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Q: the only Functional Head above N and A

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Abstract

Current versions of Chomskyan syntax take for granted that maximal or "extended" projections of the fundamental lexical categories N, A, V and P contain elaborate systems of functional heads and projections, which also differ in nature for each of these systems. This paper begins an argument, to be continued elsewhere, that this approach is currently more than "taken to extremes"; rather it is fundamentally misguided. All functional modifiers truly independent of a lexical category are types of quantifying or counting. Several unexplained properties then fall into place, among other those of subject phrases and measure phrases, and many differences between English and Japanese, both in counting and regarding subject NPs.

It is widely accepted that four central lexical categories (N, V, A, P) of language serve as "heads" (notated X or X^0) that project to phrases XP, and that only these categories are "open," i.e. contain hundreds or thousands of members and accept coining of new members by adult native speakers. Moreover for a given phrasal type in a given languages, these heads tend to systematically precede or follow their phrasal sisters YP. It is also often the case that the property of either preceding or following complements *is uniform in a language* across different choices of lexical heads. English for example is "head-initial" and Japanese is "head-final." For ease of reference, we can call the side of X inside XP the "headside" of XP.

1. Which closed class modifiers are "Functional Category Heads"?

In these terms, it is well known that a number of small closed classes of non-phrasal modifiers of X can "pile up" on the headside of X. For N we can call them "**n**", for V we can call them "**v**", etc. In head-initial English, the **x (=n, v, a, p)** are free morphemes. When an X^0 combines with a sister phrase YP, X^0 necessarily becomes a "head" that "projects" to an XP. Throughout this paper, XP is equivalently written as X'. When I need to refer to X^0 and XP together as a class, I write X^j, e.g. the nominal projections are N^j.

(1) a. $[_{NP}$ two $_n$bunches of $_n$other $_N$boys $[_{YP}$ from the city]]

b. $[_{VP}$ $_v$has $_v$been $_v$getting $_V$cut $[_{YP}$ from a tree]]

c. $[_{AP}$ { $_a$real/ $_a$pretty / $_a$how $_a$much more } $_A$important $[_{YP}$ to you]]

d. $[_{PP}$ $_p$down $_p$over $_P$into $[_{YP}$ that forest]]

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In head-final Japanese, the modifying x are rather *bound suffixes*. For instance, the +HUMAN classifier noun *–nin* in(2a), which must agree in this feature with the lexical head noun, is a bound suffix. The three v suffixes in (2b) can all occur separately with finite inflections such as *–(i)ta* 'PAST', which are characteristic of the category V.

(2) a. $[_{NP}\ [_{YP}$ Sono daigaku no $]\ [_{N}$ gakusei $]\ [_{n}\ [_{Q}$ san $]$-$[_{n}$ nin $]\ ]$ ga $]$ tsui-ta.
that university-GEN student three-CLAS-NOM arrive-PAST
'Three students of that university arrived.'

b. Taro ga $[_{VP}\ [_{YP}$ kawatta sushi o $]\ [_{V}$ tabe $]$-$[_{v}$ sase $]$-$[_{v}$ rare $]$-$[_{v}$ mas$]$-$[_{+PAST}$ ita $]\ ]$.
Taro-NOM strange sushi-ACC eat make PASS POLITE PAST
'Taro was made to eat some strange sushi.'

Now e.g. **n** and **N** are obviously not simply "the same," so what differentiates **x** from **X**? One clear difference is whether a category has at least hundreds of members, i.e. is "open," or whether it has at most a couple of dozen members that adult speakers cannot add to, i.e. is "closed":

(3) **Dictionary Insertion**. In a single maximal XP, lexical insertion from *open classes X* of the Dictionary is limited to the *most internal X^0 positions.*

That is, in a head-initial XP like NP, an open class of lexical N can appear only in the X_k position in $[_{XP}\ X_1$ - X_2 - ... - X_k -... (YP)...$]$. The other X_i must be closed class modifiers **n**.

Current work usually calls the "small" modifiers in (1)-(2) **n, v, a,** and **p** "functional categories," but what is their actual status in a system of primitives? Van Riemsdijk (1998) convincingly argues for the following hypothesis about their categorical nature. [1]

(4) **Categorial Identity Thesis** (most simply presented): **n** ∈ N, **v** ∈ V, **a** ∈ A, **p** ∈ P.

Some brief examples of arguments for (4), based on the constructions in (1)-(2), are as follows. Further arguments for the CIT appear in Emonds (2001).

n ∈ **N.** *Bunch* and *other* have regular N plurals, and *bunch* accepts adjectival and numeric modifiers. Quantity **n** such as *bunch, couple*, etc. can also function as independent nouns, and the same holds true for certain Japanese numeric classifiers (*dai* 'box', *nen* 'year').

v ∈ **V.** The English auxiliary verbs as in (1b) all exhibit verbal inflections. Similarly, the Japanese suffixes in (2b) are verbs, since all four stems take verbal inflections, such as the present tense *-(r)u*: *tabe-ru, tabe-sase-ru, tabe-rare-ru, tabe-mas-u*

a ∈ **A.** *Real* and *pretty* are clearly adjectives in their own right. As for *how,* contexts reserved for A also accept *how*: *How does he seem? How did they treat him? Much* accepts the same "degree word" modifiers as open class adjectives: *so much, very much, not too much, as much.*

p ∈ **P.** *Down* and *over* can be independent prepositions: *right down the street, two miles over the hill.*

[1] This study takes no position on whether each lexical $\mathbf{x}_i$ in (1)-(2) projects to a separate category phrase xP. Although most studies on functional categories have assumed this, there are in fact empirical arguments for flat structures in, e.g. Kubo (1996) and Emonds (2001).

Under van Riemsdijk's CIT, English head-initial structures are thus as in (5). The fact that all the X_i except X_k are in closed classes means that (5) must be supplemented with a statement to the effect of (6).

(5) Functional category structures for head-initial systems: $[_{XP}\ X_1\text{-}X_2\text{-}\ldots\text{-}X_k\text{-}\ldots(YP)\ldots]$

(6) Members of open classes cannot be inserted as X_i sisters within XP on the headside of another X_i.

Then, as (3) requires, *open class* X_i must be next to their phrasal sisters YP and not separated from them by other X_i.

Though the CIT is appealingly simple, it cannot be the whole story on functional categories. For example certain A modifiers in English (*too, as, quite, rather, somewhat*) actually share no properties with adjectives. It's similarly unlikely that demonstratives are "nouns" (e.g. Japanese *kono, sono, ano* or Spanish *este, ese, aquel*). Nor do numerals such as 5-19 typically exhibit properties of other grammatical N, cross-linguistically. These kinds of discrepancies suggest that we must somehow extend or modify the CIT.

I claim nonetheless that the CIT only need be supplemented with a *single ad*ditional *quantification head* Q. For convenience, I notate Q as Q_X in a context __XP for different values of X.

(7) **The Q-extended CIT.** Across languages, a single functional category head Q can extend all four XP to XP_Q.

While Q_N is not limited to numerals (see note 8), it almost certainly includes some basic numerals for counting items with reference, i.e. nouns, in any language. In English it is used for all counting, while in some Slavic languages (Veselovská, 2001), it is used for high counting, i.e. $Q_N > 4$. Its basic potential as a counting device for nouns and nominal projections can be expressed as (8).

(8) **Universal Counting.** The unique functional head for numerals Q can combine with nominal projections N^j.

Both Q and X^j itself, which is a categorial feature or a complex of such features, then project or "percolate" to a containing XP. The categorial subscripts on Q simply refer to the feature content of their sister, so that e.g. Q_N and Q_A differ exactly in the way that V, __DP and V, __PP differ.[2] However, the subscript Q *on a bar notation category* X^i indicates a feature that can be referred to in stating syntactic principles. That is, (7) implies that the familiar node DP is to be written as NP_Q or as [N, Q]′ and that IP = VP_Q = [V, Q]′. APs and PPs containing degree words and expressions, or any other closed class modifiers, are to be written respectively as AP_Q and PP_Q.[3]

A further property distinguishes "plain XP" or "plain X′" from those that project to XP_Q. An XP can always project to a higher XP by means of an adjunction, though it need not. But an XP_Q, one that contains a phrasal quantification, cannot further project. It is thus a "closed projection" in the sense of Fukui and Speas (1986).

[2]Just as some verbs are compatible with both these frames (*sail, bite, cross*, etc.), some functional modifiers can modify different lexical sisters: *this tall/ box, that tall/ box; less bread/ intelligent.*

[3]Throughout this study, I adopt the results of Emonds (1985, Ch. 7) to the effect that "complementizers" C are special cases of grammatical Ps in the context __IP.

2. The content and feature values of Q_N inside Noun Phrases

In this study, I limit myself to defending the Q-extended CIT (7) for noun and adjective phrases. That is, I will defend the idea that extended projections of N can contain a single quantifying functional category head above N, and that this same category can modify A. Other than Q, grammatical modifiers closer to N/A are themselves of the same category N/A. Moreover, I argue against a widely assumed—but actually never *argued for*—position that noun phrases contain additional higher heads such as demonstratives, definites, or other quantifier or numeric nodes.

2.1 Quantification of Nouns

If the CIT could plausibly account for all functional categories without exception, linguists would have recognized its value earlier. But as mentioned in the previous section, demonstratives, most numerals and certain adjectival specifiers don't really exhibit the same properties as the lexical categories that they modify, as the CIT would predict.

One of the most comprehensive generative descriptions of a closed class modifier system is the one for English noun phrases laid out in Jackendoff (1977, Ch. 4). According to him, nouns can be pre-modified by *two* main independent categories whose most characteristic elements don't seem like Ns. Here we will re-name them D and Q; they then appear in sequences D – Q – N.

(9) **Closed class modifiers for English N**
D_N = { *the,* demonstratives, WH-pronouns, universal quantifiers (*each, every, all, both*), *some, any, no* }. Possessive NPs also compete for the D position in this system.
Q_N = { *a(n),* numerals, *many, few, much, little, several* }.

One of Jackendoff's main conclusions is that in their usual logical meanings, combinations of items from one of these categories don't co-occur in a single NP.[4]

Two general claims for interpreting these categories are (i) that the logical role of all Q_N items is *existential quantification,* while (ii) D_N houses what are arguably *universal quantifiers.* There are analyses in which indefinite articles are not actually quantifiers, so-called "file card semantics," but Schwarzchild (2002) seems to resolve this question in the direction of confirming their classical status as existential quantifiers.

The second restrictive claim, that D_N is uniformly a universal quantifier position in LF, is related to several non-obvious but intriguing hypotheses. In particular, (i) N. Chomsky in class lectures in the 1980s proposed to analyze "definiteness" as simply universal quantification over sets previously defined within a single universe of discourse. Their close relatives the demonstratives should be analyzable in similar terms. (ii) He also proposed that *any* is a universal quantifier with the special property of always taking wide scope. [5] (iii) Finally, *which* is also widely taken as a WH-counterpart to a definite article; indeed like definites it is "D(iscourse)-linked." Space limits prevent us from pursuing any of these hypotheses here in detail, but they seem to together point to the accuracy of the LF dichotomy in (10).

(10) In LF, (i) Q_N is interpreted as existential quantification, and (ii) D_N as universal quantification.

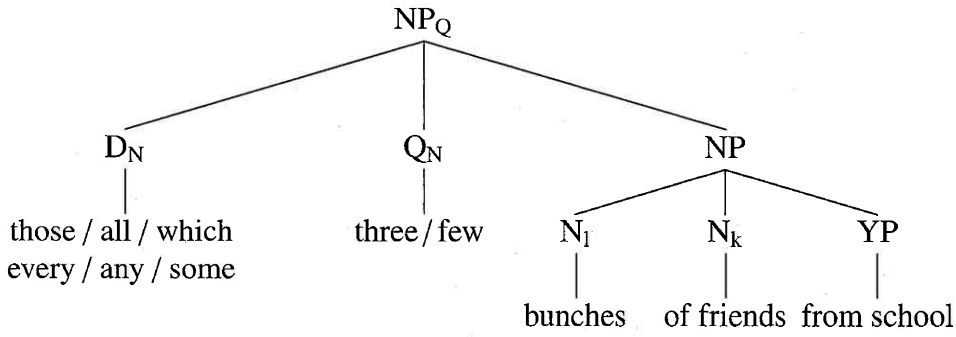
[4] There are idiomatic or otherwise atypical uses of these words that don't conform to this statement, which we don't treat here: *every which way, his every step, what the hell, a few steps,* etc.

[5] We might treat *no* in a similar way: "We own no cars" = "For all x, x a car, ~(we own x)."

The only English determiner that seems to violate (10b) is the existential quantifier *some*. In order to maintain the attractive LF generalization, I propose that the D_N *some* "alternatively realizes" Q_N in D, i.e. it spells out a D in PF that is not interpreted, while its unpronounced sister $[_Q \emptyset]$ is interpreted, as existential quantification.[6] We can note that then, as predicted, there are no precise LF differences in pairs such as *three X/ some three X; few X/ some few X.*

The general structure of NP_Q for English would thus appear to be as in (11).[7]

(11)



2.2 The nature of D_N: a head or a specifier?

In analyzing DP as NP_Q = [N, Q]′, I depart from a widespread assumption based on Abney (1987), according to which an NP and the functional head above N form a constituent *to the exclusion of material D_N to its left.* Nonetheless, all of his cross-linguistic argumentation justifying some "functional head F above N in the noun phrase" turns on the role of F *in agreement paradigms*, in particular between [N, ±PL] and possessive items outside NP. None of his paradigms actually suggest that F and NP must form a constituent F′.

Three are in fact paradigms that suggest the contrary, *that D as in (11) is not a head* with a complement phrase F′, i.e. Q′. For example, such Q′ should undergo coordination, yet:

(12) a. *Please sell these two beds and few antiques. (not understood as: *these few antiques*)

b. *They failed no graduate students or three students from one class. (not understood as: *no three students from one class*)

Moreover, in ellipsis based on Q_N +NP as in (13), the interpretation of the understood constituent $[_{NP} \emptyset]$ *cannot* include the meaning of Q:

(13) a. { John's/ Those } two books on art were cheap, but these $[_{NP} \emptyset]$ are not.

b. Her many friends in Japan found jobs quicker than any of Bill's $[_{NP} \emptyset]$ have.

There is no implication in (a) that *these books* are only two in number, nor in (b) that *Bill* has many friends or that his friends are in Japan.[8] Consequently, Q_N +NP is not acting like some constituent Q′ that undergoes ellipsis.

[6] In much the same way, the SPEC(CP) *whether* can alternatively realize the feature WH, whose canonical spell out under [C, WH] is *if* (Emonds, 2000: Ch. 4). This lexcially marked option has however been lost in several dialects of current English.

[7] As Jackendoff's work indicates, Ds and Qs with independent quantificational force don't co-occur in one NP: **all few boys, *some several churches, *any many books*, etc.

[8] Ritter (1991) uses the label NUM rather than Q. But Q is preferable, because Q has uses besides simple counting. The English quantifiers *many, few, much, little, several* and the article *a(n)* are in complementary distribution with cardinals and hence must occur in the same categorial position (Jackendoff 1977: Ch. 4). Since these A can then be further modified by Q_A, these quantifiers are in fact adjectives in the Q position.

If D_N is not a sister to a phrase Q′ but is rather structured as in (11), then it does not appear to serve as a head. The head role of the extended NP is reserved for Q_N. There are at least three further reasons for not taking D_N (that is, a node associated with Definiteness or Demonstratives) as the head of a projection above Q_N. Such a functional head D:

(14) (i) would have no role in either selection of NP sisters, nor in selection of "DP,"

(ii) unlike Q, would have no role in case assignment, and

(iii) would be the only left hand (or freely ordered) head in all of Japanese.

There are no verbs, for example, that select only definite noun phrases or only WH-phrases. In contrast, some verbs have subjects or objects that must be plural, which as we will see below is a crucial syntactic value of the head category Q_N. As for (14ii), Q_N clearly assigns genitive to its sister NP (Veselovská, 2001). D_N has no such role in assigning some characteristic case to NPs.

Regarding (14iii), there are many differences between English and Japanese noun phrases. Assuming, however, that we want universally valid hypotheses, we must take into account that Japanese demonstratives and its WH morphemes (*dare* 'who', *nani* 'what', *do* 'how', *itsu* 'when', etc.) in no way act like NP-final heads. Quite the contrary, they can be ordered freely in pre-head positions much like adjectives (Fukui and Speas 1986).

The question now arises, if D_N is not a head, what role does it have in the restricted system of modifiers expressed by hypothesis (7)? Using the category SPEC for D_N immediately comes to mind, since the D position can contain (possessive) phrases. Nonetheless, D also houses non-phrasal morphemes, those here hypothesized to be in one way or another universal quantifiers (10). From this perspective, it seems to me that limiting SPEC to containing phrases to the exclusion of non-phrasal morphemes, as proposed in Chomsky (1986), is a stipulation which is contradicted by non-cursory analyses of actual closed class modifications.[9] Even the SPEC subject of English clauses can be satisfied by monomorphemic expletives such as *it* and *there*, which are "phrasal" only by circular reasoning (i.e. by assuming SPECs must be phrases).

I therefore suggest that SPEC does exist, but is at bottom a "wild card" whose category is determined by the surrounding XP context, in ways examined in the rest of this and a subsequent paper.[10] It is nonetheless subject to an important cross linguistic restriction:

(15) **Specifier Position.** A functional head Q_X licenses *a $SPEC_X$ position on its left*, independently of a language's word order.

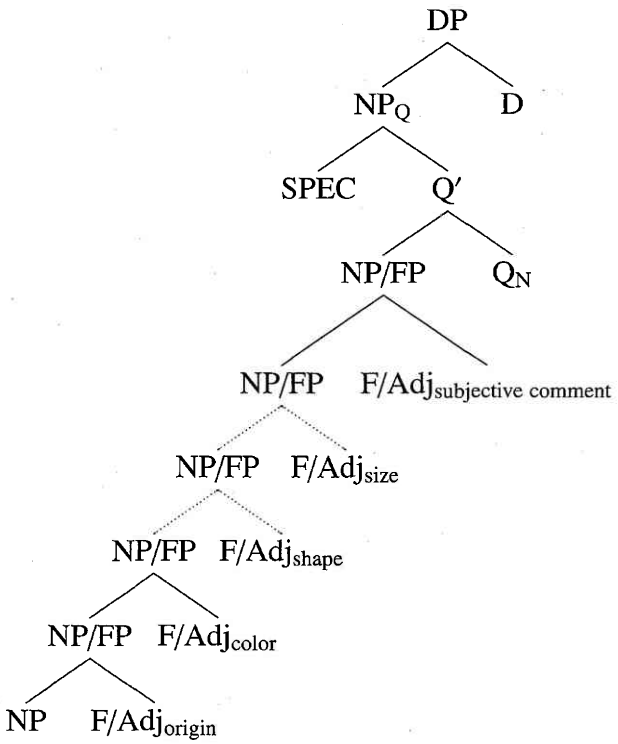
Since English is head-initial across phrasal types, its Q_X all precede their XP complements. But since the English D morphemes in (9), i.e. universal quantifiers and definiteness morphemes, are of the category $SPEC_N$, they still precede Q_X even though they are not heads.

We can terminate this outline of basic noun phrase structure by comparing that of English in (11) with that proposed for Basque in Artiagoitia (2007). His Basque counterpart to (11) is (16); I here replace some of his terms with my equivalents to facilitate comparison.

[9] It is in fact this stipulation which led, at least indirectly, to a massive expansion in the claimed repertory of functional category projections in natural language.

[10] From this perspective, we could as well use the symbol D for all SPEC positions. But I retain SPEC both for familiarity and because we are used to relativizing it in terms of what it modifies. A second paper on this topic will contain discussions of SPEC(P) and SPEC(V).

(16)



At first sight, his basic structure seems quite distinct from (11), but with some scrutiny all but one of the differences dissolve.

Some differences between (11) and (16) which seem to me unimportant for present purposes are as follows: (i) I have argued above that there is no justification for Q′ being a constituent in English, an issue not addressed in Artiagoitia's paper. (ii) His main argumentation is that a series of post-nominal adjectives in these extended nominal projections exhibits behaviors typical of Basque phrase-final heads. In work in progress, I argue on independent grounds that pre-nominal adjectives in head-initial English are in fact also heads of nominal projections; they are head-initial counterparts to Artiagoitia's position. Standard bar notation assumptions then suggest that these A actually occupy N positions; which then can be notated as N_A. We thus obtain the following labeled bracketing for the Basque DP, which leaves open the question mentioned in note 1 of how internally articulated the structures should be within the highest NP/FP in (16).

(17) **Basque nominals.** $[_{DP}\ [_{NP,Q}$ SPEC $[_{NP/FP...}(YP)...N$ - F/ N_A - F/N_A -...- F/$N_A]$ $Q_N]$ D]

Despite the differing values of the head parameter for Basque and English, the SPEC position is uniformly on the left, as required by (15). The SPEC in Basque nominal projections, as described by Artiagotia, contains numerals and measure phrases in complementary distribution. Its Q_N, analogously to English (but of course with the opposite linear order) contains low numerals and translations of *many* and *few*.

This leaves then one difference between English and Basque: are the Basque final Ds as in (17) actually final heads, which would weaken the force of the Q-extended CIT (7), or might these items be analyzed in some other way, as realizations under some F/Adj or Q? I am not competent to address this question and so leave it open.

3. The principal feature values of Q_N

Given van Riemsdijk's CIT (4), the principal hypothesis of this paper (7), and the statement for specifiers (15), let us review now how the English noun phrase is structured in LF. Recall that the main function of Q_N is for recursive counting, so that the most basic interpretation of Q_N in LF seems to be ±PLURAL.

(18) $[_{NP,Q}$ SPEC(Q_N) (=D_N) [Q_N, ±PLURAL] $[_{NP...}$ $N_1 \ldots N_2 \ldots N_k \ldots$(YP)...]]

In this structure:

(i) N_k is the open class lexical head,

(ii) any preceding N_i are closed class **n** such as *couple, bunch* and *other*,

(iii) (only) the exterior NP cannot further project (is *closed*), and

(iv) the head Q_N of this larger NP precedes its sister phrase, by the head-initial parameter of English, but follows D, by principle (15).

Let's now apply to this structure the minimalist idea of Chomsky (2001) that grammatical features are "unvalued" at the syntactic outset of a derivation, and that they hen must receive values interpretable in LF *during a derivation*. From this perspective, we can reconceptualize ±PLURAL in (18) as the LF values of Q_N, and thereby actually eliminate an extra ad hoc feature. That is, [Q_N, ±PLURAL] is to be replaced by ±Q_N, i.e. Q_N receives a ± value from any lexical numeral or quantifier inserted under it, as well as in some other ways as follows.

3.1 English Count Noun Heads

When a lexical N is a count noun, lexical singular Q_N such as *a(n)* and *one* provide the value –Q_N, while all other lexical Q_N (*two, many, few,* etc.) become +Q_N. A third possibility, even when no morpheme is inserted directly under Q_N, is that N is a count noun. If nothing else happens, this Q_N remains unvalued and the derivation crashes at LF: **Book was cheap; *I saw large house.*

There is however a way to value English Q_N with count nouns, by means of "Alternative Realization," a widely applicable syntactic device for closed class items whose uses and restrictions are outlined in Emonds (2000, Ch. 4).

(19) **Alternative Realization** (AR). A syntactic feature F canonically associated in UG with category B can be alternatively realized in a closed class grammatical morpheme under X^0, provided X^0 is the lexical head of a sister of B^j.

Now what is traditionally written +PLURAL is simply the positively valued canonical value of Q_N. So if a head N of Q_N's sister NP has the structure $[_N$ N - PLURAL], then +Q_N in its canonical position (B = Q) is alternatively realized. As discussed with many examples in the cited source, AR operates in tandem with another principle, the "Invisible Category Principle," which licenses empty categories.

(20) **Invisible Category Priniciple** (ICP). If all marked canonical features F on B are alternatively realized by AR, then B may be empty.

Thus, if Q has no other marked features, it follows that a plural suffix on N is enough to permit Q to be empty.

There is a second way that the AR/ICP can provide a value for Q_N. A SPEC morpheme generally agrees in number with Q_N, so that any overt SPEC also alternatively realizes $\pm Q_N$ and thus also licenses an empty Q in its base position: *This book was cheap; I saw some large house.*[11]

3.2 English Mass Noun Heads

Any account of the central difference between count nouns and mass nouns in English must assume that they differ by some syntactic feature ±COUNT, so as to account for contrasts as in (21):

(21) many arguments/ *many evidences/ *much arguments / much argument
few specifications/ *few informations /*little specifications / little information
several investigations/ *several researches
three fears/ *three courages
ten matches /*ten hockeys

It appears that if N is an *abstract mass noun* as in (21), Q_N must both be selected and at the same time uniformly valued as "–", since English mass nouns do not require any closed class modifiers. In fact, the only Q_N they can appear with are *much, little,* and under poorly understood restricted conditions, *a(n).*

According to these criteria, it appears that the English nominalizing suffix *-ing* in both complex event nominals (Grimshaw 1990: Ch. 3) and productive gerunds should also be classed as an abstract mass noun.

The situation for *concrete* (i.e. physically realized) mass nouns is somewhat different. Again, Q_N must be selected, but in this case, it can receive either a + or a – value. The value $+Q_N$ then uniformly leads to a well-formed LF interpreted as "different kinds of N":

(22) few breads, many bloods, several heavens, two hydrogens (heavy and normal)

Overall, English noun heads of noun phrases must appear with a Q_N, which in turn must receive a ± value for a well-formed interpretation in LF. In only one salient configuration does this fail to happen: if a +COUNT head noun neither occurs with a SPEC valued for ±Q, nor alternatively realizes an empty +Q (via a plural suffix), then Q remains unvalued and its LF is uninterpretable.

4. Phrases in SPEC(Q_N)

In the scheme (18), NPs like clauses have a subject position (to the left of Q_N), realized as possessive nominals in e.g. English. From here on I notate this frequently phrasal position as SPEC(Q_N), since in the theory being developed here, the SPEC position occurs only in the presence of Q (across categories). When Q is not present, no initial SPEC position, phrasal or non-phrasal, is available either. There is in fact a further structural condition on phrases in SPEC, which in this study remains a stipulation:

(23) **SPEC Categories.** Phrasal categories in SPEC positions must be nominal, i.e. N^j.

[11] The extensive arguments of Abney (1987) that have led most syntacticians to adopt the DP hypothesis concern exactly this agreement between phrases in SPEC and the number (and sometimes person) of a head noun or numeral. It can be seen in *this one (book)* vs. *these three (books).* Unlike AR (19), no plausible extension of movement nor the morphological Merger of Halle and Marantz (1993) can account for this agreement. An appeal to an unconstrained notion of "feature matching" simply names the problem, rather than explaining it.

A partial explanation for this requirement may be that, as we will see, there is often a relation between quantities expressed in Q and their "measure" in SPEC. Consequently, (23) might follow from some requirement that SPEC's fundamental role is to further specify number and/or quantity, which is a characteristic meaning of NP_Q. But I do not pursue this here.

As noted earlier in (9), possessive nominals in English are in *complementary distribution* with the definite article and demonstratives, as well as with many quantifiers {*some, any, no, each, every, both, which, what*}.[12] This paradigm motivates treating all these items as SPEC(Q_N), even though among them only the possessives are overtly "phrasal." So as to represent this robust complementarity, I analyze these modifiers as mono-morphemic realizations of SPEC(Q_N) in the schema (18). In Jackendoff's (1977, Ch. 4) nominal structures, this corresponds to his "first SPEC(N^j) position," which expresses this same complementary distribution.

Since the feature Q_N receives LF values from the head of its sister phrase NP, material in a SPEC(Q_N) position need not interact with Q_N. Consequently, as many studies remark, a "genitive" NP in SPEC(Q_N) *can stand in any pragmatic or argument relation to the head of NP*. In particular, it can satisfy the definition of a subject/ external argument of an X^0 head of NP, i.e. a possessive is the lowest NP_Q (= DP) which c-commands the corresponding X′.

5. Japanese Q_N: the other way to count

In my analysis up to this point, all types of English noun phrases project to an NP_Q, which has a functional head Q_N that is valued as ± (i.e. ±PLURAL) in LF. These include NPs with mass noun heads and also gerund and complex event nominals headed by *–ing*. In these latter cases, Q receives the value "–", which is shown overtly by the singular agreement on finte verbs which they induce as subjects.

However, this forced projection of NP with no Q to NP_Q is a language-specific property, more or less—but not exactly—as argued in Fukui and Speas (1986):

(24) **Q-Parameter.** Maximal NP (=N^1) in English must be *closed* by merging with a Q_N head.. NPs in Japanese must *not be closed* by merging with Q_N.

The difference between my view and that of Fukui and Speas is due to my quite different conception of Abney's (1987) "functional head above N." Since I take this head to be the locus of counting, which Japanese certainly also has, my view is not that Japanese *lacks* some fundamental structural property, but only that *it doesn't identify counting with a (functional) head.*[13]

Before we turn to Japanese, let us note a further aspect of English counting. A little investigated way to modify nouns is with what we may call a "count noun compound." These take the form of a compound "measure phrase" [$_N$ Q_N + N] , bold in (25), placed in the left hand non-head position *inside* N + N compounds. The compound-internal position of these measure phrases in compounds is evidenced by their singular form and by their ordering relative to adjectives:

(25) a. a crispy [$_N$ [$_N$ **[$_Q$ twenty] [$_N$ dollar(*s)]**] [$_N$ bill]]
*a twenty dollar(s) crispy bill

[12] This complementary distribution does not hold in many languages, including some of those such as Czech whose Ns project to N_Q.

[13] Perhaps the Q-Parameter has a third value, whereby Q *may but need not* close NP; cf. Kallulli (1999) on the 'Bare NP Singulars' of Albanian and Mainland Scandinavian. Alternatively, Economy may play a role in ruling out some alternatives to (24).

b. those good [$_N$ [$_N$ [$_Q$ **ten**] [$_N$ **day(*s**]] [$_N$ bus passes]]
*those ten day(s) good bus passes

These English [$_N$ Q_N + N] don't appear as isolated *head Ns* of NP: **I like a crispy twenty dollar in my pocket; *An ample vacation would need another good ten day.* This results from the Q-Parameter (24), which insures that head nouns, compounds or not, *must further combine* with a licensed Q_N in NP_Q, yielding e.g. *I like a crispy twenty dollars in my packet; An ample vacation would need another good ten days.* [14]

Let's now look at Japanese counting. By (24), this language lacks NP_Q. However, by (8), it can form small count noun compounds [$_N$ Q_N + N]^0 parallel to those in (25).

(8) **Universal Counting**. The unique functional head for numerals Q can combine with nominal projections N^j.

Like other compounds in Japanese and English, this structure has a right hand head (Lieber, 1980). Only a limited number of Japanese "classifier nouns" N ("CLAS") are lexically specified with the feature +<Q_N__>, meaning they are morphemes that are bound on their left by numerals. The commonly used classifiers, at least, are closed classes of nouns, notated earlier in section 1 as **n**. The earlier example (2a) serves to illustrate these Japanese count noun compounds, formatted in bold; for familiarity, we can call them "classifier compounds."

(2) a. [$_{NP}$ [$_{YP}$ Sono daigaku no] [$_N$ gakusei] [$_n$ [$_Q$ san]-[$_n$ nin]] ga] tsui-ta.
that university-GEN student three-CLAS-NOM arrive-PAST
'Three students of that university arrived.'

Since the Q-Parameter (24) excludes any other type of counting in Japanese, the Economy considerations in note 14 have no bearing on whether these classifier compounds appear in the final head position of an open NP. In fact, this latter order is a standard way of counting inside Japanese NPs, where a case-marker is a diagnostic for an NP's right edge (Oga 2001).

(26) [$_{NP}$ Ookina [$_N$ hon] [$_n$ **yon-satsu**] ga] aru.
Big book four-CLAS -NOM be
'There are four big books.'

As expected from the head-final setting for Japanese word order, a closed class "classifier compound" head **n** can appear to the right of the open class head, in accord with the independently motivated structure assigned to these constructions in the analysis of Kubo (1996).

A second way of counting in Japanese is for the classifier compound to appear as a modifier *inside the NP* headed by an open class lexical head N. As expected, a classifier compound in complement position is separated from a head N by the genitive morpheme *no*.

(27) [$_{NP}$ Ookina [$_{NP}$ [$_n$ **yon-satsu**] no] [$_N$ hon] ga] aru.
Big four-CLAS-GEN book-NOM be
'There are four big books.'

The Japanese genitive marker *no* sets off almost every type of modifying YP from a head N_k, including PP as well as NP complements, the demonstratives *ko+no, so+no, a+no*, some

[14]The issue arises, why is Japanese style counting ungrammatical in English, as in **Three people student(s) of that university arrived*, in contrast to the grammatical *Three students of that university arrived.*. The answer must be Economy, as formulated in e.g. Emonds (2000, 135): Of equivalent deep structures, prefer the derivation with the fewest insertions of free morphemes.

quantifiering expressions *takusan* 'many', etc. So not surprisingly, when a non-head expression [$_n$ $\mathbf{Q_N}$ **+ n**] precedes an open class N within NP as in (27), *no* also intervenes.[15]

According to (24), Japanese NPs contain no Q_N sister to NP; its NPs cannot be "closed." As a result, its NP have no SPEC position, by (15). So where are its possessive NPs located? Since Japanese NPs are "open," nothing then prevents an NP from merging again as a right hand head with non-head NPs on its left, which can then serve as a subject/ external argument or a possessor for an N head.

(28) Japanese NP with an internal subject or possessor:
[$_{NP}$ NP_{subj}-no [$_{NP}$ ... (YP) ... – N_k – ... - N_1]]

Since these interior NPs are not in any relation with a functional head Q of an NP_Q (just as in English), they can take on any thematic or pragmatically sanctioned role relative to the lexical N head of NP.

6. Q in the context __AP

6.1 Degree Words and Measure Phrases

Bresnan (1973) and Jackendoff (1977, Ch. 5) isolate a class of largely mutually exclusive adjectival modifiers, often called degree words (DEG). I propose that this class instantiates Q in the context __AP and so should be notated Q_A.[16]

(29) Q_A = *very, so, quite, rather, somewhat, this, that, more, most, less, least, as, too, how.*

Since multiple members of Q_A generally cannot co-occur, as seen in (30), it appears that Q_A must select APs lacking Q. That is, just like Q_N, *Q_A functions to close AP projections.*

(30) These chairs are (*how) so old?
We want a (*less) somewhat bright room.
Is she (*rather) that clever?
We consider John (*very) too arrogant.

Since adjectives are "properties" rather than "things," the Q_A in an AP (29) cannot measure quantity with integers, but only in terms of stronger, weaker, equal or deictic degrees.

Nonetheless, the counting potential of Q_A emerges clearly with it members *more, less, as, that* and *too.* These Q_A license measure phrase NPs in the context __Q_A - AP. Cf. Neeleman and Doetjes (2004).

(31) [$_{AP}$ [$_{NP}$ three times/ a bit] [$_Q$ more/ less] [$_{AP}$ [$_A$ clever] [$_{YP}$ in math] [$_{ZP}$ than you]]]
[$_{AP}$ [$_{NP}$ two days/ a good deal] [$_Q$ too] [$_{AP}$ [$_A$ short]]]
[$_{AP}$ [$_{NP}$ three times] [$_Q$ as/ that] [$_{AP}$ [$_A$ clever/ long/ old/ expensive]]]

It thus seems that the statements (15) and (23) given above apply to adjective phrases.

(15) **Specifier Position.** A functional head Q_X licenses *a $SPEC_X$ position on its left*, independently of a language's word order.

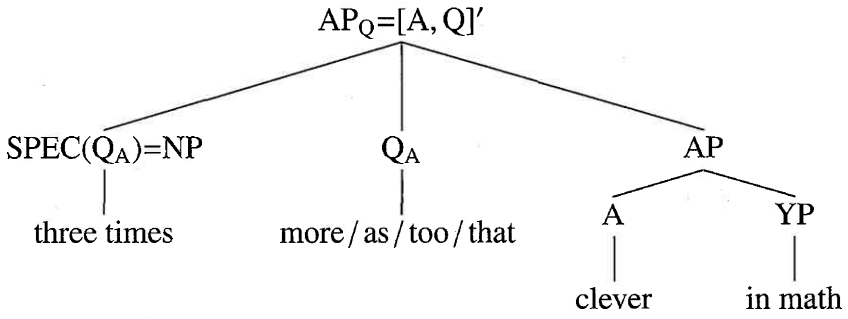
[15] Ooga (2001) specifies two further positions for classifier compounds in Japanese noun phrases, to the right of a case-marker and to the at the far left of the noun phrases. The first (righthand) position is widely agreed to be a rightward Q-floating position outside the NP. Okuda (2005) argues that the second (lefthand) position is also a type of floating Q, again exterior to NP. We can recall that Kayne (1975, Ch. 1) establishes beyond doubt that some Q float in both directions in French.

[16] Another candidate for Q_A is *enough*, which in Germanic languages surfaces after A.

(23) **SPEC Categories.** Phrasal categories in SPEC positions must be nominal, i.e. N^j.

A tree for a quantified English AP is thus as in (32): As with Q_N, the structure is flat, and both A and Q_A project as features to the closed phrase AP_Q. And as with NP_Q, I claim that no further functional head is needed with AP, again in conformity with the Q-extended CIT (7).

(32)



The structure (32) thus replicates the structure inside English NPs; compare (32) with (10). However, it appears that the only LF role of the NP in SPEC(Q_A) is to (optionally) associate certain Q with some discrete, counted measure, which inherent features of Q_A in the context __AP can't provide. The difference between the two subtypes of Q categories is that the measure for discrete nouns is *inherent* in Q_N's own content, i.e. the numerals and ±PLURAL. In contrast, a discrete "measure" for Q_A is *external* to it, in SPEC(Q_A).

In fact within NP_Q, the two types are in a little noticed complementary distribution between subject phrases and measure phrases. This paradigm is further evidence that the two types of pre-nominal NPs represent a single SPEC(Q_N) position.

(33) My mother didn't like preparing for my father's (one) vacation.
My mother didn't like preparing for several days more vacation.
*My mother didn't like preparing for my father's several days more vacation.

The new job provides two hundred dollars less salary every month.
The new job provides that man's salary every month.
*The new job provides that man's two hundred dollars less salary every month.

Thus, it is only because Q_N needs no external specification that SPEC(Q_N) is free to house NPs in with *any pragmatic relation to the head N*, the notoriously varied semantics of "possessive" NPs. The NPs in SPEC(Q_A) have no such freedom; they can only serve as "measure phrases." Previous analyses have failed to identify *measure phrases inside APs* with *possessive NPs inside NPs*, even though in English both types must be unique, and both must be NPs. But with enough perspective on the history of syntactic theorizing, it is not so surprising to find the grammatical source of the much studied and frequent possessive construction in "less frequent," less studied measure phrases, which are in turn nothing else than an extension of the primitive functional category ability to count.[17]

6.2 Measure Phrases without Degree Words

A small closed class of English adjectives (*long, high, tall, deep, wide, old, long, square*) allow measure NPs in SPEC(Q_A) in *the absence of* an overt Q_A.

[17]Less frequent dependent clauses better indicate underlying word order than main clauses; less frequent negated sentences reveal more about deep grammar than positive clauses, etc. In general, the grammatical patterns of less frequent variants of a construction are much more revealing than those of the more frequent variants.

(34) These chairs are ten years [$_Q$ Ø] { old/ *obsolete/*faded }.
The path seemed many miles [$_Q$ Ø] { long/ *lengthy/ *endless}.
His hedge got two meters [$_Q$ Ø] { wide/ *broad/ *overgrown }.

These NP, naturally enough, cannot occur with any overt Q that never allow measure phrases.

(35) *These chairs are ten years [$_Q$ very] old.
*The path seemed many miles [$_Q$ so] long.
*His hedge got two meters [$_Q$ somewhat] wide.

Since these adjectives constitute a closed class, they can by AR (19) alternatively realize some syntactic feature F common to those Q_A *more, less, as, that* and *too* which permit measure phrases in SPEC(Q_A). Consequently, the English lexical entrires of the Q_A in (34) are permitted by the ICP (20) to be empty.

Such language-particular treatment of the pattern in (35) seems appropriate, in light of their ungrammatical word for word French translations: *Ces chaises sont (*dix ans) vieilles; Le sentier semblait (*plusieurs kilometres) long.*

7. How many categories are there in syntax?

In work in progress, I widen the discussion of the Q-extended CIT (7) to PPs and VPs. The approach to PPs and their SPEC, both phrasal and non-phrasal, does not greatly differ from that just outlined for English APs.

Its extension to VP projections and clausal nodes is much less obvious, and involves an ingenious idea of Kuroda (1992), by which the functional head I above VP is crucially identified by its role in subject-verb agreement in English and the absence of this agreement in Japanese. In particular, I take number to be its most crucial component of agreement, keeping in mind that ±PLURAL in this paper has been reconceptualized as the syntax-assigned LF values $\pm Q_N$. These ideas taken together suggest that English IPs should be considered to be VP_Q, which Japanese then lacks, as argued in both Fukui and Speas (1986) and Kuroda (1992). To express this, we can generalize the Q Parameter (24) to verb phrases as in (36)

(36) **Generalized Q-Parameter.** Maximal NP and VP in English must be *closed* by merging with a Q head. NPs/VPs in Japanese must *not be closed* by merging with Q.

It then suffices to argue that Q_V can receive an LF value only from a constituent in its SPEC whose Q is *already valued*, i.e. from an NP in SPEC(V_Q). This position of course structurally corresponds to the familiar subject NP in SPEC(IP). This step is beyond the scope of the current study. Nonetheless, the reader can see the direction I am taking with a view to reducing to a single functional head Q all functional categories that are not themselves lexical categories in disguise (i.e., functional categories which obey van Riemdijk's CIT).

Then, in light of the following four considerations, I see no need for a significantly larger category inventory in syntax than that just reviewed. (i) C (= COMP) reduces to P (Emonds, 1985, Ch. 7). (ii) The only *productive* category of adverbs are heads that are special cases of A. (iii) The special discourse projections justified in root contexts in Rizzi (1997), who calls them FOC and TOP, are better analyzed as category-less projections (Emonds, 2004). (iv) As in section 2 here, what are usually called D or DET are mono-morphemic realizations of SPEC(Q_N).

This reduced set of head categories, namely N, V, A, P and Q, recalls the categorical parsimony of the generative semantics of forty years ago, which proposed to reduce the set of

syntactic categories to a small group of basic categories of modern logic. In fact, I agree with one thrust of this early school. Namely, it correctly claimed that syntax needs only a quite reduced set of categories, comparable to those in some kind of "natural language logic," i.e. what is called today LF. However, generative semantics prematurely substituted categories used in modern symbolic logic with those of empirically justified LFs for natural language. In particular, it put a lot of emphasis on items expressing truth, reference and quantification (treating numerals as a sort of extraneous elaboration of the latter. At the same time, since time and place are extraneous in symbolic logic, generative semantics wrongly ignored the important roles of PP structures.

Since symbolic logic was invented based on a simplified, intuited version of LF, it has been circular to hypothesize a natural language LF dependent on symbolic logic. Rather, natural language logic and its categories must be *newly discovered* on the basis of syntactic research, using the method of contrasting acceptabilities. In my view, we find then that. natural languages *distinguish* (do not conflate) 4 kinds of categories N, A, V and P, which both take arguments (a property of symbolic logic predicates) and at the same time can be constants and variables in larger propositions. These are supplemented by a single category Q which is first and foremost used to count (Ns), and then secondarily to quantify them and to measure properties (A) and locations and times (P). Finally, the role of Q in V projections becomes almost totally formal.

From an evolutionary perspective, the parsimonious scenario developed here greatly improves on systems which either proliferate functional categories or hand-wave aside their specific properties..

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