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Lexicography and the count-mass distinction
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To my knowledge, the only published dictionary of English which explicitly indicates whether each noun is a count noun or a mass noun is Hornby's Advanced learner's dictionary of current English. This paper is concerned with issues raised by the question of whether a dictionary in fact should indicate explicitly whether a noun is count or mass, i.e. the question of whether counthood or masshood is predictable from the meaning of the word.

I emphasize that I am speaking of the meanings of the words and not about characteristics of the entities that can be described using those words. There is clearly no difference between noodles and spaghetti that can be held responsible for the fact that noodles is a plural count noun but spaghetti is a mass noun (in English, this is, not in Italian), nor is there any such difference between garlic and onions or between rice and beans, or between the data that are referred to by a plural count noun and the data that is referred to by a mass noun. The same entities can be described as footwear or as shoes; as furniture or as chairs. However, this does not rule out the possibility that the words garlic and onion or the words footwear and shoes or the words data count and data mass differ in meaning in a way that allows one to infer that the one is a mass noun and the other a count noun. The most obvious aspect of meaning to examine for a basis for the count/mass distinction is individuation, and the obvious hypothesis to try is that the meaning of a count noun specifies an individuation, whereas the meaning of a mass noun is neutral as to individuation.

The fact that a particular type of thing always comes in individual quanta does not imply that the meaning of a word describing those things has to make reference to that individuation, e.g. from the fact that rice comes in grains or that footwear comes individuated the same way that feet are, nothing follows about the meanings of the words rice and footwear. Actually, I am not completely sure that I am making a claim that has any content when I claim that the meanings of count nouns specify an individuation but those of mass nouns do not. In fact, I am encountering head-on Quine's problem of 'radical translation'. In a language such as Japanese, in which nouns are normally unspecified as to grammatical number and a classifier must be used both in expressions of cardinal number and expressions of quantity, do I have any basis for deciding whether a given noun is a count noun or a mass noun, e.g. do I have any basis for treating Japanese hito'tubu no mu'gi 'a grain of barley' as semantically like English a grain of barley rather than like English a bean? If Japanese conceive of beans the way that we conceive of barley, how could we tell? There is an area of research that may eventually provide the basis for solid answers to such questions, namely the logic of mass expressions. However, at present that area is grossly underdeveloped. The few existing treatments of quantification of mass expressions (e.g. Parsons 1970) reduce it to quantification over individuals by

interpreting an expression such as all gold as if it were an abbreviation for all objects that result from partitioning a mass of gold. I feel strongly that this approach is misguided and that it is doomed to failure when any attempt is made to apply it to expressions such as most gold or much gold. However, until I put my typewriter where my mouth is and produce a satisfactory account of the logic of mass terms, I will have to content myself with an expression of my visceral feeling that there is content to the claim that the words rice and bean differ in meaning by more than just information as to the biological species.

I should also at this point observe that when the meaning of a word does not specify an individuation, it is not necessarily the case that what it refers to is indefinitely divisible. It has occasionally been objected (Antley 1974) against the claim that mass nouns are unspecified as to individuation that many mass nouns cannot be combined with measure expressions that refer to minute quantities, e.g.

- (1) *a molecule of footwear/rice.

However, all that that observation shows is that there can be a lower limit to the quantity of matter that can possess a given property. There are impeccable mass nouns which refer to mixtures or suspensions rather than to chemically pure substances and which thus cannot be combined with molecule:

- (2) *a molecule of {Irish coffee
butter pecan ice cream}.

If, as I conjecture, the meaning of footwear is simply 'to be worn on the feet', the oddity of *a molecule of footwear will come from the fact that a single molecule is too little to be worn. There is in fact a gradient as regards the smallest quantity that is describable by a given mass noun:

- (3) a. an atom of sodium/*water
b. a molecule of water/*ice¹
c. a milligram of ice/*garbage/*excelsior
d. an ounce of excelsior/?garbage/?ballast.

Excelsior is wood shavings used as a packing material, and you can't call something excelsior unless there is enough of it to use as a packing material. Ballast is anything used to weigh down the bottom of a floating object and thus cause it to float upright, and unless you have enough to lower the center of gravity of the object, it isn't ballast.

It is quite easy to find dictionary definitions in which a count noun is defined in terms of an individuation and a semantically similar mass noun is defined without reference to an individuation, for example,²

- (4) noodle. A thin strip of food paste, usually made of flour and eggs.
pasta. Paste or dough made of flour and water, used dried, as in macaroni, or fresh, as in ravioli.

The definition of noodle specifies an individuation: a noodle is a strip, two noodles is two such strips, etc. The definition of pasta, on the other hand, indicates no individuation: it indicates what pasta is made of, what its texture is, and how it is used, but it does not indicate a quantum of pastahood. It is also easy to find pairs of words that differ as to counthood but are defined by a dictionary in a way which provides no information from which that difference could be predicted:

- (5) rice. 1. A cereal grass, *Oryza sativa*, ...
 2. The starchy edible seed of this grass.
bean. 1. Any of several plants of the species *Phaseolus*, ...
 2. The edible seed or pod of any of these plants.

In either case, the definition amounts to 'the edible seed of X', which provides no hint of the fact that one seed of *Phaseolus vulgaris* is a bean, whereas one seed of *Oryza sativa* is not a rice but rather a grain of rice. In this case, the failure of the lexicographer to provide the information is partly due to the fact that he chose to include a non-restrictive modifier ('edible') in the definition, which forces a definite article on him and thus robs him of the possibility of using an indefinite article as a means of indicating the individuation of beans ('A seed or pod of any of these plants').³ It is less clear how the definition of rice could be fixed up so as to make it clear from the definition that rice is a mass noun. If the predicate use of nouns is taken to be the basic one, a definition of rice (that is, of is rice) could be given along the lines of 'consists of seed(s) of *Oryza sativa*', where 'seed(s)' is intended to be unspecified as to number. I offer this definition only to show that it is possible (albeit by brute force) to cast a definition of rice into a form which makes it refer not to grains of rice but to the substance of those grains.

Before leaving rice and bean. I should touch on the senses listed as '1' in these definitions. In what sort of sentences does sense 1 appear -- perhaps in sentences like (6)?

- (6) We grow beans in this field.
 A lot of rice is grown in southeast Asia.

While both of these sentences are used with reference to the planting and cultivation of whole *Phaseolus* or *Oryza* plants, and in large numbers at a time, the grammatical number of the noun is still singular in the case of rice and plural in the case of bean. Thus, even when the cultivation of whole plants is referred to, the choice of number is made as if it were the food for which that plant is grown that was being referred to. This fact leads me to conjecture that, contrary to the apparent opinion of the lexicographer responsible for the definitions (5), sense 2 is more basic than sense 1, if sense 1 is even a real sense of the words rice and bean. In fact, a case can be made that the object of grow can just as easily refer to the product that the plant yields as to the plant itself and thus that rice and bean in (6) are really used in sense 2; note, for example, that one can say

- (7) I always grow my own parsley.
I always grow my own parsnips.

in which the object NP clearly refers to the vegetable (in the culinary sense) that results, not to the whole plant or to the biological species, since parsley and parsnips are two parts of the same plant but the sentences of (7) differ in meaning.

The nouns cold and headache are clear cases of count nouns whose countness can be attributed to an individuation specified in their meanings, as contrasted with flu, diarrhea, and tuberculosis, which have meanings that are neutral as to individuation. Colds and headaches can be counted:

- (8) I had two colds last winter.
I've had two headaches within the last three days.

A cold is a 'case' of a particular infection. A 'case' must be distinguished from an 'attack': the attack is the onset of the disease, whereas the 'case' endures from onset to cure. The observation that a cold is a case of something is supported by the following facts:

- (9) I have a cold.
I have {a case } of the flu.
 {*an attack}
Do you have the same cold/*flu that you had last week?
Do you have the same case of the flu that you had last week?
I had a sudden {attack of the flu.
 {*case of the flu.}
 {*cold.

Cold appears to pattern exactly the way that case of X does.

There are also ambiguous words whose different meanings correspond to different individuations. Job has the three senses that are illustrated in the following sentences:

- (10) a. Let me finish this job, and then I'll join you in the bar.
 b. Harry and I have the same job -- we're both file clerks.
 c. They not only fired me, they abolished my job.

In (10a), the job is a specific piece of work, and the job ceases to exist when that work is completed. In (10b), the job is an ongoing activity which the agent does as a profession or means of livelihood, and two persons who are hired to perform the same activity have the same job, in this sense. In (10c), the job is an institution, which comes into being when the employer creates such a position in the organizational structure of his firm, and the job continues in existence, regardless of who is employed in the job or even of whether anyone is employed in the job and regardless of any changes that are made in the duties that the holder of that job must perform, until either the job is abolished by the

employer or the firm ceases to exist. In this sense of job, the job you have today in which you are paid \$15,000 a year to teach Montague grammar may be the same job in which 30 years ago someone was paid \$5,000 a year to teach freshman German and coach the squash team. Different words may share just one of these individuations. For example, task has only a sense parallel to the job of (10a), profession only a sense parallel to the job of (10b), and chairmanship only a sense parallel to the job of (10c). And the most common sense of work involves no individuation at all. The individuation is part of the meanings of all of these nouns (except work), and their countness is predictable from the presence of the individuation in the meaning.

Let us now turn to the case of footwear, which has been held (Katz 1970) to have the same meaning as 'articles of apparel to be worn on the feet', i.e. to have the same meaning as a count expression. It can of course be claimed (as I have, in McCawley 1971) that footwear rather has the meaning of the mass expression 'apparel to be worn on the feet', and that 'articles of apparel to be worn on the feet' makes reference to an individuation but 'apparel to be worn on the feet' does not. Due to the fact that the apparel that people wear on their feet is individuated in the same way that their feet are, it is not easy to come up with evidence that has a bearing on the question of which (if any) of these expressions differ in meaning. Relevant facts might be sought in the imaginary situation in which, through the miracles of modern technology, non-individuated footwear is put on the market, e.g. socks that you can spray on your feet and then peel off later, in the fashion of the spray-on bandages that have been developed in recent years. However, it is not clear that it is the liquid inside such an aerosol can that constitutes footwear, rather than just the sock-like units that are formed as it is sprayed on the feet. A similar situation prevails in the case of furniture, though the possibility of non-individuated furniture is much less fanciful; indeed, there are dozens of stores where you can buy crates full of modules that can be assembled to fit your fancy into one gigantic structure or several small ones. To the extent that (11) is a normal thing to say with reference to such modules, furniture will have to be taken to be unspecified as to any individuation:

(11) I've just ordered two crates of furniture.

However, there is great variability among informants as to the extent to which they are happy with (11).

There are in fact some sentences that seem to show individuation lurking in the meaning of furniture. For example, while (12b) would be true in a situation where Fred has one 2000-foot long piece of rope, (12a) is not true in a situation in which Fred has one 40-foot long sofa but no other furniture:

- (12) a. Fred has a lot of furniture.
b. Fred has a lot of rope.

(12a) seems to imply that Fred has at least several pieces of

furniture⁴, despite the fact that a single piece of furniture, unlike a grain of rice, can be enormous. Likewise, furniture admits adjectives referring to the size of the piece much more readily than do more hard-core mass nouns such as rice, and even footwear is not outlandish in such a usage:

- (13) a. large furniture
- b. ?large footwear (accepted by some informants as a way of referring to ski boots, etc.)
- c. *large rice (cf. long-grained rice)
- d. **large sand⁵

However, the a lot in (12a) does not just mean 'a large number', though it appears to imply it. (14) does not allow the interpretation that the number of pieces of furniture that Fred has exceeds the number that I do.

- (14) Fred has more furniture than I do.

It is easy to come up with situations in which (14) would be judged false even though Fred has more pieces of furniture than I do; for example, if Fred has 4 chairs, 3 magazine racks, 2 coffee tables, and 1 lamp, and I have 2 chairs, 1 desk, 1 bed, 1 sofa, and 1 table, my six pieces of furniture would constitute more furniture than Fred's 10 pieces do. The situation is similar with

- (15) Fred has more clothes than I do.

If Fred's wardrobe consists of 2 pairs of shoes, 2 pairs of socks, 1 pair of swimming trunks, and 4 T-shirts, and mine consists of 1 pair of shoes, 1 pair of socks, 1 pair of levis, 2 shirts, and 1 jacket, it would be strange to say that Fred has more clothes than I do, even though Fred has 9 or 13 articles of clothing (depending on whether a pair of shoes counts as 1 or as 2 articles of clothing) but I have only 6 or 8. I conjecture that the reason for this is that Fred's 9 or 13 articles of clothing don't clothe him as fully as my 6 or 8 articles clothe me; likewise, Fred's 10 pieces of furniture don't furnish his apartment as fully as my 6 pieces furnish mine. I thus maintain that the reason that (12a) is not true unless Fred has a large number of pieces of furniture is that a really small number of pieces of furniture is not enough to make an apartment fully furnished. Or at least, that is the case with regard to conventional furniture. George Williams informs me that modular furniture has been taken to such extremes in Germany that one can purchase modules from which one can construct a 'Wohnungs-landschaft', which may be a continuous structure constructed out of modules and incorporating sleeping space, sitting space, storage space, work space, etc. I do not find (12a) odd if it is used with reference to a single very elaborate Wohnungslandschaft which furnishes the apartment as thoroughly as could a large number of pieces of conventional furniture.

I thus conclude that the meanings of furniture, clothing, and presumably also footwear, though that is a less clear case, are not of the form 'articles for doing X' but are rather simply 'for doing

X', e.g. clothing would mean 'for wearing' or 'to be worn', footwear would mean 'to be worn on the feet', and furniture would mean something like 'to support persons and objects' (or at least, that supplemented by additional conjuncts such as 'is moveable'), and these words thus do not conflict with the claim that a noun is a mass noun if and only if its meaning does not provide an individuation for the things that it describes.

But wait a minute -- in the above argument, specifically, in example (15), the noun involved was not clothing but clothes. I could just as well have used clothing instead of clothes in that argument, and nothing would have been any different. But what about clothes? Is it a mass noun? One fact might suggest that it is really a count noun, namely the fact that it takes plural agreement:

(16) My clothes are/*is in this locker.

However, other facts show much more clearly that it isn't a count noun; for example, it can't be combined with cardinal number expressions:

(17) *I've just bought several/five clothes.
 *Many clothes are too expensive for me to buy.

Clothes evidently is a plural mass noun, as are such words as brains, guts, intestines, and hemorrhoids:

(18) His guts were splattered over the wall, (*all five of them).

So we have plural mass nouns, a fact that we'll have to live with, just as we have to live with the fact that there are count nouns with only a plural form, due to either pure idiosyncrasy (as with Russian časy 'clock') or to a minor regularity (as in the case of trousers, tweezers, and goggles).

But then what about some of the count nouns that I talked about at the beginning of this paper? Is there any way of telling whether the plural forms noodles and beans are ambiguous between a plural count sense (as in (19a)) and a plural mass sense (as in (19b))?

(19) a. How many noodles did you eat?
 b. How much noodles did you eat?

I am at a loss as to how to tell whether these are distinct senses. If this is a real ambiguity, it can be incorporated into a grammar in the form of a redundancy rule which would predict the mass sense from the count sense, e.g. it would predict a sense 'food consisting of seeds of X' for any noun which has a sense 'seed of X' (though this extra sense would be in use only for those species whose seeds were used as food). But that raises the question -- why should the prediction go in that direction rather than the opposite? Why not take the mass sense as basic, recognize a lot of mass plurals, and have a redundancy rule predicting a count sense for the singular of any mass plural with a meaning 'consisting of

X's of Y'?

Offhand, I can't think of any solid reason for preferring either analysis over the other. However, either way, the counthood or masshood of a noun will still be predictable from its meaning. But also, either way, my hope expressed above that the logic of mass expressions might provide a basis for setting up a semantic distinction between rice and beans would be shattered: it could at best provide a basis for a distinction between rice and one sense of bean, but it would not help answer the question of which sense of bean is more basic nor, thus, the question of whether bean basically differs from rice in by more than the difference between Phaseolus vulgaris and Oryza sativa. Answers to those questions would be available if someone could show that beans really is not ambiguous between a count sense and a mass sense. A way of telling whether it is ambiguous that way ought to be lurking in any grammatical theory that is worth Phaseolus vulgaris.

FOOTNOTES

¹ Do these facts imply that water is ambiguous between the sense 'H₂O' and the sense 'liquid H₂O'? Any of the molecules in a block of ice is 'a molecule of water'. The fact that the whole block cannot be described as water is probably due to conversational implicature: you could be more informative by using the word for 'solid H₂O'.

² The definitions in examples 4 and 5 are quoted from The American Heritage Dictionary of the English Language (New York, 1966).

³ The definition ought also to incorporate the fact that whether the pod is regarded as edible determines whether it is the seed or the pod that is called a bean: when the pod is normally eaten, it is the pod that is called a bean, whereas for those kinds of bean whose pods are not normally eaten, it is the seed that is called a bean.

⁴ Lurking individuation may also be seen in the fact that a piece of furniture can refer to a chair or a magazine rack but not to a leg of a chair or a drawer of a cupboard, let alone to a chip off of a table.

⁵ I have not investigated the conditions under which spatial adjectives can be combined with mass nouns in such expressions as thick cloth, long hair, deep mud.

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