quantifiers?

(ii) Of the flexible DPs, which ones start as predicates and which start as quantifiers?

As a working hypothesis for the study of these questions, I propose the following general assumption on the relationships between DP structure (cf. figure 1) and flexible semantics.[10]

The flexible DP hypothesis: *The DP level is rigidly quantificational. The NP level is rigidly predicative. The D' level is flexible between the two semantic categories.*

Using this hypothesis, we classify the following kinds of DPs:

1. *Rigid DPs*: DPs with a filled SPEC position. These DPs are assumed to be purely quantificational because the SPEC position denotes a function from predicates to generalized quantifiers (a semantic determiner).

2. *Flexible DPs*: DPs with an empty SPEC position. These include:

   (a) DPs with a filled D position. These DPs are assumed to be initially quantificational because D, like SPEC, denotes a semantic determiner function. However, since category shifting may freely apply at the D' level, these DPs can denote predicates as well.

[10]For a somewhat different proposal about the relationships between the DP's semantics and its internal structure see Zamparelli (1996) as well as the references therein.

(b) DPs where also the D position is empty. These DPs are initially predicative, because NP, like AP, is a phrase that is headed by a predicate denoting lexical element. Such DPs can also denote quantifiers due to category shifting at the D' level.

By way of abbreviation, let us refer to the two sub-classes of flexible DPs as **D's** and **NPs** respectively.

This *a priori* division of DPs into the three classes, with their different semantic properties, follows from the flexible DP hypothesis. The actual classification of various DPs as rigid, D's or NPs is a complex syntactic-semantic decision that should be empirically motivated. Thus, questions (i) and (ii) above are now stated in the following terms.

(i') What are the criterions that distinguish between flexible DPs (=NPs and D's) and rigid DPs?

(ii') What are the criterions that distinguish between NPs and D's?

In this paper I am able to address only a small part of the numerous ramifications of these questions for syntax and semantics. The rest of this section will show the assumptions about DP structure that are needed to account for the semantic data above, as well as more evidence for them.

4.1 Flexible DPs vs. rigid DPs

The criterions employed above for deciding on the flexible/rigid status of DPs were the following:

1. *Collectivity*: Flexible DPs show collectivity effects with predicates like *be a good team*, whereas rigid DPs do not.

2. *Wide scope*: Flexible DPs can take existential scope over syntactic islands,[11], whereas rigid DPs can not.

3. To a lesser extent: grammaticality in *predicative positions*. Flexible DPs easily appear in predicative positions (e.g. following the copula), whereas rigid DPs are syntactically or semantically marked in this position.

[11]This is especially clear with simple indefinites like *some/a student* and *some/three students*. With many other DPs that are assumed to be flexible it is not easy to prove this claim, simply because their WS readings are equivalent to their NS readings. However, Winter (1998b:175) follows Rooth and Partee (1982) and argues that also proper name disjunctions show wide scope effects in sentences like *if Bill praises Mary or Sue then John will be happy.*

An additional straightforward criterion for distinguishing flexible DPs from rigid DPs comes from X-bar theory. Complex numerals like *more than three, between two and four, fewer than five* must sit in SPEC, while bare numerals like *three* can sit lower within the DP (see Danon (1996) and Reinhart (1997)). Thus, the former DPs should be classified as rigid and the latter as flexible, in agreement with the other criterions.

An especially interesting test case for the distinction between flexible DPs and rigid DPs is the case of conjunction. Since we assume that proper names have an empty SPEC, they can be analyzed at the D' level.[12] Under the standard categorical identity requirement of coordination, it follows that proper name conjunctions can also be D', hence flexible. This is expected by other considerations as well, as we have already seen in (15a) that proper name conjunctions have a collective interpretation. In general, the system correctly predicates that a coordination of flexible DPs (D's) is also a flexible DP (D'). For instance, the subject in the following sentence is a coordination of two flexible DPs (D's) and it indeed has a collective reading.

(20) Mary and four other women I know are a good basketball team.

However, when one of the elements in the coordination is rigid (has a non-empty SPEC), the whole coordination must be a DP coordination, hence it must be semantically rigid. This prediction is borne out in the following sentence, contrasted with (20).

(21) *Mary and exactly four other women I know are a good basketball team.

Because the second conjunct is assumed to be a DP (with a filled SPEC position), also the first conjunct must be analyzed as a DP (with an empty SPEC). Therefore, the whole subject is also analyzed as a DP, which allows no category shifting. Collective readings are therefore correctly ruled out.

A second notable point about coordination is the distinction between conjunctions like *Mary and John* and conjunctions like *both Mary and John*. Because of contrasts as in (15) above, we assume that *Mary and John* is a flexible DP whereas *both Mary and John* is rigid. This agrees with a syntactic observation by Neijt (1979), who points out contrasts as in the following phrases.

(22) every (*both) man and woman, three/most (*either) men or women

(23) very (*both) tall and thin, ten meters (*both) above the house and below the cloud

According to Neijt, such contrasts show that while *and* and *or* can apply at the X' level, complex coordinations like *both...and* and *either...or* require a full XP. Thus, our assumption that *both Mary and John* is unambiguously a (rigid) DP whereas *Mary and John* can be analyzed as D' has evidence coming from general phrase structure.

[12]Whether proper names are D's or NPs is not relevant at this stage, but see the discussion below.

In Hebrew, this syntactic distinction between *both...and/either...or* and "bare" *and/or* coordinations has further evidence coming from the accusative marker *et*. This particle obligatory precedes proper names and other definite DPs in object positions, as in the following sentences.

(24) dan makir et rina/ ha-mora
Dan knows ACC Rina/ the-teacher
"Dan knows Rina/the teacher"

When the object is a simple *and/or* coordination, there are two options: either *et* precedes the whole coordination or there is a separate *et* for each conjunct. This is illustrated below.

(25) i. dan makir et rina ve/o sara
Dan knows ACC Rina and/or Sara
"Dan knows Rina and/or Sara"

ii. dan makir et rina ve/o et sara
Dan knows ACC Rina and/or ACC Sara
"Dan knows Rina and/or Sara"

However, when the coordination is the Hebrew parallel to *both...and* (*gam...ve-gam*) or the parallel to *either...or* (*o...o*), the accusative marker *et* must precede each conjunct separately. This is shown by the following examples.

(26) a. i. * dan makir et gam rina ve gam sara
Dan knows ACC too Rina and too Sara

ii. dan makir gam et rina ve gam et sara
Dan knows too ACC Rina and too ACC Sara
"Dan knows both Rina and Sara"

b. i. * dan makir et o rina o sara
Dan knows ACC or Rina or Sara

ii. dan makir o et rina o et sara
Dan knows or ACC Rina or ACC Sara
"Dan knows either Rina or Sara"

If we naturally assume that DPs, but not D's, are assigned accusative case using Hebrew *et*, then these contrasts follow from our previous assumptions. Namely, when the coordination is a simple *ve/o* (*and/or*) coordination, each conjunct can be analyzed as a D' and then only the complex DP needs to be assigned case using *et*. However, when the coordination is using the

more complex construction *gam...ve-gam/o...o*, we must have two separate DPs, which require two separate *et*'s.[13].

A closely related fact was noticed in an unpublished work by Dorit Ben-Shalom and Ziva Wijler, who argue that DP conjunctions with double *et* can be interpreted only distributively. The following example from Winter (1998b:185) supports this claim.

(27) dilan avar be-mispar ha-širim še katav et simon ve garfunkel
Dylan exceeded in-number the-songs that wrote ACC Simon and Garfunkel

"Dylan wrote more songs than Simon and Garfunkel"

(28) dilan avar be-mispar ha-širim še katav et simon ve et
Dylan exceeded in-number the-songs that wrote ACC Simon and ACC
garfunkel
Garfunkel

"Dylan wrote more songs than both Simon and Garfunkel"

As the English translations indicate, there is a semantic difference between sentence (27) and sentence (28). Suppose that Dylan wrote more songs than what the couple Simon and Garfunkel wrote *together*, but suppose further (unrealistically) that Dylan wrote less songs than Simon and also less songs than Garfunkel. In this situation sentence (27) can be interpreted as true but (28) is univocally false. Thus, the doubly accusative marked conjunction *et simon ve et garfunkel* in (28) must be read distributively. This is what we expect if, as assumed above, *et* applies only at the DP level and DP conjunctions are rigid, hence unambiguously distributive.

To conclude, from the syntactically plausible assumption that *both...and* and *either...or* apply with DPs and not D's, we are able to derive not only the lack of collectivity with these constructions as witnessed in (15b), but also some further facts concerning the distribution of accusative marking in Hebrew.

4.2 NPs vs. D's

So far, we have concentrated only on the distinction between rigid DPs and flexible DPs (NPs as well as D's). Now it is time to address question (ii) above about the distinction between NPs and D's. From the flexible DP hypothesis it follows that D's are initially quantificational whereas NPs are initially predicative. The semantic category of both kinds of flexible DPs can be shifted of course, but only at the D' level. There are two, seemingly independent, effects that I will argue correspond to the NP/D' distinction within the DP: the phenomenon of *verbless predication* and the so-called *appositional* use of conjunction. I propose that NPs can appear

[13]Thanks to Tanya Reinhart for discussion

with no overt copula in predicative constructions and allow appositional conjunction, while D's require an overt copula and rule out appositional uses of conjunction (described in terms of number marking).

4.2.1 Verbless predication

A well-known cross-linguistic fact is the contrast between DPs with respect to the obligatory/optional status of the copula in various predicative constructions.[14] In English, this contrast can be illustrated using "small clauses" like the following.

(29) a. John considers this woman to be *a good teacher/the best teacher/Mary/some good teacher I know/you.*

b. John considers this woman *a good teacher/the best teacher/*Mary/*some good teacher I know/*you.*

(30) a. I found John my strongest supporter.

b. *I found my strongest supporter John.

While all the italicized DPs in (29a) appear with an overt *be* copula, only two of them are allowed in (29b) where the copula is missing. A similar contrast is illustrated in (30), where the definite *my strongest supporter* is allowed without a preceding copula, but the proper noun *John* is not.

As pointed out by Doron (1983), in Hebrew this kind of contrasts is more easily visible than in English. Hebrew also allows matrix sentences to appear with no overt copula, similarly to English small clauses. With the Hebrew bare indefinite in (31) and the definite in (32), the copula is only optional as with the English *a* indefinite and definite in (29).

(31) ha-xavera haxi tova šeli (hi) mora.
the-friend most good of-I (is) teacher
"My best friend is a teacher"

(32) dana (hi) ha-mora, lo at!
Dana (is) the-teacher, not you
"Dana is the teacher, not you!"

By contrast, the Hebrew copula is obligatory with proper names, pronouns and *eize* (*some*) indefinites, as illustrated below.

[14] See Doron (1983), Higginbotham (1987), Rapoport (1987), and Zaring (1996), among others.

(33) a. *ha-xavera haxi tova šeli dana.
the-friend most good of-I Dana

b. ha-xavera haxi tova šeli hi dana.
the-friend most good of-I is Dana
"My best friend is Dana"

(34) a. *ha-mora at, lo dana!
the-teacher you, not Dana

b. ha-mora hi at, lo dana!
the-teacher is you, not Dana!
"The teacher is you, not Dana!"

(35) a. *dana eizo mora še-ani makir.
Dana some teacher that-I know

b. dana hi eizo mora še-ani makir.
Dana is some teacher that-I know
"Dana is some teacher I know"

As Doron further observes, the presence/absence of the copula corresponds to the presence/absence of a wide scope reading for a bare indefinite in the predicate position. Thus, while the sentence in (36a) is scopally ambiguous, as indicated by the translation, this is is not the case in (36b), where the copula is missing.

(36) a. rina ša'ala im dani hu psantran še-šaxaxti et šmo
Rina asked if Dani is pianist that-forgot-I ACC name-his
"Rina asked whether Dani was a pianist whose name I had forgotten" or: "There is a pianist whose name I forgot and Rina asked whether Dani was that pianist"

b. rina ša'ala im dani psantran še-šaxaxti et šmo
Rina asked if Dani pianist that-forgot-I ACC name-his
"Rina asked whether Dani was a pianist whose name I had forgotten"

Summarizing, there are two kinds of DPs with respect to the status of the copula in predicative constructions:

(37) Optional copula:

a. definites

b. *a*/bare indefinites interpreted narrowest scope

(38) Obligatory copula:

a. proper names and pronouns

b. *some/eize* indefinites (all scopes)

c. *a*/bare indefinites interpreted wide scope

Let us assume that the DPs in (37) are initially NPs, whereas the DPs in (38) are initially D'. Verbless predicative constructions require NP and an overt copula requires D'. Thus, for the sake of presentation we can assume that a predicative VP in a Hebrew matric sentence or an English small clause of the form DP-VP is introduced by one of the following rules, where BE is a morphological realization of the copula.

VP $\rightarrow$ NP

VP $\rightarrow$ BE D'

The scope effect observed by Doron in (36) gets a straightforward account in this system. Since choice functions apply only at the D' level, their introduction requires an overt copula as in (36a). This is the origin of the wide scope reading in this case. When the copula is missing as in (36b), the only possible analysis of the predicative nominal is as an NP, where CFs cannot apply. Hence, the sentence does not have any wide scope interpretation for the predicative indefinite.

The analysis of proper nouns deserves some elaboration. According to the copula test, proper nouns are D's since they require an overt copula. However, this is not always the case. As pointed out by Partee (1987) and Zwarts (1992), among others, proper nouns often behave like "ordinary" nouns, as in examples like *he is a real Einstein, the Vermeer she bought is beautiful*, etc. I propose that proper nouns are in fact "ordinary" nouns that come from the lexicon with a D' structure that semantically imposes uniqueness on the noun denotation. Syntactically, let us assume the following (possibly lexical) structure for English proper nouns, with an empty definite article ϕ_{the} and an empty determiner ϕ_{cf} with the meaning of a choice function variable.

(39) $[_{\text{D'}}\ \phi_{\text{cf}}\ [_{\text{NP}}\ \phi_{\text{the}}\ \text{N}]]$

Semantically, as in the case of regular definites (cf. (7b)-(8b) above), the empty definite article imposes uniqueness and the choice function has no alternative but to "choose" the unique element from the noun's denotation. The noun can also appear without the additional D' structure and then it behaves like any other "ordinary" noun. In Hebrew, Doron points out that it is precisely those situations where the uniqueness requirement of proper nouns is relaxed that allow them to appear without a copula. Doron's example is along the lines of the following.

(40) ha-yom dana trocki ve-sara lenin
today Dana Trotsky and-Sara Lenin

"Today Dana is Trotsky and Sara is Lenin"

In the context of a play about the Russian revolution, where Dana plays Trotsky and Sara plays Lenin, (40) is perfectly acceptable. In such a context, however, the proper nouns *Trotsky* and *Lenin* lose their uniqueness requirement, as there may be many Trotskys and Lenins in such plays. Thus, these proper nouns in (40) behave more like ordinary Hebrew bare indefinites. In principle, we may assume that the D' analysis of "proper nouns" is available for all nouns, and that the question of which nouns prominently appear as "proper" (with a D' structure) and which nouns tend to function as "bare" Ns is primarily an extra-grammatical matter of language use. This line of reasoning expects a third kind of nouns: ones with only an NP structure without the additional D' level. Such bare nouns would behave like the English/Hebrew definite, allowing verbless predication, but imposing uniqueness without any overt definite article. Possibly relevant examples may include the English noun *president* (as in *John is president*, cf. Partee, 1987:125) or languages like Polish and Russian, which express uniqueness without definite articles.

Additional evidence for the present approach comes from the contrast between the following Hebrew sentences.

(41) a. (shtey) ha-našim halalu hen soferet ve-mora.
(two) the-women these are author and-teacher
"These (two) women are an author and a teacher"

b. *(shtey) ha-našim halalu soferet ve-mora.
(two) the-women these author and-teacher

In (41a) there is an overt copula and the sentence has a coherent interpretation, asserting that one of the women under discussion is an author while the other is a teacher. In (41b), where the copula is omitted, the sentence becomes unacceptable. Recall that Hebrew bare indefinites are in general allowed to appear without an overt copula (cf. (31)) and note, moreover, that this is also so with conjunctions of bare indefinites as in the following sentence.

(42) dana (hi) soferet ve-mora.
Dana (is) author and-teacher

"Dana is an author and a teacher"

Why is the copula obligatory in (41) but only optional in (42)? The answer is straightforward in the present system. Since NP denotations are predicates, nothing prevents a simple analysis of

the coordination in (42) using set intersection of the predicate denotations. The resulting (correct) interpretation of the sentence states that Dana is an author and that she is also a teacher. Without the copula, NP coordination in (42) is thus sufficient to obtain this intuitive interpretation. However, such a simple analysis in (41b) will not do, as it would generate an odd statement entailing that "the two women are an author/a teacher". To get the collectivity effect we intuitively accept in (41b), we have to apply category shifting as in the following semantic analysis.

(43) $\exists f \exists g$[CF(f) $\wedge$ CF(g) $\wedge$ these (two) women are $min(f$(an author) $\cap$ g(a teacher))

In words, what this representation states is that there is a possibility to choose an author and a teacher, such that the predicate these two entities form together, using the *min* operator, holds of a the plurality of the two women. This is the intuitive interpretation of (41a). However, crucially, it can only be obtained by virtue of category shifting operations. Since these operations apply only at the D' level, an overt copula is obligatory for this analysis to become available.

The (previously unnoticed) contrast in (41), *vis à vis* (42), is a surprising piece of evidence in favour of the proposed analysis. My English informants identify a similar pattern in the following English small clause constructions.[15]

(44) a. *To my delight, I found my two new students a first-rate pianist and a professional singer.

b. To my delight, I found my two new students to be a first-rate pianist and a professional singer.

(45) To my delight, I found my new student (to be) a first-rate pianist and a professional singer.

4.3 Appositional conjunction

Most English DP conjunctions are in the plural. However, some DPs are known to be an exception to this rule. Consider for instance the following examples from Hoeksema (1988:36).

(46) { a. A great man and a good father / b. My great opponent and the hero of my youth / c. A great man and the best magician in New Jersey } *has* passed away.

This phenomenon is sometimes called *appositional conjunction*. The semantic intuition about these examples is that the two conjoined DPs must be coreferential. For example, the opponent and the hero in (46b) must be the same person. By contrast, Hoeksema notes that with other DPs, as in the following examples, appositional conjunction is impossible even when the DPs are known to be coreferential.

[15]Thanks to Edit Doron for her help with the formulation of this test.

(47) *{ a. Dr. Jekyll and Mr. Hyde
b. Charles Dodgson and Lewis Carroll
c. Charles Dodgson and the author of *Alice*
d. John and my best friend
e. My hero and Houdini
f. Amy and a long-time lover } *has* passed away.

Note further that indefinites with the article *some*, unlike the *a* indefinites in (46), do not allow appositional conjunction. This is illustrated below.

(48) *{ a. Some great man and some good father
b. Some great man and the best magician in New Jersey } *has* passed away.

Importantly, what we observe here is that the DPs in (37), which can appear without a copula, also allow appositional conjunction. Conversely, the D's in (38), which require a copula, also require plural number of conjunctions they appear in. The theoretical intuition that accounts for this generalization is straightforward: since the DPs that require no copula are NPs, hence basically predicative, their conjunction, like the conjunction of other predicative categories (e.g. AP and PP) requires no change in the number feature. However, at the D' level, which is not purely predicative like NP, conjunction must be in the plural. This immediately accounts for the "coreferential" interpretation in (46): the structure of the subjects in these examples is roughly as follows.

(49) $[_{DP}\ [_{D'}\ \phi_{cf}\ [_{NP}$ NP and NP]]]

Semantically, the CF variable, denoted by the empty ϕ_{cf} category, chooses one entity from the intersection of the two predicates. This is illustrated in the following semantic analysis of (46a).

(50) $\exists f$[CF(f) $\wedge$ f(a great man $\cap$ a good father) has passed away]

If however the two coordinated elements must be D's, as it is the case in (47) and (48), then plural number becomes obligatory, and the coreference impression disappears.

5 Summary

Two general assumptions have been explored in this paper. First it was assumed, following Partee's work, that some DPs are ambiguous between predicates and quantifiers. Partee's assumption about a third kind of "referential" DPs was eliminated. The predicate/quantifier ambiguity was derived by two phonologically covert *category shifting* operations: the *choice function* mechanism and the *minimum* operator. Unlike Partee, it was proposed that only some DPs are flexible in this way, while others are rigidly quantificational. A second element in the proposal,

the *flexible DP hypothesis*, employs the DP structure to put restrictions on the circumstances where category shifting can apply. While DPs and NPs were assumed to be rigidly quantificational/predicative respectively, the intermediate D' level was assumed to be the location where category shifting mechanisms apply.

Because of this "mapping hypothesis", syntactic differences between DPs are semantically manifested. One such difference is the distinction between DPs with a null SPEC and DPs with a full SPEC. According to the flexible DP hypothesis, the former are predicted to be semantically flexible while the latter rigidly denote quantifiers. It was argued that this syntactic/semantic distinction is reflected in the availability of collective interpretations and of wide scope construals beyond syntactic islands. While D's allow category shiftings that derive these effects, DPs with a full SPEC position rule them out. Special attention was given to the syntactic distinctions between *both...and* constructions, which apply only at the XP level, and plain *and* conjunctions, which also apply at the X' level. These two kinds of constructions were shown to exhibit semantic contrasts as anticipated by the flexible DP hypothesis. Another syntactic distinction that turns out to be semantically relevant is the distinction between D's and NPs. According to the flexible DP hypothesis, the former are initially quantificational while the latter are initially predicative. This distinction was shown to have semantic implications for the analysis of verbless predicative constructions and appositional conjunctions. While NPs were assumed to allow such constructions, D's rule them out. Some previously noticed and unnoticed generalizations were accounted for in this way.

By way of summarizing the main proposal in this paper, table 1 gives the proposed syntax and initial semantics of the various DPs that were discussed. The label $\pm$Q denotes whether a DP is quantificational or predicative. The label $\pm$F denotes whether a DP is flexible or rigid. The table illustrates the assumption that all NPs are initially predicative and flexible, all D's are initially quantificational and flexible, and all full DPs are rigidly (hence also initially) quantificational.

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Syntax	Semantics	
	value	category
[NP a student]	$\mathbf{student}'$	−Q +F
[NP the student]	$\mathbf{the}'(\mathbf{student}')$	−Q +F
[NP three students]	$\mathbf{three}'(\mathbf{students}')$	−Q +F
[D′ some [NP student]]	$f(\mathbf{student}')$	+Q +F
[D′ ϕ_{cf} [NP ϕ_{the} Mary]]	$f(\mathbf{the}'(\{\mathbf{m}'\}))$	+Q +F
[D′[D′ ϕ_{cf} [NP ϕ_{the} Mary]] and [D′ ϕ_{cf} [NP ϕ_{the} John]]]	$f(\mathbf{the}'(\{\mathbf{m}'\})) \cap g(\mathbf{the}'(\{\mathbf{j}'\}))$	+Q +F
[D′[D′ ϕ_{cf} [NP ϕ_{the} Mary]] and [D′ ϕ_{cf} [NP the student]]]	$f(\mathbf{the}'(\{\mathbf{m}'\})) \cap g(\mathbf{the}'(\mathbf{student}'))$	+Q +F
[DP every [D′[NP student]]]	$\mathbf{every}'(\mathbf{student}')$	+Q −F
[DP no [D′[NP student]]]	$\mathbf{no}'(\mathbf{student}')$	+Q −F
[DP exactly three [D′[NP students]]]	$\mathbf{exactly\_three}'(\mathbf{students}')$	+Q −F
[DP[DP[D′ ϕ_{cf} [NP ϕ_{the} Mary]] and [DP every [D′[NP student]]]]	$f(\mathbf{the}'(\{\mathbf{m}'\})) \cap \mathbf{every}'(\mathbf{student}')$	+Q −F
[DP both [DP[D′ ϕ_{cf} [NP ϕ_{the} Mary]] and [DP[D′ ϕ_{cf} [NP ϕ_{the} John]]]]	$f(\mathbf{the}'(\{\mathbf{m}'\})) \cap g(\mathbf{the}'(\{\mathbf{j}'\}))$	+Q −F

Table 1: DP syntax and semantics

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