

第4部 Determiners and Quantification

A Head Movement Analysis of the Split QP Construction

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In English, some quantified phrases (henceforth QPs) are comprised of quantificational determiners and nominals that they take as their complements. Thus, according to the DP hypothesis put forth by Abney (1987) and many others, the QP *everyone* has the following structure:

(1) [DP[D every][NP one]]

As noted by Watanabe (1991), there are comparable QPs in Japanese, an example of which is given below:

(2) [DP[NP dare][D mo]]

person every

'everyone'

Putting aside the word order difference between the two languages, we notice that the QP in (2) is structured in the same way as its English counterpart in (1): in (2), the quantificational determiner *mo* takes the nominal *dare* as its complement (hereafter I refer to those nominals that are selected by quantificational determiners in Japanese as indeterminates, following Kuroda's (1965) terminology).¹

While the determiner and the indeterminate in (2) have a

very close relationship, namely, a head-complement relation, they can be separated from each other, as noted by Kuroda (1965), Hoji (1985), Nishigauchi (1990), and Watanabe (1991), among others. Consider the following examples:²

- (3)a. [[Dare mo-ga kaita] hon]-ga omosiroi.
person every-NOM wrote book -NOM is-interesting
'The book that everyone wrote is interesting.'
- b. [[Dare-ga kaita] hon mo] omosiroi.
person-NOM wrote book every is-interesting
'lit. Every book that a person wrote is interesting.'

In (3a), the determiner and the indeterminate are put together, and the complex serves as the subject in the relative clause. Of interest is (3b): while the indeterminate is confined in the relative clause, the determiner is attached to the head noun of the relative clause, so that they apparently are not in the head-complement relation. Just for ease of reference, let us call cases like (3b) split QP sentences. In what follows, I will argue that split QP sentences involve movement of quantificational determiners from the positions where they select indeterminates to their surface positions.

Sentence (3b) is a typical case of the split QP construction, where an indeterminate is dominated by a larger noun phrase, the head of which the associated determiner is attached to. A few more similar examples are given below:

- (4)a. [[Hanako-ga dare-o aisiteiru toyuu] uwasa mo]
 -NOM person-ACC loves that rumor every
 hontooda.
 is-true
 'lit. Every rumor that Hanako loves a person is true.'
- b. [Dare-no konpyuutaa mo] kosyoositeiru.
 person-GEN computer every is-out of order
 'Everyone's computer is out of order.'

In (4a), the indeterminate is contained in the appositive clause modifying the noun *uwasa* 'rumor', which is immediately followed by *mo*. In (4b), the indeterminate serves as the possessor of the noun *konpyuutaa* 'computer' right next to which the determiner occurs.

In addition to these, the phenomenon in question can be found in those cases where indeterminates are dominated by certain PPs, the heads of which the determiner is attached to (see Nishigauchi 1990 and Watanabe 1991). Consider the following examples:

- (5)a. [Dare kara mo] tegami-ga kita.
 person from every letter-NOM came
 'A letter came from everyone.'
- b. Hanako-wa [dare-no hahaoya e mo] tegami-o
 -TOP person-GEN mother to every letter-ACC
 okutta.
 sent
 'Hanako sent a letter to everyone's mother.'

In (5a-b), the indeterminate is contained in the PPs headed

by *kara* 'from' and *e* 'to', respectively, and the determiner immediately follows these postpositions.

From the above examples, the following descriptive generalization can be made:

- (6) In the split QP construction, a quantificational determiner must be attached to the head of the phrase that dominates an indeterminate.

In fact, the validity of this is confirmed by the following unacceptable sentences:

- (7)a. * *Gakusei mo* [[*dare-ga kaita*] *hon*]-*o yonda*.
student every person-NOM wrote book-ACC read
'lit. Every student read a book that a person wrote.'
- b. * [*Dare-no konpyuutaa*]-*ga muzukasii keisan*
person-GEN computer -NOM difficult calculation
mo sita.
every made
'lit. A person's computer made every difficult calculation.'

In (7a), *dare* is inside the matrix object and *mo* appears on the matrix subject, whereas in (7b), *dare* is contained in the subject and *mo* is attached to the object. In these cases, the phrases that the determiner is attached to do not dominate the indeterminate.

The generalization in (6) directly follows if the split QP phenomenon involves movement of a quantificational

determiner from the position where it takes an indeterminate as its complement to its surface position. To illustrate the point, let us consider the following schematized representations, where *Ind* and *QD* stand for an indeterminate and a quantificational determiner, respectively:

- (8)a. ... [XP ... [DP[NP *Ind*] [D *QD*]] ... X] ...
 b. ... [XP ... [DP[NP *Ind*] [D *t*₁]] ... [x[x X] *QD*₁]] ...

In (8a), the determiner and the indeterminate comprises a constituent, namely a DP, which is dominated by some larger phrase, labeled as XP. (8b) is derived from (8a) by adjoining the determiner to the head X of XP. The movement depicted here not only conforms to the structure preserving hypothesis extended to head movement by Chomsky (1986) (namely, it involves adjunction of a head to another head), but also satisfies the well-established c-command condition on movement (*QD* c-commands its trace in (8b)³).

According to this analysis (henceforth, the D(eterminer)-raising analysis), (3b) and (5a), for instance, are represented as in (9a-b), respectively.

- (9)a. [DP[NP[CP [DP[NP *dare*] [D *t*₁]]]-ga *kaita*] hon]
 [D[D *e*] *mo*₁]] *omosiroi*
 b. [PP[DP[NP *dare*] [D *t*₁]]] [P[P *kara*] *mo*₁]] *tegami-ga kita*

Here movement of *mo* originates from the position where it takes *dare* as its complement, and it adjoins to the head D (assumed to be null) of the matrix subject DP in (9a) and

the P *kara* in (9b). In both cases, the moved determiner c-commands its trace.

Turning to the unacceptable sentences in (7), we readily notice that they fail to meet the c-command condition. Consider the following schematic representations of (7a-b):

(10)a. (for (7a))

[_{IP}[_{DP}[_{NP} *gakusei*][_D[_D *e*] *mo*₁]][_{VP}[_{DP}[_{CP}
[_{DP}[_{NP} *dare*] *t*₁]-*ga* *kaita*] *hon*]-*o* *yonda*]]

b. (for (7b))

[_{IP}[_{DP}[_{DP}[_{NP} *dare*] *t*₁]-*no* *konpyuutaa*]-*ga*
[_{VP}[_{DP}[_{NP} *muzukasii keisan*][_D[_D *e*] *mo*₁]] *sita*]]

In (10a), *mo* is supposed to move from the position inside the matrix object where it selects *dare*, adjoining to the head of the matrix subject DP. The first branching node dominating *mo* is the subject DP, which does not dominate its trace, so that the raised determiner fails to c-command its underlying position. In (10b), *mo* is assumed to move from the inside of the subject DP, adjoining to the head of the object DP. The first branching node dominating *mo* is the object DP, and it does not dominate its trace: hence, the alleged head movement violates the c-command condition.

Not only does the D-raising analysis account for the generalization in (6), it explains other properties of the split QP construction as well. First of all, since it base-generates quantificational determiners in the positions where they select indeterminates, it predicts that selectional relations should be present between them even if they are taken apart by D-raising. In this regard, let us

first consider (11), which shows that *mo* only selects indeterminate complements: it cannot take common noun phrases as its complements.⁴

- (11)a. [DP[NP dare /? nani /doko /itu] mo]
 person/ thing/place/time every
 'everyone/everything/everywhere/always'
- b. * [DP[NP hito /gakusei/mono /hon] mo]
 person/student/thing/book every
 'every person/student/thing/book'

As expected, this selectional restriction persists in the split QP construction. Compare (12) with (13).

- (12)a. [[Dare-ga kaita] hon mo] omosiroi. (= (3b))
 person-NOM wrote book every is-interesting
 'lit. Every book that a person wrote is interesting.'
- b. [[Nani-o katta] hito mo] yorokonda.
 thing-ACC bought person every was-pleased
 'lit. Every person that bought a thing was pleased.'
- (13)a. * [[Hito /Gakusei-ga kaita] hon mo]
 person/student-NOM wrote book every
 omosiroi.
 is-interesting
 'lit. Every book that a person/student wrote is interesting.'

- b. * [[Mono /Hon-o katta] hito mo] yorokonda.
 thing/book-ACC bought person every was-pleased
 'lit. Every person that bought a thing/book was
 pleased.'

Examples (13a-b) are obtained by replacing the indeterminates in (12a-b), respectively, with the common nouns in (11b), and they are as degraded as (11b).

The selectional relation between raised determiners and leftover indeterminates can be detected at a more abstract level as well. As a preliminary, let us note that there are two types of binding relations between quantifiers and nominals. The following, so-called donkey sentences exemplify them:

- (14)a. Every person who owns a donkey beats it.
 b. Every person who owns a donkey usually beats it.

In (14a), the quantificational determiner *every* binds a *donkey* as well as *person*, so that the sentence means that 'For every *x*, *y*, *x* a person, *y* a donkey, if *x* owns *y*, *x* beats *y*.' The binding relation between *every* and a *donkey* is one of what Heim (1982) calls unselective binding. Unselective binders are not selective about their binders: they can be associated with any quantifier as long as they are in appropriate structural contexts. Witness the fact that (14b) can have the reading where a *donkey* is bound by the adverb of quantification *usually*, so that the sentence can mean that every donkey owner beats most of his donkeys. Of direct relevance to our discussion is the cohesion

holding between *every* and *person* in (14a-b). In both cases, *person* is necessarily bound by *every*: for example, the nominal cannot be bound by *usually* in (14b). Let us call this cohesive relation selective binding, which should reflect the head-complement relation between *every* and *person*.

We are now ready to examine split QP sentences. Let us consider (3b), which is repeated as (15), and (16).

- (15) [[Dare-ga kaita] hon mo] omosiroi.
 person-NOM wrote book every is-interesting
 'lit. Every book that a person wrote is interesting.'
- (16) [[Dare-ga kaita] hon mo] taitei omosiroi.
 person-NOM wrote book every usually is-interesting
 'lit. Every book that a person wrote is usually interesting.'

As noted by Nishigauchi (1990), (15) has the interpretation that 'For every x , y , x a person, y a book that x wrote, y is interesting': that is, both *dare* and *hon* are bound by *mo*. Of importance is (16), which is obtained by adding the adverb of quantification *taitei* 'usually' to the matrix clause in (15). The example has the reading where *hon* is bound by the adverb (namely, it can mean that 'For every x , x a person, most books that x wrote are interesting'), but cannot be understood with *dare* bound by the adverb (thus, it must necessarily be bound by *mo*). These facts show that in (15) and (16), while *hon* is an unselective bindee, *dare* is a selective bindee and must be associated with *mo*.⁵ This selective relation between the indeterminate and the

determiner is a direct consequence of the D-raising analysis, which postulates that they are in head-complement relation underlyingly.

A further argument for the D-raising analysis comes from the ungrammaticality of the following split QP sentences:

- (17)a. * [[Taroo-ga dare to Hanako-ni katta] mono
 -NOM person and -for bought thing
 mo] yasukkata.
 every was-cheap
 'lit. Everything that Taroo bought for a person
 and Hanako was cheap.
- b. * [[Hanako to dare-kara renmei-de
 and person-from joint signature-under
 kita] tegami mo] gozi darake datta.
 came letter every wrong-character full-of was
 'lit. Every letter that came from Hanako and a
 person under joint signature was full of wrong
 characters.'

In (17), the indeterminate *dare* is embedded in coordinate structures, being conjoined with *Hanako*. The D-raising analysis, according to which (17a-b) are assigned the schematic representations in (18a-b), respectively, can account for their ill-formedness readily by means of Ross's (1967) Coordinate Structure Constraint.

- (18)a. * [... [DP[DP dare t₁] to Hanako_{DP}]-ni ... mo₁] ...
 |_____↑

b. * [[_{DP} Hanako_{DP} to [_{DP} dare t₁]]-kara ... mo₁] ...

|_____↑

Here, *mo* is extracted out of one of the conjoined DPs, in violation of the CSC.

That the CSC is indeed responsible for ruling (17) out is confirmed by the fact that (17) becomes acceptable if the conjunct *Hanako* is replaced with an indeterminate. Compare (19a-b) with (17a-b), respectively.

(19)a. [[Taroo-ga dare to dare-ni katta] mono
 -NOM person and person-for bought thing
 mo] yasukkata.
 every was-cheap
 'lit. Everything that Taroo bought for a person
 and a person was cheap.

b. [[Dare to dare-kara renmei-de
 person and person-from joint signature-under
 kita] tegami mo] gozi darake datta.
 came letter every wrong-character full-of was
 'lit. Every letter that came from a person and a
 person under joint signature was full of wrong
 characters.'

D-raising should be able to take place across the board in these cases, and hence they are correctly expected to be grammatical.

I have so far proposed and argued for the D-raising analysis of the split QP phenomenon. One might be aware that D-raising wildly violates the Head Movement Constraint

or the Condition on Extraction Domain in some of the cases considered above (see (9) for instance). The present analysis, if correct, at least casts doubts on the validity of those conditions as applying to head movement. Further, given that D-raising is an instance of movement, one should wonder what triggers it. The recent minimalist framework assumes that feature checking must be involved when movement takes place. D-raising appears to be exceptional since it apparently is not accompanied by feature checking (compare (3a-b), for example). I would like to take another opportunity to address these and other issues arising from the line of inquiry introduced here (see Takahashi 1999).

References

- Abney, Steven. 1987. The English noun phrase in its sentential aspect. Doctoral dissertation, MIT, Cambridge, Mass.
- Chomsky, Noam. 1986. *Barriers*. Cambridge, Mass.: MIT Press.
- Diesing, Molly. 1992. *Indefinites*. Cambridge, Mass.: MIT Press.
- Heim, Irene. 1982. The semantics of definite and indefinite noun phrases. Doctoral dissertation, University of Massachusetts, Amherst.
- Hoji, Hajime. 1985. Logical form constraints and configurational structures in Japanese. Doctoral dissertation, University of Washington, Seattle.
- Kuroda, Shigeyuki. 1965. Generative grammatical studies in the Japanese language. Doctoral dissertation, MIT, Cambridge, Mass.
- May, Robert. 1985. *Logical form*. Cambridge, Mass.: MIT Press.
- Nishigauchi, Taisuke. 1990. *Quantification in the theory of grammar*. Dordrecht: Kluwer Academic Publishers.
- Reinhart, Tanya. 1976. The syntactic domain of anaphora.

- Doctoral dissertation, MIT, Cambridge, Mass.
- Ross, John, R. 1967. Constraints on variables in syntax.
Doctoral dissertation, MIT, Cambridge, Mass.
- Stechow, Arnim, von. 1996. Against LF pied-piping. *Natural Language Semantics* 4:57-110.
- Takahashi, Daiko. 1999. Determiner Raising and Scope Shift. Ms.,
Tohoku University, Sendai.
- Watanabe, Akira. 1991. Wh-in-situ, subjacency, and chain
formation. MIT occasional papers in linguistics 2.
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Notes

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¹ As has long been known (see Kuroda 1965, Nishigauchi 1990, Watanabe 1991 and so on), indeterminate function as *wh*-phrases in Japanese. This is illustrated in the following example:

(i) Dare-ga kimasita ka?

who-NOM came Q
'Who came?'

Because of this, indeterminates are sometimes referred to as *wh*-phrases in the literature. Following Watanabe (1991), I assume that *wh*-phrases are not made of indeterminate nominals alone, but rather are headed by the empty interrogative determiner, which takes them as its complements. Thus, the subject in (i) is supposed to be represented as in (ii), where *wh* stands for the empty interrogative determiner.

(ii) [DP[NP dare][D *wh*]]

This makes the structure of *wh*-phrases in Japanese in conformity with the general make-up of QPs.

² In typical Japanese sentences, the subject and the object are marked by the nominative marker *ga* and the accusative marker *o*, respectively. When they are attached to by quantificational determiners in split QP sentences, these markers sometimes drop, as noted by Nishigauchi (1990). Thus, although the complex noun phrase functions as the subject in (3b), it is not accompanied by the nominative marker. This phenomenon is not touched here.

³ I assume Reinhart's (1976) definition of *c*-command in terms of the first branching node, as well as May's (1985) segment theory of adjunction, according to which the upper *X* node does not count as the first branching node dominating *QD* in (8b) (the *XP* node does).

⁴ The indeterminates in (11a) can be selected by the (null) interrogative determiner, and the phrases so formed serve as *wh*-phrases (see Kuroda 1965, Nishigauchi 1990, and Watanabe 1991):

(i)a. [DP[NP Dare] *wh*]-ga kimasita ka?
 person WH -NOM came Q

- 'Who came?'
- b. Kimi-wa [DP[NP nani] wh]-o kaimasita ka?
 you-TOP thing WH -ACC bought Q
 'What did you buy?'
- c. Kimi-wa [DP[NP doko] wh]-de/[DP[NP itu] wh]
 you-TOP place WH -at time WH
 sore-o kaimasita ka?
 it-ACC bought Q
 'Where/When did you buy it?'

On the other hand, the common noun phrases in (11b) do not behave this way:

- (ii)a. * [DP[NP Hito /Gakusei] wh]-ga kimasita ka?
 person/student WH -NOM came Q
 'Which person/student came?'
- b. * Kimi-wa [DP[NP mono /hon] wh]-o kaimasita ka?
 you-TOP thing/book WH -ACC bought Q
 'Which thing/book did you buy?'

Basically following Kuroda (1965), let us assume that these two types of nominals are distinguished in terms of the feature [\pm indeterminate] and that the quantificational determiners in Japanese considered in this article select only [+ indeterminate] nominals. Note incidentally that (11b) is acceptable under an irrelevant reading, namely, with *mo* taken to mean something like *also*. This usage of *mo* is put aside here.

⁵ The observation made in (15) and (16) is reinforced by (i), which is obtained by replacing the matrix predicate in (15) *omosiroi*, an individual predicate, with a stage-level predicate.

- (i) [[Dare-ga kaita] hon mo] kono tosyokan-ni aru.
 person-NOM wrote book every this library-in is.

'lit. Every book that a person wrote is in this library.'

While (i) has the kind of multiply universal reading found in (15), it also permits the interpretation that 'For every x , x a person, some book that x wrote is in this library,' where hon is existentially bound possibly by the operator introduced by what Diesing (1992) calls existential closure. Here again the indeterminate must necessarily be bound by mo . See Stechow 1996 and the references therein for related observations.

Determiners and Nouns*

Keiko Muromatsu

1. Introduction

Determiners and nouns combine to form noun phrases that are subject to various interpretations. The characteristics of a noun phrase differ depending on which determiners it contains. Determiners are categorized by Milsark (1977) into two groups: strong and weak. Some determiners are said to induce ambiguity between specific and non-specific interpretations. In this paper, I will consider ways determiners combine with nouns and how they interact to yield various interpretations.

The organization of this paper is as follows. Section 2 uses data from Dutch and English to compare the behavior of nouns and the indefinite article, the latter being shown to have two functions. Section 3 takes up numerals, these being a kind of determiner, and shows how taking classifiers into consideration can provide an account of quantification, by interpreting it in terms of enumeration. Section 4 discusses the issue of specificity, with respect to which noun phrases containing the indefinite article and numerals are said to be ambiguous. Section 5 considers two types of determiners, “strong” and “weak”, and proposes that the two occupy different syntactic positions, based on semantic and syntactic considerations. Section 6 proposes to make a three-way distinction among quantificational, specific, and weak noun phrases, and looks at distributional differences among the three types of noun phrase.

2. Indefinite Article

I shall start with the indefinite article. Consider first some Dutch data:

- (1) Dutch:
 - a. Jan is schilder.
is painter
'Jan is a painter.

* This is a shorter version of the paper presented at the workshop “Determiners and Quantification” of the Special Research Project for the Typological Investigation into Languages and Cultures of the East and the West, at the University of Tsukuba. I would like to express my gratitude to the organizers and audience, especially Shosuke Haraguchi and Roger Martin. I thank Juan Uriagereka for many helpful comments and suggestions. This paper has also benefited from discussions with Ken Hale and Rozz Thornton. I also wish to thank Tom Frost, Caro Struijke, and Yi-Ching Su for providing data.

- b. Jan en Piet zijn schilder.
 and are painter
 ‘Jan and Piet are painters.’ (Dik 1980:99-100)

In (1a), the predicate *schilder* is a bare noun. Kraak and Klooster (1968) say that *schilder* ‘painter’ in (1a) is like an adjective rather than a noun. *Schilder* in (1a) denotes a quality, as if it were an adjective, and this quality is predicated of *Jan*. Interestingly, *schilder* ‘painter’ in (1b) does not take a plural form even with a plural subject. But this is not surprising if the noun is denoting quality – adjectives cannot be pluralized either.

Now, consider (2):

- (2) Dutch:
 a. *Jan is schilder die ik in Parijs ontmoet heb
 is painter who I in Paris met have
 ‘Jan is a painter I met in Paris.’
 b. Jan is een schilder die ik in Parijs ontmoet heb
 is a painter who I in Paris met have
 ‘Jan is a painter who I met in Paris.’ (Dik 1980:100)

(2a) is ungrammatical with the bare noun *schilder* without the indefinite article. On the other hand, (2b) is grammatical with the indefinite article.

Similar contrasts can be seen in other languages:

- (3) Spanish:
 a. Es profesor de Inglés
 is-he professor of English
 ‘He is an English professor.’
 b. Es un profesor de Inglés que encontré ...
 is-he one professor of English that met-I
 ‘He is an English professor that I met ...’ (Givón 1984:432)
- (4) Hawaiian English Creole:
 a. Joe he teacher
 he teacher
 ‘Joe is a teacher.’
 b. Joe he wan-teacher I bin-see ...
 he one-teacher I PERF-see
 ‘Joe is a teacher that I saw...’ (Givón 1984:411)

What these examples seem to show is that when a noun expresses a pure characteristic, it does not require an indefinite article. This is why *schilder* in (1b) does not take plural

form: it resembles an adjective. On the other hand, in (2a), the relative clause *die ik in Parijs ontmoet heb* ‘who I met in Paris’ cannot modify the pure characteristic expressed by the bare noun *schilder*. Intuitively, the speaker cannot meet what is expressed as some pure characteristic. In contrast, in (2b), what the relative clause modifies is a reified instance of the quality *painter*, a member of the class of painters, and here the indefinite article appears.

In (3a), *profesor* ‘professor’ is without an indefinite article, and this noun can be modified by *de Inglés* ‘of English’, which expresses a characteristic. In contrast, (3b) contains a relative clause, which requires an instance of *profesor*, and the indefinite article appears again.

In a classic study, Christophersen (1939) claims the indefinite article is a marker of unity. “A common name is only an idea with potential realizations; the idea itself is abstract, the realizations are concrete” (p.65).¹

The question might arise as to why it is impossible to say (5a) in English:

- (5) a. *John is painter.
b. John is a painter.

First of all, let us ask whether the indefinite article is marking a unity in (5b). I claim that this is not necessarily the case; it can be ambiguous. It can be considered to have the interpretation “John is a member of the class of painters”. At the same time, it can be a bare noun, even though it is accompanied by an indefinite article. Following Higginbotham (1987), I claim that in the latter case this is a reflex of syntax; more specifically the English noun phrase requires agreement in number.² In (5b) an indefinite article is required because the number agreement is forced to *painter*, which agrees with the singular *John*. To see this, let us make the subject plural:

- (6) a. *John and Peter are painter.
b. John and Peter are painters.

In (6b), when the subject is plural, the predicate nominal also needs to agree with the plural subject. The indefinite article in (5b) and the plural marker in (6b) are markers of agreement at the sentence level. (6a) is ungrammatical because it lacks number agreement.

¹ In the case of nouns that can only be count nouns, “the function of *a* consists in a stressing of the element of unity already inherent in the word itself; in the case of words belonging to both” count and mass nouns, “*a* marks the addition of an element of unity” (Christophersen 1939:73).

² I thank Ken Hale for discussion regarding this matter.

Is such agreement only necessary in English? Let us look at some more Dutch data. We have already seen that agreement in number at the sentence level is not required in Dutch. And yet Dutch requires the nominal predicate to agree in gender. Consider (7):³

- (7) Dutch:
- a. Marie is schilderes.
is painter
'Marie is a painter.'
 - b. Marie en Els zijn schilderes.
and are painter
'Marie and Els are painters.'

In (7a), the Dutch noun for 'painter' manifests itself as feminine, *schilderes*, agreeing with the subject *Marie*. As for the plural subject, as in (7b), the form of the nominal predicate stays the same as that of its singular counterpart (7a), showing agreement only in gender.

A descriptive generalization is that an English noun is particular about agreement in number, whereas a Dutch noun is particular about agreement in gender.

Jespersen (1933) asserts that English manifests a disinclination to use bare (naked) substantives in these sorts of examples. For example, there are expressions in which English requires an indefinite article while other languages do not, as shown by the contrast in (8) and (9):

- (8) a. John took an interest in the question.
b. John does not have any idea how to do it.
- (9) Spanish:
- a. Juan tomó interés por la cuestión.
took interest for the question
'Juan took an interest in the question.'
 - b. Juan no tiene idea de cómo hacerlo.
not has idea of how to-do-it
'Juan does not have any idea how to do it.'

Thus the English indefinite article induces ambiguity:

- (10) a. John is a painter.
b. John is a painter who I met in Paris.

³ Thanks to Carolina Struijke for the Dutch data in (7) and (12). She pointed out that, nowadays, the masculine forms are used for women for political reasons.

The indefinite article in (10a) can be for agreement, while the one in (10b) is for counting individuated painters (of which there is one).⁴

Analogously, the plural marker in English is also ambiguous between the two readings:

- (11) a. John and Peter are painters.
b. John and Peter are painters who I met in Paris.

If Jespersen (1933) is right about the English disinclination for bare nouns, then from the present perspective the reason for the plural in (11a) is also agreement. *Painters* in (11a) is abstract, whereas its counterpart in (11b) is reified. The plural marker *-s* in (11a) is for agreement in number with its subject, while the one in (11b) is for the realization of countability.

We can predict that in Dutch, such ambiguity will not occur, and the prediction is borne out:

- (12) Dutch:
a. Jan en Piet zijn schilder.
and are painter
'Jan and Piet are painters.'
b. Jan en Piet zijn schilders die ik in Parijs ontmoet heb
and are painters who I in Paris met have
'Jan and Piet are painters who I met in Paris.'

The nominals in (12a) and (12b) manifest the difference, unlike the English counterparts: *Schilder* in (12a) is bare, and *schilders* in (12b) is with a plural marker.

Though English exhibits ambiguity, it can be resolved in some contexts:⁵

- (13) John said he would be a painter, and
a. painter he is.
b. a painter he is.
(14) John said he would meet a painter, and
a. *painter he met.
b. a painter he met.

⁴ Interestingly, you cannot say (ia), using *one*, but you can say (ib):

- i) a. *John is one painter.
b. John is one painter but we will need at least five of them to finish the job on time.

This is because the numeral *one* is used for counting. When enumeration is involved, the noun cannot be bare. Recall that bare nouns only denote quality and can be specified with respect to degree. Counting presupposes the presence of an instance or instances.

⁵ Rozz Thornton pointed out to me the contrast in (13)- (16) that English nouns exhibit (p.c.).

In (13a) the predicate *painter* can be bare, while in (14a) the bare noun *painter* is not acceptable as an object of *meet*.

Some in (15b) and (16b) suggests enumerating painters, and the phrase *some painters* is grammatical only as an object of *meet*, but not as a predicate:

- (15) John and Peter said they would be painters, and
a. painters they are.
b. *some painters they are.
- (16) John and Peter said they would meet painters in Paris, and
a. painters they met.
b. some painters they met.

By considering predicate nominals in a few languages, we have found a parallelism between bare nouns and nouns with the indefinite article. The indefinite article in English seems to have at least two functions. One of these is to signal some concretization of the pure characteristic that the bare noun denotes, and the other is merely to mark a number agreement as a reflex of syntax.

Now, I would like to concentrate on the first function of the indefinite article, since it can be seen across languages, while the agreement phenomenon seems to be English-particular.

According to Christophersen, John Stuart Mill considers that “an ordinary common name is connotative”, and the indefinite article “marks the transition from abstract to concrete” (Christophersen 1939:58). It is true that bare count nouns express *mere abstraction*. The question to be asked here is whether it is the indefinite article itself that really makes the transition, or if it merely signals a transition made by something else.

The historical origin of the indefinite article is the numeral *one*, and Christophersen claims that the numeral *one* also marks unity (See also Givón 1981). And not only diachronically, but synchronically also: Perlmutter (1970) regards the indefinite article *a* as the unstressed version of the numeral *one*. Indeed, among the European languages, the English indefinite article *a* is peculiar in that its form is distinct from the numeral *one*. In French, German, Spanish, and so on, the so-called indefinite article has the same shape as the numeral one: *un, ein, uno, etc.*

Not only *one*, but also other numerals, such as *two, three*, and so on seem to serve as markers of unity that can be counted. And it is a reasonable step to consider the relationship between nouns and numerals in general, a numeral being a kind of determiner.

3. Numerals, Nouns, and the Need for Classifiers

In enumeration, some languages require an intervening device between a noun and a numeral; this is called a numeral classifier. Japanese is such a language. For example, when counting pencils, a classifier *hon* is necessary, as in (17):

- (17) a. enpitu go hon
pencil five CL
'five pencils'
- b. *enpitu go
pencil five
'five pencils'

In previous studies, classifiers have been regarded as merely a supplemental device to introduce numerals, since these cannot occur without a classifier. However, I claim it is not merely a supplemental device. I will show in this section that, in fact, classifiers play a key role in the structure of noun phrases.

3.1. Individuation

In Section 2, we saw that the indefinite article is a kind of numeral, and we examined its behavior in Dutch, Spanish, Creole, and English. Let us see then how numerals and classifiers behave in Japanese in similar environments:

- (18) a. Jiro to Taro wa gaka de aru.
and TOP painter be
'Jiro and Taro are painters.'
- b. *Jiro to Taro wa futa-ri no gaka de aru.
and TOP two-CL GEN painter be
'Jiro and Taro are two painters.'

In (18a), *gaka* 'painter' is without a classifier. When *gaka* 'painter' appears with a classifier, as in (18b), the sentence is rendered ungrammatical. These examples suggest that a predicate nominal is classifierless.⁶

⁶ When the subject is singular, the predicate nominal is also classifierless as in (ia). And yet the example in (ib) is still grammatical with the classifier. However, (ib) conveys a different meaning from (ia), a meaning which is somewhat idiomatic:

- i) a. Jiro wa gaka de aru.
TOP painter be
'Jiro is a painter.'
- b. Jiro wa hito-ri no gaka de aru.
TOP one-CL GEN painter be
'Jiro is nothing but a painter.'

Moreover, predicate nominals resist the suffix *tati*, which gives a noun plural meaning.⁷ In (19a), *gaka-tati* ‘painters’ is fine in the subject position, while the same expression cannot appear as a predicate nominal in (19b):

- (19) a. Gaka-tati ga kissaten de tooron-siteiru.
 painter-PL NOM coffee shop at discussion-doing
 ‘Painters are having a discussion at the coffee shop.’
- b. *Jiro to Taro wa gaka-tati de aru.
 and TOP painter-PL be
 ‘Jiro and Taro are painters.’

Thus the exact parallel between Japanese and Dutch is apparent.

Let us now consider why, in Japanese, classifiers are necessary. What is their function? As a starting point, consider the two interpretations of classifiers given by Quine (1969). One interpretation is to view classifiers as constituting part of the numeral, thereby forming a suitable style for whatever is counted. Another way is to view them as constituting part of the noun, the classifier doing the job of individuation.

(20) illustrates these two interpretations:⁸

- (20) go too no usi
 a. five CL GEN oxen ‘five oxen’
 b. five CL GEN cattle ‘five head of cattle’

The first view corresponds to the classifier being chosen so as to attach to the numeral *five*. As in (20a), this numeral-classifier pair is rendered suitable for counting big animals, such as oxen. If a different classifier had been chosen, it would have been suitable for counting slim objects, such as pencils and sticks.

On the second view, the Japanese word *usi* amounts to the English mass term ‘cattle’, as in (20b). The classifier *too* ‘head’ ‘‘applies to this mass term to produce a composite individuating term, . . . ‘head of cattle’,’’ and the numeral applies directly to the individuating term ‘‘without benefit of gender’’ (Quine 1969:36).

Although Quine (1969) provides no answer as to which view of classifiers is right, I will argue that the second is more adequate. To see this we must consider how a classifier individuates a noun. My specific claim is that classifiers have the function of giving a structured form to a formless mental space. By obtaining a form, the noun is thereby individuated so as to become countable. Of course, without similarity of form, nothing can be counted.

⁷ *Tati* is not a real plural marker (see Martin 1988). But this is not crucial here.

⁸ Quine (1969) does not use actual Japanese words, but I will provide them here.

Counting assumes the presence of separate objects (Wierzbicka 1985). Yet, it is only a necessary condition, not a sufficient one. We need to know what counts as one. Intuitively, the association between form and what counts as an individual seems to be a correct one. To borrow Greenberg's (1977:283) celebrated example, "[i]f I cut a piece of meat in two, I have two pieces of meat, but if I cut a dog in two, I still have only one dog, a dead one".

Further, as Frege (1950) argues, "we only think of things in terms of number after they have first been reduced to a common genus". And classifiers perform precisely this task of categorization. Let us consider this point. Classifiers are so named because they provide "a semantic classification of the head noun" (Greenberg 1977:277). The classification "is based primarily on the parameters of animateness, shape or function which are attributed to the head noun" (Adams and Conklin 1973:1).

With regard to animateness, for example, human beings, animals, and birds are categorized separately in Japanese as in (21):

- (21) a. kodomo go nin
 child five CL[for humans]
 'five children'
- b. uma go too
 horse five CL[for large animals]
 'five horses'
- c. inu go hiki
 dog five CL[for small animals]
 'five dogs'
- d. kanaria go wa
 canary five CL[for birds]
 'five canaries'

In (21b) *too*, meaning 'head' classifies large animals. It is also used for counting cows, tigers, bears, etc. And these nouns form a class by sharing the same classifier for enumeration.

Classification by shape includes long and flat. For example, long objects such as pencils, sticks, and trees are classified by the use of the classifier *hon* in Japanese:

- (22) a. enpitu go hon
 pencil five CL[for long objects]
 'five pencils'

- b. kasa ni hon
 umbrella two CL
 ‘two umbrellas’
- c. banana yon hon
 banana four CL[for long objects]
 ‘four bananas’

A group of nouns which share an associated classifier are categorized as belonging to the same group. The classifier in each case can be regarded as a label for the group in question. Clearly, one function of a classifier is the classification of nouns. The choice of a classifier is semantically constrained, the primary parameters being animateness, shape or function.⁹

In sum, a classifier makes a noun countable by virtue of its individuating function; individuation is achieved by means of classification (i.e. categorization by virtue of form). So, what makes the transition from abstract to concrete is neither the indefinite article nor numerals but rather classifiers. Numerals signal that the individuation has taken place.

The question is how is such a mode of individuation provided in non-classifier languages. I adopt Muromatsu’s (1995) view that individuality is obtained by applying numeral classifiers to nouns in non-classifier languages as well. In such languages, e.g. Dutch and English, classifiers are invisible but nonetheless present. And numerals signal the presence of classifiers.

⁹ Such a tight classificational relationship between a noun and a classifier does not preclude a given noun being associated with more than one classifier. If a noun has several features enabling it to fit into several different classes, then it can belong simultaneously to each of those classes. For example, in Japanese:

- i) a. denwa ni dai
 telephone two CL [for machines]
 ‘two telephones’
- b. denwa ni hon
 telephone two CL [for long, thin objects]
 ‘two telephone calls’

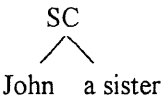
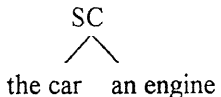
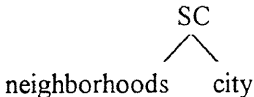
In (ia), classifier *dai* tells us that *denwa* ‘telephone’ belongs to the category of machine. In contrast, in (ib), the same noun *denwa* ‘telephone’ belongs to the category of long, thin objects, which is expressed by the classifier *hon*. The associability of a given noun with more than one classifier does not mean that the relationship between classifiers and nouns is loose; it still involves classification.

3.2. Integral Relation

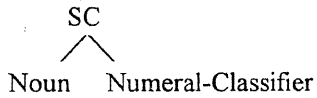
We saw above that a classifier and a noun maintain a tight relationship, a classifier serving as a label for the categorization of nouns. I propose that such a tight relationship be considered an Integral Relation, or a kind of part/whole relation, and further that a noun and an associated classifier phrase form a small clause of the kind proposed by Hornstein et al. (1994). Uriagereka (1993) and Hornstein et al. (1994) postulate a small clause that embodies a kind of predication that they name “Integral”. The Integral Relation can be observed in the following examples:

- (23) a. John’s sister
 b. a sister of John’s
- (24) a. the car’s engine
 b. an engine in the car
- (25) a. the poor neighborhoods of the city
 b. a city of poor neighborhoods

In (23), *John* and *a sister* are in a relationship of inalienable possession. In (24) *the car* and *an engine*, and in (25) *the neighborhoods* and *the city*, are in a part/whole relation. Hornstein et al. propose to express such relations in an Integral Small Clause as in (26), demonstrating how making such assumptions enables us to explain the distinct properties of the constructions (23) – (25):

- (26) a.  b.  c. 

Applying their analysis to the current issue, and considering the tight relationship observed between some nouns and classifiers, I propose the Integral Small Clause structure of (27):

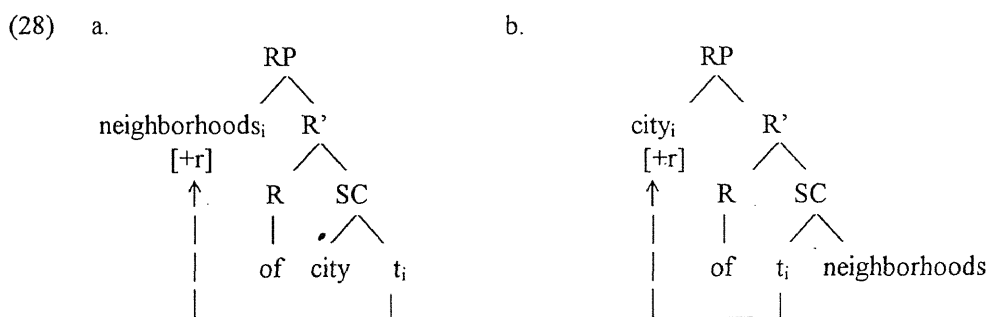
- (27) 

And I propose that a noun expressing an abstract notion is converted into a reified instance by a classifier that holds an integral relation with it.

3.3. Reference and Word Order

Besides there being an Integral Relation between the subject and the predicate of the small clause, another property common to the examples (23) – (25) is variation in word order. Kayne (1993), proposing a possessive structure for English that is essentially parallel to that proposed for Hungarian by Szabolcsi (1983), derives *a sister of John's* from *John's sister* by the movement of *a sister* to the left of *John's*.

Using recent developments of the Minimalist Program (Chomsky 1995), Uriagereka (1995) proposes a formal feature, Reference, which drives movement of the subject and the predicate of the small clause. The small clause serves as a source to enable the derivation of various surface manifestations. Consider the case of (25) as an illustration. The reference of the expression is different in (25a) and (25b): *the poor neighborhoods* in (25a), but *a city* in (25b). What is interesting in regard to Uriagereka's (1995) analysis is that reference is determined as the consequence of a syntactic process: R attracting the feature [+r]:



In (28a) *neighborhoods* moves to the Spec of R(eference), while in (28b) *city* moves to the Spec of R as a consequence of syntactic checking of the Reference feature [+r]. Whatever has moved to the checking domain of R determines the reference of the whole expression, while maintaining the basic relation between *the neighborhoods* and *the city*, as expressed in the small clause in both (28a) and (28b).

In addition to the kind of relation observed in examples (23) to (25), another point in common is variations in word order among nouns and classifiers. For example, 'Mari bought two pencils' can be expressed in Japanese in at least two ways depending on the position of the classifier phrase:¹⁰

¹⁰ There are additional variations in word order in Japanese. In this paper, however, I consider only variations within a noun phrase, in particular the two variations shown in (29). For a comprehensive discussion of the variations that occur at the sentence level, see Miyagawa (1989).

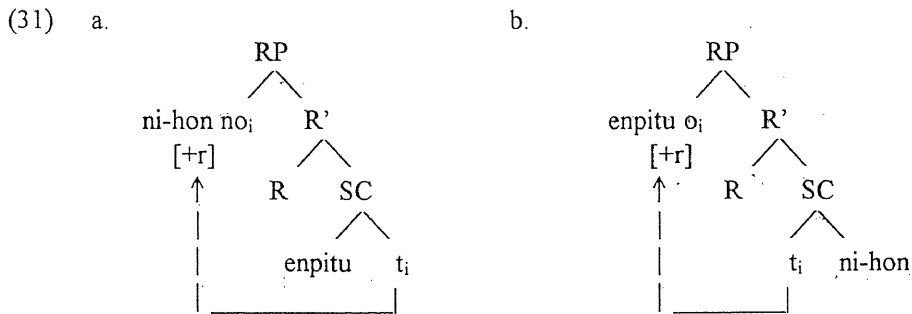
- (29) 'Mari bought two pencils.'
- a. Mari wa ni-hon no enpitu o katta.
 TOP 2-CL GEN pencil ACC bought
- b. Mari wa enpitu o ni-hon katta.
 TOP pencil ACC 2-CL bought

Such variations in the word order between the noun and the numeral classifier are in fact not limited to the Japanese language. According to Greenberg's (1975, 1977) observation, the following two variations exist among numeral classifier languages in regard to word order:

- (30) a. Q-CL ↔ N
 b. CL-Q ↔ N

The Japanese language is an instance of (30a). While a numeral is always to the left of the classifier, one finds variation in the order of the noun and the numeral classifier phrase.

Now, considering that certain nominal expressions require reference, and given the syntactic implementation of reference proposed by Uriagereka (1995), it should be possible to represent the structures of the two variations of the noun phrase in (29) in a similar fashion, as shown in (31):



Even though both (29a) and (29b) depict that Māri bought pencils and that the number of pencils is two, there is a difference in interpretation. *Ni-hon no enpitu* 'two pencils' in (29a) is talking about two individual pencils, being paraphrasable as 'two sticks that are pencils'. Here, the reference of the noun phrase is *ni-hon* 'two sticks'. On the other hand, in (29b), *enpitu o ni-hon* is about pencils, the entire noun phrase being paraphrasable as 'pencils, of which the number is two'. Here, the reference is *enpitu* 'pencil'.

Up to this point we have been considering quantification from the perspective of counting, of the sort that requires individuation.¹¹ Now I turn to the issue of specificity, with respect to which the indefinite article and numerals are said to induce ambiguity.

4. Specificity and Classifiers

Enç (1991) claims that the specific/non-specific distinction codes a difference in the domain of discourse. Specific noun phrases are linked to the previous discourse, while non-specific ones are not. Consider English example (32):

(32) I sent two children to the seventh grade, and one child to the eighth grade.

In (32), *two children* is ambiguous. It can be the first mention of the children, or they might have been previously introduced into the domain of discourse.

However, in Turkish, specificity of indefinites is marked overtly through accusative case marking. Consider the Turkish example (33):

(33) ‘I sent two children to the seventh grade, and one child to the eighth grade.’

- a. İki çocuk-u yedinci sınıf-a, bir çocuk-u
two child-ACC seventh grade-DAT one child-ACC
da sekizinci sınıf-a gönderdim.
and eighth grade-DAT I-sent,
- b. Yedinci sınıf-a iki çocuk, sekizinci sınıf-a
seventh grade-DAT two child eighth grade-DAT
da bir çocuk gönderdim.
and one child I-sent. (Enç 1991:6)

According to Enç, “the sentence [here 33a] can only be interpreted as saying something about some children previously introduced into the domain of discourse. In contrast, [33b] is interpreted as involving first mention of the children, a consequence of the fact that the objects in [33b] bear no case” (Enç 1991:6).

Muromatsu (1997) points out that the specific/non-specific distinction involving accusative case marking in Turkish has a parallel in Japanese. However, the distinction is coded not as a difference in case marking but rather through the differing position of numeral classifiers. Compare (34a) and (34b):

¹¹ As for another kind of quantification – the amount in terms of measures – this will not be discussed here due to space limitations. See Muromatsu (1995, 1998, Forthcoming a, Forthcoming b) for an analysis of mass terms and the hierarchical structure of the noun system.

(34) ‘I sent two children to the seventh grade, and one child to the eighth grade.’

a. Futa-ri no kodomo o sitinen-sei ni,
 2-CL GEN child ACC seventh-grade DAT

hito-ri no kodomo o hatinen-sei ni ireta.
 1-CL GEN child ACC eighth-grade DAT sent

b. Sitinen-sei ni kodomo o futa-ri, hatinen-sei ni
 seventh-grade DAT child ACC 2-CL eighth-grade DAT

kodomo o hito-ri ireta.
 child ACC 1-CL sent

(Muromatsu 1997:85)

(34a), where the classifier phrase is pre-nominal, exactly parallels Turkish (33a) in that the children in the sentence are linked to the previous discourse. On the other hand, in (34b), where the classifier phrase is post-nominal, the children are mentioned for the first time, which corresponds to Turkish (33b). I take the noun phrase in (34a) to correspond to specific noun phrases in Japanese, with the pre-nominal numeral classifier phrase somehow making a noun phrase specific.

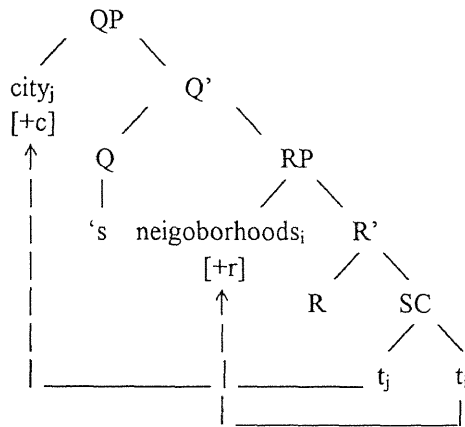
As manifested in the different positions of classifier phrases, the specific/non-specific distinction is a syntactic one in Japanese. Based on this new observation, I claim more precisely that the specific/non-specific difference resides in the architecture of the noun phrase.

In order to make a connection between the difference in the domain of discourse, on the one hand, and the positions of the classifier phrase, on the other, Muromatsu (1997) used Context as a formal feature, following Uriagereka (1995). Let us first consider some examples of this here:

- | | | | | |
|------|----|---|----|------------------------------------|
| (35) | a. | $\begin{array}{c} \text{SC} \\ \swarrow \quad \searrow \\ \text{city} \quad \text{neighborhoods} \end{array}$ | b. | the poor neighborhoods of the city |
| | | | c. | a city of poor neighborhoods |
| | | | d. | the city's poor neighborhoods |

We have seen that (35b) and (35c) are derived from the same Integral Small Clause of (35a), each conveying different reference. As for (35d), Uriagereka (1995) derives the word order as in (36):

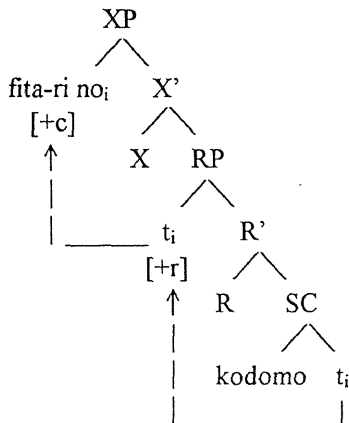
(36)



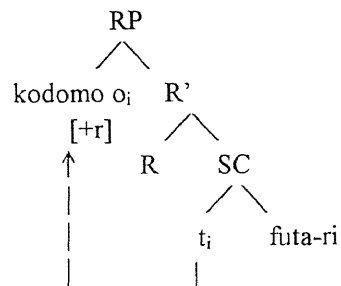
Following Higginbotham (1988), Uriagereka (1995) proposes that the Q introduces a context variable C, and incorporates the mechanism into syntax: “Whatever moves to Spec of Q has a contextual character. In particular, we may take speakers to confine the range of whatever quantification Q invokes in terms of the element C that moves to this Spec” (Uriagereka 1995:273-274). This is how he derives *the city’s poor neighborhoods*.

Following Enç’s (1991:11) convention that “contextually relevant means ‘already in the domain of discourse’”, and Uriagereka’s (1995) syntactic implementation of the semantic notion of Context in Higginbotham (1998), I propose the structure in (37a) for specific noun phrases:

(37) a.



b.

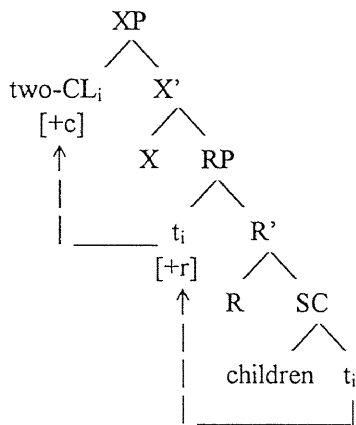


In (37a) the classifier carrying [+c] moves to the Spec of XP. By this mechanism, I propose to link the two individuals expressed by *futa-ri* ‘2-CL’ to the previous discourse.

The two individuals who are referred to are linked to the context, which is provided outside of the sentence in which they are mentioned. In contrast, (37b) expresses ‘children, of which the number is two’, this expression being clearly non-specific. The reference feature [+r] is carried by *kodomo* ‘children’, and the classifier phrase acts as a predicate specifying the number of children. There is no context feature involved here.

I have now captured the positional variations of Japanese numeral classifier phrases observed within indefinite noun phrases in terms of a difference in reference and specificity. The English specific noun phrase, in parallel to its Japanese counterpart, can be considered to have the structure in (38):

(38)



Interestingly, specific readings are lacking in mass terms. For example, *much milk* does not have a specific reading. The fact that specificity is only associated with individuated nominals can be connected to a function of classifiers: A classifier that has a function of individuation can be linked to previous discourse. That is, it can carry the Context feature.

5. A Syntactic Interpretation of Strong and Weak Determiners

This section considers two types of determiners, strong vs. weak, from the perspective of classifiers. Milsark (1977) distinguishes “strong” from “weak” determiners in terms of their permissibility in the post-copular position of existential sentences. “Weak” noun phrases are those with “weak” determiners, such as the indefinite article *a* and numerals, and, as in (39), they are permitted in existential sentences:

- (39) a. There is a cat on the chair.
 b. There are dogs in the room.
 c. There are three books on the table.

“Strong” noun phrases, on the other hand, are those with “strong” determiners, such as the definite article *the*, *most*, *every*, and *all*. These are excluded from the post-copular position in existential sentences, as in (40):

- (40) a. *There is the cat on the chair.
 b. *There is every dog in the room.
 c. *There are most books on the table.

Milsark (1974, 1977) considers the determiners for weak noun phrases to be “cardinality words”. And he considers only strong determiners to be “quantifiers”. We now consider how these two types of determiners, i.e. “quantifiers” and “cardinality words”, are expressed in our noun phrase structure.

5.1. Previous Proposals

First let us briefly consider some previous proposals for noun phrase structures, devoting specific attention to the treatment of determiners. Jackendoff (1977) considers the head of a noun phrase to be N, consistent with tradition. He treats indefinite and definite articles in a uniform way, as Art, an N^{'''} Specifier. In spite of this uniform treatment of indefinite and definite articles, he distinguishes two types of quantifiers in accordance with their definiteness: N^{'''} quantifiers (which are definite) and N^{''} quantifiers (which are indefinite). As for numerals, their categorial status is noun, and yet they are also N^{''} Specifier, as are indefinite quantifiers.

Overall, Jackendoff’s (1977) analysis captures the strong/weak distinction among determiners with only a few exceptions. But the two main differences between his proposal and mine are that my structure captures (i) specificity residing inside the noun phrase while his does not, and that (ii) noun phrases always project up to N^{'''} in Jackendoff’s system, while mine distinguishes three types of projection: RP, XP, and QP (QP will be discussed in Section 5.3).

In Abney (1987), the head of a noun phrase is considered to be D(eterminer), taking an NP as its complement (See also Hellan 1986). Article-like elements such as *a* and *the* belong to the same category D, irrespective of their definiteness. And they are distinguished from quantifier-like elements such as *many*. All noun phrases are categorized uniformly as DPs.

In contrast to Jackendoff (1977) and Abney (1987), who treat all kinds of noun phrases as N^{'''} and DP, respectively, in Giusti’s (1991) system there are two types of

noun phrases, QP and DP. For Giusti (1991), Q is a functional head. It takes DP as a complement when the quantifier is a universal quantifier, and takes NP as a complement when the quantifier is indefinite. Giusti (1991:444) asserts that “*many/few* and numerals can function either as adjectives or as quantifiers and can accordingly appear in either position”. She does not discuss how the indefinite article is treated in her system.

5.2. Classifiers and the Strong/Weak Distinction

An interesting fact is pointed out by Muromatsu (1997, 1998): Among determiners, classifiers seem to go only with cardinality words (i.e. weak determiners) but not with quantifiers (i.e. unambiguously strong determiners), a fact which, to my knowledge, has not been noticed before. And this suggests that not only numerals but also weak determiners, such as *many*, go with classifiers, and this prediction is borne out:¹²

- (41) a. Chinese: henduo ben shu
many CL book
'many books'
- b. Thai: rôm laaj khan
umbrella many CL
'many umbrellas'
- (77b, Hundius & Kölver 1983:179)

Higginbotham (1987) claims that quantifiers that do not have an adjectival interpretation are strong determiners. Compare (42) and (43):

- (42) a. The apostles are twelve. (Higginbotham 1987:48)
b. They are many (in number). (Higginbotham 1987:68)
- (43) *The men are all/each. (Bowers 1975:541)

While the weak determiners *twelve* and *many* can be predicative, having adjectival interpretations in (42), the strong ones, *all* and *each*, are not predicative in (43). Bowers (1975) observes two other adjectival characters of weak determiners.¹³ In addition to being predicative, they can follow the definite article, just like adjectives:

¹² I thank Yi-Ching Su for the Chinese data (41a) and (53).

¹³ Bowers (1975) does not necessarily consider the two types of determiners from the perspective of the strong/weak distinction but rather in terms of whether or not they have adjectival characters. For example, on the basis of this criterion, he groups the weak determiner *some* with *the* and *all*, since it does not behave adjectivally. It is unclear at this point why *some* behaves differently from other weak determiners.

noun phrases, QP and DP. For Giusti (1991), Q is a functional head. It takes DP as a complement when the quantifier is a universal quantifier, and takes NP as a complement when the quantifier is indefinite. Giusti (1991:444) asserts that “*many/few* and numerals can function either as adjectives or as quantifiers and can accordingly appear in either position”. She does not discuss how the indefinite article is treated in her system.

5.2. Classifiers and the Strong/Weak Distinction

An interesting fact is pointed out by Muromatsu (1997, 1998): Among determiners, classifiers seem to go only with cardinality words (i.e. weak determiners) but not with quantifiers (i.e. unambiguously strong determiners), a fact which, to my knowledge, has not been noticed before. And this suggests that not only numerals but also weak determiners, such as *many*, go with classifiers, and this prediction is borne out:¹²

- (41) a. Chinese: henduo ben shu
 many CL book
 ‘many books’
- b. Thai: rôm laaj khan
 umbrella many CL
 ‘many umbrellas’
- (77b, Hundius & Kölver 1983:179)

Higginbotham (1987) claims that quantifiers that do not have an adjectival interpretation are strong determiners. Compare (42) and (43):

- (42) a. The apostles are twelve. (Higginbotham 1987:48)
 b. They are many (in number). (Higginbotham 1987:68)
- (43) *The men are all/each. (Bowers 1975:541)

While the weak determiners *twelve* and *many* can be predicative, having adjectival interpretations in (42), the strong ones, *all* and *each*, are not predicative in (43). Bowers (1975) observes two other adjectival characters of weak determiners.¹³ In addition to being predicative, they can follow the definite article, just like adjectives:

¹² I thank Yi-Ching Su for the Chinese data (41a) and (53).

¹³ Bowers (1975) does not necessarily consider the two types of determiners from the perspective of the strong/weak distinction but rather in terms of whether or not they have adjectival characters. For example, on the basis of this criterion, he groups the weak determiner *some* with *the* and *all*, since it does not behave adjectivally. It is unclear at this point why *some* behaves differently from other weak determiners.

- (44) a. the five/many/few cats
 b. the small cats
 c. *the most/all/every cat(s)

Third, weak determiners, excluding numerals, can be modified by degree expressions:

- (45) a. so many/few cats
 b. so small cats
 c. *so most/all/every cats

The fourth instance where *many* behaves adjectivally is that it can be repeated:¹⁴

- (46) Many, many, many people are at the party.

Svenonius (1992) also claims adjectival status for *many*, and shows a parallel case in Norwegian: ‘many’ in Norwegian can (a) be predicative, (b) follow the definite article, and (c) be modified by intensifiers:

- (47) Norwegian:
 a. Fangene var mange, men vokterne var få.
 prisoners.DEF were many but guards.DEF were few
 ‘The prisoners were many, but the guards were few.’
 b. de mange fangene
 the many prisoners.DEF
 c. veldig mange
 very many (Svenonius 1992:106-8)

Svenonius (1992) further points out that *many* has comparative and superlative forms, this also being one of the characteristics of adjectives:

- (48) a. English: many, more, most
 b. Norwegian: mange, mer, mest
 many, more, most (Svenonius 1992:106)

From the above observations, I take weak determiners (including numerals) to be adjoined to classifiers, to which they are adjectival (thus differing from ordinary adjectives). An item of supporting evidence comes from a fact about word order observed by Greenberg (1977:293-294). Among the six possible word orders for the

¹⁴ This was pointed out to me by Juan Uriagereka (p.c.).

numeral classifier constructions, as in (49), the two non-occurring orders are the ones where the numerals and the classifiers are separated, as in (49e) and (49f):

- (49) a. Q-CL-N
b. N-Q-CL
c. CL-Q-N
d. N-CL-Q
e. *CL-N-Q
f. *Q-N-CL

Also, the order of a numeral and a classifier is fixed within a given language, but “the combination of the two may vary between placement before or after the head noun”, as we observed in Japanese in Section 3.3. Furthermore, “[t]he connection between the numeral and classifier is so close prosodically that they may have one accent, in which case it is on the numeral and there may be fused forms such that analysis becomes difficult. . . . In many languages, analysts consider the numeral + classifier construction to be a single word.” And finally, the numeral-classifier combination can often be separated from the enumerated noun. Given these facts, we can conclude that the numeral and the classifier form a constituent without any intervening elements between them.

Weak determiners are expressions of cardinality, the only difference between the pure cardinal words and *many* being the vagueness that the exact number is unspecified, as Milsark (1977) asserts. (And I take the reason for the incompatibility of intensifiers and numerals to be a semantic one, numerals specifying exact numbers.) An expression of cardinality requires the presence of numeral classifiers.

5.3. Quantifiers and Specific Noun Phrases

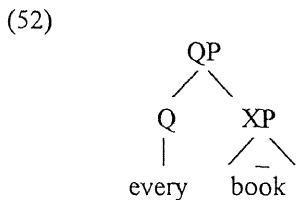
As is standardly assumed, all quantifiers quantify over contextually given sets. For example, (50) does not mean Jane read every book on earth, but she read every contextually relevant book:

- (50) Jane read every book.

Enç (1991:11) says that “It is reasonable to assume that contextually relevant means ‘already in the domain of discourse’, since the contextually relevant individuals are those that have been previously established in the discourse. If quantification is over contextually relevant sets of individuals, it follows that NPs that quantify universally are specific”. Indeed, in Turkish, universally quantified noun phrases must be marked with accusative case as shown in (51):

- (51) Turkish:
- a. Ali her kitab-i okudu.
 every book-ACC read
 ‘Ali read every book.’
- b. *Ali her kitap okudu.
 every book read
- (Enç 1991:10)

Recall that a specific indefinite object is overtly accusative-marked in Turkish. Quantifiers presuppose a specific noun phrase to quantify over. Thus quantifiers are not directly responsible for making the noun phrase specific. In the previous section, we expressed a specific noun phrase as an XP, a classifier carrying [+c]. Naturally, the position of quantifiers will be higher than the XP in our system so as to quantify over the XP:



As in (52), I propose that quantifiers are generated over the projection for context confinement, X. I depart from Uriagereka’s (1993, 1995) analysis in separating the quantifier site (Q) from the context confinement site (X).

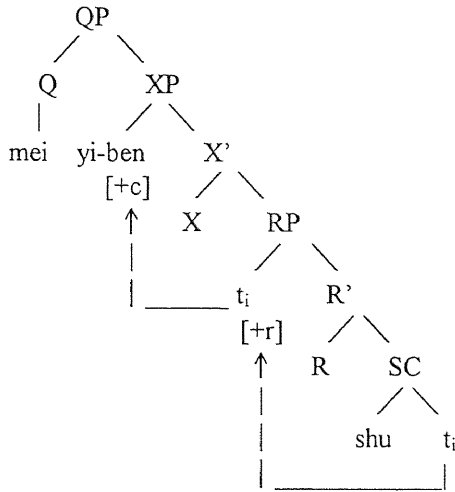
An item of evidence comes from Chinese:

- (53) Chinese: mei-yi-ben shu
 every-one-CL book
 ‘every book’

From our perspective, if a classifier is what makes a noun phrase specific (given some syntax), and a universal quantifier requires a specific noun phrase that contains a classifier in the relevant position, then it is reasonable to distinguish the syntactic position of classifiers from that of quantifiers.

I assign (53) the structure (54):

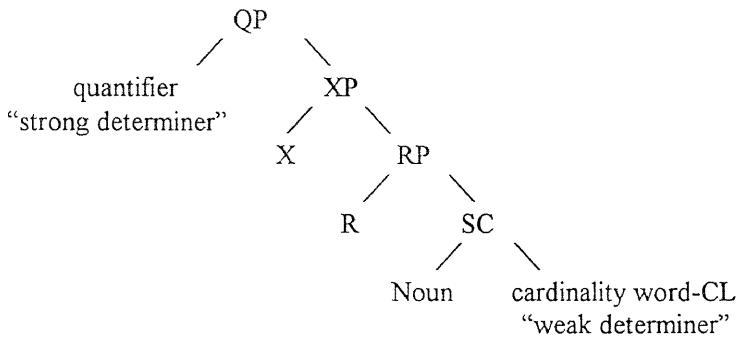
(54)



The structure above shows that ‘contextually relevant books’ is expressed in the projection up to XP, which means it is specific, and then the universal quantifier *mei* ‘every’ applies to contextually given books.

From semantic and syntactic considerations, I claim that strong determiners and weak determiners have positions as in (55):

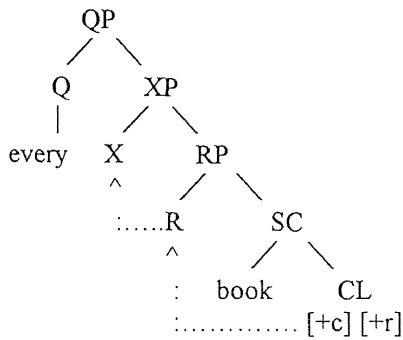
(55)



According to my proposal, Milsark’s quantifiers are situated at Q. The quantifier Q takes the specific noun phrase XP as its complement. On the other hand, cardinality words with classifiers are inside the small clause.

Now returning to our English example, *every book*, we see that its internal structure is (56), thus parallel to its Chinese counterpart (54):

(56)



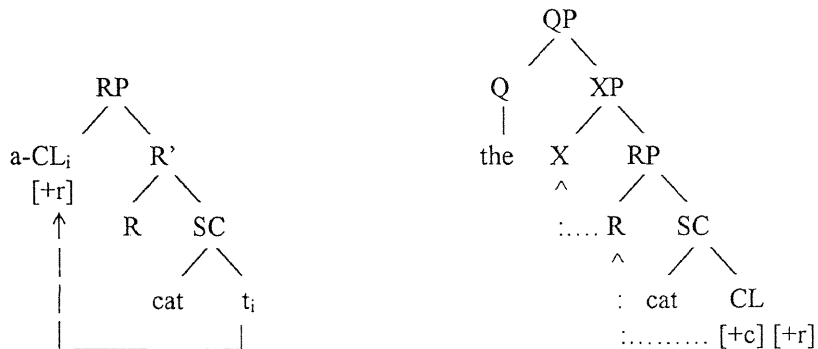
In this subsection I proposed different sites for quantifiers and cardinality words, based on semantic and syntactic considerations. Note that by quantifiers, I mean specifically “strong determiners” as defined in Milsark (1977).

5.4. Definite and Indefinite Articles

Given Milsark’s (1977) strong/weak distinction as a mapping onto differing syntactic positions, we are led to conclude that the definite article and the indefinite article likewise occupy different syntactic positions; thus we are rejecting a uniform treatment of indefinite and definite determiners like that of Jackendoff (1977) and Abney (1987). The weak noun phrase *a cat* and the strong one *the cat*, for example, have the representations in (57):

(57) a. *a cat*

b. *the cat*



As for the definite article – following Chomsky (1975), Milsark (1974, 1977), and going back to an idea by Bertrand Russell (See Neale 1990) – I regard it as a kind of universal quantifier.

The above structure allows the cooccurrence of the definite article and numerals, as in (58a), while banning the cooccurrence of the indefinite article and numeral *one* as in (58b):

- (58) a. the three cats
 b. *a one cat

It is natural to wonder then why the definite article and the indefinite article do not cooccur, when the definite article and numerals do so:

- (59) a. *the a cat
 b. the two cats

I claim that without a number, the classifier is assumed to carry the value of one. This is very common in classifier languages: When a numeral is absent from a classifier, the noun is considered singular. Consider examples from the language, Mu-Ming. In both (60a) and (60b) the numeral is absent, but the entire noun phrase is interpreted as singular:

- (60) Mu-Ming:
 a. ?baa soì
 CL paper
 ‘one sheet of paper’
 b. ?baa poi
 CL fan
 ‘one fan’

(Conklin 1981:118)

Analogously, we may consider that the English singularity marker *a* is implicit with *the*, but when it is stressed as *one*, it surfaces.

In this section I used facts concerning numeral classifiers to argue for a positional interpretation of “strong” and “weak” determiners. By placing the two kinds of determiner in different positions in the noun phrase structure, my scheme is able to capture several semantic and syntactic properties.

In the next section I discuss the determiner *many*, which is ambiguous between strong and weak.

6. Weak, Specific, and Quantificational Noun Phrases

6.1. Strong and Weak *Many*: Milsark (1974, 1977)

Milsark (1974, 1977) finds an interesting correlation between strong/weak noun phrases and two types of predicates: state-descriptive (SD) and property (P).

SD-predicates, such as *sick*, *hungry*, *tired*, and *alert*, denote “states, conditions in which an entity finds itself and which are subject to change without there being any essential alteration of the entity” (Milsark 1977:12). P-predicates, such as *tall*, *intelligent*, *wooden*, and *heavy*, are “descriptions which name some trait possessed by the entity and which is assumed to be more or less permanent, or at least to be such that some significant change in the character of the entity will result if the description is altered” (Milsark 1977:12-13). He observes that only strong noun phrases are compatible with P-predicates; weak ones are not. Witness:

- (61) a. The cat is hungry.
 b. A cat is hungry.
- (62) a. Every cat is intelligent.
 b. *Three cats are intelligent.

The point is that a given noun cannot appear in both of the two environments: the post-copular position of existential sentences and the subject position of P-predicates. Strong noun phrases are banned from the former, weak ones from the latter:

- (63) a. *There is the dog in the yard.
 b. The dog is intelligent.
- (64) a. There is a dog in the yard.
 b. *A dog is intelligent.

Interestingly, however, there are some determiners that do not appear to fit the strong/weak distinction. Consider (65):

- (65) a. There are many dogs in the yard.
 b. Many dogs are intelligent.

In (65a), *many dogs* is in the post-copular position of the existential sentence, exhibiting the character of a weak noun phrase, whereas in (65b), the same noun phrase is permitted as the subject of a P-predicate, behaving like a strong noun phrase.

The examples above, however, are not counterexamples to the strong/weak distinction. Milsark (1974) discusses such cases:

- (66) Many people were at the party. (Milsark 1974:199)

“[66] can mean either that the party had rather a lot of people at it or that it is true of many people, as opposed, one suspects, to others, that they were at the party” (Milsark 1974:199).

The former reading tells us the cardinality of people. The latter reading, on the other hand, tells us a given proportion. For example, in the situation that eight people came to the party when actually ten people were invited, the proportional reading of (66) is true, while the cardinal reading is false. For the cardinal reading of (66) to be true, the absolute number of people present at the party must be large, say 500.

Milsark (1974) notes that the two readings can be disambiguated by the placement of stress on *many*. Stressing *many* gives a proportional reading, while destressing it gives a cardinal reading. For this reason, the destressed *many*, which induces cardinal readings, is written as *mny*. The two readings are sometimes referred to as the “many” reading vs. the “mny” reading.

Milsark (1974) finds that the proportional reading of *many* cannot be obtained in existential sentences. (67) has only the cardinal sense:

(67) There were many people at the party. (Milsark 1974:199)

Coming back to the examples in (65), *many* in (65a) is “weak”, exhibiting the same pattern as (64), and *many* in (65b) is strong, showing the pattern of (63).

Given this, Milsark (1974) further distinguishes a third type of determiner with respect to “strong” and “weak” behaviors. One of the two types, which is unambiguously “strong,” includes *the, each, all, every, most*, etc. The second type we have looked at allows only a cardinal reading, and is represented by numerical expressions, such as *three* or *four*; this includes the indefinite article *a*.

The members of the third type include *many, some, few*, and the plural indefinite \emptyset . They are ambiguous between “strong” and “weak,” as we saw above. Recall, for example, that the strong “many” reading is the proportional reading, while the weak “mny” reading is the cardinal one. However, as Milsark (1974:202) states, by *ambiguous* it is not meant that “both readings are available in all instances of the use of the determiner in question. . . . What is meant is only that the two senses are in principle available with a certain determiner and can in fact be brought out by construction of a suitable syntactic and semantic environment.”

From this perspective, consider (68):

- (68) a. Many dogs are in the yard. (e.g. 7 dogs out of 10)
 b. Mny dogs are in the yard. (e.g. 60 dogs)

In (68a) *many dogs* is telling the proportion of the dogs (e.g. 7 out of 10 dogs); and then *in the yard* is predicated of the subset (7 dogs). Here, *many* is functioning as a quantifier. (68b) on the other hand is merely expressing the cardinality of dogs. I will call the third

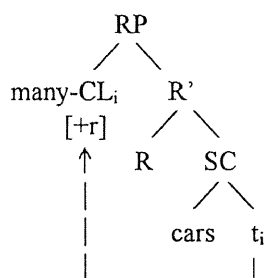
type of determiners, which are ambiguous between the weak and the strong reading, “quantificational cardinality words”.

6.2. Positions of Strong and Weak *Many*

In Section 5, I proposed that weak determiners are adjectives and that weak noun phrases are RPs. We saw that *many* exhibits several characteristics of adjectives: it (i) is predicative, (ii) can follow the definite article, (iii) can be modified by intensifiers, (iv) can be repeated, (v) has comparative and superlative forms. We also saw that weak determiners combine with classifiers, just as numerals do.

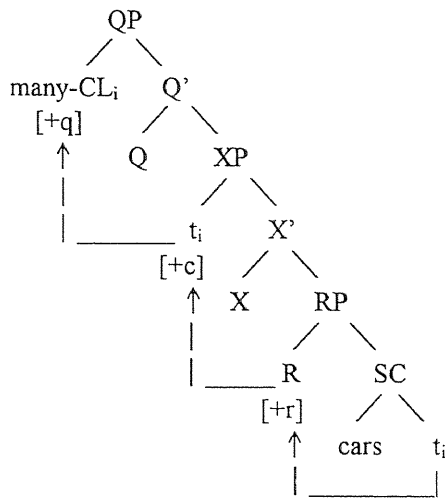
Given the above, then naturally when *many* has a weak reading, the structure of the noun phrase is as in (69):

(69) weak *many*:



I now turn to the strong reading of *many*. In Section 5.3, I captured strong noun phrases as QPs, a quantifier presupposing a specific noun phrase (XP) to quantify over. Given this consideration, noun phrases with the strong reading of *many* should also be QPs; thus I propose (70):

(70) quantificational *many*:



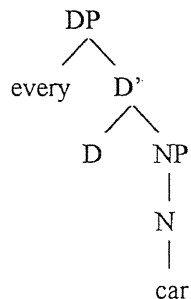
I propose that not only cardinal *many*, but also quantificational *many*, start out inside a small clause. However, quantificational *many* carries the quantificational feature [+q], which needs to be checked in the checking domain of Q.

And of course, for the quantification, context confinement is also necessary. For the quantification of *many*, contextually relevant cars are required, which will be provided by [+c] at the XP level. I take the CL part of *many-CL* to carry the [+c] feature. Thus, *many-CL* goes through Spec XP to check [+c] of *CL* there, and then it moves up to Spec QP to check [+q] of *many*.

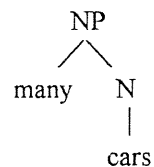
6.3. Hudson (1989)

With regard to the strong/weak distinction, Hudson's (1989) proposal captures it internally to noun phrase structure. He departs from Abney (1987) in that he distinguishes DPs from NPs:

(71) a.



b.

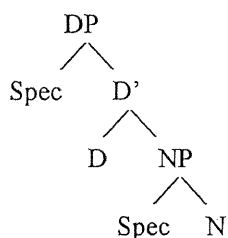


Hudson (1989) places strong determiners in the Spec of DP, and weak determiners in the Spec of NP.

Among the previous approaches to noun phrase structure, Hudson's is the closest to mine in that it distinguishes the sites for weak and strong determiners, and as a result the categorial status of the weak and strong noun phrases is distinct, NP vs. DP.

Hudson also claims that his system can capture the ambiguity of *many* internally to the DP.

- (72) Quantificational Determiners are generated in the Spec of DP. Cardinal Determiners are generated in the Spec of NP, but can raise to the Spec of DP to yield a Quantificational use.



(Hudson 1989:210-211)

Hudson's (1989) system has two sites for *many*: the Spec of DP and the Spec of NP; my system also has two sites: the Spec of QP and the Spec of RP. However, my structure provides a third site, namely the Spec of XP.

The question arises here as to whether or not *many-CL* can stop at the Spec of XP, or in other words, whether there is a purely specific, yet non-quantificational reading of *many*.

In relation to this question, we need to consider the status of specific indefinites. Specific indefinite noun phrases are called "strong" by some linguists (Diesing 1992, and De Hoop 1992, among others), and the question naturally arises of how Hudson's system captures these indefinites, whether as DP or as NP. If specific indefinites are considered DPs, they are on a par with definite noun phrases. If they are considered NPs, they are on a par with weak noun phrases.

6.4. Different Interpretations of "Strong" and "Weak"

There are several different interpretations of the notion "strong" and "weak", given by various linguists. For Milsark (1977), cardinal numbers are unambiguously weak, and the strong reading of *many* is proportional. He does not consider specific indefinites. For Enç (1991), a presuppositional noun phrase is specific. Thus, both specific indefinites and definite noun phrases are specific. Likewise, Diesing's (1992)

presuppositional reading includes not only specific indefinites but also Milsark's quantificational reading. De Hoop (1992) makes no distinction between a proportional and a partitive reading. In sum, these authors make only two-way distinction between strong and weak.

Partee (1988), however, distinguishes a partitive reading from a proportional reading. In other words, she treats quantificational noun phrases and specific indefinites as distinct, thus making a three-way distinction. In my terms they are quantificational, specific, and weak.

I claim with Partee (1988) that rather than a two-way distinction between strong and weak, we in fact need a three-way distinction among quantificational, specific, and weak. I propose to capture this distinction among noun phrases internally: each type of noun phrase carries different interpretable formal features, [+q], [+c], and [+r], each attracted to Q, X, and R, respectively.

Recall that we have an unanswered question, namely whether or not there is a purely specific, yet non-quantificational reading of *many*, which is associated with the Spec of XP in our system. If this reading exists, it is an item of evidence for the three-way distinction under discussion. And the answer is yes; it does exist.

6.5. Specific *Many*

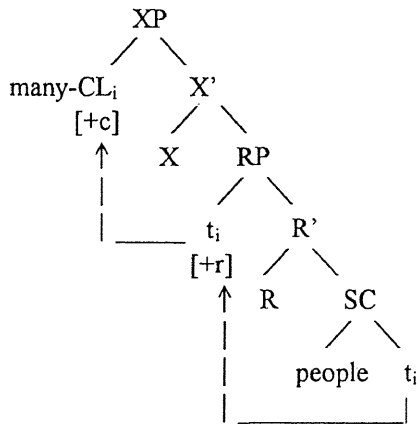
Imagine this situation: there are 12 million people in Tokyo.¹⁵ 8 million go to the beach one hot August day. Then you say:

(73) Still, many people stayed at home.

This, of course, means that 4 million people stayed home. *Many people* here expresses whatever it does within the relevant set of 12 million people, and thus apparently is a specific expression. Importantly, though 4 million is not proportionally many – in fact, it is proportionally few (for a 12 million total) – it is still arguably many in some cardinal sense. Thus *many* here is specific, but not obviously quantificational. I believe this proves the existence of a purely specific *many*, to which I assign the structure in (74):

¹⁵ The scenario that follows was suggested to me by Juan Uriagereka (p.c.).

(74) specific *many*:



Here, *many* does not carry [+q], but *CL* carries [+c] to link *many-CL* to the previous discourse.

Note also that the structure I am proposing here predicts that something like *the many people* cannot have the proportional reading. And the prediction is borne out: as Partee (1988) points out, *many* here has only the cardinal reading. There is no proportional meaning involved.

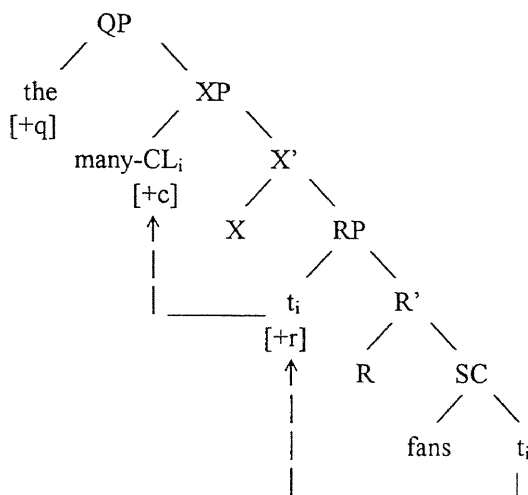
Furthermore, our system requires *many* in *the many people* to be specific, not non-specific, due to the presence of the quantifier *the*. Consider the following sample of discourse:¹⁶

(75) There was a huge crowd of people. The many fans were lined up to buy tickets.

Here *many fans* is included in the huge crowd of people mentioned in the previous discourse. (Or more accurately, because of the article *the*, *the many fans* is a huge crowd of people.) Thus, this *many* is not simply cardinal but is also specific. *The many fans* has the structure in (76) in our system:

¹⁶ Thanks to Tom Frost for providing this scenario (p.c.).

(76) *the many fans*



In Hudson’s (1989) system, there is no site for specific *many*, or more generally, it is not clear where determiners for specific indefinites are hosted in his structure.

In this section, I claimed to distinguish three kinds of noun phrase, following Partee’s (1988) insight. As a piece of evidence, I showed three different readings of *many* and the noun phrase structure associated with each. The “weak” reading of *many* is purely cardinal and not specific; and the noun phrase that includes such reading of *many* is RP. The “specific” reading of *many* is not proportional, but neither is it purely cardinal in that it is linked to previous discourse. The “quantificational” reading of *many* is proportional, and being quantificational, it is also specific.

In sum, the QP in my structure corresponds to “strong” in the sense of Barwise and Cooper (1981), and it is quantificational. The XP, corresponding to “specific” indefinites in Enç’s (1991) sense, is discourse linked. The RP is weak in everyone’s sense.

It is also important to note where the strong/weak distinction falls in my noun phrase structure. Milsark’s (1974, 1977) strong/weak distinction falls between QP and RP (XP is not dealt with in his analysis), whereas Diesing (1992) cut the line between XP and RP. And Partee (1988) finds a three-way distinction that corresponds to my QP, XP, and RP.

6.6. Distributional Differences

I have proposed three different types of noun phrase structure, QP, XP, and RP, which correspond to quantificational, specific, and weak noun phrases, respectively. The

structural difference predicts that the three types of phrase should have different distributions within a given language.

It is also possible that in some languages, only QP is considered strong, while in other languages QP and XP are both considered strong. If so, the strong/weak behaviors we find in many languages can be parameterized in terms of where the line of the strong/weak distinction is drawn.

In this section we will consider a couple of samples of such distributional differences among RPs, XPs, and QPs. I first demonstrate the three-way distinction at work within a given language, Japanese.

Harada (1976) observes that a Japanese noun phrase of post-nominal classifier phrase type cannot serve as a subject of a stative predicate:

(77) Japanese:

*Gakusei wa san-nin kasikoi.
student TOP 3-CL intelligent
'Three students are intelligent.'

In terms of the present perspective, post-nominal versions are characterized as weak noun phrases (RPs), and the incompatibility of post-nominal versions with state predicates naturally follows. Milsark's (1974, 1977) weak/strong distinction, as well as Diesing's (1992) non-presuppositional/presuppositional distinction, can also account for the ungrammaticality of (77): weak or non-presuppositional noun phrases cannot be in the subject position of state predicates.

Now consider the pre-nominal classifier phrase versions in (78), which are grammatical:

(78) Japanese:

- a. San-nin no gakusei wa kasikoi.
3-CL GEN student TOP intelligent
'Three students are intelligent (but not others).'
- b. Sono san-nin no gakusei wa kasikoi.
that 3-CL GEN student TOP intelligent
'The three students (under discussion) are intelligent.'

The noun phrase in (78a) is an XP for us, and the one in (78b) is a QP. Both are compatible with state predicates, and yet the QP and the XP render the interpretation of each sentence different. While (78b) is a canonical sentence with the topic marker *wa*, (78a) requires the interpretation of contrast, the marker *wa* being referred to as contrastive *wa* by Kuno (1973).

To recapitulate, RPs, XPs, and QPs exhibit different distributions with respect to state predicates in Japanese. RPs are banned, XPs induce a contrastive reading, and QPs are topic-marked.

However, with Milsark's two-way distinction, the grammaticality of (78a) is not predicted since XPs are still weak in his terms. As for Diesing (1992), the grammaticality of (78a) and (78b) is predicted, both being presuppositional, and yet the meaning difference between (78a) and (78b) is not captured.

We next compare the post-copular noun phrases in existential sentences in English and Dutch. English existential sentences ban specific indefinite noun phrases in the post-copular position:

(79) *There are two unicorns intelligent.

De Hoop (1992) points out in contrast that, in Dutch, strong readings of weak noun phrases (i.e. specific indefinites) can be obtained with the expletive *er* 'there':

(80) Dutch:

Els zegt dat er twee eenhoorns intelligent zijn
Els says that there two unicorns intelligent are
'Els says that two (of the) unicorns are intelligent.'

(De Hoop 1992:125)

However, it is still the case that strong determiners, such as *most*, are banned from existential sentences, just as in English.

The noun phrase structure proposed here would be ideal for capturing variations like those we have just seen in Dutch and English. With respect to permitted noun phrases in the existential construction, only RPs are allowed in English, these being associated with [+r]; [+c] is not permitted. In Dutch, on the other hand, both XPs and RPs are allowed, these being associated with [+c] and [+r]; [+q] is not permitted.

With the system developed by Hudson (1989), however, it is not clear how specific indefinites and quantified noun phrases are to be treated. The difference observed above between English and Dutch cannot be dealt with.

I have not yet explored other distributional differences involving the three types of noun phrase; but with the noun phrase structure developed here, such language variation can be parameterized. Whatever formal features are carried by them, whether [+q], [+c], or [+r], they are affected in different ways at the sentence level in different languages. I leave such exploration for future research.

7. Conclusion

This paper has examined ways that determiners and nouns combine with each other, showing the key roles played by classifiers. Without a classifier's individuating function, a noun merely expresses an abstract notion. But once a classifier applies to it, the classifier now expresses a reified instance of the abstract notion expressed by the noun. For enumeration, individuation is necessary, and thus a classifier is required. Specificity is also associated with a classifier that carries a Context feature. Recall that a mass term, which is not individuated and thus do not contain a classifier, lacks a specific reading.

Strong and weak determiners are analyzed as being placed in different positions, and likewise for the definite article and indefinite article. Weak determiners, expressing cardinality, are analyzed to be adjectival to a classifier, based on Greenberg's (1977) observations on word order. A strong determiner does not combine directly with a classifier, but rather it requires a specific noun phrase that contains a classifier in the relevant position.

Unlike the two-way distinction between strong and weak, I proposed to make a three-way distinction among noun phrases – quantificational, specific and weak, with the three types of noun phrase being analyzed as QP, XP, and RP, respectively.

References

- Abney, Steven Paul. 1987. *The English noun phrase in its sentential aspect*. Doctoral dissertation, MIT.
- Adams, Karen L. and Nancy Faires Conklin. 1973. Toward a theory of natural classification. *CLS* 9:1-10.
- Barwise, Jon and Robin Cooper. 1981. Generalized quantifiers and natural language. *Linguistics and Philosophy* 4:159-219.
- Bowers, John S. 1975. Adjectives and adverbs in English. *Foundations of Language* 13:529-562.
- Chomsky, Noam. 1975. Questions of form and interpretation. *Linguistic Analysis* 1:75-109.
- Chomsky, Noam. 1995. *The minimalist program*. Cambridge, Mass.: MIT Press.
- Christophersen, Paul. 1939. *The articles: A study of their theory and use in English*. Copenhagen: International Publisher.
- Conklin, Nancy Faires. 1981. *The semantics and syntax of numeral classification in Tai and Austronesian*. Doctoral dissertation, University of Michigan.
- Diesing, Molly. 1992. *Indefinites*. Cambridge, Mass.: MIT Press.
- Dik, S. 1980. *Studies in functional grammar*. London: Academic Press.
- Enç, Müevet. 1991. The semantics of specificity. *Linguistic Inquiry* 22:1-25.

- Frege, Gottlob. 1950. (1884). *The foundations of arithmetic*. Translated by J. L. Austin. Oxford: Blackwell.
- Giusti, Giuliana. 1991. The categorial status of quantified nominals. *Linguistische Berichte* 136:438-454.
- Givón, Talmy. 1981. On the development of the numeral 'one' as an indefinite marker. *Folia Linguistica Historica* 2:35-53.
- Givón, Talmy. 1984. *Syntax: A functional-typological introduction*, Volume I. Amsterdam: John Benjamins.
- Greenberg, Joseph H. 1975. Dynamic aspects of word order in the numeral classifier. In *Word order and word order change*, ed. C. N. Li, 27-45. Austin: University of Texas Press.
- Greenberg, Joseph H. 1977. Numeral classifiers and substantial number: Problems in the genesis of a linguistic type. In *Linguistics at the crossroads*, ed. A. Makkai, V. Makkai and L. Heilmann, 276-300. Padova, Italy: Liviana Editrice.
- Harada, Shin-Ichi. 1976. Quantifier float as a relational rule. *Metropolitan Linguistics* 1:44-49.
- Hellan, Lars. 1986. The headedness of NPs in Norwegian. In *Features and projections*, ed. Pieter Muysken and Henk van Riemsdijk, 89-122. Dordrecht: Foris.
- Higginbotham, James. 1987. Indefiniteness and Predication. In *The representation of (in)definiteness*, ed. E. Reuland, and A. ter Meulen, 43-70. Cambridge, Mass.: MIT Press.
- Higginbotham, James. 1988. Contexts, models, and meanings: a note on the data of semantics. In *Mental representations: The interface between language and reality*, ed. R. M. Kempson, 29-48. Cambridge: Cambridge University Press.
- Hoop, Helen de. 1992. *Case configuration and noun phrase interpretation*. Doctoral dissertation, University of Groningen.
- Hornstein, Norbert, Sara Rosen, and Juan Uriagereka. 1994. Integrals. *University of Maryland working papers in linguistics* 2:70-90.
- Hudson, Wesley. 1989. Functional categories and the saturation of noun phrases. *NELS* 19:207-222.
- Hundius, Harald and Ulrike Kölver. 1983. Syntax and semantics of numeral classifiers in Thai. *Studies in Language* 7:165-214.
- Jackendoff, Ray S. 1977. *X-bar syntax: A study of phrase structure*. Cambridge, Mass.: MIT Press.
- Jespersen, Otto. 1933. *Essentials of English grammar*. London: George Allen and Unwin.
- Kayne, Richard S. 1993. Toward a modular theory of auxiliary selection. *Studia Linguistica* 47:3-31.
- Kraak, A. and W. G. Klooster. 1968. *Syntaxis*. Culemborg: Stam-Kemperman.
- Kuno, Susumu. 1973. *The structure of the Japanese language*. Cambridge, Mass.: MIT Press.

- Martin, Samuel E. 1988. *A reference grammar of Japanese*. Tokyo: Charles E. Tuttle. (First published in 1975 by Yale University.)
- Milsark, Gary. 1974. *Existential sentences in English*. Doctoral dissertation, MIT.
- Milsark, Gary. 1977. Toward an explanation of certain peculiarities of the existential construction in English. *Linguistic Analysis* 3:1-29.
- Miyagawa, Shigeru. 1989. *Structure and case marking in Japanese: Syntax and semantics* 22. San Diego: Academic Press.
- Muromatsu, Keiko. 1995. The classifier as a primitive: Individuation, referability, and argumenthood. *University of Maryland working papers in linguistics* 3:144-180.
- Muromatsu, Keiko. 1997. The context feature and specificity. *Proceedings of TACL Summer Institute of Linguistics 1997 (TACL 4)*:85-96. Tokyo Metropolitan University.
- Muromatsu, Keiko. 1998. *On the syntax of classifiers*. Doctoral dissertation, University of Maryland, College Park.
- Muromatsu, Keiko. Forthcoming a. The Count/mass distinction and the ordering of adjectives. To appear in *MIT working papers in linguistics*.
- Muromatsu, Keiko. Forthcoming b. Classifiers and the count/mass distinction. To appear in *The Proceedings of the symposium on diachronic and synchronic studies on the syntax of East Asian languages*. The Hague: Holland Academic Graphics.
- Neale, Stephen. 1990. *Descriptions*. Cambridge, Mass.: MIT Press.
- Partee, Barbara H. 1988. Many quantifiers. *ESCOL* 1988:383-402.
- Perlmutter, David M. 1970. On the article in English. In *Progress in Linguistics*, ed. M. Bierwisch and K. E. Heidolph, 233-248. The Hague: Mouton.
- Quine, Willard Van Orman. 1969. Ontological relativity. In *Ontological relativity and other essays*, 26-68. New York: Columbia University Press.
- Svenonius, Peter. 1992. The extended projection of N: Identifying the head of the noun phrase. *Working papers in Scandinavian syntax* 49:95-121. Department of Scandinavian Linguistics, Lund.
- Szabolcsi, Anna. 1983. The possessor that ran away from home. *The Linguistic Review* 3:89-102.
- Uriagereka, Juan. 1993. Specificity and the name constraint. *University of Maryland working papers in linguistics* 1:121-143.
- Uriagereka, Juan. 1995. Warps: Some thoughts on categorization. *University of Maryland working papers in linguistics* 3:256-308.
- Wierzbicka, Anna. 1985. Oats and wheat: The fallacy of arbitrariness. In *Iconicity in syntax*, ed. J. Haiman, 311-342. Amsterdam: John Benjamins.

No ‘No’: On the Crosslinguistic Absence of a Determiner ‘No’*

Uli Sauerland

This paper concerns the semantics of determiners. I point out that the currently dominant generalized quantifiers analysis of determiners has certain deficiencies. I then provide an alternative which seems offer some hope not suffer from the same deficiencies.

It is generally believed that the semantics of all determiners fits into one or a limited number general schema. The same assumption is made also for other categorial classes. This assumption is well motivated, since there must be a general mechanism that relates syntactic structures to semantic representations. This mechanism can be easy and elegant in a straightforward way if the semantics of each syntactic class is internally uniform, such that for example all transitive verbs, or all complementizers belong to the same semantic type of things.

The general schema of determiner quantification that is most popular these days is the generalized quantifier analysis. This analysis goes back to at least Montague (1970) and was developed by Barwise and Cooper (1981) and Keenan and Stavi (1986) among many others. All modern textbooks of natural language semantics (Larson and Segal 1995, Heim and Kratzer 1998, de Swart 1998) present this analysis of determiner quantification. The basic claim, the general schema, is that all determiners are two place functions that take two predicates as arguments.

In this paper I want to do the following. In the first section, I argue that the a certain generalized quantifier, the one usually called NO, is not attested in any natural language, and that what use be analyzed as NO is better analyzed as a morpho-syntactically composed expression but should semantically as negation plus an indefinite. As I argue, this observation provides motivation to seek an alternative

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to the generalized quantifiers view of determiner quantification. In the second part of the paper, I propose an alternative to generalized quantifiers, that is based on a different syntactic structure of quantificational DPs and involves quantification over choice functions. For this reason, I introduce the term Cfantifiers for these semantic functions. While the considerations I offer are unfortunately at present still inconclusive, I hope to show that there is some reason for optimism.

1 Absence of Negative Quantifiers

According to the generalized quantifiers view of determiners, all determiner meanings are two place functions that take two predicates as their arguments and yield truth values as their result. In the type-theoretic notation of Montague (1970), generalized quantifiers are the functions of type $\langle\langle e, t \rangle, \langle\langle e, t \rangle, t \rangle\rangle$. The generalized quantifiers analysis is, as far as I know, descriptively successful: all determiners of English and as far as I know also all other languages can be assigned the right interpretation on the generalized quantifier analysis, though it may sometimes be difficult to figure out which analysis of a number of candidates is the correct one. The criticism I develop in this section is, though, that of all the semantically possible generalized quantifiers few are actually attested—I believe at most universal, existential, and cardinal quantification is attested.

For reasons of space I focus on one conceivable generalized quantifier, the quantifier NO. I want to show that no language has a determiner that means NO. In particular, I claim that the English word *no* must be analyzed as *not+one* by decomposition into sentential negation NOT together with an existential determiner \exists .

$$(1) \quad \text{NO}(R)(S) = 1 \text{ iff } \forall x : R(x) \Rightarrow \mathcal{S}(x)$$

I don't address in this paper other expressions that have been sometimes analyzed as generalized quantifiers (Keenan and Stavi 1986). I'm thinking of comparatives like *more than three*, partitives like *three out of four*, and superlatives like *most*. I believe that all of these are also semantically decomposed into smaller parts and that the determiners that occur in the decomposed LF-structure all accord to my

generalization, but don't have the space here to justify this assumption.

Consider now the English Quantifier *no*, which seems an even more likely candidate that the complex expressions of the previous paragraph for a determiner since it's one word in English. As already mentioned, a popular analysis of the sentence in (2a) is that sketched in (2b) where the meaning of *no* is the generalized determiner NO of (1).

- (2) a. Andy has no enemies.
 b. $\text{NO}(\llbracket\text{enemies}\rrbracket)(\lambda x \text{ Andy has } x)$

An alternative semantic analysis of (2a) is to decompose *no* into negation and an indefinite. This is sketched in (3a) and paraphrased in (3b).

- (3) a. $\text{NOT}(\exists x \in \llbracket\text{enemies}\rrbracket): \text{Andy has } x$
 b. 'It's not the case that Andy has an enemy'
 'Andy doesn't have any enemies.'

The truth conditions of (3a) are identical to those of (2b). I argue in the following sections with evidence from a variety of languages that only the analysis (3a) is actually possible for sentences with *no* or their equivalents in other languages. I show that some languages don't have a word like the English *no*, but must express the meaning by overtly using either negation and indefinite (Japanese and Salish) or negation and a negative concord item (French, Italian, and Japanese), which I take to be a morphological variant of an indefinite. I then show evidence from four languages (Mohawk, Norwegian, German, and English) that seem to have a word *no* which shows that in these languages to *no* can be decomposed into negation and indefinite, and in at least Mohawk and Norwegian must be. Based on these data I'll conclude that the simplest assumption, especially from an acquisition point of view, is that the determiner *no* is always decomposed, which means that the generalized quantifier NO is not attested in any natural language.

1.1 Overt Decomposition: Japanese and Salish

In some languages, there's no candidate for a determiner meaning 'no'. Japanese apparently is such a language (Yabushita 1996). The way to express a statement like 'No students read that book' is (4), where negation and an indefinite are used to capture the English 'no'.

- (4) Sono hon-o yonda gakusei-wa hitori-mo inai.
that book read students one-even exist-not
'Students who read that book don't exist.' (*literally*)
'No students read that book.'

Another way to express 'No students read that book' is (5), where again 'NO' is split into 'not' and an indefinite.

- (5) gakusei-wa sono hon-o yomanakatta
students that book read-not-past

Japanese also has negative concord/polarity words which offer another way to express the meaning of 'no'. Such expressions are discussed in the next subsection.

Another language, where the only way of expressing 'no' is transparently decomposed into an indefinite and negation is Salish (Matthewson 1998:49-50) (see also Matthewson 1998 for the details of the transcription).

- (6) a. xwa kwet syaqcu-s (Sechelt)
neg THING wife-his
'His wife didn't exist.' (*literally*)
'He had no wife.'
- b. 7axw ti ka lhalas 7ala 7ats (Bella Coola)
NEG DET HYP boat here
'A boat doesn't exist here.' (*literally*)
'There's no boat here.'

1.2 Negative Concord: French, Italian, Japanese, ...

Negative concord words are words that can only cooccur with negation in the same sentence, and moreover must be in the scope of negation. Negation and the negative

concord word together have a meaning equivalent to English *no*. For example in French and Italian, the words that seem to translate ‘no’ must cooccur with sentential negation when they occur in a sentence (or at least when they occur in object position). (see Haegeman 1995, Herburger 1998, Ladusaw 1992, Zanuttini 1997, among many others)

- (7) a. Je n’ai vu personne (French)
 I not-have seen nobody
 ‘I saw nobody.’
 b. *Je ai vu personne
 I have seen nobody

- (8) a. Non o visto nessuno (Italian)
 Non have seen nobody
 ‘I saw nobody.’
 b. *o visto nessuno
 have seen nobody

One interesting question that has been asked about negative concord is whether the negative force of sentences like (7a) and (8a) originates with the negation word or is part of the meaning of the negative concord item. As far as I know, the majority of the literature on the topic assumes that negation is interpreted in examples like the above, and that the interpretation of a negative concord word is essentially that of an indefinite. The strongest argument for this assumption comes from cases that contain more than one negative concord item. If more than one of the negative concord item occurs in a sentence as in (9) only one instance of sentential negation is required to license all of them. Moreover, an interpretation with multiple negation isn’t available as shown by (9) (Haegeman and Zanuttini 1996:(13)).

- (9) Non ho mai detto niente a nessuno (Italian)
 No I have never told nothing to noone
 ‘I haven’t ever told anybody anything.’
 *‘I have never told nobody nothing.’

If it is true that words like *nessuno* are to be analyzed as indefinites that require a special relationship with negation, that means that negative concord languages also belong to the languages that lack a determiner meaning NO.

1.3 Decomposition I: Mohawk

In the following four sections, I address languages that seem to possess a morphological determiner meaning NO. My goal is to show that in the first two languages actually the determiner must always be analyzed as decomposed, while in the second two languages the decomposition analysis must be possible, and might be the only possible one.

Mohawk seems to have a word, *yahuhka*, that has the generalized quantifier meaning also attributed to *nobody* (Baker 1995, 28-29, Baker 1996, 58-60).

- (10) Shawatis yahuhka to-shako-ka-0
 John nobody neg-Agr-see-stat
 John saw nobody.

However, Baker argues that *yahuhka* is not a determiner, but decomposed into negation and an indefinite. I summarize Baker's argument. First, *Yahuhka* cannot appear following the verb unlike other nominal phrases as shown by the contrast between (11) and (12).

- (11) *Shawatis to-shako-ka-0 yahuhka
 John neg-Agr-see-stat nobody
- (12) a. Shawatis akweku wa-shako-kv-'
 John all fact-Agr-see-punc
 John saw everyone.
- b. Shawatis wa-shako-kv-'
 John fact-Agr-see-punc akweku
 John saw everyone.

Furthermore, *Yah* is the morpheme for sentential negation.

- (13) a. Ter yah te-ha-yena-0 ne takos
 Peter not neg-Agr-catch-stat ne cat

Peter didn't catch the cat.

- b. Sak yah kanusha' te-ho-hninu-0
Sak not house neg-Agr-buy-stat
Sak didn't buy a/the house.

And, *Uhkak* has an existential meaning.

- (14) Uhkak wa-shako-kv-'
someone fact-Agr-see-punc
He saw somebody.

In fact, *yahuhka* can be split into *yah* and *uhka* (without the final /k/ of *uhkak*, see discussion by Baker).

- (15) yah to-shako-ka-0 uhka
not neg-Agr-see-stat somebody
He didn't see anybody.

Hence, Baker proposes that *yahuhka* should really be analyzed a compound of negation and the indefinite *uhka(k)*. Notice that the ungrammaticality of (11) is only be explained, if the decomposition is the only possible analysis of *yahuhka*. If the generalized quantifier existed as an option, (11) should be grammatical.

1.4 Decomposition II: Norwegian

Norwegian behaves exactly like Mohawk, except that the relationship between Norwegian *ingen* ('no') and the negation and indefinite morphemes is less transparent (the following discussion is a summary of Christensen 1986 via Kayne 1998).

The first property of *ingen* that resembles Mohawk is that it cannot occur following a verb as shown in (16).

- (16) a. *Jon har lest ingen romaner.
John hasn't read no novels.
b. *Dette er en student som leser ingen romaner.
This is a student who reads no novels.

There are examples like (17) where *ingen* seems to be following the verb, but in (17)

the verb has moved to C and therefore the base position of the verb might well be following the *ingen* phrase.

- (17) Jon leser ingen romaner.
John reads no novels.

Secondly, in Norwegian a synonymous, but transparently decomposed way of expressing (17) is available as illustrated by (18).

- (18) John leser ikke noen romaner.
John read not any novels

For the examples (16), decomposition of *ingen* into *ikke* and *noen* is the only way to express the English equivalent in Norwegian.

- (19) a. John har ikke lest noen romaner.
John has not read any novels.
b. Dette er en student som ikke leser noen romaner.
this is a student that not reads any novels

If negation must occur to the left of the base position of the verb, and *ingen* can only occur as the result of some morphological replacement when negation and the indefinite *noen* are adjacent, these facts are expected. Again, the explanation of the ungrammaticality of (16) argues in this analysis that *ingen* must be decomposed into negation and an indefinite, and that the generalized quantifier NO is not a possible meaning of *ingen*.

1.5 Decomposition III: German

In German the equivalent of English *no* is *kein*. Unlike in Mohawk and Norwegian, *kein* can appear in essentially any position a DP can occur (see below). However, there is semantic evidence that the determiner *kein* ('no') can be decomposed into negation and an indefinite (Bech 1955/1957, Lerner and Sternefeld 1984, Kratzer 1995). Namely, a modal can take scope between negation and the indefinite in both (20a) and (20b). Furthermore, there's a difference between the plural of *kein* in (20a) and the singular in (20b). Namely, the example (20a) with the plural allows only the interpretation where the modal takes scope between two parts of

the decomposed *kein*. The example (20b) with the singular, on the other hand, also allows an interpretation that can be characterized both as the generalized quantifier NO taking scope over the modal or as negation and the indefinite part of *kein* both taking scope above the modal.

- (20) a. weil keine Beispiele bekannt sein müssen
 since no examples known be must
 ‘since it’s not necessary that examples are known’
 (not >> must >> some, *NO >> must, *must >> NO)
- b. weil kein Beispiel bekannt sein muß
 since no example known be must
 (not >> must >> some, NO >> must, *must >> NO)

A second argument for the decomposition analysis is that negation cannot be directly followed by an indefinite as shown by (21a). (21b) shows that topicalization of the indefinite makes the cooccurrence of negation and an indefinite in the same sentence possible. This indicates that the sequence *nicht ein* is morphologically transformed into *kein* whenever it occurs.

- (21) a. ??Dem Hans ist nicht ein Beispiel bekannt.
 The John is not an example known.
- b. Ein Beispiel ist dem Hans nicht bekannt.
 An example is the John not known.
 ‘John doesn’t know one example.’

Kratzer (1995) observed a second difference between singular and plural *kein* in (22). While plural *kein* is ungrammatical as the subject of an individual level predicate, singular *kein* can occur as the subject of an individual level predicate.

- (22) a. *weil keine Ärzte altruistisch sind
 since no doctors altruistic are
- b. weil kein Arzt altruistisch ist
 since no doctors altruistic is

Based on (20) and (22), Kratzer (1995) claim that while plural *kein* must be decomposed in German, singular *kein* can also be a generalized quantifier. With the assumption that indefinites must always reconstruct to the narrowest scopal position, this assumption explains the contrast in (20). In the plural example, the split reading is forced, because negation cannot reconstruct while the indefinite must reconstruct below the modal. In the singular example, the decomposition analysis of *kein* gives rise to the split reading, while generalized quantifier analysis explains the second reading available in this example. The contrasts in (22), follows from Kratzer's assumption together with the belief that the decomposition analysis is blocked by the presence of an individual level predicate.

Kratzer's analysis would provide the first evidence that at least in some cases the generalized quantifier NO is attested. However, an alternative analysis of her facts is possible, based on the assumption that *kein* is always decomposed. Namely, assume that the indefinite part of *kein* must be interpreted in the lowest position of its chain only when its plural (cf. Carlson 1977). This predicts the contrast in (20) straightforwardly, and is not less likely to be true than Kratzer's assumption that the indefinite part of decomposed *kein* must reconstruct regardless of whether it's singular or plural. Since reconstruction is blocked with individual level predicates, the new assumption also explains the contrast in (22). In (22a), the reconstruction requirement of plural *kein* conflicts with whatever blocks reconstruction in individual level predicates.

The scope evidence in (20) argues that regardless of number, the German *kein* at least can always be decomposed into negation and an indefinite part. In the plural, this must be the only possible analysis of *kein* since the split scope is the only interpretation possible. However, for the singular of *kein* it might be that both the generalized quantifier analysis and the decomposition analysis are possible as Kratzer proposes, or that only the decomposition analysis is possible as we saw in the previous paragraph.

1.6 Decomposition IV: English

Even in English there's evidence that the decomposition of *no* must be assumed in at least some cases. Johnson (1996) points out that negative quantifiers can serve as

the antecedent material for an indefinite in VP-ellipsis. It's well established that an elided VP must be identical to an antecedent (Sag 1976, Tancredi 1992). Then the first conjunct in (22) must somehow be able to provide an antecedent of the form *find a solution*. This is easily explained, if *no* can decompose into negation and the indefinite *a*.

(23) I could find no solution, but Holly might ⟨find a solution⟩

Kayne (1998) presents a second, independent argument from English that argues for a form of decomposition—in his version, overt movement of negative quantifiers to negation. His argument is based on the contrasts in (24).

(24) a. I'm required to work out no solution. (not>>required>>a solution)
b. I'm required to work no solution out. (required>>not>>solution)

Kayne's argument relies on the similarity of the contrast in (24) to other extraction properties of particle verbs. For reasons of space I leave out Kayne's main argument. Note however, that (24) show the same split scope as the German example (20). Namely, (24a) shows that negation and indefinite can take scope in different positions. Hence, the decomposition analysis is also possible in English. In English, however, there's no evidence for or against the generalized quantifier analysis of *no*.

1.7 Section Conclusion

The evidence in this section showed that a whole number of typologically diverse languages—Japanese, Salish, French, Italian, Mohawk, and Norwegian—simply lack a determiner with the meaning NO. A way to express the same meaning, however, available to all these languages was the combination of negation and the indefinite. For German and English, I showed that the decomposition of *no* is also possible. However, the available evidence didn't allow us to decide whether or not in English and in the German singular the analysis of *no* as the generalized quantifier NO is possible. The easiest assumption would be, however, that universally no language has a determiner that means what the generalized quantifier 'NO' expresses.

The following acquisition consideration supports the assumption that English

and German also lack the generalized quantifier NO. The consideration is based on the assumption that children can only rely on positive evidence in the acquisition process (Crain 1991). However, as I discussed above there's no evidence available from either German or English whether the generalized quantifier NO is available. If one were to postulate NO for German and English, it would hence need to be the default of children to assume a generalized quantifier analysis of the morpheme *no*. But, if that was true, how would children acquire Mohawk and Norwegian? In both Mohawk and Norwegian a morpheme similar to *no* occurs, hence the generalized quantifier analysis of it as NO should be entertained by the children, and some evidence must have triggered them to reject this analysis. However, the evidence above that led us to conclude that the generalized quantifier NO is not available in Mohawk and Norwegian was only negative evidence—namely the ungrammaticality of (11) and (16). This evidence, however, cannot be available to the child learning either language, and therefore the assumption that the generalized quantifier analysis is available in English and German must be wrong.

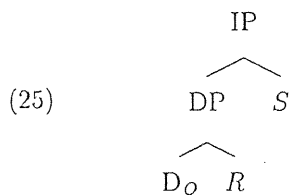
In sum, no language has a determiner with the meaning of NO. Depending on the syntactic and morphological structure of a language—especially the word order of Neg, Verb, and Object—the decomposition of NO is more or less obscured. In languages where negation on one side of the verb and the object on the other, *no* must be transparently decomposed into *not* and indefinite as we saw in Japanese and Salish, as well as in the negative concord languages. In Mohawk and Norwegian, we saw that the morpheme *no* only surfaces when negation and indefinite object are adjacent. Finally, German and English seem to allow negation to always morphologically interact with the verb. German, since it is verb final with negation on the left of the VP, is straightforward. In English, negation and the object seem to be separated by the verb, which we would expect to block the insertion of *no*. Hence the finding lends support to the idea that the surface position of the English verb is not its base position (Kayne 1998 and references therein).

What implications does the result have for the semantics of determiners? First consider what it would imply for the standard semantic theory of determiner meaning: generalized quantifiers. As far as I can see, we would need to postulate

a second semantic universal ‘Non-negativity’ akin to the ‘Conservativity’ constraint of Barwise and Cooper (1981) and Keenan and Stavi (1986). Since this is not an attractive option, unless the constraint could be argued to follow from something, I take the result to be motivation to search for alternatives to the Generalized Quantifiers view of determiner quantification in the hope they might predict the restrictions on available determiner quantifiers. This is what the rest of the paper is about.

2 An Alternative to Generalized Quantifiers

One major support of the generalized quantifiers view of quantification is that it fits very well with the surface syntactic structure of English. Namely, underlying the generalized quantifiers view are structure like (24) where D_Q is a quantificational determiner, R is the NP-complement of D_Q and S is the scope of the Determiner Phrase headed by D_Q .



A structure like (25) can be easily correlated with a semantics of quantifiers where these take two arguments. These are the restrictor R , which is provided by the complement of the Determiner, and the scope S , which is provided by the complement of the Determiner Phrase.

(26) $Q(R)(S)$ or more explicitly $Q(\lambda x R(x))(\lambda y S(y))$

For example (27a) has the semantics in (27b): The generalized quantifier NO takes the two one-place properties “man” and “smoked” as its arguments.

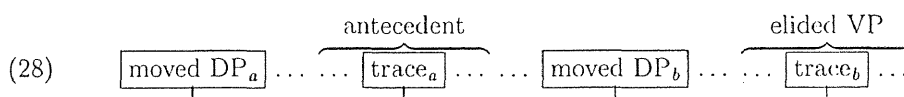
- (27) a. No man smoked.
 b. $\text{NO}(\text{man})(\text{smoked})$

However, the next section points to some evidence that the structures that are actually interpreted are in some cases quite different from the surface syntax of English. Namely, it seems that a quantifier takes only one argument, which contains both the restrictor and the scope information of the generalized quantifier analysis.

2.1 Restrictors inside the Scope

There is evidence that the restrictor of a quantifiers occurs in a position inside the scope at LF when a quantifier is A-bar moved.. (Chomsky 1993, Fox 1995, 1999, Sauerland 1998)

On argument from my own work (Sauerland 1998) in favor of this assumption is based on VP-ellipsis of constituents containing a trace of quantifier movement. In English, a VP can often be elided if it means the same as an antecedent. If both the antecedent and the elided VP contain a trace, as sketched in (28), the possibility of deletion can be used to test for the content of the trace position.

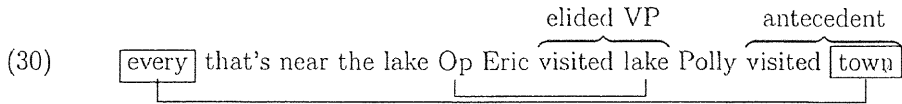


The expectation of the copy theory is that Ellipsis of a VP containing a trace is possible exactly if the two trace positions have the same content. An argument of this type is developed by Sauerland (1998:ch.3) based on paradigms with antecedent contained deletion like (29), which bear out the expectation in (28). Since In (29), the antecedent of the elided VP on the surface is the matrix VP *visited every town that ...*. Since the antecedent containment in (29) must be resolved by quantifier raising of the matrix object, at LF the antecedent VP is *visited t*, where *t* is the trace left by QR of *every town* with the adjoined relative clause. The observation in (29) is that ellipsis is only licensed when the head noun of the DP undergoing QR and the head noun of the relative clause head are identical.

- (29) a. *Polly visited every town that's near the lake that Eric did ⟨visit *t*⟩.
(Kennedy 1994)
- b. Polly visited every town that's near the town that Eric did ⟨visit *t*⟩.

The contrast in (29) bears out the prediction of the copy theory—two traces are

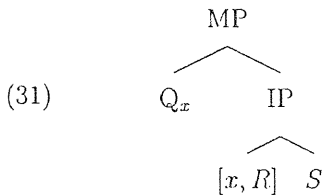
considered identical when their antecedents are. My account of (29) relies on a representation like (30) where the trace positions contain material of their antecedents. This means that the trace of a moved quantifier has content which restricts the range of the quantifier.



This result then argues that the syntactic division of restrictor and scope of the English surface syntax, is not as clear at LF. Hence, the assumption of generalized quantifier theory that restrictor and scope are the two arguments of a quantificational head is in doubt.

2.2 Cfantifiers

My first departure from generalized quantifier theory is the LF-structures. As argue in the previous section, I assume that the syntactic structure of quantification is that sketched in (31): the Quantifier Q takes as it's complement a phrase that contains both the lexical content of the scope and the restrictor, but there is a semantic relationship between the quantifier and the restrictor.



The next question is what the semantic relationship between quantifier and restrictor is—or, in other words, what the variable x may refer to. Since the interpretation of $[x, R]$ is the complement of S , which is a predicate, it's natural to assume that the meaning of $[x, R]$ serves as the argument of S , and hence is of the type of individuals. I assume that x is a function applying to the predicate R and resulting in an individual.

Hence, the semantics of (31) I assume to be that in (32).

(32) $Q(\lambda f S(f(R)))$

The meaning of Q , hence, is that of a function assigning to a predicate of certain functions a truth value. I'll use the term *Cquantifier* for such functions.

(33) A *Cquantifier* is a function assigning to a predicate of type $\langle\langle\langle e, t \rangle, e \rangle, t \rangle$ a truth value.

2.3 Weak Crossover

Quantification over functions may seem counterintuitive as an analysis of quantifiers like *every*. Before spelling out the analysis in more detail, consider a benefit of this analysis: The following new implication falls out from the assumption that quantifiers don't quantify over individual. Namely, the so called weak crossover constraint would be a consequence of this view.

It's well known that in many cases moved quantificational expressions cannot bind pronominals anywhere in their scope. This is the so-called weak crossover constraint (Wasow 1972).

- (34) a.??A relative of his_i is visiting every student_i.
b.??One of her_i friends was talking to every teacher_i.
c.??Which student_i are his_i relatives visiting?

If in all these cases, the lexical material restricting the moved quantifier is interpreted in the trace position, the dependency between the quantifier and its trace is mediated by a variable ranging over functions.

(35) *Which λf are his_f relatives visiting f (student)

But, the pronoun in (35) would have to be interpreted as a function rather than an individual. The result we expect to be illformed, since for example the function in the pronoun position doesn't have an argument. Therefore, weak crossover is a corollary of the view that quantifiers don't range over individuals, when they are binding material from an A-bar position.

2.4 Expressiveness of Cfantifiers: Easy Case

Now consider the following question: For which determiners is there a Cfantifier that captures the meaning of the determiner accurately? The result we are aiming is that for “no” there can be no Cfantifier that captures the meaning of “no” as a primitive, while at least for “every” and “a” such a cfantifier exists.

Without knowledge of what possible determiners the question of the expressiveness of Cfantifiers would be hard to decide. However, we can rely on the theory of generalized quantifiers as a guide, since it captures a lot of the determiner meaning that were investigate accurately, it just allowed to many possible determiner meanings. In fact, there is also systematic relationship of the syntactic structure assumed by generalized quantifier theory, and the structures I’m assuming here. This makes it easy to compare the expressiveness of the two theories. So, given the more than adequate descriptive coverage of generalized quantifiers, a natural question to ask is (36). As I show in the following section, (36) represents only the easy case of the expressiveness comparison.

(36) For which generalized quantifiers Q is there a Cfantifier C such that:
 $Q(R)(S) \leftrightarrow C(\lambda f S(f(R)))?$

It turns out that it’s easier to ask for which Q a corresponding C doesn’t exist. For such a Q there must be R_1, R_2, S_1 and S_2 for which Q yields different values ($Q(R_1)(S_1) \neq Q(R_2)(S_2)$), but all Cfantifiers C yield the same values. That implies that (37) holds.

(37) $\lambda f.S_1(f(R_1)) = \lambda f.S_2(f(R_2))$

Since for any x there’s an f with $f(R_1) = f(R_2) = x$, (37) implies:

(38) $S_1 = S_2 =: S$

If S isn’t constant then $R_1 = R_2$ follows, because otherwise there is an f with $S(f(R_1)) \neq S(f(R_2))$. But, if $R_1 = R_2$ then it can’t be that $Q(R_1)(S) \neq Q(R_2)(S)$ contrary to assumption. Hence, S must be a constant function that is either always

true or always false.

This leads to the conclusion that, for a Q with $Q(R_1)(\emptyset) \neq Q(R_2)(\emptyset)$ or a $Q(R_1)(D_e) \neq Q(R_2)(D_e)$, there is no corresponding cfantifier.

Are such quantifiers relevant for linguistic purposes? I think so. Consider the example in (39): If everybody left, the predicate left is true of every individual. But, if two boys and only one girl are all the people, (39a) is judged true, while (39b) is false. Hence, it seems that there are possible generalized quantifiers that cannot be expressed by Cfantifiers.

- (39) a. Two boys left.
b. Two girls left.

This result is, however, built on assumptions about semantics more simple than the usual one. Specifically, presuppositions weren't considered in the argument.

I follow Heim (1983, 1992) in modelling presuppositions formally using partial functions. Presupposition failure corresponds to an undefined function. So for example, the predicate "stop" presupposes that whatever stopped or didn't stop was going on in the past. This is expressed by assuming that "stop" only is defined for two arguments, an individual x and a VP P , if $P(x)$ held at some point in the past.

- (40) a. John stopped smoking.
b. \llbracket stopped smoking $\rrbracket(x)$ is defined only if x has been smoking.

Consider now again the question from above, but under the assumption that the predicate initiated by λf can be either true, false or undefined for any f :

- (41) For which generalized quantifiers Q is there a Cfantifier C such that:
 $Q(R)(S) \leftrightarrow C(\lambda f S(f(R)))$?

The reasoning as above shows that all Q can be expressed by Cfantifier except for maybe a Q that yields different values for two different R 's while S is either the constantly true or the constantly false predicate. Actually, though even for such a

$Q, \lambda f.S(f(R))$ can differ in whether f is defined for R . For any $R_1 \neq R_2$, there is an f with $f(R_1)$ defined and $f(R_2)$ not defined. Hence, at least for all generalized quantifiers Q there is a corresponding Cfantifier C that has the same truth value.

This result shows that we haven't lost any of the expressiveness of generalized quantifiers by adopting Cfantifiers instead. This is not the desired, since the goal is to lose expressiveness, to lose at least the generalized quantifier NO. The next section shows, that actually the easy case considered is not the only to consider when asking whether a Cfantifier captures the meaning of generalized quantifier.

2.5 Expressiveness of Cfantifiers: Difficult Case

What is the case of Cfantifiers we didn't consider yet? Since the material that on the generalized quantifier view is the restrictor occupies a position internal to the scope, it should also be able to contain a variable bound within the scope. Actually, such structures have been considered in the literature. One place where something like Cfantifiers have been employed previously is the work of Engdahl (1980) on the interpretation of questions. In particular, she discusses examples like (42) where the interrogative phrase contain a bound variable.

(42) Q: Which friend of her_i's did every student_i invite?

A: Mary invited John and Sue invited Bill.

Engdahl (1980) proposes LF-representation in (43) and a semantics involving quantification over functions.

(43) $\underbrace{\text{which } \lambda f \text{ did every student}_i \text{ invite } f(\text{friend of her}_i\text{'s})}_{\text{LF-representation}}$

See also recent work on existential quantification (Reinhart 1994, 1997, Kratzer 1998, and others).

The question is cfantifiers can be defined such that structures with a bound variable in the argument of the choice function receive the right interpretation. First, consider what the right interpretation is—the interpretation generalized quantifier theory predicts.

- (44) a. Every student brought a/two/no book of his.
 b. a/two/no λf every student_i brought $f(\text{book of his}_i)$

It seems to be generally the case that the interpretation of such examples with bound variables is correctly described by a generalized quantifier taking scope below the binder of the variable. Then the question is, or which Q is there C such that (45) holds for T , R and S .

$$(45) \quad T(\lambda x.Q(R_x)(S_x)) = C(\lambda f.T(\lambda x.S_x(R_x)))$$

I cannot conclusively answer this question at this moment, especially the even for the case of indefinites recent work by Chierchia (1999) has shown that modifications are required. Instead I would like to offer a heuristic.

3 Constructing some Cfantifiers

In this section, I approach the question of which generalized quantifiers can be expressed by a cfantifier in a heuristic way. I try to develop a general schema for defining cfantifiers adjusting it to cover as many examples as possible. It turns out then that on this approach the first assumptions about how to define cfantifiers seem very natural and that then a cfantifier expressing NO turns out to not definable.

The general schema for defining Cfantifiers that I assume is a reduction to a predicate of sets D , which has to be intuitive. I assume that every cfantifier is related to a D by the formula in (46). Furthermore, for the C expressing a determiner Det , D has to be the intuitive set-predicate correlate of Det : D for the existential determiner “a” should be the predicate “non-empty”, D for cardinal determiners “ n -many” should be the predicate “ n -many elements”. I leave open for now what D should be for the universal “every”.

$$(46) \quad C(P) = \exists M \subset P: (D(M) \text{ and } M \text{ fulfills certain requirements})$$

In the schema (46), I assume that the additional requirements on M , whatever their nature maybe, don't vary with the Cfantifier C , but are the same for all Cfantifiers we define.

3.1 An Existential Cfantifier

Is there a Cfantifier that can capture existential quantification? Or more formally:
Is there Cfantifier C with (47) for any R, S and T ?

$$(47) \quad T(\lambda x. \exists (R_x)(S_x)) = C(\lambda f. T(\lambda x. S_x(R_x)))$$

If we assume that C involves existential quantification, maybe over some set M which is a subset of the total domain of Cfantifiers, it follows that this subset must be that of choice functions. Namely, (48a) entails (48b).

$$(48) \quad \begin{aligned} \text{a. } & \forall R, S: (\exists f : S(f(R)) \rightarrow \exists x \in R: S(x)) \\ \text{b. } & \forall R: \forall f \in C: \forall R: f(R) \in R \end{aligned}$$

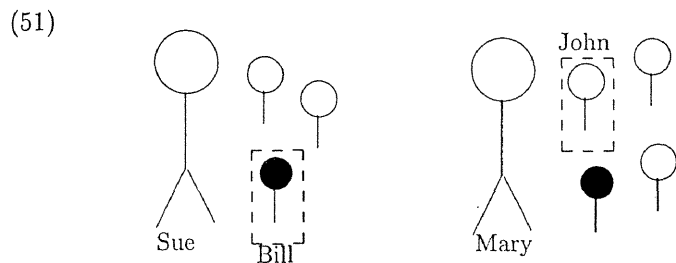
This is in fact Engdahl's (1980) analysis of questions: existential quantification over choice functions. Consider the example in (49a), which Engdahl analyzes as in (49b).

$$(49) \quad \begin{aligned} \text{a. } & \text{Which friend of her}_i\text{'s did every student}_i \text{ invite?} \\ \text{b. } & \exists \lambda f C_{+wh} \text{ did every student}_i \text{ invite } f(\text{friend of her}_i\text{'s}) \end{aligned}$$

A choice function is a function which assigns to sets elements thereof. The concept is defined in (50).

$$(50) \quad f \text{ is a } \textit{Choice Function} \text{ iff. } \forall X \in \text{Domain}(f) : f(X) \in X$$

For illustration, consider example (49) in the situation (51), where only the marked people have received an invitation.



In this situation, (49) is a felicitous question and could be answered *Sue invited Bill and Mary invited John*. This is explained by the existence of a choice function that satisfies the predicate in (52), which is the scope of the quantification in (49b). Namely, the choice function that from every set of friends of someone picks the one that is marked in (51).

(52) $\lambda f C_{+wh}$ did every student_i invite f (friend of her_i's)

Choice functions have also been used for wide scope existentials (Reinhart 1994 and others). (53) gives one illustration of this analysis.

- (53) a. Mary will leave if a certain philosopher comes.
 b. $\exists \lambda f$ Mary will leave if f (a certain philosopher) comes.

3.2 Cardinal Quantifiers

I assume with Diesing (1992) and others that English cardinal expressions can be indefinites, but also quantificational. This explains that they can occur in environments limited to indefinites as in (54a), but also take distributive wide scope as in (54b).

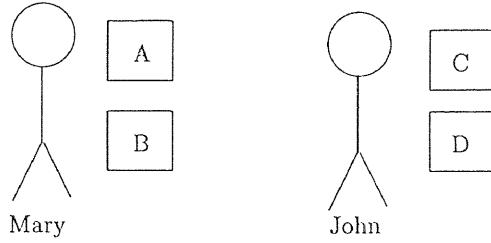
- (54) a. There are three women in the room.
 b. A different man greeted three women.

With cardinal quantifiers, however, there are problems assuming quantification over all choice functions. Here I assume that cardinal quantifiers are expressed reduced to the cardinal predicate “ n -many element” for the appropriate n .

Namely, assuming quantification over all choice functions incorrectly predicts (55a) to be true in the situation sketched in (56).

- (55) a. Every student_i brought two books of his_i.
 b. $\text{two } \lambda f \text{ every student}_i \text{ brought } [f, \text{books of his}_i]$

(56)



The scope of (55b) is satisfied by the two distinct choice functions f and g defined as follows. Hence, (55b) is true in situation (56), while intuitively (55a) is false.

- (57)
- a. $f: \{\text{books of Mary}\} \mapsto A$
 $\{\text{books of John}\} \mapsto C$
 - b. $g: \{\text{books of Mary}\} \mapsto A$
 $\{\text{books of John}\} \mapsto D$

At this point, a further restriction on the set of choice functions D applies to becomes necessary. It seems fairly clear, that what is going wrong in (57) is that the choice function f and g both pick the element A from the set of books of Mary.

3.3 Pointwise Different Choice Functions

As we saw, if cardinal quantifiers are requirements on the number of elements of a set of choice functions, this set must usually be a true subset of the set of all choice functions satisfying the complement of the cardinal quantifier.

I propose the modification of the choice function approach in (58).

- (58) **Proposal:** Quantificational determiners range over pointwise different choice functions.

Two choice functions are pointwise different if they choose different elements for every set that is in the domain of both of them. This is stated in (59).

- (59) f and g are *pointwise different* iff.

$$\forall x \in \text{Domain}(f) \cap \text{Domain}(g) : f(x) \neq g(x)$$

This restriction brings about another shift: the choice functions the existential cfantifier quantifies over could have all been total choice functions: ones that are defined for any nonempty set. But, note that two global choice functions can never be pointwise different, because for any singleton in their domain that must yield the same value. Hence, now we are committed to partial choice functions. This, however, doesn't affect the earlier argument since for the truth of the predicate the Cfantifier applies to only the value of the choice function for those sets that it's presupposed that the choice function is defined for matters.

The proposal avoids the problem noted above. The problematic f and g of (57) are not pointwise different. They choose the same element from the set of books of Mary.

- (60) a. $f: \{\text{books of Mary}\} \mapsto A$
 $\{\text{books of John}\} \mapsto C$
 b. $g: \{\text{books of Mary}\} \mapsto A$
 $\{\text{books of John}\} \mapsto D$

3.3.1 The PPD-set

For *two* a set of two pointwise different choice functions that satisfy the scope is required. For other cardinal quantifiers a set of choice functions must satisfy the scope each two of which are pointwise different.

- (61) a. Every student brought three books of his.
 b. three λf every student brought [f , books of his_{*i*}]

The set of choice functions required must have the property of being pairwise pointwise different. The following abbreviation is useful:

- (62) PPD(S) is true iff. S is a set of choice functions with

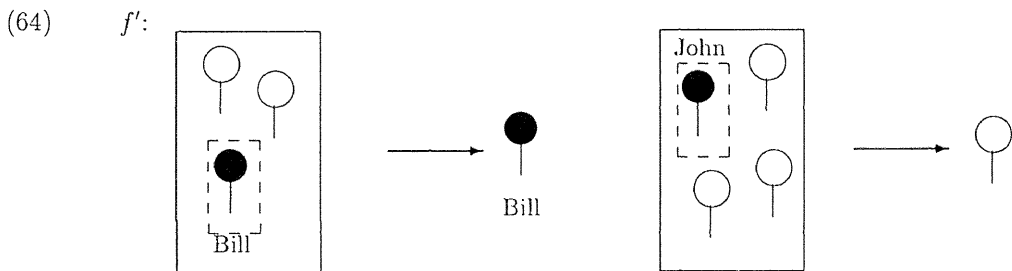
$$\forall f, g \in S : f, g \text{ are pointwise different or } f = g$$

3.4 Quantification over the PPD-set

If quantification is restricted to a PPD-set, how is the PPD provided. One option to consider is that the PPD-set is given by context. This assumption runs into problems: Consider example (63a) in the situation (51), where it was intuitively true.

- (63) a. Every student_{*i*} invited a friend of her_{*i*}'s.
 b. $\exists \lambda f$ every student_{*i*} invited f (friend of her_{*i*}'s)

If quantification over choice functions was restricted to a contextually salient PPD-set, the truth of (63a) actually depends on the PPD-set. Since there's only one f that satisfies the scope of (63b), only if this f was always in the relevant PPD-set, would (63a) be predicted true regardless of the context. But, if the f' in (64) is in the contextually relevant PPD-set, the only f satisfying the scope of (63b) was excluded, since the f' in (64) is not pointwise different with f with it.



Hence, in a context where f' is contextually relevant, (63) should be false and (65) should be true.

- (65) It's not true that every student_{*i*} invited a friend of her_{*i*}'s.

Therefore, the PPD-set cannot be contextually given. I suggest that the PPD set is existentially quantified over, like other implicit arguments are. For cardinal quantifiers this amounts to the lexical entry in (66):

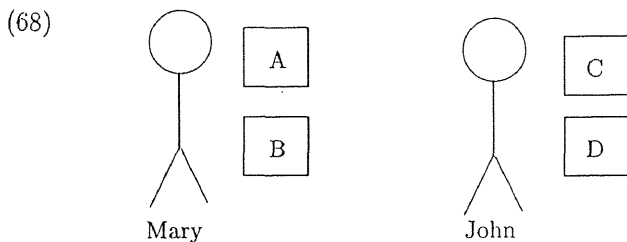
- (66) $\llbracket \text{more than } n \rrbracket(S)$ is true iff. $\exists F$ (PPD(F) and there are more than n f such that $S(f)$ and $f \in F$)

3.5 Absence of Negative Quantifiers

The reasoning so far, has lead us to the definition schema in (67), where D is determined as discussed above. We can now argue that the schema in (67) doesn't allow the definition of a Cfantifier expressing NO.

$$(67) \quad C(P) = 1 \text{ iff } \exists M: (D(M \cap P) \text{ and } M \text{ is a PPD set of choice functions} \\ \text{(more restrictions possible)})$$

Assume we're to define a cfantifier for 'no' following schema (67). Then consider again the situation with two students M and J and four books A, B, C, D (two each) where each student brought one of his book, namely Mary brought A, and John brought C.



In this situation, consider the following examples with an existential quantifier in (69), a cardinal quantifier in (70), and “no” in (71). The result we want is that (69) is true, while (70) and (71) are false.

- (69) a. Every student brought a book of his.—TRUE
 b. $a \lambda f$ every student_i brought f (book of his_i)
- (70) a. Every student brought two books of his.—FALSE
 b. two λf every student_i brought f (books of his_i)
- (71) a. Every student brought no books of his.—FALSE
 b. no λf every student_i brought f (books of his_i)

Let's use B_M to stand for the set of books of Mary and B_J to stand for the set of books of John. Consider the two PPD-sets in (72).

- (72) a. $M_1 = \{\{\langle B_M, A \rangle, \langle B_J, C \rangle\}, \{\langle B_M, B \rangle, \langle B_J, D \rangle\}\}$
 b. $M_2 = \{\{\langle B_M, A \rangle, \langle B_J, D \rangle\}, \{\langle B_M, B \rangle, \langle B_J, C \rangle\}\}$

At least these two PPD-sets must be amongst the possible Values for M in the schema (67) since the truth of (70) could be due to any of the choice functions in $M_1 \cup M_2$. In the situation we're considering, the scope of the cfantifiers in (69), (70), and (71) is true of only one of the four choice functions in $M_1 \cup M_2$, namely $\{\langle B_M, A \rangle, \langle B_J, C \rangle\}$, which is an element of M_1 . Clearly for the situation could be modified such that any other choice function in $M_1 \cup M_2$ was the one satisfying the scope. Hence, both of these sets must be considered.

'No' cannot be expressed following the above schema. Consider any set predicate D in schema (67) that leads to the result that "no" is false in the situation we're considering. It would be required that D is false of both $M_1 \cap P$ and $M_2 \cap P$ in (71). This means D must be false of both the empty set and the singleton set containing $\{\langle B_M, A \rangle, \langle B_J, C \rangle\}$. Moreover, this consideration holds regardless of which of the four choice functions in (72) actually is the one satisfying the scope of the cfantifier. Hence, D must be false of any other singleton set. We could go on to show that D must actually be false of any set of choice functions. However, there are situations where (71) is true. Then, the same D should be true of either $M_1 \cap P$ or $M_2 \cap P$. In fact, this sets will both be the empty set in this situation. Clearly, it's impossible that D sometimes be true and sometimes be false of the same set. Therefore, "no" cannot be expressed by a quantifier following the schema (67).

This is the desired result. "No" cannot be captured as a determiner meaning by the given theory of possible determiner meanings. Hence, 'No' can only be expressed by decomposition into negation that takes scope above the existential quantifier.

4 Conclusion

This paper first argued for a new observation, namely that Negative Quantifiers (specifically "no") must be composed out of negation and an indefinite. This is not expected on the standard theory of possible determiner meanings: generalized quantifier theory.

I then pursued an alternative theory of possible determiner meanings, based on a different syntactic structure of quantification at LF. I claimed Quantification ranges over complicated objects (functions). Since there are in intuitive sense more functions than there are individuals, the theory of quantifiers becomes more difficult. The argument I developed, showed that Existentials must be allowed over a big subset of these functions, but for cardinals smaller subsets must be considered separately. This led to the assumption that there is existential quantification over the small subset under consideration in the schema defining possible quantifiers. I then showed that negative quantification cannot be expressed in this form because of the existential quantifier over subsets. This leads to the result that decomposition of negative quantifiers into negation and an indefinite part is the only way the meaning of ‘no’ can arise.

The character of the argument, which is still incomplete as I noted, relies on comparison of the expressiveness generalized quantifiers and the new type of quantifiers, cfantifiers, which I define above. I try to argue that only certain generalized quantifiers can be expressed by cfantifiers. However, a little consideration shows that there are also many cfantifiers that cannot be expressed by generalized quantifiers. The actually attested quantifiers are those that can be expressed by a generalized quantifier and equivalently by a cfantifier. This indicates that both generalized quantifiers and cfantifiers play a role. Since cfantifiers match the syntactic LF-structure of quantification, I assume that they’re the primary semantic device of quantification. Generalized quantifiers, however, might well play a role in processing systems. Then quantificational determiners are required to be expressible as both generalized quantifiers and cfantifiers. Since this is not the case for “no” this gives the desired result.

References

- Baker, Mark C. 1995. On the absence of certain quantifiers in Mohawk. In *Quantification in Natural Languages*, ed. by Emmon Bach *et al.*, 21–58. Dordrecht: Kluwer.
- 1996. *The Polysynthesis Parameter*. Oxford, Great Britain: Oxford University Press.
- Barwise, Jon, and Robin Cooper. 1981. Generalized quantifiers and natural language. *LP* 4.159–219.
- Bech, Gunnar. 1955/1957. *Studien über das deutsche Verbum infinitum*, volume 35 no. 2 and 26 no. 6 of *Historisk-filologiske Meddelelser*. Copenhagen: Det Kongelige Danske Videnskabernes Selskab.

- Carlson, Greg N. 1977. *Reference to Kinds in English*. Ph.D. dissertation, University of Massachusetts, Amherst.
- Chierchia, Gennaro. 1999. A puzzle about indefinites. Manuscript, University of Milan.
- Chomsky, Noam. 1993. A minimalist program for linguistic theory. In *The View from Building 20, Essays in Linguistics in Honor of Sylvain Bromberger*, ed. by Ken Hale and Jay Keyser, 1–52. MIT Press.
- Christensen, Kirsti Koch. 1986. Norwegian *ingen*: A case of post-syntactic lexicalization. In *Scandinavian Syntax*, ed. by Osten Dahl and Anders Holmberg, 21–35. Stockholm: Institute of Linguistics, University of Stockholm.
- Crain, Stephen. 1991. Language acquisition in the absence of experience. *Behavioral and Brain Sciences* 14.597–650. Includes open Peer Commentary and Authors Response.
- de Swart, Henriëtte. 1998. *Introduction to Natural Language Semantics*. Stanford, California: CSLI.
- Diesing, Molly. 1992. *Indefinites*. Cambridge, Massachusetts: MIT Press.
- Engdahl, Elisabeth. 1980. *The Syntax and Semantics of Questions in Swedish*. Ph.D. dissertation, University of Massachusetts, Amherst.
- Fox, Danny. 1995. Condition C effects in ACD. In *Papers on Minimalist Syntax, MITWPL 27*, ed. by Rob Pensalfini and Hiroyuki Ura, 105–119. Cambridge, Massachusetts: MITWPL.
- 1999. Reconstruction, variable binding and the interpretation of chains. *LI* 30.157–196.
- Haegeman, Liliane. 1995. *The Syntax of Negation*. Cambridge, UK: Cambridge University Press.
- , and Raffaella Zanuttini. 1996. Negative concord in West Flemish. In *Parameters and Functional Heads*, ed. by Adriana Belletti and Luigi Rizzi, chapter 4, 117–179. Oxford, UK: Oxford University Press.
- Heim, Irene. 1983. On the projection problem for presuppositions. In *Proceedings of WCCFL 2*, ed. by D. Flickinger, 114–125. Stanford, California, CSLI.
- 1992. Presupposition projection and the semantics of attitude verbs. *JOS* 9.183–221.
- , and Angelika Kratzer. 1998. *Semantics in Generative Grammar*. Oxford: Blackwell.
- Herburger, Elena. 1998. Spanish N-words: Ambivalent behavior or ambivalent nature. In *The Interpretive Tract, MITWPL 25*, ed. by Orin Sauerland, Uli an Percus, 87–102. Cambridge: MITWPL.
- Johnson, Kyle. 1996. When verb phrases go missing. *GLOT* 2.3–9.
- Kayne, Richard S. 1998. Overt vs. covert movement. *Syntax* 1.128–191.
- Keenan, Edward, and Y. Stavi. 1986. A semantic characterization of natural language determiners. *LP* 9.253–326.
- Kennedy, Christopher. 1994. Argument contained ellipsis. Linguistics Research Center Report LRC-94-03, University of California, Santa Cruz.
- Kratzer, Angelika. 1995. Stage-level and individual-level predicates. In *The Generic Book*, ed. by Gregory N. Carlson and Francis Jeffrey Pelletier, 125–175. Chicago: University of Chicago Press.
- 1998. Scope or pseudoscope? Are there wide-scope indefinites? In *Events in Grammar*, ed. by Susan Rothstein. Dordrecht: Kluwer.
- Ladusaw, Bill. 1992. Expressing negation. In *Proceedings of SALT II*, ed. by Chris Barker and David Dowty, 237–260. Columbus, Ohio State University, Department of Linguistics, Working Papers.
- Larson, Richard K., and Gabriel Segal. 1995. *Knowledge of Meaning: An Introduction to Semantic Theory*. Cambridge, Massachusetts: MIT Press.

- Lerner, Jean-Yves, and Wolfgang Sternefeld. 1984. Zum Skopus der Negation in komplexen Satz des Deutschen. *Zeitschrift für Sprachwissenschaft* 3.159–202.
- Matthewson, Lisa. 1998. *Determiner Systems and Quantificational Strategies: Evidence from Salish*. The Hague: HAG.
- Montague, Richard. 1970. The proper treatment of quantification in ordinary English. In *Richard Montague: Selected Papers. 1974*, ed. by R. Thomason, 247–270. New Haven, Connecticut: Yale University Press.
- Reinhart, Tanya. 1994. Wh-in-situ in the framework of the minimalist program. OTS Working Papers 94/03, Utrecht University, Utrecht, The Netherlands.
- . 1997. Quantifier scope: How the labor is divided between QR and choice functions. *LP* 20.335–397.
- Sag, Ivan. 1976. *Deletion and Logical Form*. Ph.D. dissertation, Massachusetts Institute of Technology, Cambridge.
- Sauerland, Uli. 1998. *The Meaning of Chains*. Ph.D. dissertation, MIT, Cambridge, Massachusetts.
- Tancredi, Christopher. 1992. *Deletion, Deaccenting and Presupposition*. Ph.D. dissertation, MIT, Cambridge, Massachusetts.
- Wasow, Thomas. 1972. *Anaphoric Relations in English*. Ph.D. dissertation, MIT, Cambridge, Massachusetts.
- Yabushita, Katsuhiko. 1996. On certain semantics differences between English and Japanese quantifier expressions. In *Research Bulletin of Humanities and Social Sciences*, 43–63. Japan, Naruto University of Education.
- Zanuttini, Raffaella. 1997. *Negation and Clausal Structure*. Oxford: Oxford University Press.

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