

ENGLISH CLASSIFIER CONSTRUCTIONS

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Although not a classifier language, English has an open class of words that are functionally similar to classifiers: *a HEAD of lettuce, a HERD of cattle, a BOX of candy*. For some words the lexical and collocational properties must be directly represented in the lexicon. *Pride* would be listed as the collective classifier for *lion*. Classifiers are not without meaning, however, as is evident in extended senses of these words. Compare *a HERD of linguists* with *a FLOCK of linguists*. In many cases the classifier meaning follows from the normal meaning and no special information need be included in the lexicon. Novel uses of words in classifier constructions (*a BOARD of statues*) require pragmatic rules of interpretation which depend on the prior existence of conventional classifiers. The appendix, on the syntax of classifiers in English, shows that all the syntactic tests which purport to distinguish among measure phrases, partitives, pseudo-partitives, and complement PPs ultimately fail.

1. Introduction

Among the constructions in English which have the surface linear structure [(Det) N of (Det) N] are a significant subgroup, which I will call classifiers, (constructions which include partitives, pseudo-partitives, and measure phrases). These constructions are exemplified by phrases such as the following:

- | | |
|-------------------------------|---------------------------------|
| (1) <i>a bunch of bananas</i> | <i>a row of the beans</i> |
| <i>hundreds of people</i> | <i>two kinds of experiences</i> |
| <i>two pounds of coffee</i> | <i>a group of these women</i> |
| <i>a number of children</i> | <i>a box of my candy</i> |
| <i>a herd of cattle</i> | <i>a head of cattle</i> |

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English is not considered to have classifiers, since classifier languages, as described by Greenberg (1972), Allan (1977a,b), Denny (1976,1979), Adams and Conklin (1973), and others, have a small, closed, paradigmatical-contrasting set of morphemes, which are obligatory, at least in some constructions. In English we often use a classifier when individuating masses, but a classifier is not obligatory. Thus we can say:

(2) Waitress, I'd like water, please.

Moreover, mass nouns are freely used as count nouns, and any implicit classifier would be determined by the pragmatics of the situation.

(3a) Waitress, bring us 3 coffees, please. (cups of coffee)

(3b) Three coffees are especially high in caffeine. (kinds of coffee)

(3c) Can you reach those coffees on the top shelf? (cans, packages of coffee)

Since English does not have a closed set of classifiers, (but instead an open and productive class), we must look at the rather complex interaction of syntactic, semantic, collocational, and pragmatic factors that apply to words which could be used as classifiers, both as conventional classifiers and as novel ones. The syntactic form of classifier expressions in English is:

(4) (Det) N₁ _{pp} [*of* (Det) N₂]

In most cases *of* cannot be replaced by another preposition, nor can it be paraphrased as a compound which reverses the order of the two nouns. *A cup of marbles*, 'the amount of marbles that a cup holds', loses its measure meaning in *cup with marbles*, *cup for marbles*, or *marble cup*. Sometimes the prepositional phrase can be postposed or preposed, as in (5a,b):

(5a) A bunch was used of those wonderful fresh carrots that Sally brought us.

(5b) Of the carrots that I was talking about, two bunches were used.

There are a number of interesting syntactic problems involved in classifier expressions, such as which noun is the head, whether *of* should be generated in deep structure, whether *of* and the following noun phrase constitute a prepositional phrase, and whether different deep structures distinguish *a bunch*

of the carrots from *a bunch of carrots*. These issues are treated in Appendix 2. The following questions must be answered in order to describe and explain the meaning and use of classifier expressions:

- (1) What are the possible categories of nouns in English that can serve as classifiers? To answer this question, we must provide a taxonomy of types of classifier expressions.
- (2) Are the selection restrictions between the classifier and the following noun phrase (e.g. *head* and *lettuce* in *head of lettuce*) due to arbitrary collocational facts or can they be explained in terms of the meanings of the words?
- (3) How is the semantic interpretation affected when classifiers are used in unusual contexts, (e.g. *a pride of philosophers*)? Is the phrase rejected as anomalous or can a hearer find a plausible interpretation? If the latter, what mechanisms contribute to the interpretation?
- (4) How is the syntax and semantics of classifiers represented in the lexicon?

2. Taxonomies of classifiers

Let us begin by looking briefly at Allan's taxonomy of classifiers for English, which illustrates the range of constructions I am concerned with (Allan (1977a,b)).

Allan lists seven categories of classifiers, which he does not claim to be exhaustive or disjoint.

- (1) Unit counters: *a piece* of equipment, two *head* of cattle.
- (2) Fractional classifiers: 3 *quarters* of the cake.
- (3) Number set classifiers: many *hundreds* of people, *dozens* of birds.
- (4) Collective classifiers: Two *clumps* of grass, a *herd* of animals.
- (5) Varietal classifiers: Two *species* of wheat, all *kinds* of flowers.
- (6) Measure classifiers: Two *pounds* of cabbage, one *liter* of wine, a *box* of candy, a *bowl* of sugar.
- (7) Arrangement classifiers: Two *rows* of beans, 3 *stacks* of books.

There is another group of classifiers, which Eloise Jelinek has pointed out to me (personal communication). These include expressions like *a bear of a man*, *a slip of a girl*, and *a dream of a house*. I will call these 'metaphorical comparison' classifiers, since their interpretation seems to involve a compar-

ison between the two nouns, and the classifier noun is understood metaphorically. I will have little to say about fractional and number set classifiers (categories 2 and 3), since the syntax and semantics for quantifiers will handle most of them. Some of these number set terms are used largely in the informal registers, e.g. *zillions*, *oodles*, *scads*, and they refer to a vague large number. Whether speakers can make quantitative comparisons and say which term denotes more – *oodles*, *scads*, or *lots* – is open to investigation. *Zillions* seems to denote a large number, because of its rhyme with *millions*, *billions*, etc. But, of course, *zillions* is likely to be used in contexts where a real numerical expression would be an exaggeration.

- (6) I've told you a $\left\{ \begin{array}{l} \text{million} \\ \text{zillion} \end{array} \right\}$ times not to do that.

In discussing the other categories of classifiers in Allan's taxonomy, I will use his labels.

3. Lexical considerations and collocations

Some classifiers are closely connected with certain nouns, and conversely, certain nouns are characteristically enumerated by certain classifiers. This is especially true of venery terms. 'In English there is a unique association between the collective classifier *pride* and the noun *lions* and similarly between *gaggle* and *geese*' (Allan (1977a)). Thus we have:

- | | |
|--|-------------------------------|
| (7) a herd of cattle, deer, elephants, goats | a school of fish ¹ |
| a pack of dogs, rats(?), coyotes, wolves | a pod of seals |
| a flock of sheep, geese | a swarm of bees |
| a pride of lions | a colony of ants, coral |

According to Lipton (1968) many of these terms were codified in the 15th century, and each venery term was common knowledge at that time. Many have since become archaic or obsolete or relatively unknown by the average speaker.²

¹ Lipton (1968) suggests that *school* is a corruption of *shoal*.

² Even the better known classifiers, like *pride* and *gaggle* are likely to be learned formally, either in school or from word lists or word games.

- | | |
|---------------------|---------------------|
| (8) cete of badgers | nye of pheasants |
| skulk of foxes | exaltation of larks |
| singular of boars | badling of ducks |
| sounder of swine | |

Lipton suggests that the process of creating venery collective nouns was productive in the 15th century and that a certain amount of word play was involved. New expressions were coined so that the classifier would reveal some property of the object. This can be best seen in expressions like:

- | | |
|--------------------|----------------------|
| (9) pride of lions | flight of swallows |
| leap of leopards | army of caterpillars |
| swarm of bees | cowardice of curs |
| sloth of bears | |

The last four classifiers would probably not be recognized by most speakers today as collectives at all.

4. Semantic considerations

One question that arises is whether there is a semantic element involved in explaining these collocations. Are elephants grouped into herds and geese into flocks because of some particular property that makes *herd* applicable to one but not the other? To some extent this is a 'chicken and egg' issue. The normal collocations as well as the whole range of metaphoric and affective associations constitute the syntagmatic meaning of the terms, and it is instructive to look at these classifiers in unusual (transferred) contexts. Consider:

- (10) a { herd
flock
bevy
swarm
gaggle
litter } of philosophers.

Herd connotes, not only a group whose members are in close proximity, but whose members are heavy, capable of stampeding. Consequently, *a herd of mice* sounds somewhat humorous, because mice are small. *A flock of philoso-*

phers connotes a group of followers without much inclination for independent thought. *A swarm of philosophers* suggests a large number of closely packed individuals who are on the move (literally or figuratively). Moreover, *flock* is more appropriate with nonaggressive beings. Thus we see that the connotations of *herd*, *flock*, etc. are derived from their prototypical collocations.³

4.1. Some unit classifiers: an interaction of collocation and meaning

Let us look at some unit classifiers to see if there are some arbitrary lexical cooccurrences here as well. We say:

- (11) a head of cabbage, lettuce, cauliflower
- a stalk of celery, broccoli, rhubarb
- a piece of equipment, furniture, property
- an ear of corn
- a blade of grass

These phrases look like rather straightforward productive, non-idiomatic combinations, a sum of their parts. Cabbage, lettuce, and cauliflower are roughly spherical (or at least saliently chunky), as are heads. A stalk *is* prototypically a vertically growing plant. There is, however, something partially arbitrary. Roundish vegetables could be individuated by other roundish objects:

- (12) a ball of cabbage (cf. a ball of yarn)
- a moon of cabbage
- a sphere of cabbage

So we can see that there is something partially arbitrary in these classifications.⁴ Comparative lexicology also shows the partial arbitrariness. In German one says:

- (13) Zwei Stück Kohl, Gamsen '2 heads of cabbage, elk'

³ The University of Auckland published a book entitled *A Pride of Academics*, which carries with it not only the associations of lions (royalty, ferocity, etc. but also any other reflected associations of other meanings of *pride*).

⁴ Makkai (1972) draws a useful distinction between idioms of decoding and idioms of encoding. Idioms of decoding are those that a speaker could figure out upon hearing, while idioms of encoding are those he could not figure out. The phrases in (12) belong to the former.

Although *Stück* is usually translated as ‘piece’, this translation is misleading because *Stück* has a wider distribution than ‘piece’. Thus an English speaker must learn that *head* is the proper classifier for roundish vegetables that grow above ground but not on vines. Thus we do not normally speak of *two heads of acorn squash*.⁵

Piece in *piece of equipment, furniture* poses a special problem, because the core meaning of *piece* is ‘part, not whole’, and therefore, the unit classifier use diverges from the general meaning. If we speak of *a piece of cabbage, celery*, we are speaking not of a unit, but only a portion. *A piece of furniture* does not refer to a table leg; that would be a piece of a piece of furniture. *Piece*, in this construction, functions like German *Stück*. Of course, furniture typically is placed in sets or groups, so that one could argue that *piece of furniture* retains its meaning of ‘part’. However, even if a person has only one furniture item or one independent equipment item, the correct classifier for these nouns is *piece*.⁶ Furniture and equipment are marginally classified by *item*:

(14) ?Yesterday I bought an item of equipment, furniture.

It has often been pointed out that classifier languages often use shape as a basis for categorizing (Denny (1976, 1979), Adams and Concklin (1973)), and that shape is also a salient property of objects which children use when learning their language (Clark (1976)). As we have seen, *head* and *stalk* have an element of shape in their meaning and use. Many other English classifiers are also based on shape. Among unit classifiers: ball, loaf, cube, slice, string, sheet; among arrangement classifiers: stack, row, line, heap, pile.

Many of these classifiers are relatively free in their distribution and can occur with any noun capable of having the appropriate shape:

(15)
$$a \left\{ \begin{array}{c} \text{ball} \\ \text{wad} \\ \text{cube} \\ \text{sheet} \\ \text{string} \end{array} \right\} \text{ of } \left\{ \begin{array}{c} \text{yarn} \\ \text{dough} \\ \text{litter} \\ \text{mud} \\ \text{paper} \end{array} \right\}$$

⁵ *Head of cattle* is not related to shape at all and is even more arbitrary.

⁶ Allan (1980) observes that *equipment* is a noun least able to be treated as count. *Furniture* seems to be in this class, too. In some languages, the translation equivalent is count. In English *information* is often individuated by *piece*, but *item* can be used. *Interest* comes in items, not pieces. *An item of interest*, **a piece of interest*. I consider these to be unit classifiers because they ‘individuate’ mass nouns as other unit classifiers do.

Any restrictions would seem to be pragmatic in nature. Some classifiers, however, like *head* and *blade* involve both standard collocations and meanings based on shape. *Loaf* is the standard classifier for portions of bread which are larger than individual portions, but there is also a shape involved. The prototypical shape of *loaf* will depend on the shape of bread one is most familiar with. For me a prototypical loaf has an oblong base with a flat or slightly raised top. For others, a prototypical loaf may be round, rather cake like. In the old days, sugar came in cone-shaped loaves, so rock formations like Rio's Sugarloaf presumably derived its name in this way. Phrases like the following seem acceptable:

- (16) Loaf of pâte, clay, rice, plastic, insulation.

Loaf can go with anything that can take on the appropriate shape. But whatever shape bread is (long, like a bagette, round, square), we would call it *loaf* because this is the conventional classifier for bread.

Therefore, we see that unit classifiers, like collective classifiers, have an element of lexical arbitrariness in their collocations in addition to their semantic content.

Before leaving the topic of unit classifiers, I wish to look at some unit classifiers that are derived from verbs. (They are unit classifiers because they individuate mass nouns.)

- | | |
|----------------------|-------------------------|
| (17) dash of tabasco | swallow of beer |
| pinch of salt | sip of water |
| slice of bread | sprinkle of sugar, rain |
| glimmer of light | sniff of fresh air |
| flicker of hope | |

Bolinger (1979) suggests that such classifiers are rather specific as minimal classifiers and limited. However, they seem to be projectable, at least in part, from their meaning and from extralinguistic facts as well. *Pinch of salt* sounds more natural than *pinch of pepper* because salt, more often than pepper, is served in an open container and is added to food by pinching a small amount between the thumb and index finger. Moreover, since salt is crystalline, it is less likely to stick to the fingers than a powdery substance, like ground pepper. However, it is a linguistic fact that *pinch* and *dash* (and probably *sprinkle*) are conventionally used as classifiers. In the following 'recipe', all parts of the instructions are comprehensible, but speakers will notice the difference between the conventional classifiers and the novel ones:

- (18) To season the stew properly, add a pinch of salt, a dash of tabasco, a grind of pepper, a shake of thyme, a sprinkle of parsley, and a toss of chopped onions.

A similar observation can be made for *slice*, which has become a completely conventionalized classifier, based on shape, to denote a part of a three-dimensional object divided so that one dimension is relatively thin, broad, and flat and the two largest sides are roughly parallel. We can interpret other phrases with deverbal classifiers, but we recognize them as novel:

- (19) a tear of bread a chop of carrot
 a hack of meat a mince of beef
 a break of celery a shave of chocolate
 a dice of potatoes

Glimmer, *gleam*, and *flicker* are typically associated with *light*, as are the noun classifiers *ray* and *beam*, and some of these terms may be used with *hope*, especially *glimmer* and *ray*, possibly because light has become a conventional metaphor for hope.

Unit classifiers, like the collective classifiers we have looked at, manifest an interaction of conventionalized collocations and semantic content. Although much about their use and distribution follows from their meaning, there is still an arbitrary or conventional element present as well.

4.2. More on the semantics of collectives

We have seen that even classifiers with severely restricted distribution derive some meaning from their contextual associations. Collective classifiers refer to a number of individuals, but with respects to numerosity, is there any meaning to *herd*, *flock*, *pride*, besides 'plurality' or 'group'?

For nondomestic animals, a herd, flock, pride, etc. would be a group of animals that live, move, and/or nest together in geographical proximity, with a more or less constant membership. Suppose we identify two groups of elephants, each with different permanent members. In addition, two elephants are sometimes with one group and sometimes with the other. I think we would conclude that there are two herds, although we might not be able to decide which herd the two migratory elephants belonged to (or whether they belonged to either). On the other hand, if members moved freely and frequently from one group to the other, we would be inclined to conclude that there was only one herd with two territories.

When we turn to domestic animals, human agency may play a role (cf. Pulman (1983)), Imagine Farmer Jones, who has some cattle that are raised for beef and other that are milk cows. Suppose further that they graze together and are separated only at breeding time. Here I think we might decide that there are two herds.

The actual number or range of individuals designated by the classifier is vague and presumably determined by knowledge of the behavior of animals. A flock of sheep can include less than a dozen to several thousand individuals, but we might hesitate to call three sheep a flock, even a small flock.

Some of the animal classifiers have more specific meanings. *Litter* (of puppies, kittens) refers not only to a plurality, but to individuals born to the same mother at a time. Similarly, *brood* would denote young offspring hatched together, having the same mother.

Consider the collective classifiers *bunch* and *cluster*. These two words, although they overlap in meaning somewhat, seem to incorporate both a numerical and arrangement aspect. Even though the number involved is vague (and relative to some reference or norm), *bunch* seems to denote a larger quantity than *cluster*, a feature which comes out in colloquial expressions like:

- (20) There were a bunch of people at the party ('many people, lots of people').

which is not suggested by the marginal:

- (21) There were a cluster of people at the party.

With respect to the arrangement element, *bunch* suggests closer proximity than *cluster* for the things in question. Prototypical examples of bunches are grapes, bananas, or other pluralities of individuals which are tightly tied together, such as carrots, parsley, radishes or cut flowers. *Cluster*, in comparison to *bunch*, suggests a smaller number of individuals, more separately arranged. A prototypical cluster would be cherries, tree blossoms, or pine needles. K. Allan (personal communication) observes that a bunch is more untidy and less focused than a cluster.

For terms like *pair*⁷ and *brace*, a specific number is included in the meaning,

⁷ Allan (1977a) argues that *pair* is polysemous. One meaning is that it is a unit classifier for pluralia tantum nouns which denote objects with two leglike members, hinged at some point: pants, trousers, glasses, pinchers, tweezers, scissors. In the colloquial speech of some Americans, however, these words have been reanalyzed as N + s, where s is a plural. I have heard utterances

namely two, plus a specification that the two belong to a set of some sort (this specification may be stronger for *brace* than for *pair*):

- (22) a brace of ducks (= a mating pair or a dead pair)
a brace of pistols (matched pair)

But there are apparently lexical restrictions for *brace*. We do not refer to a set of salt and pepper shakers as a brace.

5. Measure classifiers

Allan (1977a) divides measure classifiers into two subtypes, which he calls fixed measures and irregular measures. However, I prefer the alternative terminology of exact and inexact measures. Examples of exact measures are:

- (23) two pounds of potatoes
two miles of bush
two cubic foot (feet) of helium⁸
a thousand barrels of oil
two cups of flour

Examples of inexact measures include:

- (24) two cups of tea
a mouthful of food
a bucket of water
a packet of detergent

According to Allan, the set of exact measures is small and closed, while the set of inexact ones are 'almost limitless' (p. 104). There is systematic polysemy between words for containers and words for amounts, as pointed out by Lehman (1979) and Norrick (1981). As Norrick shows, there is a very general

like *Hand me that scissor, please*. (From Habadashery salesman): *I have a really nice slack, here. Maybe this pant will fit*. The other meaning of *pair* is the number of set classifier, two, usually in a set.

⁸ Greenberg (1972: 31) points out that measures are closely related to numerical expressions: 'They are syncategormatic with quantifiers and have no reality without them. One cannot ask about the characteristics of an ounce *outside* of its measure meaning'.

principle which allows us to construct a measure (amount) sense from a container word (p. 59). Since this principle is general, it can be stated once, and each lexical entry does not have to list the measure meaning. Notice, however, that *cup* appears on lists for both exact and inexact measures. It is necessary to provide an additional definition to the lexical entry for *cup*, since the exact measure (8 oz. in the U.S. and 10 oz. in the British Commonwealth countries) is not predictable by general principles. Of course, as a measure, no *cup* need be involved. A *cup* of butter is usually measured by marks on the paper in which the butter is packaged. The historical development from the utensil *cup* to the measure *cup* is transparent. A similar development has taken place with *teaspoon* and *tablespoon*. (1 *tablespoon* = 1/32 oz. U.S.; 1 *teaspoon* = 1/96 oz.) *Barrel* has undergone a similar development. In fact, container words can be used as classifiers, but they normally remain as inexact measures.⁹

The concept 'container' must be construed very generally to include not only objects for putting other objects and substances *in* but also *on* and even *under*. Thus we can have *a ceiling of posters*, *a wall of pictures*, and *a shelf of books*. To the extent that almost any object or area can be considered a container in this broad sense, the class of inexact measure classifiers is, as Allan says, virtually limitless.

The suffix *-ful* is frequently added to nouns when they function as classifiers. So we have:

- (25) a closetful of clothes
- a mouthful of meat
- a pocketful of coins
- a roomful of people¹⁰
- a buildingful of busy executives

The addition of *-ful* is thus a productive way of creating new classifier expressions. Often *-ful* can be omitted, as in:

- (26) a room of people
- a pocket of coins
- a closet of clothes

⁹ Thus *cup* has at least three senses: (1) container; (2) irregular measure, and (3) precise measure.

¹⁰ In written English *-ful* often appears as an independent word *full*, but there is a clear semantic difference between (a) *a roomful of people*, and (b) *a room full of people*. This second phrase is about a room; the first is about a quantity of people. There are also phonological differences. In (a) the stress pattern is *rôomfûl*. In (b) it may be *rôom fûll*.

but in other cases, *-ful* must appear:

- (27) ?a building of busy executives
 *a mouth of meat

Words whose primary semantic content is their reference to a container of some sort, generally do not require *-ful*:

- (28) a vase of flowers
 a jug of water
 a shelf of books
 a bowl of fruit

But *-ful* could be added. Notice that *-ful* can never be added to exact measures which are not derived from a container. Compare (29a) with (29b):

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|---------------------------|---------------------------|
| (29a) *a literful of milk | (29b) a cupful of milk |
| *a gallonful of oil | a teaspoonful of medicine |
| *a tonful of coal | |

In general, if a noun which is not usually considered a container is to be semantically extended to carry a container meaning, *-ful* must be added, as shown in (30):¹¹

- | | |
|-------------------------|-------------------------------|
| (30) a mouthful of meat | *a mouth of meat |
| a handful of sand | *a hand of sand |
| a beakful of fish | *a beak of fish |
| a treeful of fruit | ?a tree of fruit ≠ fruit tree |

Tree, unlike *bowl*, would not have ‘container’ in its semantic characterization; therefore, to be used as a container, we must add *-ful*. Consider the following:

- (31) ?A lakeful of dirty water, burning oil
 *A puddleful of dirty water

¹¹ Another factor might be that *of* is so vague, *-ful* is needed to disambiguate the phrase. *A hand of sand* is open to many interpretations: ‘hand made from sand’, ‘hand made for sand’, etc.

The unacceptability of *puddleful* follows from its meaning. A puddle is not a container – it is an amount, although it is a vague amount. Thus, it is analogous to a *liter*. *Lake* is more problematic, since we can think of a lake either as a container or as the substance that fills it (see Nunberg (1981) for a discussion of this sort of polysemy). Thus we can speak of *dry lakes*, where we focus on the container aspect, the lake bed. But we normally think of a lake as the substance, the water. *A lake of water* is odd for a different reason. It is redundant since lakes are normally composed of water. When *lake* is used as a classifier, it is best in a context where the meaning is extended, as in *a lake of burning oil*, where *lake* means ‘a large quantity of some liquid’.

A poolful of water is almost as acceptable as *a pool of water*, since *pool* has become even more clearly polysemous than *lake* in referring to either a container or to a quantity of liquid.

6. Varietal classifiers

Varietal classifiers are special in several respects. First of all, they do not denote a quantity, as do the other classifiers. Secondly, their cooccurrence with singular nouns after *of* differs from that of other classifiers. When the varietal classifier is singular, the following noun is preferably singular, and sometimes the indefinite article is permitted.¹²

- (32) a nasty kind of (a) person
- my favorite type of bean
- an interesting sort of (a) theory
- rare breed of cat

Plural varietal classifiers require plural or mass nouns after *of*.

- (33) nasty kinds of people
- my favorite types of beans
- various sorts of matter
- rare breeds of cats

¹² G. Carlson (1977: 211) observes that no other determiner is possible. **Some kind of one man*;
**A kind of the man*.

In the varietal classifiers we find the same interaction of collocational, semantic, and pragmatic features. *Kind*, *sort*, and *type* are very general and can be used with most nouns, sometimes with subtle semantic differences.

- (34)
- | | | | |
|---------------|---|----|---|
| You need many | $\left\{ \begin{array}{l} \text{kinds} \\ \text{sort} \\ \text{types} \end{array} \right\}$ | of | $\left\{ \begin{array}{l} \text{lettuce for a good green salad} \\ \text{animals for a zoo} \\ \text{ideas to succeed in the world} \\ \text{theories to understand philosophy} \\ \text{tools to have a good workshop} \\ \text{appliances to make life easier} \\ \text{cakes to please John} \end{array} \right\}$ |
|---------------|---|----|---|

Some varietal classifiers are specific to some domains, e.g. those used in biological taxonomies (*phylum*, *order*, *genus*, *species*) or to anthropological classification (*race*) or to animal breeding (*breed*). When transferred to other domains, they carry the connotations associated with their usual collocations.

- (35)
- | | | | |
|-------|---|-------------|------------------------------------|
| A new | $\left\{ \begin{array}{l} \text{breed} \\ \text{race} \\ \text{species} \\ \text{genus} \end{array} \right\}$ | of linguist | has emerged in the last few years. |
|-------|---|-------------|------------------------------------|

Class, in addition to its technical sense in biological taxonomies, is a fairly general classifier. *Family*, too, besides its technical meaning, functions as a collective classifier, retaining its semantic connection with 'kinship'.

Brand is restricted to manufactured goods and refers to the manufacturer's name for the product. But for some products more specific classifiers are used, and there are mini taxonomies involved: *make* for cars, *model* for subtypes of cars, appliances, computers, etc.

There are also other words that are peripheral varietal classifiers: *style*, *size*, and to a lesser extent, *shape* and *color*.

- (36)
- | | | | |
|--------------------------|---|----|--|
| this | $\left\{ \begin{array}{l} \text{style} \\ \text{size} \end{array} \right\}$ | of | $\left\{ \begin{array}{l} \text{clothing} \\ \text{car(s)} \end{array} \right\}$ |
| all colors of paint | | | |
| many shapes of cardboard | | | |

The varietal classifiers not only differ among themselves with respect to their normal collocations, but they also differ with respect to the way in which

things are partitioned. *Species*, *genus*, *brand*, *make*, *model*, *race*, and *breed* determine the partitioning of the following NP, while *kind*, *sort*, and *type* do not. Carlson (1977) points out that *kinds of dogs* can refer to a division into breeds (collies, beagles, cocker spaniels, etc.) or into ‘functions’ (watch dogs, lap dogs), or sizes (small dogs, large dogs), or almost any other imaginable division, but the sets must be *disjoint*. Therefore, a sentence like:

(37) Two kinds of dogs are in the next room.

cannot partition dogs into collies and watchdogs, since the two sets are not disjoint. In fact, the disjointness can come about through implicatures, as shown by Carlson’s example:

(38) There are two kinds of cars in the world, cars that run right, and Fords. (1977: 323)

Sentence (38) implies that Fords do not run right. Or we could have:

(39) I like only two kinds of dogs: really big dogs and chihuahuas.

The interpretation requires that we know that chihuahuas are small dogs and that therefore, the two kinds of dogs form a disjoint set.

7. Metaphorical comparisons

The last group of classifiers, called to my attention by Eliose Jelinek, are metaphorical comparisons. These include the expressions illustrated in (40):

(40) a bear (bull, tiger) of a man
 a slip (wisp, midget) of a girl
 a dream (honey, jewel, peach, angel) of a woman
 a devil (hell, nightmare, mess) of a situation

Jelinek observes that these expressions seem to be confined to specific semantic classes: strong and aggressive, weak and small, exceptionally good and desirable, or exceptionally bad and undesirable. Moreover, the *a* before the second noun is required, and that noun must be singular (and therefore count). Thus we do not get the following:

- (41) *a bear of man
 *a slip of girls
 *a dream of job

The noun in the classifier slot functions as a metaphorical comparison. Thus *a bear of a man* means something like ‘a (type of) man who is like a bear’. The semantics of these constructions will be left for future research.

8. Recognizing classifiers

How do we recognize classifier expressions? As we have seen, semantic and pragmatic factors permit words which are not usually classifiers to be so used. Except for varietal classifiers, which require (or at least preferably take) singular count nouns following *of*, the canonical form is:

- (42) (Det) N_1 of (Det) $\left[\begin{array}{c} N_2 \\ \text{Mass or} \\ \text{Pl} \end{array} \right]$

where N_1 is the classifier. Some classifiers will be lexically specified as classifiers of certain nouns, and conversely some nouns will be specified as taking certain classifiers. When phrases as in (43) are encountered:

- (43) a piece of furniture
 a herd of cattle
 a head of lettuce

the construction is easily identified and interpreted with *piece*, *head*, or *herd* as classifiers and *furniture*, *cattle*, and *lettuce* as the ‘semantic heads’.

Some classifiers are determined by their meaning: among these will be varietals (*type*, *sort*, *genus*, etc.), containers (*cup*, *bottle*, etc.), periods of time (*day*, *hour*), as in *a day of utter boredom*, collections (*group*, *committee*, *class*), measures (*liter*, *quart*, *ton*), or arrangements (*stack*, *row*, *pile*). The suffix *-ful* will also semantically mark the noun to which it is attached as a container.

In other cases, when novel constructions are used, the interpretation will depend on the speaker’s or hearer’s assessment of similarity between the meaning of the noun in the classifier classes. Thus the following phrases could be construed as ‘containers’, provided the following noun is something that could be ‘contained’:

- (44) a land of immigrants a car(ful) of contraband
 a ship of fools a century of horror (i.e. of horrible events)
 an island of tourists a year of fun
 a board of sculpture a face of scars/freckles/wrinkles
 a paper of gossip

The following do not permit (or at least not as far as I can figure out) a classifier interpretation:

- (45) a face of $\left\{ \begin{array}{l} \text{floors} \\ \text{volumes} \\ \text{defense} \\ \text{laws} \end{array} \right\}$

Consider the following, from S.J. Perlman:¹³

- (46) a firkin of gerkins
 a ramelein of fescue
 a pipkin of halvah

Since these phrases fit the canonical form in (42), a reasonable guess at their meaning may be that the first noun is a classifier and the second is a substance.

The semantics of the classifier expression will constitute, as Guéron (1979) points out, a single argument. The classifiers (except for varietal and perhaps some arrangement classifiers), designate quantities, implicitly, if not explicitly. And except for the regular measures, most of these quantities are vague. Consider first some standard combinations:

- (47) a bowl of soup
 a slice of toast

The amount of soup is roughly what one gets or expects when a prototypical bowl is more or less full. The amount of toast is what one gets or expects when one cuts a loaf of bread into slices (of prototypical thickness).

- (48) a board of sculpture
 a face of freckles

¹³ Quoted by M. Schmid in 'The changing voices of S.J. Perlman', in *The language of humor and the humor of language*, ed. by D.L. Nilsen and A.P. Nilson, Tempe, AZ (1983).

The meaning of *board of sculpture* refers to an amount of sculpture that could fit on a board. In *a face of freckles*, the interpretation is that there are enough freckles on the face so that most areas have some freckles on them. *Three freckles on one cheek* is not sufficient. The amount denoted is vague, of course. Bowls and boards come in different sizes, and people may have different views about how many freckles it takes to have a faceful. Of course, in many speech situations and contexts, the possible interpretations will be restricted.

To test the prediction that novel classifiers are interpreted by analogy to the existing semantic categories, it is useful to look at some newly coined collectives (also created for humorous purposes). Thus Kreisberg (1984), reviewing several books on specialized language, has come up with the following:

- (49a) a Mayflower of Americans
- (49b) a column of journalists
- (49c) a poverty of relatives
- (49d) a file of civil servants
- (50a) a rejection of editors
- (50b) a fraud of Freudians
- (50c) a blast of hunters
- (50d) a dampness of babies

From Lipton (1968) are the newly coined expressions in (51a–d):

- (51a) a piddle of puppies
- (51b) a trip of hippies
- (51c) a flush of plumbers
- (51d) a conjunction of grammarians
- (51e) a complex of psychoanalysts

Of course, in the context of these works, the reader knows ahead of time that the first noun is to be understood as a collective classifier. Moreover, since some of the constructions involve puns, a hearer might suspect that some phrases require additional interpretation. However, suppose that each of these constructions were to appear in a different and separate context that did not provide the clues given by their occurring in books on classifiers. How would they be interpreted?

I would predict that the phrases in (49a–d) would easily be interpreted as classifiers. *Mayflower* is a boat, and a boat is a container, thus (49a) would be

interpreted as a measure phrase. *Column* is an arrangement and therefore is straightforwardly interpreted as an arrangement classifier, although the image of a line of journalists strung out may not have been the only thing Kreisberg intended. *Poverty* can be interpreted as a lack of something, and therefore as a quantifier. *File* has several senses, one of which is an arrangement term and could therefore be easily interpreted as an arrangement classifier, similar to the interpretation for *column*.

The phrases in (50a–d) would most likely be interpreted in a different way: the first nouns would be processed as the semantic head and the second nouns as an agentive, such that *of* could be replaced with *by*.

Of the phrases in (51a–d), I would predict that only the last three would be interpreted as classifiers, and probably not by all speakers. One must search through the various senses of each noun and find one that is compatible with the classifier interpretation, and since some of these senses are not particularly salient, a hearer might miss them. *Flush*, for example, can mean ‘plentiful’ or ‘abundant’ and thus be treated as a quantity. One meaning of *conjunction* is ‘combination’ or ‘collection’ and thus (51d) would be interpreted as a collective classifier. Finally, *complex* can refer to something consisting of connected parts and could be used as an arrangement classifier.

9. Toward a formal semantics of classifier expressions

Ultimately, we want to be able to incorporate the lexical and semantic information provided here into a formal semantic analysis. Although I will not attempt to provide such a formal analysis here, I will sketch out several problems that must be faced in the process.

One issue involves the selection of a formalism, and Lehman (1979) provides a promising formal analysis. According to Lehman only three semantic rules are needed to account for classifiers:

- (1) Classifiers for counting unit members of sets: *head, piece*.
- (2) Classifiers used to enumerate elements of power sets:
 - (a) measure words used for mass nouns and some count nouns, and
 - (b) grouping words (*bunch, herd, group*), used only with count nouns.
- (3) Classifiers for enumerating partitions either of ordinary sets or power sets (*kinds, varieties*).

Unit counters enumerate individuals and the classifier part of the complex noun phrase can easily be dealt with in quantificational theory. We must,

however, enrich the analysis with possible worlds semantics to account for expressions without any extension, such as *three tanks of phlogiston*.

Lehman's point in combining mass and count nouns in the second category is that power sets are necessary for dealing with mass terms, and the same mechanism will handle subsets of count nouns as well. In the expression *three drops of water*, water is divided into subsets of drops. In *two herds of cattle*, cattle are divided into subsets of herds. Philosophers have distinguished between objects and substances and have tried to link this distinction to the count–mass distinction. But as Ware (1975) observes, the linguistic system and the ontology that philosophers and logicians are concerned with, do not neatly coincide, as illustrated in (52) and (53) (see also Dillon (1977)).

(52) John has a gardenful of $\left\{ \begin{array}{l} \text{water} \\ \text{sculpture} \end{array} \right\}$

(53) John has a mouthful of $\left\{ \begin{array}{l} \text{marbles} \\ \text{mashed potatoes} \end{array} \right\}$

Water and sculpture are both mass nouns, but water denotes a substance and sculpture denotes a set of objects. The same difference can be seen in the count nouns in (53). Ware's observation further supports Lehman's proposal for combining measure words and grouping words (see Pelletier (1975) for a collection of papers on mass terms).

Varietals, as we have seen, do not partition into quantities but into disjoint sets in a way determined by the particular noun: (*brand, species, type*). Both count and mass nouns may be partitioned, e.g. *species of wheat, species of dogs*.

The second problem to be faced in a formal analysis is that of vagueness. Many of the expressions examined denote inexact, vague amounts. I have suggested that prototype theory may be appropriate for at least some of these expressions, e.g. *a bowl of soup, a glass of water* would denote the amount of soup or water that is contained in a prototypical sized bowl or glass. However, in some cases, it is doubtful that formal semantics can or even should try to impose a determinate interpretation. Thus Powell (1985) argues that some expressions not only have vague meanings but that:

'Vagueness, in itself, may constitute a viable communicative option for ordinary speakers. As theoreticians, therefore, we may err if, following Barwise & Cooper (1981), we always appeal to a fixed context to make their meaning option as lame as performing a descriptive purpose which might better have been served had it been encoded with precision; rather, as in the case of vague quantifying expressions, vagueness may perform a sometimes highly subjectively determined evaluative function in which a speaker expresses a judgment concerning the significance of a quantity.' (1985: 33)

Thus expressions like *oodles* and *zillions* as in:

(54a) Oodles of people signed up for my course.

(54b) We performed zillions of experiments.

are not to be interpreted in context as implying:

(55a) Over 20 people signed up for my course.

(55b) We performed over 85 experiments.

The third issue has to do with additional entailments made by the classifier expression. Lehman (1979) and others (e.g. Parsons (1970), Cartwright (1975)) treat expressions like *bucket of water*, *cup of soup* as quantities or amounts. Certainly an amount is part of the meaning, but ironically, the container word itself may not be part of the meaning, *qua* container. For example, does (56) make sense?

(56) John was served a cup of soup, but it came to him in a glass (jug, barrel).

This would mean that the *amount* of soup is what is contained in a prototypical cup, but the container was something other than a cup. My intuitions are not very firm with respect to this matter, but I find that the implication on the nature of the container can be cancelled, as in (56).

In contrast, arrangements classifiers do entail the arrangement denoted by the classifier. The sentences in (57a,b) are contradictory in a way that (56) is not.

(57a) Farmer Jones planted a row of wheat in a clump.

(57b) The stack of books was in a heap.

Plausible interpretations can easily be found, of course. (57b) can mean something like 'The books that were formerly in a stack or were supposed to be in a stack were arranged in a heap'.

10. Further concerns

The final question I wish to raise is: are there classifiers for everything in English that a speaker might want to classify? This question can be reduced to

a more general question of whether there is an appropriate word or phrase for every concept the speaker wishes to express. Often there is no conventional classifier available, but speakers can create new classifiers by regular means: by extending the meaning of existing classifier expressions, by using metaphors, or by finding a long paraphrase.

For example, if we look at a waterfall, at the top the water falls over the ledge in sheets, then breaks up into smaller units; sometimes into drops, sometimes into amounts that seem too large to be called drops. Perhaps we could call them 'globs' or 'falling puddles'. Perceptually some quantities of water consisting of drops and globs can be grouped (by the perceiver) into a collection or group. The closest English word I have been able to think of is *clump*, although *clump* prototypically denotes a solid mass, e.g. dirt, coal, grass, or sometimes which, unlike water, holds its shape. We could also find a wordier paraphrase using more general words, perhaps 'a perceptual grouping of small masses of water'.

Or consider another example. Suppose I have three puppies from different mothers. It would be misleading to call the group a *litter*. *Menagerie* of puppies is not quite right, though I might use *menagerie* or *zoo* of pets for the three puppies, two cats, parrot, rabbit, hamsters, and tropical fish. *Collection of puppies*? I could simply say *three puppies*. Since English does not require a classifier with count nouns, the use of one should serve some purpose, and my choice will reveal this. (See Denny (1976)). Even with mass nouns, noun classifiers can be avoided by using a quantifier, as in:

- (58) I want some water.
I bought some bread.

Thus the answer to the question raised above is that although there may be no appropriate prototypical classifier for all possible situations, speakers can create or find an appropriate one.

11. Conclusion

A complete analysis and interpretation of classifier expressions in English involves a complex interaction of syntactic, collocational, semantic, and pragmatic factors. The prototypical syntactic frame is (D) N_1 _{PP} [*of* N_2] where N_2 is a plural or mass noun. In some cases the PP can be postposed, and postposed constructions are best when a determiner is present in N_2 .

A few classifiers are tied to specific nouns, and their meaning contributes relatively little to the meaning in the case of their normal collocation. E.g. *a flock of sheep* or *a herd of cattle* denote a group or collection. However, in nonstandard collocations these classifiers carry along with them the associations of those nouns. *A herd of linguists* carries with it those associations appropriate to the animals normally classified by *herd*.

In other cases, the meaning of N_1 determines the classifier meaning in a straightforward way: *a bowl of sugar*, *a box of fruit*, *a group of people*, *a page of writing*. When lexically or semantically specified classifier uses are unavailable, the interpretation becomes dependent on pragmatic factors, and the hearer must interpret N_1 to make it analogous to some noun that can be used as a classifier.

It has been shown that although English is not a classifier language, it has constructions that serve functions similar to those found in classifier languages: to individuate mass nouns, to denote quantities and collections, and to categorize according to limited types of organization principles (e.g. shape). Although this analysis does not directly support a modular theory of language, it is compatible with principles of modularity, in that the lexical, collocation, semantic, and pragmatic information is needed to provide an interpretation of classifier expressions. There is no single level or component of language description that will suffice.

Appendix 1 contains samples for lexical entries in generative grammar. In some cases polysemy is postulated, as for *cup*, with two transparently related senses. Nunberg (1981) has suggested that we can reduce the number of senses for words by relying on general cognitive strategies for interpreting word meanings in context. Thus, he proposes that *chicken* need not be given two meanings, one for the bird and one for the meat, since the 'meat' meaning is projectable from the 'bird' meaning (see also Allan (1975)). This approach is attractive and explains in part our ability to create and understand novel constructions, but it ignores the evaluation problem. Although we conventionally use *chicken* for the meat, we use *pork* and *beef* instead of *pig* and *steer*. The mature speaker-hearer knows that *a slice of bread/ham/cheese* is a conventional combination, while *hack of meat* and *tear of bread* are not, even though the latter are easily interpreted. However, if we add the information that a word is conventionally used as a classifier we are not saying that it has an extra sense. We are merely providing information on its syntactic distribution which is available for the interpretation and which will depend on an interaction of semantic and pragmatic principles. Such information provides an 'evaluation' of the construction as conventional or nonconventional.

Although my use of the term 'evaluation' may evoke memories of a

grammatical–acceptable or competence–performance distinction, it should not be equated with either of these distinctions. Expressions like:

- (59) a shake of pepper
a tear of bread
a shave of chocolate

or

- (60) We ate $\left\{ \begin{array}{l} \text{pig} \\ \text{cow} \\ \text{sheep} \end{array} \right\}$

are neither ungrammatical, since an optimal grammar will generate them,¹⁴ nor meaningless, since we can easily understand them, nor unacceptable, though this point is perhaps controversial. They are, however, unconventional, and the mature speaker recognizes them as such (and may evaluate them positively or negatively).

Appendix 1

Lexical entries for selected English words used in classifier expressions

1. Unit classifiers

Head

- + N
- (1) unit classifier_____ of $\left[\begin{array}{c} \text{N} \\ \text{mass} \end{array} \right]$
- count
- + sg with (1a)* (1a) prototypical
cattle, game animals
- ± sg with (1b) (1b) roundish vegetables
- * That is, three $\left[\begin{array}{c} \text{head} \\ * \text{heads} \end{array} \right]$ of cattle but three *heads* of lettuce.
- (2) 'upper or anterior part of a person or animal, containing eyes, ears, nose, mouth, brain (...)'

Two senses are proposed.

¹⁴ The phrases in (59) cannot be ruled out grammatically because *shake*, *tear*, and *shave* are all nouns, as well as verbs: *there's a tear in my dress*; *he needs a shave*; *give it a good shake*.

Pride

- + N
+ count
- (1) collective classifier — of $\begin{bmatrix} \text{N} \\ \text{pl.} \\ \text{lions} \end{bmatrix}$
- (2) other meanings, e.g. 'emotion'

Flock

- + N
+ count
- collective classifier — of $\begin{bmatrix} \text{N} \\ \text{plural} \\ \text{animals} \end{bmatrix}$
- (sheep, birds (esp. on ground))
'a group of animals that live, travel, or feed together'

Band

- + N
+ count
- (1) collective classifier — $\begin{bmatrix} \text{of} & \text{N} \\ & \text{pl.} \end{bmatrix}$
'people or animals having a common purpose or moving together'
- (2) 'musicians who play together'
prototypical instruments: wind, brass, percussion

3. Other classifiers or nouns that can be used as classifiers*Cup*

- + N
+ count
- (1) 'container for one person, handle, ceramic, shape to'
(2) measure 8 oz. US, 10 oz. British

Two (obviously related) senses are listed. See note 9. For a more precise definition of the first sense see Wierzbicka (1984). There is no need to specify a special classifier use for the imprecise measure, since containers generally may function as classifiers.

Pool

- + N
+ count
- (1) 'large container, esp. for water'
- (2) classifier — of $\begin{bmatrix} \text{N} \\ \text{mass} \\ \text{liquid} \end{bmatrix}$
'body of (relatively still) liquid'

Bowl

- + N
+ count
- 'a hemispherical container, of glass or ceramic, usually wider than deep'

There is no need to specify a classifier use.

Kind

+ N
+ count varietal classifier — of $\begin{bmatrix} N \\ P \end{bmatrix} *$

‘a class of things’

* plural refers to number agreement between N₁ and N₂: *a kind of book*;
several kinds of books

Crowd

+ N ‘large number of people gathered together’

+ count

+ Verb Classifier use follows from the meaning.

List

+ N ‘an arrangement of written or printed items, often of a specified
+ count category’

Use as a collective/arrangement classifier follows from the meaning.

Stack

+ N ‘a vertical arrangement of physical objects into layers, often orderly’

+ count

Classifier use follows from the meaning.

4. Nouns with conventional classifiers*Cattle*

+ N [zoological specification: mammal, bovine, etc.]

Pluralia collective classifier: *herd*

Tantum unit classifier: *head*

Bird

+ N [zoological specification]

+ count collective classifier: *flock*

Redundancy rules would transfer this information to hyponyms of bird.

Corn

- + N (a) British: 'grain; any of a variety of edible cereals' (bontanical specification)
 + mass unit classifier: *ear*
 (b) US = 'maize' (bontanical specification)
 unit classifier: *ear*

I am not proposing 2 meanings here; merely referential indices for what *corn* means in different geographical speech communities.

Lion

- + N [zoological specification: mammal, feline ...]
 + count collective classifier: *pride*

Equipment

- + N [definition]
 mass unit classifier: *piece*

Appendix 2**The syntax of classifiers**

The syntactic issues involved in classifier expressions are focused around the following interrelated questions:

- (1) Are there different syntactic structures for partitives, pseudo-partitives, and measure phrases?
- (2) What is the head of each construction in $_{NP}[(\text{Det}) N_1 \text{ of } (\text{Det}) N_2]$ structures?
- (3) Does *of* N_2 constitute a prepositional phrase?

Several syntactic tests have been proposed to choose among alternative syntactic analyses:

- (1) Prepositional phrase extraposition and PP preposing
- (2) Number agreement between the subject head noun and the finite verb
- (3) Tag questions
- (4) Preposition stranding
- (5) *One(s)* substitution

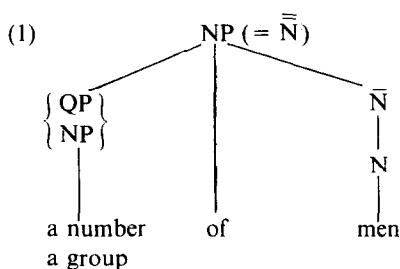
Each of these problems and the syntactic tests will be taken up in turn. Although I will use the vocabulary of transformational grammar, I am not necessarily committed to that theory. I leave open the question of whether prepositional phrases are extraposed or preposed by a movement rule or generated in place and related to another constituent by an interpretive rule.

1. PP Extraposition

Prepositional Phrase Extraposition has been proposed as a test to support the view that measure phrases and pseudo-partitives on the one hand and partitives and PP complement constructions on the other hand have different constituent structures.

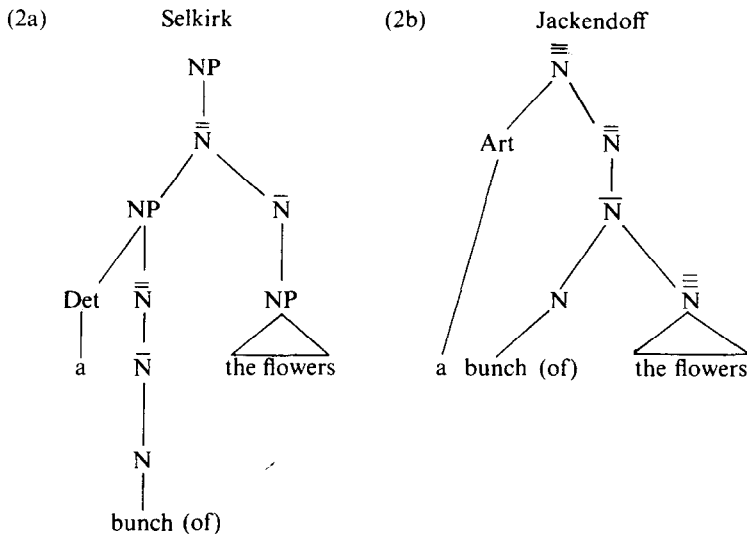
These distinctions in Selkirk (1977) are defined largely in terms of the postulated deep structures and allowable transformations. Measure phrases contain quantifier or quantifier-like nouns as in *many objections* and *a number of objections*. The noun *objection* is the head in both cases. Partitives contain a determiner of some sort between *of* and the following NP, e.g., *a number of her objections*, *three pounds of that meat*. In these constructions *a number* and *three pounds* are the heads, and *of* plus the following NP does not form a PP in deep structure. In pseudo-partitives, there is no determiner in the NP following *of*, nor does *of* form a PP with what follows. Examples are *a bunch of flowers*, *a selection of commentaries*, where *flowers* and *commentaries* would be the heads of the constructions. Finally, there are noun complement structures, e.g. *a bunch of flowers*, where *bunch* is the head and *of flowers* is a deep structure prepositional phrase.

Selkirk (1977), Jackendoff (1977), and Akmajian and Lehrer (1976) have argued that measure phrases always and classifier (pseudo-partitive) phrases sometimes have the following syntactic structure:

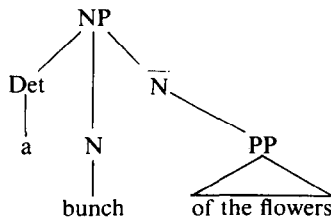


Men is the head of the NP.

In contrast to (1), partitives have a different structure, as illustrated in (2a–c):



(2c) Akmajian and Lehrer; also Selkirk's analysis of noun complements



Although there are differences of detail in the three analyses, all agree that *bunch* is the head. It has been argued that the following *of* NP can be extraposed from the structure in (2a–c) but not the structure in (1). Some speakers find all sentences acceptable, thereby casting doubt on the basis of different structures. In any case, the asterisks should be interpreted as acceptability rather than grammaticality judgments, since some starred sentences sound weird for pragmatic or stylistic reasons.

- (3a) *A bunch was taken of fresh carrots.
- (3b) A bunch was taken of those fresh carrots.
- (3c) *Two pounds were drunk of coffee.
- (3d) Two pounds were drunk of the coffee.

The validity of the PP Extraposition test has been challenged by Guéron (1979) and Oehrle (1977), however. Guéron argues that extraposition in pseudo-partitives PPs is acceptable if the extraposed material is heavy enough.

- (4) A large quantity was sold of books which had been written in Moscow and published in Paris.

(I find many of Guéron's examples of postposed pseudopartitives and measure phrases with *a lot* and *a number* to be marginal.) However, it remains open whether the unacceptability is a matter of grammar or of style. In addition, the PP extraposition test does not completely correlate with syntactic structures, since some sentences which have structures of the forms in (2a–c) do not allow extraposition.

- (5a) No proof will ever be found of the theorem.
 (5b) *No proof will ever be sound of the theorem. (Oehrle (1977))
 (5c) *A slip was seen of a girl. (Guéron (1977))

(5a) is acceptable, while (5b) and (5c) are not, even though they all have the same surface structure. Apparently there are semantic and stylistic factors that control PP extraposition in addition to syntax. Therefore, the PP extraposition test does not enable us to determine the syntactic structures of $_{NP}[(\text{Det}) N \text{ of } (\text{Det}) N]$ constructions nor to determine which N is the head.

2. The head of the NP

A second syntactic issue is that of determining the head of $_{NP}[(\text{Det}) N \text{ of } (\text{Det}) N]$ constructions. A major test for headship is number agreement between the subject head and the finite verb. Akmajian and Lehrer give the following examples to show that either *herd* or *elephant* could be the head, and whichever is chosen will agree with the verb.

- (6a) The *herd* of elephants *was* larger than I thought.
 (6b) The herd of *elephants* *were* stampeding toward us.

Unfortunately subject–verb number agreement in English is controlled by semantic as well as syntactic factors. Allan (1975, 1977a) has shown that collective NPs may take plural verb forms, a phenomenon which is commoner in British dialects than in American ones.

- (7) The $\left\{ \begin{array}{l} \text{herd} \\ \text{army} \\ \text{government} \end{array} \right\}$ are getting $\left\{ \begin{array}{l} \text{restless} \\ \text{ready to act} \\ \text{worried} \end{array} \right\}$

Another violation of number concord occurs when venery terms are used.

(8) Elephant have been overhunted in Africa.

In (7) and (8) there is no problem in selecting the head, because only one noun is available.

There are also sentences where a plural subject may occur with a singular verb, namely when the collection is viewed as a unit.

(9a) Five *courses* is the maximum a student may take.

(9b) Two *brothers* is one too many.

A second test for headhood, proposed by Akmajian and Lehrer, is agreement between the subject head and the pronoun in a tag question. Guéron points out counterexamples, however, where the two tests give different results.

(10a) A *pair of gloves* was lost at the party, *weren't they?*

(10b) A married *couple* was seen in public { *weren't they?* }
 { **wasn't it?* }

Thus we see that number agreement and tag pronoun agreement are limited as tests for determining the head of a complex NP.

3. Is *of* part of a Prepositional Phrase?

A third syntactic problem concerning _{NP}[(Det) N of (Det) N] constructions is whether *of* and the following NP constitute a prepositional phrase. One of the commonest tests for constituency has been the possibility of transformation, either movement or substitution. However, these tests are based on theory internal considerations, such as the constraint that a transformation can move only a single constituent (Akmajian and Heny (1975)). According to this constraint, if *of* + NP can be postposed, it must be a PP that is moved.

Not all linguists working within the transformational model accept this constraint, however. In Selkirk (1977) *of* is not in the deep structure of either partitives or pseudo-partitives and does not form a PP with the following NP even after it is added by transformation.

In addition to PP extraposition, two other 'rules' (or structures) are relevant: PP proposing and preposition stranding. The possibility of preposing would suggest that *of* + NP forms a constituent; conversely, the necessity for preposition stranding would suggest that the *of* does not form a constituent with the following NP (Janda (1980)).

Let us look first at Prep + NP constructions, where PP is dominated by VP. In general, in these constructions, the whole PP can be preposed or the preposition can be stranded.

- (11a) Of which book do we have a review?
 (11b) Which book do we have a review of?
 (12a) To these songs we have all the words.
 (12b) These songs we have all the words to.

With quantifiers and partitives both structures are possible, but not stylistically equivalent.

- (13a) Of the men we invited $\left\{ \begin{array}{l} \text{some} \\ \text{all} \\ \text{a couple} \\ \text{a number} \end{array} \right\}$
 (13b) The men we invited $\left\{ \begin{array}{l} \text{some of} \\ \text{all of} \\ \text{a couple of} \\ \text{a number of} \end{array} \right\}$
 (13c) Of the animals we saw $\left\{ \begin{array}{l} \text{a herd} \\ \text{a pride} \\ \text{a large number} \end{array} \right\}$

Notice, however, that when the preposed element has no determiner the results are unacceptable:

- (14a) *Of men we invited $\left\{ \begin{array}{l} \text{a couple} \\ \text{a number} \\ \text{a group} \end{array} \right\}$
 (14b) *Of animals we saw $\left\{ \begin{array}{l} \text{a herd} \\ \text{a pride} \end{array} \right\}$
 (14c) *Of $\left\{ \begin{array}{l} \text{what} \\ \text{whom} \end{array} \right\}$ did we see a $\left\{ \begin{array}{l} \text{couple?} \\ \text{number?} \\ \text{group?} \end{array} \right\}$

Preposition stranding is preferable in *wh*-questions, as in (15), and permissible in left-dislocated constructions as in (16).

- (15) $\left\{ \begin{array}{l} \text{What} \\ \text{Whom} \end{array} \right\}$ did we see a $\left\{ \begin{array}{l} \text{couple of?} \\ \text{herd of?} \\ \text{row of?} \end{array} \right\}$
 (16) $\left\{ \begin{array}{l} \text{Men} \\ \text{Elephants} \end{array} \right\}$ we saw a $\left\{ \begin{array}{l} \text{group of} \\ \text{herd} \\ \text{couple} \\ \text{dozen} \end{array} \right\}$

These phenomena might be used to support Selkirk's analysis, where different structures are assigned to partitives (where a determiner node appears) and to pseudo-

partitives (where there is no determiner node). However, similar judgments can be made for other ${}_{NP}[(D) N PP]$ structures where there is no problem of determining the PP constituency or NP headship.

- (17a) What is it a book about?
- (17b) ?Dogs we have a book about.
- (17c) ?Girls I saw a picture of.
- (18a) ?About what is it a book?
- (18b) ?About dogs we have a book.
- (18c) ?Of girls I saw a picture.
- (19a) About those Huskie dogs we have a book.
- (19b) Those Huskie dogs we have a book about.
- (19c) Those girls we have a picture of.
- (19d) ?Of those girls we have a picture.

These sentences show that certain problems of preposition stranding and preposing are more general than simply the problems involving partitives and pseudo-partitives. Preposed prepositional phrases are better when there is a determiner than when there is none (just as with postposed PPs).

Preposing out of subject position is more constrained than out of object position, and linguists have searched for general constraints to explain this fact (see, for example, Wexler and Culicover (1980) and Kayne (1984) for discussions on this point). Preposing of the NP is ungrammatical with partitives, pseudo-partitives, PP complements, and *wh*-words.

- (20) *The men a group of were found. (Partitive)
- *Animals a herd of were seen. (Pseudo-partitive)
- *The girls a picture of is on the wall. (PP complement)
- *Birds a story about came out recently. (PP complement)
- *What were a couple of found?

Preposing of PP out of subject position produces variable results. Preposing occurs freely with quantifiers and marginally with partitives, but judgments vary considerably.

- (21) Of $\left\{ \begin{array}{l} \text{the} \\ \text{your} \\ \text{those} \end{array} \right\}$ books $\left\{ \begin{array}{l} \text{some} \\ \text{a couple} \\ \text{a number} \\ \text{all} \end{array} \right\}$ were used.

- (22) ?Of the men a group was found.
- ?Of those animals a herd were seen.
- ?Of these names a list was constructed.
- Of your beans two rows were planted.
- ?Of the water a drop had evaporated.

ʔOf this sand two bucketfuls were used.

ʔOf these cherries a bowl is sitting on the table.

PP preposing is considerably worse with pseudopartitives, however.

- (23) $\left\{ \begin{array}{l} \text{couple} \\ \text{number} \\ \text{group} \\ \text{list} \\ \text{row} \end{array} \right\}$ were found.
 *Of books a

In the case of PP complements, I find the results variable, often depending on the preposition, but many preposed constructions are bad for me. (K. Allan (personal communication) has suggested that a more elaborate context will improve the sentences.)

(24) *Of the girls a picture is on the wall.

*Of girls a picture is on the wall.

ʔAbout the birds of North American a book recently appeared.

*ʔAbout birds of North American a book appeared recently.

ʔFrom my fans letters are always welcome.

*ʔFrom fans letters are always welcome.

Clearly more investigation is needed with respect to preposed structures. But these data suggest that whatever structural differences there may be between PPs with a determiner and PPs without one carry over to PP complements and do not merely distinguish between partitives and pseudo-partitives.

Preposition stranding and preposing do not provide adequate tests for determining the constituency of classifier expressions. Even within current models of generative transformational grammar, there are restructuring rules that allow one to revise constituent structure in a derivation (Akmajian, Steele and Wasow (1979)). For example, such a restructuring rule permits a passive to be formed from intransitive verbs followed by PP, as in:

(25a) The bed was slept in by George Washington.

(25b) In the past, this lake could be swum in.

In this case NP_1 AUX $_{VP}$ [V_{PP} [P NP_2]] is initially generated and P is detached from PP and reattached to V .

Conversely, if *of* is introduced into derived structures, we can adapt McCawley's proposal (after Anderson) that a grammar may contain syntactic combinatory rules which introduce categories in the process of derivation (1982: 183):

'If prepositional phrase is universally characterized as "consists of P and NP", then Anderson's policy allows a language to have surface PP's without necessarily also having deep structure PP's; all that is necessary is that in the course of derivation, constituents be formed by the adjunction of a preposition to an NP, since such a constituent then meets the (universal) criterion for being a PP.'

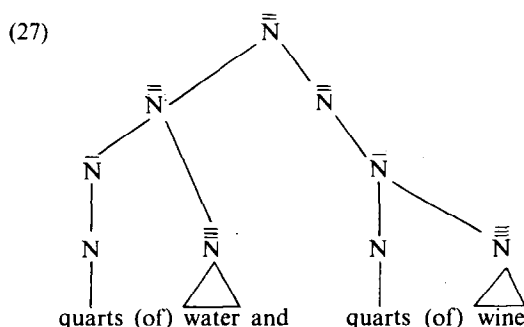
Thus, if we adopt McCawley's position, whenever *of* is followed by a NP, the resulting construction always is a prepositional phrase, no matter how *of* gets generated. And if restructuring rules are allowed, whenever the NP complement of a prepositional phrase gets 'moved' the preposition may be attached to something else. If these proposals are correct, the syntactic tests of prepositional phrase movement and preposition stranding will not help us determine the syntax of classifier phrases.

4. *One(s)* substitution

Another test that is marginally relevant to the syntactic structure of partitives and pseudo-partitives is *one(s)* substitution. In particular the test may help us decide what the constituent structure of the noun phrase is within \bar{X} theory and what exactly the PP complement of partitives and pseudo-partitive is attached to. Baker (1978), followed by Hornstein and Lightfoot (1981) and followed in turn by Radford (1981) all assume that only the Nom constituent (\bar{N} in \bar{X} theory) can be replaced by *one(s)*. Jackendoff (1977) applies the *one(s)* substitution test as well, but Jackendoff requires that phrase structure rules have the form $X^n \rightarrow X^{n-1}$, whereas the others allow for PS rules of the form $X^n \rightarrow X^n$. Jackendoff rejects sentences like those in (26):

(26) *The quarts of wine and the ones of water were left behind.

and concludes that the correct analysis of the noun phrases in such sentences must be that as in (27), where the complement (*of water*) is attached to N.¹⁵



¹⁵ Jackendoff's treatment of pseudo-partitives is inconsistent. In his treatment of complements, phrases like *quarts of water* are analyzed with *quarts* as the head, and *of water* the complement. In his chapter on specifiers, however, in which pseudo-partitives are analyzed, he seems to treat *water* as the head and *quarts of* as the specifier.

The first thing to notice about these constructions is that if either noun is modified, constructions with *one(s)* are much less awkward. In fact, sentences in (28a–c) and (29a,b) seem quite acceptable. Nor does it matter whether an article is present in NP₂ (but both conjuncts must be parallel). In other words, with respect to *one(s)* substitution, partitives and pseudo-partitives behave identically. First consider *one(s)*-substitution for N₁ (*one(s)* replaces any prenominal adjectives as well as the noun, therefore, it applies to \bar{N} , rather than N).

- (28a) The corked quarts of (the) wine and the capped *ones* of (the) water were left behind.
- (28b) Two brown bottles of (the) gin and three brown *ones* of (the) whiskey were stolen.
- (28c) Straight rows of (the) beans from California and crooked *ones* of (the) peas from Europe were planted last week.

Next consider the sentences where N₂ undergoes *one(s)*-substitution.

- (29a) Bottles of large pills from the chemist and jars of small *ones* from the doctor had been discarded.
- (29b) Rows of the green beans from California and clumps of the yellow *ones* from Europe were planted today.

Moreover, if the noun in N₂ is unmodified, the construction with *one* is as awkward as (26).

- (30) *Bottles of pills from the chemist and the jars of ones from the doctor had been thrown away.

Thus we must conclude that at least some complements for partitives and pseudo-partitives must be \bar{N} in Jackendoff's system, if *one(s)* substitution replaces N. Moreover, these sentences show that *one(s)* substitution (or the interpretative counterpart) is partly subject to pragmatic and stylistic factors, not only syntactic ones. *One(s)* replaces only part of a NP and must be used with contrastive material.

5. Conclusion

We have seen that the syntactic tests that have been proposed to show that certain NP[(Det) N of Det N] constructions have different deep structures are inadequate. Prepositional phrase movement, preposition stranding, subject–verb agreement, and *one(s)* substitution depend on semantic, pragmatic, and stylistic factors as well as on syntactic ones.

The simplest syntactic rules would therefore generate all these ${}_{NP}[(\text{Det}) N_1 \text{ of } (\text{Det}) N_2]$ constructions in the same way namely as $(\text{Det}) N \text{ PP}$, where N is the syntactic head and *of* forms a prepositional phrase with the following NP.

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