In E. Bach *et al*, eds. (1995) *Quantification in Natural Languages*.
Kluwer, Dordrecht, pp. 81–107.

REMARKS ON DEFINITENESS IN WARLPIRI[1]

Maria Bittner

Rutgers

Ken Hale

MIT

In this paper, we discuss some rather puzzling facts concerning the semantics of Warlpiri expressions of cardinality, i.e. the Warlpiri counterparts of English expressions like one,two, many, how many. The morphosyntactic evidence, discussed in section 1, suggests that the corresponding expressions in Warlpiri are nominal, just like the Warlpiri counterparts of prototypical nouns, eg. child. We also argue that Warlpiri has no articles or any other items of the syntactic category D(eterminer). In section 2, we describe three types of readings—"definite", "indefinite" and "predicative"—which are generally found with Warlpiri nouns, including those which correspond to English common nouns and cardinality expressions. A partial analysis of these readings is sketched in section 3. Since Warlpiri has no determiner system, we hypothesize that the source of (in)definiteness in this language is semantic. More specifically, we suggest that Warlpiri nominals are basically interpreted as individual terms or predicates of individuals and that their three readings arise as a consequence of the interaction of their basic meanings, which are specific to Warlpiri, with certain semantic operations, such as type shifting (Rooth and Partee 1982, Partee and Rooth 1983, Partee 1986, 1987), which universally can or must apply in the process of compositional semantic interpretation.

[1] We wish to thank Mary Laughren, David Nash, Tova Rapoport, Michele Sigler, and Jane Simpson for their helpful comments on the first draft of this paper. We also gratefully acknowledge support for this work from the National Science Foundation, companion grants BNS-9108381 and BNS-9108331.

1. The major morphosyntactic categories of Warlpiri.

1.1. Lexical categories.

Warlpiri has just two major lexical categories, nouns (N) and verbs (V). Morphologically, the distinction between these two categories is clear-cut. Members of the category N inflect for case and combine with derivational morphology associated exclusively with nouns. Members of the category V belong to one of the four verb conjugations and inflect for tense, mood, or the infinitival formative. In this system of two major categories, there is no obvious overlap. Stems of the N and V categories are mutually exclusive in their inflectional capabilities—though, of course, stems of either category may combine with derivational morphology to form new stems of the other category.

Semantically, verbs are primarily used to describe dynamic events. That is to say, with few exceptions, Warlpiri verbs are active, not stative. And the exceptions generally correspond to usages in which an active verb is "coerced" to combine with a nominal to describe a state. This device is often resorted to in order to permit expression of tense distinctions, impossible in the nominal system. The stance verbs *nyina-mi* 'sit', *karri-mi* 'stand', etc. are often used in this way. But generally, Warlpiri verbs are active, while notions which in English would be expressed by means of stative verbs are expressed by means of nominals instead, with or without an accompanying tense-bearing verb. For example, uses of the English stative verb *want* are generally rendered into Warlpiri with the nominal *ngampurrpa* 'desirous, wanting'; the English verb *know* is generally translated with the Warlpiri nominal *pina* 'knowledgeable about'; and so on. In this respect, the two-category system of Warlpiri differs from two-category systems found in some other languages, eg. Navajo, where stative relations and properties are apportioned to the category V rather than N.

In addition to functioning as the main predicate in the sentence, when the predicate is stative, Warlpiri nominals are used to express secondary predication as well as the arguments of the main predicate. When a nominal serves as an argument, it triggers pronominal agreement, in person and number, with the auxiliary; the same nominal used as a secondary predicate will exhibit adjective-like agreement, in number and case, with the argument it is construed with.

Examples of Warlpiri nouns are given in (1), arrayed along an approximate scale according to their typical syntactic function, with group (a) most likely to express the arguments of the main predicate, and group (f) restricted to serve as the main predicate or a secondary predicate in the sentence.

(1) a. Pronouns, demonstratives, and other indexicals:
eg. *ngaju* 'I', *nyampu* 'this', *yangka* 'evocative demonstrative, i.e., the one we both know about', *jintakumarrarni* 'all of it, all of them', *nyarrpara* 'which one'.

b. Names:
eg. *Jakamarra, Nakamarra, Napaljarri,...*, in general, the subsection terms used as names; dreaming names, European names, place names, and so on; *ngana* 'who'.

c. Common nouns:
eg. *karnta* 'woman', *ngarrka* 'man', *miyi* 'vegetable food', *nyiya* 'what'.

d. Expressions of quality or cardinality:
eg. *wiri* 'big', *nyurnu* 'sick', *panu* 'many', *nyajangu* 'which ones, how many'.

e. Expressions of psychological states:
eg. *pina* 'knowledgeable about DAT', *ngampurrpa* 'wanting DAT'.

f. Locatives and directionals:
eg. *kulkurru* 'in the middle', *yatijarra* 'north', *nyarrpara* 'where'.

To some extent, the preferred use of a Warlpiri nominal, as an argument or a predicate, may be semantically motivated. On independent grounds, Rooth and Partee (1982), Partee and Rooth (1983) and Partee (1986, 1987) have argued that each lexical item has a basic meaning from which predictable alternative meanings of other semantic types may be derived by universal type-shifting principles. If we adopt this view, then the preferred use of a Warlpiri nominal seems likely to reflect the semantic type of its basic meaning—viz., the individual type, *e*, for a nominal primarily used as an argument (group (a)-(b)), and some predicative type, <*e*, *t*>, <*e*, <*e*, *t*>>, or the like, for a nominal primarily used as a predicate (group (c)-(f)). On this view, a less preferred use of a nominal involves deriving from its basic meaning a related alternative meaning of an appropriate type—*e* or <*e*, *t*>—by means of a suitable type-shifting operator.

1.2. Overt NP expressions.

The essential elements of a Warlpiri (dependent) clause are exemplified by the following:[2]

(2) *…kuja-ka-Ø-rla ngarrka-ngku kuyu-ku warri-rni*
…COMP-PRS$_5$-3S$_1$-DM$_2$ man-E$_1$ meat-D$_2$ seek-NPST$_5$
Lit. 'when/that man is looking for meat (i.e. hunting)'

The tensed verb projects a structure which licences not only its arguments, but also the elements which realize the tense of the clause. These are represented discontinuously at s-structure by the present tense auxiliary base *ka-* and by the nonpast inflection on the verb—in (2), the suffix *-rni* which marks nonpast tense in the conjugation to which *warri-* 'seek' belongs. Dependent clauses of

[2] The abbreviations used in the glosses are: A = absolutive; D = dative; E = ergative; LOC = locative; 1, 2, 3 = 1st, 2nd, 3rd person; d = dual; p = plural; s = singular; DM = dative registration marker; FUT = future; INF = infinitive; OBV = obviative; PROX = proximate; PRF = perfective; PRS = present; PST = past; NPST = non-past. Word-internal morpheme boundaries are indicated by '-', clitic boundaries, by '='. Elements which are construed with each other are coindexed when the construal relation is relevant.

this particular type also involve the use of a complementizer. In (2), the "central coincidence" complementizer *kuja-* (cf. Hale 1986, and for exemplification, Hale 1976) appears prefixed to the auxiliary, as usual in tensed dependent clauses of the type represented by (2). The subject and object argument expressions in (2) consist simply of the head noun and the case inflection.[3] In tensed clauses, the arguments of the verb are also represented in the auxiliary (i.e. in INFL) by pronominal agreement (generally overt, except in the case of third person singular subjects or direct objects; cf. Hale 1973). Since the Warlpiri agreement system qualifies as "rich", it is not surprising that the language makes extensive use of null anaphora (cf. Taraldsen 1978, Chomsky 1981), or pro-drop. In tensed clauses particularly, the truly stable reflection of a verb's arguments consists in the agreement system.

But here we are concerned primarily with overt NP expressions. While these may be simple, consisting just of a head noun in an appropriate case, they may also be complex, consisting of a head noun and one or more modifiers, as in (3):

(3) ***Maliki wiri-ngki*** *ka-Ø-ju* *(ngaju) wajilipi-nyi*
dog **big-E$_1$** PRS-3s$_1$-1s$_2$ (me$_2$) chase-NPST
'A/the big dog is chasing me.'

The subject here consists of the head noun *maliki* 'dog' together with another nominal *wiri* 'big', functioning as a modifier. The syntactic structure of Warlpiri expressions of this sort is discussed at length in Nash (1980). In (3), the noun and modifier form a constituent—this is indicated both by the fact that the sequence precedes the auxiliary (a "second position" element in Warlpiri) and by the fact

[3] The syntactic structure of clauses with overt NP expression of arguments in Warlpiri is a matter of continuing inquiry (cf. Hale 1983, Jelinek 1984), the issue being whether an overt NP expression corre-sponding to a verbal argument is in fact in an argument position or in an adjunct position. We will not enter into this question here, and we will use the term "argument" to include the overt NP correlates of the semantic arguments of the verb, whatever the syntactic status of these NPs proves ultimately to be.

that the construction is marked by a single, right marginal, case inflection (the ergative, in conformity with the ergative case marking system of Warlpiri).

Although the subject forms a constituent in (3), Warlpiri nominal expressions of this type are often "discontinuous", each subpart being separately marked for case, and each counting as a complete constituent in relation to the principle which governs the surface position of the auxiliary in tensed clauses:

(4) a. ***Maliki-rli*** *ka-Ø-ju* ***wiri-ngki*** *wajilipi-nyi*
dog-E$_1$ PRS-3s$_1$-1s$_2$ **big-E$_1$** chase-NPST

b. ***Maliki-rli*** *ka-Ø-ju* *wajilipi-nyi* ***wiri-ngki***
dog-E$_1$ PRS-3s$_1$-1s$_2$ chase-NPST **big-E$_1$**

c. ***Wiri-ngki*** *ka-Ø-ju* *wajilipi-nyi* ***maliki-rli***
big-E$_1$ PRS-3s$_1$-1s$_2$ chase-NPST **dog-E$_1$**

Warlpiri strings having the surface appearance of (4b) or (4c), and to a lesser extent (4a), (hereafter, *discontinuous apposition*) are generally ambiguous: out of two identically case-marked nominals, the one which functions as the modifier—here, *wiri* 'big'—can be either restrictive or appositive. On the restrictive reading, (4b) and (4c) are equivalent to the unambiguous sentence (3)[4]—"a/the big dog is chasing me"; whereas the appositive reading would normally be rendered into English with a secondary predicate or an appositive relative clause—"the dog, which is big, is chasing me" (cf. Halliday 1967, 1968, Hale 1983, Simpson 1983, Rapoport 1990). The same ambiguity is found in sentences (5)-(7), which also show that discontinuous apposition is possible for every argument of the verb.

[4] The restrictive reading is strongly favored when the modifier forms a constituent with the modified nominal. We cannot, however, say that the appositive reading is impossible in sentences of the general type represented by (3). In some cases, the appositive interpretation is probably more likely then the restrictive one—eg. in an expression like *yinarlingi jilkarlaparnta* (porcupine spiny) 'spiny porcupine'.

(5) *Ngarrka-ngku ka-Ø-Ø-rla* ***karnta-ku*** *ngapa yi-nyi* ***mata-ku.***
man-E_1 PRS-$3s_1$-$3s_2$-DM_3 **woman-D_3** water-A_2 give-NPST **tired-D_3**
(i) 'A/the man is giving some/the water to a/the tired woman.'
(ii) 'A/the man is giving some/the water to the woman, who is tired.'

(6) ***Ngarrka-ngku*** *ka-Ø-Ø-rla karnta-ku ngapa yi-nyi* ***mata-ngku.***
man-E_1 PRS-$3s_1$-$3s_2$-DM_3 woman-D_3 water-A_2 give-NPST **tired-E_1**
(i) 'A/the tired man is giving some/the water to a/the woman.'
(ii) 'The man, who is tired, is giving some/the water to a/the woman.'

(7) *Ngarrka-ngku ka-Ø-Ø-rla karnta-ku* ***ngapa*** *yi-nyi* ***ngurrju.***
man-E_1 PRS-$3s_1$-$3s_2$-DM_3 woman-D_3 **water-A_2** give-NPST **good-A_2**
(i) 'A/the man is giving some/the good water to a/the woman.'
(ii) 'A/the man is giving the water$_2$, which$_2$ is good, to a/the woman.'

As already mentioned, discontinuous apposition can be disambiguated in favour of its restrictive reading by including the modifier in the same constituent as the modified nominal—cf. (3). The appositive reading, on the other hand, is favored in the presence of temporal enclitics, when the scope of the enclitic is restricted to the predicate to which it is attached—as in (8).

(8) *Ngarrka-ngku Ø-rla* ***karnta-ku*** *ngapa yu-ngu* ***mata-ku=wiyi.***
man-E_1 PRF-$3s_1$-$3s_2$-DM_3 **woman-D_3** water$_2$ give-PST**tired-D_3=***before*
'A/the man gave the woman$_3$ some/the water, (when she$_3$ was) tired before.'

1.3. The absence of a determiner category.

The syntactic constructions described above—i.e. simple noun in an appropriate case (2), continuous apposition (3), discontinuous apposition (4)-(7), and secondary predication (8)—are not restricted to common nouns and nominal

expressions of quality, but are quite generally characteristic of all the members of the category N listed in (1)—where the category N, as the reader will recall, was identified on the basis of morphological criteria (inflects for case and is compatible with exclusively nominal derivational morphology). The only constraint on admissible combinations seems to be the interpretability of the resulting structure. For instance, in (9), the "evocative" demonstrative *yangka* is construed with the common noun *karli* 'boomerang', forming a single syntactic constituent therewith in (9a), and forming a discontinuous expression in (9b).

(9) a. *Warri-rni ka-rna-rla* ***karli yangka-ku***, *kuja-npa-ju yu-ngu*
seek-NPST PRS-1S-DM_2 **boomerang that-D_2** COMP-2s-1s give-PST

b. ***Karli-ki*** *ka-rna-rla warri-rni* ***yangka-ku***, *kuja-npa-ju yu-ngu*
boomerang-D_2 PRS-1s-DM_2 seek-NPST **that-D_2** COMP-2s-1s give-PST
'I'm looking for that boomerang you gave me.'

Syntactically, there is no evidence that the demonstrative nominal *yangka* in these constructions bears a different relation to the common noun it is construed with than the nominal of quality *wiri* 'big' does in (3) and (4b), respectively. The semantic interpretation of the resulting structure is, of course, different, but that, we suggest, is due to independently motivated semantic differences between *yangka* and *wiri* ; on syntactic grounds, the two items are indistinguishable.

Likewise, the quantificational or group-denoting nominal *jintakumarrarni*, glossed as 'all of them', can be used on its own as a simple noun in an appropriate case, as in (10)—just like *ngapa* 'water' in (8); or in a discontinuous appositive construction, as in (11)-(12)—where it is syntactically parallel eg. to *wiri* 'big' in (4b), *mata* 'tired' in (5)-(6), *ngurrju* 'good' in (7), and the evocative demonstrative *yangka* 'that' in (9b). The semantic contribution of *jintakumarrarni* may be similar to that of *yangka*, if it can be analyzed as a group-denoting term (Landman 1989), roughly equivalent to the collective reading of *all of them* or *all of it* in English. This analysis is consistent with the

fact that the Warlpiri *jintakumarrarni*—just like the English *all*—can quantify over masses (10) as well as individuals (11)-(12)[5] and would predict that sentences with *jintakumarrarni* should allow distributive readings just in case their counterparts with evocative demonstratives do.[6] Whatever the correct semantic analysis, though, the point here is that *jintakumarrarni* syntactically behaves just like all the other Warlpiri nominals—in agreement with our claim that it, too, is a member of the category N.

(10) *Yurnmi-jarri ka-lu* ***jintakumarrarni***=*lki*
ripe-become-NPST PRS-3p$_5$ **all$_5$**=then
'Then they$_5$ get ripe, all (parts) of them$_5$.'

(11) ***Jintakumarrarni***=*jikijala ka-lu wapa kankarlu-mipa*
all-A$_4$=of.course PRS-3p$_4$ move-NPST above-only
paarrpardi-nja-rla ***pinkirrpa-kurlu-Ø***
fly-INF-PROX **feather-ones.with-A$_4$**
'All of them$_4$ of course live only up in the air flying, [the feathered ones]$_4$.'

(12) ***Jampijinpa-rlu Jangala-rlu*** *ka-pala yunpa-rni* ***jintakumarrarni-rli***
Jam.-E$_7$ **Jang.-E$_7$** PRS-3d$_7$ sing-NPST **all-E$_7$**
'[Jampijinpa and Jangala]$_7$ are singing, all of them$_7$ (i.e. both of them$_7$) '

Observations such as the above lead us to conclude that Warlpiri has no class of elements which can correctly be said to represent the syntactic category D, or determiner. To be sure, Warlpiri has demonstrative and quantificational elements, exemplified in (9)-(12), whose nearest equivalents in other languages have the morphological form and syntactic distribu-tion characteristic of

---

[5] In (8b), *jintakumarrarni* may quantify over kinds (cf. *all birds can fly* , in English). This need not be in conflict with the above generalization, if kinds are modelled as a sort of individuals, as in Carlson (1977).

[6] As far as we know at this point, neither *jintakumarrarni* nor plural evocative demonstratives can be interpreted distributively, i.e. neither can be used as an equivalent eg. of 'each of them' in English.

determiners. In Warlpiri, however, demonstratives and quantifiers alike are simply members of the lexical category N. Syntactically, they have the same distribution as common nouns and other prototypical members of the category N in Warlpiri: like nouns in general, they can head their own autonomous phrases, and can appear in construction with other nouns by entering into one or the other of two relations, apposition or secondary predication. Quite unlike canonical functional categories, Warlpiri determiners and quantifiers (and any other candidates for membership in the D-category) do not have a fixed position within NP when they appear there. Indeed, as we have seen, they are not even limited in their occurrence to NP-internal positions. Thus, for example, *maliki nyampu, nyampu maliki* and *maliki … nyampu* (either order) are all grammatical realizations of the expression corresponding to English *this dog.* [7] By contrast, the clearly functional categories of Warlpiri—eg. case, tense, and complementizer—are rigidly fixed in their placement. This is an unfair comparison, it might be said, for most of these elements are bound morphemes in Warlpiri. While this is true by and large, there is one striking exception. In most occurrences, the auxiliary—a complex of functional elements—is morphologically free, not bound; yet its position is fixed within the syntactic domain it defines (i.e. the tensed clause). In short, there is little to suggest that there is a specific D-projection in Warlpiri. Elements which, by virtue of their meaning, might be considered good candidates for inclusion in a determiner category display a syntactic behaviour which is not at all different from canonical representatives of the syntactic category N in this language.[8]

With this background, we wish now to turn to the main focus of this paper, namely the systematic ambiguity of Warlpiri nominals in the middle range of

---

[7] There is, perhaps, a significant tendency in favour of the ordering according to which the nominal which functions as a restrictive modifier—here, *nyampu* 'this'—appears finally within its NP.

[8] There is a possible alternative conception of Warlpiri categorial system, according to which the determiner category exists but is limited to the suffixal elements representing the grammatical category number, eg. *-jarra* 'dual', *-patu* 'paucal'. This would not affect our central claim concerning demonstratives and quantificational nominals, however.

(1)—i.e. common nouns as well as the nominal expressions of quality and cardinality—between readings which, for common nouns, might be characterized as "definite" and "indefinite" and, more generally, as "strong" and "weak" (Milsark 1974, Barwise and Cooper 1981, Heim 1987, *et al.*)

2. The readings of Warlpiri nominals.

At several points in the foregoing discussion, Warlpiri sentences were glossed in such a way as to give the reader to understand that a nominal argument expression was ambiguously either definite or indefinite (eg. in sentences (5)-(8)). This is a regular possibility when an argument is expressed by means of a nominal whose basic meaning is of a predicative type—eg. a common noun or a nominal expression of quality (group 1.c-d); but not if the nominal is basically interpreted as an individual term—i.e., is a pronoun, demonstrative, name, etc. (group 1.a-b)—in which case it is always "definite". Thus, a common noun like *karnta* 'woman', or a nominal expression of quality such as *wiri* 'big', when not in apposition with an individual term, is open to either the definite or the indefinite interpretation. There are certain factors which encourage one or the other interpretation—eg. the linear ordering of old and new information (cf. Hale, 1992; Swartz, 1985, 1987) or the use of certain discourse-linked enclitic elements (eg. *-ju* for repeated, or old, topic)—but other than that, definite and indefinite interpretations are readily available for such nominals.

This is all quite familiar and expected, of course. And since Warlpiri has no determiners, we hypothesize that the source of definiteness and indefiniteness in this language is some semantic mechanism still to be discovered. Such a view of Warlpiri would distinguish that language form another class of superficially similar languages which "lack articles", i.e. languages which have an otherwise full and standard determiner system but in which the definite and indefinite articles are non-overt. In such a language, definiteness and indefiniteness could

still have a syntactic source, viz. the features associated with the null determiner. In Warlpiri, by contrast, (in)definiteness in nominal expressions of the type under consideration here could not be attributed to a determiner system. It is, rather, a matter of interpretation, and the interpretive principle involved is applicable to any nominal within the middle range of (1), representing by far the majority of morphologically simple nominals in Warlpiri.[9] It is this circumstance which will be of interest here. The relatively free application of an operation which fixes the definiteness—more generally, the strength—of a nominal expression gives rise to certain usages in Warlpiri which are somewhat suprising.

2.1. Ambiguous cardinality nominals.

By way of introduction to the usages in question, we will shift now to the first person singular voice of one of the co-authors as he relates his expectations and confusions while doing field work in the Warlpiri community of Central Australia.

No matter how sophisticated, liberal, or open minded a field worker thinks he or she is, the tyranny of what you know, innately or through learning, is awesome—it prevents you from seeing the world, in effect. When you study a language in the field, you do so as a big baby. Like a baby, and like a drowning person, you hungrily seize new linguistic data and associate it with what you know. Only, unlike a baby, you are contaminated with one or more native languages, whose grasp upon the mind is fiercely jealous, blocking your view of any other language system. So if you come to understand your field language primarily in terms of your linguistic knowledge, the overwhelming influence of

---

[9] These are nominals in the informal classes (1c) and (1d). Nominals in groups (1e) and (1f) are normally steadfastly predicative. While these do sometimes appear heading an argument expression, this is extremely rare. Any predicative nominal can, however, be combined with the derivational suffix *-pirdinypa* 'the one(s) which'. Such derived nominals, which are always definite, can be used as argument expressions.

your native language inevitably wins, no matter how good a field worker you are. For the most part perhaps, it does not matter since the greater part of any language is universal grammar, or so we think. But it is a mistake to be too sanguine about this. We cannot easily avoid mistakes. One of my many mistakes in relation to Warlpiri had to do with certain expressions of cardinality.

When I started to work on Warlpiri, I did what I had always done. I tried to find out how you said this, and how you said that. Of course, this and that were notions I expressed to myself mentally in English. A primitive method, but the only one I could possibly use if I were to get started and get into the business quickly. Later, I told myself, I would correct it all by using a "method" I had for doing this—see below.

In the process of trying to learn Warlpiri in this manner, I happily learned how to say "many" (i.e. *panu*), and I eventually also learned how to say "how many" (i.e *nyajangu*). It all seemed totally straightforward to me. "Many" is *panu*, "how many" is *nyajangu*, "two" is *jirrama*, "one" is *jinta*, and so on. Simple, even boring. Let's move on to something hard. Let's get to the big problems.

In fieldwork, what appears to be simple is usually pretty sneaky. It's the small scorpion that stings the worst, not the big one. So I went on for a decade with the assumption that I didn't have to ask anything more about Warlpiri "one", "two", "many", "how many", and the like. I knew it all.

About ten years after I started to work on Warlpiri, I began to collect lexicographic essays from Warlpiri speakers. This was part of my "method" for correcting mistakes in the data—in particular, it was the method for correcting mistakes in meanings. A second and important purpose of the method, however, was to get material on complex sentences. Essays on the meaning of words—all words, not just exotic ones—required the exercise of the entire range of expressive resources available in the language. This proved to be the very best way, for example, to get relative clauses and other complex constructions. Also,

it uncovered aspects of the meanings of words which were missed in the initial phase of field work. The method was simple: I simply asked articulate speakers of Warlpiri to define orally, or to give an oral essay on, each item in the vocabulary which I had already assembled—they were to do it in Warlpiri, pretending that, by some bizarre accident, I knew all of Warlpiri vocabulary except the particular item being defined.

It was in the course of this phase of my investigation of Warlpiri that I discovered how hopelessly wrong I had been about the expressions for "many" and "how many" in Warlpiri. When I came to the word *panu*, which I felt completely comfortable with, in my misunderstanding of it, and when I asked a Warlpiri speaker to define it for me, the oral essay that came forth simply did not correspond to the meaning which my mind had fixed upon. To illustrate the meaning which came to his mind first, the Warlpiri essayist set up a situation involving two speakers, one of whom said to the other:

(13) ***Panu-****rna* *ma-ni*
PANU-PRS-1s take-NPST

This my understanding of Warlpiri would only permit me to interpret as meaning "I'll take A LOT of them" or "I'll take MANY of them". But the context the essayist had constructed simply did not allow this interpretation—it was clear from the context that the imaginary speaker was saying "I'll take ALL of them". Not "many", but "all". It was very clear. And to make sure, I went over the essay several times. It was evident that *panu* could mean "all" as well as "many". I assumed this was some sort of mistake, and in my arrogance, I assumed that the Warlpiris were simply being vague and imprecise, not really using the word properly. How could a word mean both "many" and "all"? Impossible. But, it eventually became clear to me that *panu* could mean "all". In fact, at a later point, when I asked for a definition of the group-denoting nominal *jintakumarrarni* 'all of it, all of them' (cf. (9)-(12) above), I was told the following:

(14) *"Jintakumarrarni" ka-rnalu ngarri-rni "**panu**"*
PRS-1p say-NPST
' *jintakumarrarni* means *panu*.'

Thus, not only can *panu* mean "all", that turns out to be the fully salient meaning of the word—enough so that it was deemed possible by Warlpiri speakers to use *panu* to define another word which cannot mean anything else.

Then, some time later, my sense of order was completely destroyed when I had the Warlpiri essayist define *nyajangu*, which clearly meant "how many", I thought. No problem. I just sat back and waited for the fine essay which was going to tell me what I already knew about the meaning of the word. I was astounded when in the middle of the essay, he had one of his imaginary speakers say:

(15) ***Nyajangu*** *Ø-pala ya-nu-rnu?*
NYAJANGU$_1$ PRF-3d$_1$ go-PST-HITHER
(Apparent transl.: # '**HOW MANY$_1$** (dual$_1$) came?')

Here he used the word in conjunction with dual agreement in the auxiliary. For goodness sakes! The entire imaginary conversation made no sense at all to me. If you know there are two, then how can you ask "how many"? I had missed the point again, of course. After about an hour of intense discussion with the Warlpiri essayist, it was clear that the imaginary speaker was asking

(15') **WHICH ONES$_1$** (dual$_1$) came?

A passage which I had found puzzling, in an earlier essay on fauna, began to make sense:

(16) *Kuja-ka-npa-ju payi-rni* ***nyajangu*** *ka-lu ngulya-ngka nyina,*
COMP-PRS-2s-1s ask-NPST **NYAJANGU$_4$** PRS-3p$_4$ hole-LOC live-NPST
kapi-rna-ngku yirdi-ngarri-rni
FUT-1s-2s name-say-NPST
'Since you are asking me **WHICH ONES** live in holes, I will name them for you.'

This was actually part of an exchange between the essayist and me. I had asked, I thought, how many animals live in burrows. For the Warlpiri essayist, I could have been asking which animals live in burrows—that is what he assumed, and, after announcing (16), he proceeded to list various animals, including the infamous introduced, and much prized, rabbit.

At a later point in the essay on *nyajangu* itself, the meaning I was prepared for surfaced as well (both for *nyajangu* and for *panu*), in the following imaginary dialogue, whose larger context makes it clear that it is the cardinality of boomerangs, not their identity, that is involved:

(17) Q: ***Nyajangu*** *Ø-Ø-ngku karli yu-ngu nyuntu-ku?*
NYAJANGU PRF-3s-2s$_4$ boomerang give-PST you-D$_4$
'**HOW MANY** boomerangs did he give you?'
A: ***Panu*** *Ø-Ø-ju yu-ngu karli.*
PANU PRF-3s-1s give-PST boomerang
'He gave me **MANY** boomerangs.'

In the essay as a whole, I was being told that Warlpiri *nyajangu* means both "how many" and "which ones". In this case, there was concrete morphosyntactic evidence (in the form of the dual agreement) in support of the meaning that so violated my preconceptions.

It took me many years to come to my present understanding of what is going on. The understanding I now have makes sense in the context of the

remarks we have made here concerning the Warlpiri system of lexical and functional categories. If Warlpiri does in fact lack the functional category projection which expresses the usual "determiner" functions, and if the function normally attributed to the definite article, for example, is instead assumed by a semantic operation applying in general to common nouns and other nominals whose basic meaning is of the predicative type, <e,t>, then it is to be expected that this operation could in particular apply to the cardinality nominals, since these, too, can be analyzed as expressions of the relevant type—to wit, as predicates of groups (cf. Hoeksema 1983, Link 1983 ff., Landman 1989). Thus, the cardinality expressions and common nouns in Warlpiri form a natural class not only with respect to their syntax—a fact which led us to conclude that both are members of the same category, N—but also with respect to their semantics. Some empirical evidence in favour of a unified analysis of the ambiguities of Warlpiri nominals—specifically, common nouns as well as the cardinality nominals—is discussed in 2.2 and 2.3 below.

*2.2. Assimilating **panu** to other noninterrogative nominals.*

Quite generally, noninterrogative nominals in the middle range of (1) in Warlpiri—i.e. common nouns and nominal expressions of quality and cardinality—have three types of readings: "weak", "strong", and "predicative". And for common nouns as well as quality and cardinality nominals, the same morphosyntactic devices (discussed below) can be used to convey a particular reading in an unambiguous manner. In particular, the striking ambiguity of the cardinality nominal *panu*, between 'many' and 'all', is not peculiar to this nominal but, rather, is an instance of a much more general phenomenon—to wit, of the ambiguity between the weak and the strong readings which are systematically found for all non-interrogative nominals in the middle range of (1).

Thus, for example, sentence (18), which contains a common noun, is three-way ambiguous. Putting aside considerations of felicity in discourse, a bare common noun—here, *kurdu* 'child'—can be interpreted as indefinite, as definite, or as a secondary predicate (of the non-overt object argument in this instance).

(18) ***Kurdu*** *ka-rna-Ø nya-nyi*
child$_5$ PRS-1s-3s$_5$ see-NPST
(i) I see a child. [weak]
(ii) I see the child. [strong]
(iii) I see him/her$_5$, who$_5$ is a child [predicative]

The same range of readings is found with bare cardinality nominals, eg. *panu* in (19). This nominal, we assume, has a basic meaning which is closely parallel to that of the common noun *kurdu* exemplified in (18). Just like the basic extension of *kurdu* is the set of children, so the basic extension of *panu* is the set of groups with at least n members each, where n qualifies as a large number by the contextually relevant standard—in other words, the basic meaning of *panu* is roughly equivalent to "large group"[10]. The analogy with *kurdu* then brings us a step closer to explaining the unusual ambiguity of *panu* : the reading of *panu* which is parallel to the weak reading of *kurdu* in (18) is equivalent to "a large group" (19.i), which amounts to interpreting *panu* as "many"; while the strong reading—on a par with the strong reading of *kurdu*—is "the large group" (19.ii), which amounts to interpreting *panu* as collective "all". So, according to this analysis, the exotic ambiguity of the cardinality nominal *panu* is an instance of the same, not at all exotic, ambiguity between weak and strong readings which in Warlpiri is also found with other nominals, such as the common noun *kurdu* in (18).

---

[10] To draw this parallel, we need to model groups as individuals—a view which is compatible with several model-theoretic treatments of plurality, eg. Hoeksema (1983), Link (1983) ff. and Landman (1989).

(19) ***Panu*** *ka-rna-jana nya-nyi*

many$_5$ PRS-1s-3p$_5$ see-NPST

(i) I see a large group (of them). [weak]

(ii) I see the large group (of them). [strong]

(iii) I see them$_5$, who$_5$ are a large group [predicative]

Sentences (20) and (21) illustrate the manifestations of the same three-way ambiguity for other bare cardinality nominals—here, *jinta* 'one' and *jirrima* 'two'. For sentences with these nominals, intuitively correct truth conditions are predicted if the general mechanism, still to be explicated, which accounts for the weak, strong, and predicative readings of Warlpiri nominals is combined with the assumption that the basic extension of *jinta* is the set of (degenerate) groups with exactly one member each, and of *jirrima*, the set of two-membered groups (cf. the predicative analysis of English numerals eg. in Hoeksema 1983).

(20) ***Jinta*** *ka-rna-Ø nya-nyi*

one$_5$ PRS-1s-3s$_5$ see-NPST

(i) I see one (of them). [weak]

(ii) I see the one. [strong]

(iii) I see him/her/it$_5$, which$_5$ is one (i.e. alone). [predicative]

(21) ***Jirrima*** *ka-rna-palangu nya-nyi*

two$_5$ PRS-1s-3d$_5$ see-NPST

(i) I see two (of them). [weak]

(ii) I see the two (of them). [strong]

(iii) I see them$_5$, who$_5$ are two (i.e. a pair) [predicative]

Examples (18)-(21) strongly suggest that the ambiguity of *panu* (19) is not an isolated phenomenon in the grammar of Warlpiri, but an instance of a pervasive pattern which generalizes to all nominals in the middle range of (1), including other cardinality nominals (20)-(21) as well as common nouns (18). Further

evidence in favour of treating all of the ambiguities illustrated in (18)-(21) as a unified phenomenon comes from the fact that the same morphosyntactic devices can be used for all nominals in the middle range of (1) to disambiguate sentences like (18)-(21) in favour of a particular reading. We now illustrate this point for the predicative reading, the weak reading, and the strong reading, in turn.

The reader will recall that temporal enclitics strongly favour the predicative reading of the nominal to which they are attached, when the scope of the enclitic is restricted to that nominal. An example of this disambiguating effect involving the clitic *wiyi* 'before' attached to a nominal of quality *mata* 'tired' was given in (8), which is repeated in (22) below. Comparison with sentence (23) shows that the same enclitic can also be used to bring out the predicative reading of a cardinality nominal, here *panu* 'a large group'.

(22) *Ngarrka-ngku Ø-rla karnta-ku ngapa yu-ngu mata-ku=**wiyi**.*
man-E_1 PRF-$3s_1$-$3s_2$-DM_3 woman-D_3 water$_2$ give-PST tired-D_3=**BEFORE**
'The man gave the woman$_3$ water, (when she$_3$ was) tired before.'
= (8)

(23) *Panu=**wiyi** Ø-rna-jana nya-ngu.*
many-A_3=**BEFORE** PRF-1s-$3p_3$ see-PST
'I saw them$_3$ (when they$_3$ were) a large group before.'

The weak reading can be brought out by means of the nominal suffix *-kari*. Once again, the device is available for all nominals in the middle range of (1)—in particular, as the following sentences illustrate, for common nouns (24)-(25) and cardinality nominals (26) alike.

(24) *Jarntu-**kari** Ø-Ø parnka-ja yatijarra, jarntu-**kari** kurlirra.*
dog-**KARI$_5$** PRF-$3s_5$ run-PST north, dog-**KARI** south
'A dog ran north, a dog (ran) south.'

(25) *Jarntu-**kari** Ø-li parnka-ja yatijarra, jarntu-**kari** kurlirra.*
dog-**KARI**$_5$ PRF-3p$_5$ run-PST north, dog-**KARI** south
'A group of dogs ran north, a group of dogs (ran) south.'

(26) *Panu-**kari** ka-rna-jana nya-nyi, panu-**kari** Ø-li wurulyya-nu.*
many-**KARI**$_5$ PRS-1s-3p$_5$ see-NPST, many-**KARI**$_7$ PRF-3p$_7$ hide-PST
'I see a large group, (but) a large group went into hiding.'[11]

Finally, construal with an obligatorily "definite" nominal, such as a demonstrative, forces a strong, defnite, reading. As usual, all nominals in the middle range of (1), including common nouns (27) and cardinality nominals (28), are affected in the same manner.

(27) ***Yalumpu-rra** ka-rna-jana pura-mi jarntu.*
that-PL$_2$ PRS-1s-3p$_2$ follow-NPST dog$_2$
'I am following [those dogs]$_2$.'

(28) ***Yalumpu-rra** ka-rna-jana pura-mi panu.*
that-PL$_2$ PRS-1s-3p$_2$ follow-NPST many$_2$.
'I am following [that large group]$_2$.'

*2.3. Assimilating **nyajangu** to other interrogative nominals.*

The ambiguity of the interrogative nominal *nyajangu*, between 'how many' and 'which ones', is also not an isolated phenomenon. Other interrogative nominals in Warlpiri exhibit parallel ambiguities. Thus, the interrogative *ngana* means either 'who' or 'which one (human)', while *nyiya* means either 'what' or 'which one (non-human)'. For each nominal, phenomena which are sensitive to the weak/strong distinction (eg. *there*-insertion) identify one of the available

[11] Mary Laughren points out (p.c.) that the usual distinction between (greater) plural and "paucal" is neutralized in combination with *-kari* , thus *panu-kari*can be predicated of any group with at least three members. Also, the English word *group* used in translation merely implies plurality not the "cohesiveness" normally associated with the English word.

readings as weak—to wit, 'how many', 'who', and 'what'—and the other reading as strong—'which ones', 'which one (human)', and 'which one (non-human)' (Safir 1982, Heim 1987). This suggests a semantic analysis which interprets interrogative nominals in Warlpiri just like the noninterrogative nominals—in particular, the mechanism responsible for the weak and the strong readings applies to all nominals across the board—up to the differences which are motivated by their interrogative semantics.

3. A partial explanation.

At this point, we can only offer a very partial account of the ambiguities found with Warlpiri nominals. In particular, we have nothing more to say here about the ambiguity of the interrogative nominals and leave them as a puzzle for further research. We believe that the explanation which we suggest for the ambiguity of the noninterrogative nominals is likely to generalize to the interrogative nominals as well, but the details are not clear at this point—not least because the facts concerning the possible answers to questions with the interrogative nominals are in need of further empirical clarification. In the following discussion, we therefore focus on the ambiguity of the noninterrogative nominals, where the basic facts are clearer.

3.1. Comparison with other languages without articles.

We begin by noting that the ambiguity of the Warlpiri cardinality expressions cannot be attributed to the absence of articles in this language. This can be seen by comparing Warlpiri with other languages without articles, eg. Polish and Greenlandic Eskimo. In the latter two languages, the cardinality expressions also have readings of the weak and predicative variety—just like their Warlpiri counterparts. The strong readings, on the other hand, are systematically missing. This, in spite of the fact that common nouns in both Polish and Eskimo pattern

just like common nouns in Warlpiri, exhibiting the same ambiguities between strong—definite— and weak—indefinite—readings (cf. 18).

For instance, if the Warlpiri sentence (29) were uttered in the context "Going into the store, I saw a child playing outside on the road; when I came out,...", then the object argument expressed by the cardinality nominal *jinta* construed with the common noun *kurdu* could be interpreted as either indefinite (i) or definite (ii). In the same context, the object of the Polish sentence (30) could only receive the indefinite interpretation, while the Eskimo sentence (31) would be infelicitous because of its partitive presupposition. The Eskimo sentence would be appropriate if, on going into the store, the speaker had seen a group of children and then saw one of those children again on going out. To get the definite reading, in either language, the cardinality expression in (30) and (31) would have to be left out or replaced with a demonstrative.[12]

(29) Warlpiri

Jinta *Ø-rna-Ø yarda-nya-ngu* ***kurdu***

one-ABS$_5$ PRF-1s-3s$_5$ AGAIN-see-PST **child-ABS$_5$**

(i) I again saw a child. [weak]

(ii) I saw the child again. [strong]

(30) Polish

znowu *zobaczylem* ***jedno*** ***dziecko***

again see-PST-1s.masc **one-ACC** **child-ACC**

(i) I again saw a child. [weak]

* (ii) I saw the child again. [strong]

[12] The new abrreviations used in this section are: ABS = absolutive; ACC = accusative; ERG = ergative; DAT = dative; GEN = genitive; NOM = nominative; masc = masculine; fem = feminine; neut = neuter; IMPER = imperative; IND = indicative; Q = interrogative mood or question particle; [+tr] = verb which takes an ergative subject; [-tr] = verb whose subject, if any, is not ergative.

(31) Eskimo

miiraq ***ataasiq*** *taku-qqip-p-a-ra*

[child-ABS one-ABS]$_5$ see-AGAIN-IND-[+tr]-1s.3s$_5$

(i) 'There was one child which I saw again.' [weak]

* (ii) I saw the child again. [strong]

Likewise, the intended meaning of the Warlpiri sentence (32), taken from a narrative describing the cooperative efforts of two individuals making a shield, cannot be rendered verbatim into Polish or Eskimo. While the Warlpiri cardinality expression *jinta* in (32) can be interpreted as definite, this is not possible for the corresponding cardinality expressions in Polish (33) and Eskimo (34). The only interpretation available for (33) and (34) is weak (partitive), which is infelicitous in this narrative context, where there is only one co-worker.

(32) Warlpiri

Jinta *ka* *ngarri-rni "nyuntu=lkurdilykipaka-ka*

one-ABS$_4$ PRS-3s-3s$_4$ tell-NPST "you=NOW chop-IMPER"

'(So) he tells the one (he's working with): "Now, you chop!"

(33) Polish

Wiec mow-i ***jednemu****: "Teraz ty rab!"*

so tell-PRS-3s **one-DAT**: "Now you chop!"

'So he tells one (co-worker): "Now, you chop!" '

(34) Eskimo

Taava ***ataasiq*** *uqarfig-Ø-a-a: "Massakkut illit ikun-niar-it"*

so **one-ABS$_4$** tell-IND-[+tr]-3s.3s$_4$: "now you chop-IMPER-2s"

'So he tells one (co-worker): "Now, you chop!" '

The same is true for the other cardinality expressions. Thus, the strong reading of the cardinality nominal *panu* in the Warlpiri sentence (35)—which is

taken from a naturally occurring discourse (a question by a doctor) where this nominal is clearly intended to mean 'all'—also fails to generalize to the cardinality expressions, *duzo* in Polish (36a) and *ikattut* in Eskimo (37a), which share the weak reading of *panu* equivalent to 'many'. Being restricted to the weak reading, which is inappropriate in this context, the (a)-sentences in Polish and Eskimo are somewhat odd (#). To express the strong reading of *panu* in either language, a separate, morphologically unrelated, word must be used—to wit,*wszyscy* in Polish (36b), and *tamarmik* in Eskimo (37b)—which is restricted to this reading only.[13]

(35) Warlpiri

Yapa ka-lu nyina ***panu*** *nyampu-rla ngurrju?*

person-ABS_2 PRS-$3p_2$ be-NPST **many$_2$** this-LOC well

'Are all the many people here well?'

(36) Polish

\# a. *Czy* ***duzo*** *ludzi tutaj jest zdrowych?*

Q **many** people-GEN_2 here is healthy-GEN_2

\# 'Are many people here well?'

b. *Czy* ***wszyscy*** *ludzie tutaj sa zdrowi?*

Q **all-NOM$_2$** people-NOM_2 here are_2 healthy-NOM_2

'Are all the people here well?'

[13] The ambiguities of the interrogative nominals in Warlpiri also do not generalize to either Polish or Eskimo. Eg. the weak reading of *nyajangu*, on which the word is equivalent to 'how many', would be rendered as *ile* in Polish, and as*qassit* in Eskimo. The strong reading corresponding to 'which ones', would be expressed by morphologically unrelated words: *ktorzy* in Polish and *surlit* in Eskimo.

(37) Eskimo

\# a. *Inuit* ***ikattut*** *maani piqqip-pa-t?*
people-ABS$_2$ **many-ABS$_2$** this-LOC be.healthy-Q-3p$_2$
\# 'Are many people here well?'

b. *Inuit* ***tamarmik*** *maani piqqip-pa-t?*
people-ABS$_2$ **all-ABS$_2$** this-LOC be.healthy-Q-3p$_2$
'Are all the people well here?'

To summarize the cross-linguistic pattern which emerges from the above discussion. Bare common nouns in Warlpiri, as well as Polish and Eskimo, behave like bare common nouns in other languages without articles, i.e. are ambiguous between strong, definite, and weak, indefinite, readings. In Warlpiri, the ambiguity extends to the expressions of cardinality, whereas in Polish and Eskimo, the strong reading is systematically missing for this class of expressions.

3.2. Explanation in terms of type shifting.

Why is the strong, definite, reading possible for the Warlpiri cardinality expressions but not for their Polish, Eskimo, or for that matter English, counterparts? We suggest that the crucial difference is that, in Warlpiri, the cardinality expressions are members of the same syntactic category as common nouns, proper names, demonstratives, etc., whereas the cardinality expressions in Polish, Eskimo, and English are adjectives, determiners, or other categories which, crucially, do not include proper names, pronouns, or any other members whose basic meaning is of the individual type. The basic idea is this.

Suppose that in languages without articles, the source of definite readings is a type-shifting operator whose semantic effect is equivalent to that of the definite article. For concreteness, we will assume this to be Link's (1983) variable binding operator σ. Applied to a (singular or plural) predicate *P*, the σ operator yields a term, $\sigma x.P(x)$, which denotes the maximal element in the extension of *P* if there

is such an element; otherwise, $\sigma x.P(x)$ is undefined. Any other operator which mimics the semantic effect of the definite article and combines with a predicate of type <*e*,*t*> to yield an individual term would do just as well for the purposes of the explanation we propose. The other crucial ingredient in our explanation is that, just like syntactic transformations are generally constrained to be structure-preserving, so semantic type-shifting operations is required to be *type range-preserving* in the sense that they cannot create any new combinations of a syntactic category and semantic type. That is, a type-shifting operator of type <***a***, ***b***> can apply to a constituent of type ***a*** and syntactic category κ, only if there are constituents of category κ whose *basic meaning* is of type ***b*** .

It would then follow that the type-shifting operator σ (or equivalent) could derive definite readings for common nouns in Warlpiri, Polish, and Eskimo alike. The derivation would shift eg. a common noun like *kurdu* from its basic meaning **child'**, of the predicative type <*e*, *t*>, to the definite reading, $\sigma x.\textbf{child'}(x)$, of the individual type *e*. This shift is type range-preserving in the required sense, because there are other constituents of the category N whose basic meaning is of the individual type—eg. proper names like *John.* Since the cardinality expressions in Warlpiri are also members of the category N, the type-shifting operator σ will permitted to operate on them, too, giving rise to closely analogous definite readings. But it will not be permitted to operate on the cardinality expressions in Polish, Eskimo, or English—not even if the basic meanings of those expressions are of the required predicative type—because the operation would not be type range-preserving. This is because the operator σ creates expressions of the individual type, whereas, by hypothesis, the cardinality expressions in Polish, Eskimo, and English, are adjectives, determiners, or members of some other category which does not include any members whose basic meanings are of that type. Hence the absence of definite readings for this class of expressions.

REFERENCES

Barwise, J. , and R. Cooper (1981) "Generalized Quantifiers and Natural Language," *Linguistics and Philosophy* 4:159-219.

Carlson, Gregory N. (1977) *Reference to Kinds in English*. Ph. D. dissertation, University of Massachusetts at Amherst. Distributed by GLSA, Dept. of Linguistics, UMASS, Amherst, M.A. 01003.

Chomsky, Noam (1981) *Lectures on Government and Binding*. Foris, Dordrecht.

Hale, Ken. (1973) "Person Marking in Warlpiri," in S. Anderson and P. Kiparsky, eds., *A Festschrift for Morris Halle*. Holt, Rinehart and Winston, New York. Pp. 308-344.

————————. (1976) "The Adjoined Relative Clause in Australia," in R.M.W. Dixon, ed., *Grammatical Categories in Australian Languages*. Australian Institute of Aboriginal Studies, Canberra. Pp. 78-105.

————————. (1983) "Warlpiri and the Grammar of Non-Configurational Languages," *Natural Language and Linguistic Theory* 1:5-47.

————————. (1986) "Notes on World View and Semantic Categories: Some Warlpiri Examples," in Muysken and van Riemsdijk, eds.

————————. (1992) "Basic Word Order in Two 'Free Word Order' Languages." In Doris Payne, ed., *Pragmatics of Word Order Flexibility*. John Benjamins, Amsterdam. Pp. 63–82.

Halliday, M.A.K. (1967) "Notes on Transitivity and Theme in English, Part 1," *Journal of Linguistics* 3.

————————. (1968) "Notes on Transitivity and Theme in English, Part 2," *Journal of Linguistics* 4.

Heim, Irene (1987) "Where Does the Definiteness Restriction Apply? Evidence from the Definiteness of Variables," in E. J. Reuland and A.G.B. ter Meulen, eds., *The Representation of (In)definiteness.* MIT Press, Cambridge, Massachusetts. Pp. 21–42.

Hoeksema, Jack (1983) "Plurality and Conjunction," in Alice G. B. ter Meulen, ed., *Studies in Modeltheoretic Semantics*. Foris, Dordrecht. Pp. 63–84.

Jelinek, Eloise (1984) "Empty categories, Case, and Configurationality," *Natural Language and Linguistic Theory* 2:39-76.

Kratzer, Angelika (1989) *Linguistics 610: Semantics and Generative Grammar*, unpublished lecture notes, Department of Linguistics, University of Massachusetts at Amherst.

Landman, Fred (1989) "Groups, I," *Linguistics and Philosophy* 12:559-606.

Link, G. (1983) "The Logical analysis of plurals and mass terms: a lattice-theoretic approach," in R. Bäuerle, Ch. Schwrze, and A. von Stechow, eds., *Meaning, Use, and Interpretation*, Walter de Gruyter, Berlin. Pp. 302-323.

————————. (1984) "Hydras. On the Logic of Relative Clause Constructions with Multiple Heads," in F. Landman and F. Veltman, eds., *Varieties of formal Semantics*, Foris, Dordrecht. Pp. 245–258.

————————. (1991) "Plural," in A. von Stechow and D. Wunderlich, eds., *Semantics/Semantics.* Walter de Gruyter, Berlin. Pp. 418–441.

Milsark, G. (1974) *Existential Sentences in English.* Ph.D. dissertation, MIT, Cambridge, Massachusetts.

Muysken, Pieter, and Henk van Riemsdijk (1986) *Features and Projections.* Foris, Dordrecht.

Nash, David (1980) *Topics in the Grammar of Warlpiri.* Ph.D. dissertation, MIT, Cambridge, Massachusetts.

Partee, Barbara H. (1986) "Ambiguous Pseudo-clefts with unambiguous *be* ," in S. Berman, J. W. Choe, and J. McDonough, eds., *Proceedings of NELS* 16. GLSA, University of Massachusetts at Amherst. Pp. 354-366.

————————. (1987) "Noun Phrase Interpretation and Type-Shifting Principles," in J. Groenendijk, D. de Jongh, and M. Stokhof, eds., *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers.* Foris, Dordrecht. Pp. 115–144.

Partee, Barbara H., Emmon Bach, and Angelika Kratzer (1987) "Quantification: A Cross-linguistic Perspective." University of Massachussetts at Amherst proposal to the National Science Foundation.

Partee, Barbara H., and Mats Rooth (1983) "Generalized conjunction and type ambiguity," in R. Bäuerle, C. Schwartze, and A. von Sechow, eds., *Meaning, Use, and Interpretation of Language*, Walter de Gruyter, Berlin. Pp. 361-383.

Rapoport, Tova (1990) "Secondary Predication and the Lexical Representation of Verbs," *Machine Translation* 5:31-55.

Rooth, Mats, and Barbara H. Partee (1982) "Conjunction, Type Ambiguity, and Wide Scope *or* ," in D. P. Flickinger, M. Macken and N. Wiegand, eds., *Proceeding of WCCFL* 1, Linguistics Dept., Stanford University. Pp. 353-362.

Safir, K. (1982) *Syntactic Chains and the Definiteness Effect.* Ph.D. dissertation, MIT, Cambridge, Massachusetts.

Simpson, Jane (1983) *Aspects of Warlpiri Morphology and Syntax.* Ph.D. dissertation, MIT, Cambridge, Massachusetts.

Swartz, Stephen (1985) "Pragmatic Structure and Word Order in Warlpiri." SIL manuscript.

————————. (1987) *Measuring Naturalness in Translation by Means of a Statistical Analysis of Warlpiri Narrative Texts With Special Emphasis on Word Order Principles.* Pacific College of Graduate Studies manuscript.

Taraldsen, Tarald (1978) "On the NIC, Vacuous Application, and the That-Trace Filter," MIT manuscript.

Williams, Edwin (1980) "Predication," *Linguistic Inquiry* 11:203-238.