〔Refereed Article〕

Acceptability of Count-to-Mass Shifting of Concrete Count Nouns in English

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Abstract

It is often argued that any count noun can be used as a mass noun in a proper context. To support this argument, linguists give sentences that contain a syntactic mismatch: e.g. 'There was cat all over the driveway.' Twenty-five native speakers of English evaluated the acceptability of a total of 136 test sentences with a concrete count noun in the context that is expected to force a mass reading. There are two types of count-to-mass shifting, the deformation type in which the referent loses its physical integrity, and the domain shift type in which the referent remains physically intact while the focus of attention shifts from one aspect to another, e.g. from 'cat' as an animal to 'cat' as a smell. The data collected from the questionnaire survey indicate that neither deformation nor domain shift forces a mass reading of a concrete count noun, although domain shift allows a mass reading depending on how the referent is perceived. Concrete count nouns are resistant to count-to-mass shifting even in a context that demands a count-to-mass shift. Neither expansibility nor deformation forces a count-to-mass shift. Expansibility, however, influences the acceptability of the indefinite article. Domain shift allows a count noun to behave as a mass noun syntactically, but it does not necessarily force a count-to-mass shift.

Key Words

count-to-mass shift, count/mass distinction, deformation, domain shift, expansibility

1. Count-to-mass shifting of nouns

It is generally agreed that most nouns in English have both a count and a mass use. Some argue that every noun can be used as either a count or a mass noun in the proper context: Gleason (1965: 136-137) says:

> The shifting of nouns from mass to count and from count to mass seems to be a fairly regular and productive pattern in English. It must, therefore, be considered a grammatical fact, and it demands a grammatical description.
>
> Are there limitations to this shifting? At first there seems to be …. But it is soon found that many of the ones with both uses are very much more frequent in one than in the

other. The less frequent use occurs only in rather unusual circumstances. *Water* as a mass noun is common and widespread; as a count noun is nearly restricted to waiters. Even if the restaurant usage had not been observed, the pattern would remain and this use might arise at any time. Perhaps some of the other words would also show both uses if sufficiently unusual situations were conceived. This seems to be the case. For example, *book and shelf* are both fairly typical count nouns. With the present vogue for speaking-animal stories, we can imagine one featuring a mother termite concerned over her child: *Johnny is very choosey about his food. He will eat book, but he won't touch shelf.* This is farfetched, of course. But it does suggest that <u>every noun, given the right context can occur in either type of usage, count or mass</u>. (Text underlines added by Kodera for emphasis.)

Pelletier (1979: 6) says:

The reader has doubtless guessed by now the purpose of our universal grinder: Take an object corresponding to any (apparent) count noun he wishes (e.g., 'man'), put the object in one end of the grinder and ask what is on the floor (answer: 'There is man all over the floor'). Perhaps there are other answers to this question, such as 'There are pieces of a man all over the floor', but this is irrelevant to the test. All that needs be the case is for *one* of the possible normal answers to use the mass sense of our "normal" count noun, and this has been supplied. It is apparent that this test can be employed at will, <u>always giving us a mass sense of count nouns</u> having physical objects as their extension.

Langacker (2008: 142-145) says:

Being conceptual in nature, the count/mass distinction reflects our capacity for conceiving and portraying a situation in alternate ways. The dexterity we exhibit in this regard has the consequence that categorization is rather fluid. In one way or another, <u>probably every noun can be used in either manner</u>.

Taylor (2002: 378) says:

Even nouns which at first blush might seem to resist a substance interpretation can sometimes be used as mass. One does not have to imagine someone 'eating cat' in order to construe *cat* as a mass noun—see the examples in (3)—while the mass use of *car* (again, a pretty good candidate, one might think, for an exclusively count noun) has become familiar from the advertising slogan *More car for your dollar!* In fact, it may not be too outrageous to suggest that <u>just about any noun—some more readily than others, to be sure—can, under special circumstances, be used as either count or mass</u>.

(3) a. After the accident, there was cat all over the road.

　　b. There's a smell of cat in this room.

The following examples are used to support the argument for count-to-mass shifting of typical count nouns:

a) Put some apple in the salad.　　　　　　　　　　　　(Quine 1960: 91)

　b) He's got egg on his tie.　　　　　　　　　　(Murcia and Larsen-Freeman 1999: 295)
　c) There is man all over the floor.　　　　　　(Pelletier 1979: 6)
　d) There was cat all over the driveway.　　　　(Huddleston and Pullum 2002: 337)
　e) After the accident, there was cat all over the road.　　　　(Taylor 2002: 378)
　f) After I ran over the cat with our car, there was cat all over the driveway.
　　　　　　　　　　　　　　　　　　　(Langacker 1991: 73)
　g) After several lorries had run over the body, there was rabbit splattered all over the road.
　　　　　　　　　　　　　　　　　　　(Copestake and Briscoe 1991: 98)
　h) Emmy finds squashed spider more nauseous than the thing alive.　　(Allan 1980: 547)
　i) The scrapyard is full of smashed car awaiting recycling.　　　　(Allan 1980: 547)
　j) Johnny is very choosey about his food. He will eat book, but he won't touch shelf.
　　　　　　　　　　　　　　　　　　　(Gleason 1965: 136)
　k) The termite was living on a diet of book.　　(Huddleston and Pullum 2002: 337)
　l) It smells like new baby here.　　　　　　　　(Reid 1991: 88)
　m) There's a smell of cat in this room.　　　　　(Taylor 2002: 378)
　n) The whole neighbourhood is full of *skunk*.　　(Radden and Dirven 2007: 73)
　o) With pre-owned vehicles, you get a lot of car for your money.　　(Langacker 2008: 143)
　p) Could you move along a bit? I haven't got much table.　　(Cruse 2004: 274)
　q) I can hear too much piano and not enough violin. (Cruse 2004: 274)

　　There are two types of count-to-mass shifting. One is the deformation type as in '*There is cat all over the driveway*' (Talmy 2001: 52). The original referent of a count noun loses its physical integrity and becomes a substance without clear boundaries, not a discrete object any more. The other type is domain shift (Dirven 2003: 14-15), also called 'metonymical reinterpretation' (Cruse 2011: 274) or 'image-schematic transformation' (Evans and Green 2006: 187) as in '*The termite was living on a diet of book.*' The referent (book) is physically intact, but it is seen as a foodstuff, and its shape is irrelevant for a termite.

　　The sentences (a-i) are of the deformation type with the referent physically changing from an individual object to a substance, and (j-q) are of the domain shift type with the referent remaining physically intact while the focus of attention shifts from one aspect to another. In (j) and (k), an object is reinterpreted as a foodstuff. In (l-n), the focus of attention shifts from an animate being to its smell. In (o-q), the referent's shape becomes irrelevant when the focus of attention shifts from the object to size (o), working space (p), and sound (q) (Cruse 2004: 274).

　　The sentences of the deformation type (a-i) create a mismatch between a lexical meaning and a contextual meaning by putting a count noun in a context that forces a substance reading of the noun. In (a), apples in a salad are expected to be in the form of slices or pieces, not in the form of whole apples. In (f), the verb phrase 'ran over' suggests that the cat is deformed and the adverbial phrase 'all over the driveway' suggests that the cat disintegrates into multiple parts. In (h), the modifier 'squashed' suggests that the spider is deformed, not keeping its original shape.

The sentences of the domain shift type (j-q) also use a mismatch between a lexical meaning and a contextual meaning that forces an unusual reading of the noun while the referent remains physically intact. In (j), the adjective phrase 'choosy about food' forces a foodstuff reading of 'book' and 'shelf.' In (l) and (m), the verb and the noun 'smell' forces a smell reading of 'new baby' and 'cat' respectively. These nouns (*book, shelf, baby, cat*) typically refer to discrete objects with clear boundaries and their shapes are an essential part of their meanings. When the focus of attention shifts from the physical appearance of the referent to a different aspect (e.g. foodstuff, smell, etc.) in which the shape and boundary are irrelevant, a mass reading of the noun is forced.

Linguists argue that every count noun can be used as a mass noun when the referent is 'reinterpreted' (Huddleston and Pullum 2002), 'construed' (Langacker 1991, Tayler 2002), or 'conceptualized' (Wierzbicka 1985) as a substance. Is this a pedagogically sound argument? Is it appropriate to teach EFL students that every English noun can be used as both a count and a mass noun depending on how the referent is perceived? The purpose of this paper is to examine the acceptability of count-to-mass shifting of concrete count nouns, both the deformation type and the domain shift type, through a questionnaire survey.

2. Method

2.1. Participants

Twenty-five native speakers of English participated in this questionnaire survey. Out of the 25 participants, ten are speakers of British English (graduate students and researchers at the University of Cambridge in the UK), eight are speakers of Australian English (ESL instructors at International College, Queensland University of Technology in Australia), and seven are speakers of American English (EFL instructors at Hannan University in Japan). The participants' ages range from their late teens to sixties: 1 in late teens, 4 in 20s, 5 in 30s, 10 in 40s, 3 in 50s, and 2 in 60s.

2.2. Materials

A total of 16 nouns (*animal, apple, baby, bottle, boy, car, carrot, cat, leaf, man, milk, tree, tomato, toy, spider, vegetable*) were selected to see the acceptability of the zero article singular form (Ø), the indefinite article singular form (*a/an*) and the zero article plural form (pl). A total of 136 test sentences were arranged randomly. The test sentences were checked by four native speakers of English (two British English speakers, one American English speaker, and one Australian English speaker) to see if they sound natural except for the target noun phrase (or determiner phrase), and necessary revisions were made.

2.3. Procedure

The participants were instructed to evaluate the acceptability of each sentence and choose one of the following five ordered response levels. Then, a t-test (at the 5% significance level) was used to compare the mean scores between Ø, *a/an* and pl.

    1. Totally Unacceptable

    2. Moderately Unacceptable

    3. Neither Acceptable nor Unacceptable

    4. Moderately Acceptable

    5. Perfectly Acceptable

The test sentences include the following three sentences to test the validity of this research method.

    （After I dropped the milk）

        a）There was a milk all over the floor.（1.68）

        b）There was milk all over the floor.　　（5.00）

        c）There were milks all over the floor.（1.12）

The clause 'After I dropped the milk' gives the context, and the participants were instructed not to evaluate the acceptability of the clause in parentheses. Sentence（a）had a mean score of 1.68,（b）had 5.00, and（c）had 1.12, which means that many participants found（a）and（c）'Totally or Moderately Unacceptable' while all participants found（b）'Perfectly Acceptable.'

    10 nouns were selected from the 16 test nouns for analysis, following the individuation continuum proposed by Gentner & Boroditsky（2001: 230）and Yoshida & Smith（2003: 33）, which lists entities from the most individuable（self-moving entities, such as humans, animals, vehicles, toy with eyes）to the least individuable（stationary entities such as amorphous objects）. The ten nouns include four nouns that refer to most individuable entities（*man, cat, spider, car*）, two nouns（*bottle, tree*）, which are not likely to be used to refer to a deformed entity（A bottle becomes pieces of glass when broken, and a tree becomes woodchips when chopped up）, three nouns（*toy, animal, vegetable*）that are superordinate words, and one noun（*leaf*）that refers to an entity the discreteness of which is not very clear.

3. Results and analysis

3.1. Influence of linguistic backgrounds

    This study did not find any big difference in mean scores between British, American and Australian English speakers. The only case that found a difference of 2.00 or over was on the acceptability of 'prepared tomatoes' between American English（4.6）and Australian English（2.5）.

3.2. Example sentences presented in the earlier studies

    From the list of sentences（a-q）, five（a, c, f, h, i）are selected to examine their acceptability of count-to-mass shifting. Some sentences are changed to some extent, for example, to provide a better context. The participants were instructed to evaluate the acceptability of the following groups of sentences（a', c', f', h', i'）.

a'） I had $\begin{bmatrix} \text{an apple} \\ \text{Ø apple} \\ \text{apples} \end{bmatrix}$ in my salad.

c'）(After the truck ran over $\begin{bmatrix} \text{the man)} \\ \text{the man)} \\ \text{those men)} \\ \text{those men)} \end{bmatrix}$ There $\begin{bmatrix} \text{was} \\ \text{was} \\ \text{was} \\ \text{were} \end{bmatrix}$ $\begin{bmatrix} \text{a man} \\ \text{Ø man} \\ \text{Ø man} \\ \text{men} \end{bmatrix}$ all over the highway.

f'）(After I ran over $\begin{bmatrix} \text{the cat with our car)} \\ \text{the cat with our car)} \\ \text{those cats with our truck)} \\ \text{those cats with our truck)} \end{bmatrix}$ There $\begin{bmatrix} \text{was} \\ \text{was} \\ \text{was} \\ \text{were} \end{bmatrix}$ $\begin{bmatrix} \text{a cat} \\ \text{Ø cat} \\ \text{Ø cat} \\ \text{cats} \end{bmatrix}$ all over the highway.

h'）She finds $\begin{bmatrix} \text{a squashed spider} \\ \text{Ø squashed spider} \\ \text{squashed spiders} \end{bmatrix}$ more nauseating than a living one/living spiders.

i'）The scrapyard is full of $\begin{bmatrix} \text{smashed car} \\ \text{smashed cars} \end{bmatrix}$ awaiting recycling.

All the sentences represent the deformation type shifting, from a discrete object to a substance through disintegration. Each group includes two to four different noun phrases: *a/an* and Ø in the context of one referent, and Ø and pl in the context of two or more referents. For example, (c') includes the following four test sentences:

(After the truck ran over the man)　　There was a man all over the highway.
(After the truck ran over the man)　　There was Ø man all over the highway.
(After the truck ran over those men)　There was Ø man all over the highway.
(After the truck ran over those men)　There were men all over the highway.

Table 1 shows the mean scores of the acceptability of each sentence. In (c'), *a/an* scored 1.24, Ø scored 1.60 with one referent and 1.44 with two or more referents, and pl scored 1.68. In (a'), the number of referents is not known and the mean score 4.88 applies to Ø with both one referent and two or more referents. The rest of the results follow in the same way. Among five nouns (*apple, man, cat, spider, ca*r), only 'apple' scored over 4.00 (4.88) on Ø, which suggests that 'apple' can be used as a mass noun when the referent's physical integrity is lost while the other nouns may not. 'Apple' and 'spider' scored over 4.00 on both *a/an* and pl, and 'car' scored 4.80 on pl, which suggests that they are used as count nouns even when the referent has lost its physical integrity. 'Man' scored below 1.70 on all noun forms, which indicates that 'man' is not used when the referent's physical integrity is lost. 'Cat' scored below 3.00 on *a/an* and pl and below 4.00 on Ø. The data in Table 1 do not support the argument for count-to-mass shifting of count nouns. Deformation of a referent does not force a mass reading of a count noun.

Table 1. Deformation and acceptability

	1 referent		2 or more referents	
	a/an	Ø	Ø	pl
a’) *apple*	4.20	4.88		4.48
c’) *man*	1.24	1.60	1.44	1.68
f’) *cat*	1.76	3.88	3.56	2.56
h’) *spider*	4.56	2.64	3.44	4.92
i’) *car*	N/A	N/A	2.12	4.80

(‘N/A’ means ‘Not Applicable.’)

3.3. Deformation

Several factors distinguish count nouns from mass nouns. Wierzbicka (1985: 315, 1988: 506) mentions ‘arbitrary divisibility.’ Langacker (1991: 70) lists ‘bounding,’ ‘homogeneity,’ ‘expansibility/contractibility,’ and ‘replicability.’ Taylor (2002: 367) lists ‘internal homogeneity,’ ‘divisibility,’ ‘replicability,’ and ‘inherent boundedness.’ Taylor (2002: 367) says:

> The conceptual basis of the count-mass distinction is fairly transparent; it has to do with the distinction between an individuated ‘object’ and an unindividuated ‘substance’. An individuated object has its own internal structure and composition—split it up and it loses its identity. Dismantle a car and you have car parts, not a car any more. But if you divide up a quantity of meat you still have meat, and if you put two quantities of meat together you have, again, meat. If you put one car next to another car you have, not ‘car’, but ‘two cars’.
>
> The distinction between count and mass can be appropriately captured in terms of **internal homogeneity**. Flowing from this are the properties of **divisibility**, **replicability**, and **inherent boundedness.**

3.3.1. Premodification that suggests deformation

Suffice it to say that the basic count/mass distinction is whether the noun refers to an individuated object or an unindividuated substance when discussing the acceptability of count-to-mass shifting of concrete count nouns. Taylor says (2002: 367): "Dismantle a car and you have car parts, not a car anymore." This means that ‘car’ in ‘dismantled car’ and ‘spider’ in ‘squashed spider’ should behave as a mass noun. In this section, we will see how the participants evaluated the acceptability of *a/an*, Ø and pl for four nouns with premodification that indicates deformation of the referent: *squashed spider, shredded leaf, dismantled car, chopped-up tree*. In all the test sentences listed below (1-10), a premodifer is expected to force a mass reading.

1) $\begin{bmatrix} \text{A dismantled car} \\ \text{Ø Dismantled car} \end{bmatrix}$ takes up far more space than you think.

2) $\begin{bmatrix} \text{Ø Dismantled car} \\ \text{Dismantled cars} \end{bmatrix}$ shall not be stacked higher than the fence.

3) (After throwing my book at the spider)

I had $\begin{bmatrix} \text{a squashed spider} \\ \text{Ø squashed spider} \end{bmatrix}$ on the cover of my book.

4) (Feeling something mushy in her shoe, she took her foot out.)

It was $\begin{bmatrix} \text{a squashed spider.} \\ \text{Ø squashed spider.} \\ \text{squashed spiders.} \end{bmatrix}$

5) (They used real spiders in all the shots in the movie.)

Think of how $\begin{bmatrix} \text{much squashed spider} \\ \text{many squashed spiders} \end{bmatrix}$ there must have been.

6) The truck was full of $\begin{bmatrix} \text{Ø chopped-up tree.} \\ \text{chopped-up trees.} \end{bmatrix}$

7) He grabbed the trash bag with $\begin{bmatrix} \text{a chopped-up tree} \\ \text{Ø chopped-up tree} \end{bmatrix}$ in it.

8) Rolling papers are used to roll shredded tobacco $\begin{bmatrix} \text{leaf} \\ \text{leaves} \end{bmatrix}$ into cigarettes.

9) The nest is made of shredded $\begin{bmatrix} \text{leaf.} \\ \text{leaves.} \end{bmatrix}$

10) (After the lawn was mowed)

$\begin{bmatrix} \text{Shredded leaf was} \\ \text{Shredded leaves were} \end{bmatrix}$ placed in a pile.

As Table 2 shows, 'dismantled car' in (1) scored 4.88 on *a/an,* which is significantly higher than Ø (2.36) (8.540<p.001), and in (2) it scored significantly higher on pl (4.28) than Ø (1.56) (8.981<p.001). This clearly indicates that 'car' remains a count noun when the referent's physical integrity is lost. In (3) and (4), 'squashed spider' scored significantly higher on *a/an* than Ø, and in (5) it scored significantly higher on pl than Ø. 'Spider' remains a count noun when the referent has lost its physical integrity. 'Chopped-up tree' in (6) scored significantly higher on pl than Ø. In (7), it scored below 4.00 on *a/an* (3.68) and Ø (3.56), and there was no significant difference between them (0.293, ns). 'Shredded leaf' in (8) scored 4.48 on Ø and 4.52 on pl, and there was no significant difference between them. In (9) and (10), it scored significantly higher on pl than Ø.

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Table 2. Premodification and deformation

		a/an	Ø	pl
dismantled car	1)	4.88	2.36	N/A
	t（24）=	8.540 ＜p.001		
	2)	N/A	1.56	4.28
	t（24）=		8.981 ＜p.001	
squashed spider	3)	4.96	4.60	N/A
	t（24）=	2.221,p＜.02		
	4)	5.00	4.12	3.88
	t（24）=	3.156,p＜.01		
	5)	N/A	3.28	4.72
	t（24）=		4.625,＜p.001	
chopped-up tree	6)	N/A	3.20	4.84
	t（24）=		5.197 ＜p.001	
	7)	3.68	3.56	N/A
	t（24）=	0.293, ns		
shredded leaf	8)	N/A	4.48	4.52
	t（24）=		0.157, ns	
	9)	N/A	3.36	4.88
	t（24）=		5.055 ＜p.001	
	10)	N/A	2.68	4.20
	t（24）=		5.151 ＜p.001	

The acceptance of *a/an* and pl was generally high. *A/an* scored 4.88 or over on three sentences（1, 3, 4）out of four, and pl scored 4.20 or over on six sentences（2, 5, 6, 8, 9, 10）out of seven. On the other hand, the acceptance of Ø was generally low. A mean score over 4.00 was found only on three sentences（3, 4, 8）out of ten. These findings suggest that count nouns are more likely to remain count nouns than to shift to a mass noun when preceded by modifiers that indicate deformation of the referents. It can be hypothesized that the modifiers give the meaning of indiscreteness（or disintegration）, and the noun does not have to resort to Ø to show count-to-mass shifting. With the help of a modifier, a count noun can behave syntactically as a count noun while semantically as a mass noun. Comparison between the following two groups of sentences in（11）supports this hypothesis.

Table 3 shows that both 'shattered bottle' and 'shattered toy' scored significantly higher than 'bottle' and 'toy' respectively on all noun forms（*a/an*, Ø and pl）, regardless of the number of referents. This suggests that the premodifier 'shattered' gives a mass meaning to 'bottle' and 'toy,' which makes it easier for these two nouns to behave as both a count and a mass noun syntactically and semantically. The premodifier 'shattered' allows, but not fully, the count nouns 'bottle' and 'toy' to remain count nouns with a mass meaning.

11)（After I ran over the/those bottle/toy/s with our car）

$$\text{There} \begin{bmatrix} \text{was} \\ \text{was} \\ \text{was} \\ \text{were} \end{bmatrix} \begin{bmatrix} \text{a bottle/toy} \\ \text{Ø bottle/toy} \\ \text{Ø bottle/toy} \\ \text{bottles/toys} \end{bmatrix} \text{all over the driveway.}$$

$$\text{There} \begin{bmatrix} \text{was} \\ \text{was} \\ \text{was} \\ \text{were} \end{bmatrix} \begin{bmatrix} \text{a shattered bottle/toy} \\ \text{Ø shattered bottle/toy} \\ \text{Ø shattered bottle/toy} \\ \text{shattered bottles/toys} \end{bmatrix} \text{all over the driveway.}$$

Table 3. Premodification and mass reading

		bottle	*shattered bottle*	t（24）=	*toy*	*shattered toy*	t（24）=
1 referent	*a/an*	1.76	3.44	4.738, p<.001	1.67	3.56	6.516, p<.001
	Ø	2.32	3.44	3.645, p<.01	1.92	3.24	3.880, p<.001
2 or more referents	Ø	2.28	3.04	2.854, p<.01	2.24	2.88	2.268, p<.05
	pl	3.96	4.72	2.568, p<.02	3.40	4.84	4.707, p<.001

This applies to 'grated carrot(s).' Table 4 shows that 'grated carrot' in (12) scored very high on all noun forms, 4.72 on *a/an*, 4.52 on Ø, and 4.83 on pl, and there was no significant difference between *a/an* and Ø and between Ø and pl. 'Grated carrot(s),' which refers to a substance, can behave as both a count and a mass noun.

12)（She is on a diet.）

$$\text{She eats only} \begin{bmatrix} \text{a grated carrot} \\ \text{Ø grated carrot} \\ \text{grated carrots} \end{bmatrix} \text{for breakfast.}$$

Table 4. Grated carrot

NP	*a/an*	Ø	pl
grated carrot	4.72	4.52	4.83
t（24）=	1.155, ns		
		0.430, ns	

This theory applies to other foodstuffs as well. 'Mashed potato' and 'scrambled egg' can be used in any form of *a/an*, Ø and pl. British people are split over the count and mass use of 'mashed potato' and 'scrambled egg,' while American people prefer the count use for both （Kodera 2009: 90-92）. Wisniewski et al.（2003: 611）argue that Americans use the plural form to characterize how the substance originated because they do not want to incorrectly imply

that the act of cooking (mashing, scrambling) was applied to a substance. Count nouns do not have to resort to Ø to show count-to-mass shifting because modifiers (*grated, mashed, scrambled*, etc.) give the meaning of deformation. Count nouns can remain count nouns and resist count-to-mass shifting when preceded by proper modifiers.

3.3.2. Twofold condition of deformation and expansibility

In this section, we will see how the participants evaluated the acceptability *a/an*, Ø and pl for eight nouns (*cat, animal, man, car, tree, bottle, toy, vegetable*) in a twofold condition of deformation and expansibility, which is expected to force a mass reading and prevent an object reading of a count noun. Sentences in (13-17) are preceded by a clause that suggests deformation of the referent: '*after I dismantle the car*,' '*after I ran over the bottle with our car*,' etc. In addition to the loss of discreteness described in the subordinate clause, the test sentence (or the main clause) indicates the expansibility of the referent: '*all over the garage*,' '*all over the highway*,' etc. It was predicted that the acceptability of Ø would be very high and that of *a/an* would be very low.

13) (After I ran over the cat/those cats with our car/truck)

$$
\text{There} \begin{bmatrix} \text{was} \\ \text{was} \\ \text{was} \\ \text{were} \end{bmatrix} \begin{bmatrix} \text{a cat} \\ \text{Ø cat} \\ \text{Ø cat} \\ \text{cats} \end{bmatrix} \text{all over the driveway.}
$$

14) (After the truck ran over the/those man/men, animal/s)

$$
\text{There} \begin{bmatrix} \text{was} \\ \text{was} \\ \text{was} \\ \text{were} \end{bmatrix} \begin{bmatrix} \text{a/an man/animal} \\ \text{Ø man/animal} \\ \text{Ø man/animal} \\ \text{men/animals} \end{bmatrix} \text{all over the highway.}
$$

15) (After I dismantled the car/those cars)

$$
\text{There} \begin{bmatrix} \text{was} \\ \text{was} \\ \text{was} \\ \text{were} \end{bmatrix} \begin{bmatrix} \text{a cat} \\ \text{Ø cat} \\ \text{Ø cat} \\ \text{cats} \end{bmatrix} \text{all over the garage.}
$$

16) (After the tree was/the trees were chipped by the wood chipper)

$$
\text{There} \begin{bmatrix} \text{was} \\ \text{was} \\ \text{was} \\ \text{were} \end{bmatrix} \begin{bmatrix} \text{a tree} \\ \text{Ø tree} \\ \text{Ø tree} \\ \text{trees} \end{bmatrix} \text{all over the ground.}
$$

17)（After I ran over the/those bottle/s, toy/s, vegetable/s with our car/truck）

$$
\text{There} \begin{bmatrix} \text{was} \\ \text{was} \\ \text{was} \\ \text{were} \end{bmatrix} \begin{bmatrix} \text{a bottle/toy/vegetable} \\ \text{Ø bottle/toy/vegetable} \\ \text{Ø bottle/toy/vegetable} \\ \text{bottles/toys/vegetables} \end{bmatrix} \text{ all over the driveway.}
$$

Contrary to the prediction, the acceptability of Ø is generally low (1.44-3.88) as Table 5 shows. Only two nouns scored over 3.00 on Ø: 'cat' with one referent and two or more referents (3.88 and 3.56 respectively) and 'vegetable' with one referent (3.04). The acceptability of *a/an* is very low for all nouns (1.24-1.96) as expected. Pl scored higher (1.68-4.12) than *a/an* for all nouns, but still low. Only 'vegetable' scored over 4.00 on pl. The high score of 'vegetable' in the plural form may be caused by the fact that its count use applies to kinds rather than objects (Wierzbicka 1988: 549). The noun 'vegetable' may not have been a good choice for this research. 'Man', 'car', 'tree', and 'animal' did not score over 3.00 on any noun form regardless of the number of the referents.

For 'man' and 'car,' there was no significant difference between any pair of *a/an*, Ø and pl, which indicates that the twofold condition of deformation and expansibility does not force a mass reading. There was no significant difference between pl and Ø for 'tree' and 'animal' and between *a/an* and Ø for 'bottle' and 'toy.' With two or more referents, only 'cat' scored significantly higher on Ø than pl. With one referent, four nouns (*tree, animal, cat, vegetable*) scored significantly higher on Ø than *a/an*, as shown by an arrow (↑ means higher and ↓ means lower). Three nouns (*bottle, toy, vegetable*) scored significantly higher on pl than Ø. Four nouns (*man, car, tree, animal*) showed no significant difference between *a/an* and pl, although pl is expected to accept expansibility far more easily than *a/an*. These findings indicate that the twofold condition of deformation and expansibility does not force a mass reading, although it prevents an object reading (*a/an*, pl), especially the acceptance of *a/an*.

Table 5. Twofold condition of deformation and expansibility

	1 referent		2 or more referents	
	a/an	Ø	Ø	pl
cat	1.76	↑ 3.88	3.56 ↑	2.56
t (24) =	5.579, p<.001		2.970, p<.01	
	2.342, p<.05 (*a/an*-pl)			
man	1.24	1.60	1.44	1.68
t (24) =	1.475, ns		0.881, ns	
	1.792, ns (*a/an*-pl)			
animal	1.96	↑ 3.00	2.36	2.76
t (24) =	3.113, p<.01		0.873, ns	
	1.979, ns (*a/an*-pl)			
car	1.80	2.00	2.40	1.88

t (24) =	0.707, ns		1.422, ns	
	0.253, ns (*a/an*-pl)			
tree	1.68	↑ 2.40	2.56	2.16
t (24) =	2.688, p<.02		1.044, ns	
	1.596, ns (*a/an*-pl)			
bottle	1.76	2.32	2.28 ↓	3.96
t (24) =	1.638, ns		4.351, p<.001	
	6.535, p<.001 (*a/an*-pl)			
toy	1.67	1.92	2.24 ↓	3.40
t (24) =	*t (23) =0.924, ns		2.390, p<.05	
	*t (23) =5.486, p<.001 (*a/an*-pl)			
vegetable	1.88	↑ 3.04	2.92 ↓	4.12
t (24) =	4.649, p<.001		2.640, p<.02	
	7.296, p<.001 (*a/an*-pl)			

* Degree of freedom is 23. One of the participants left no response for 'a toy.'

3.3.3. Threefold condition of deformation and expansibility

In this section, the acceptability of *a/an*, Ø and pl is examined in a context of a threefold mass reading condition: deformation indicated by premodification, deformation suggested in the subordinate clause, and expansibility suggested in the main clause. In (18), the subordinate clause in parentheses suggests deformation of an object (or objects), and the premodifier 'shattered' indicates its disintegration, and the adverbial phrase 'all over the driveway' suggests that the object has broken into pieces and spread across the place. It was predicted that the threefold condition would force a mass reading and the acceptance of Ø would be significantly higher than that of *a/an* and pl.

18) (After I ran over the/those bottle/toy/s with our car)

$$\text{There} \begin{bmatrix} \text{was} \\ \text{was} \\ \text{was} \\ \text{were} \end{bmatrix} \begin{bmatrix} \text{a shattered bottle/toy} \\ \text{Ø shattered bottle/toy} \\ \text{Ø shattered bottle/toy} \\ \text{shattered bottles/toys} \end{bmatrix} \text{all over the driveway.}$$

As Table 6 shows, the acceptability of Ø is generally low for both 'shattered bottle' and 'shattered toy' (2.88-3.44) regardless of the number of referents. With one referent, both scored low on *a/an* and Ø (3.24-3.56), and there was no significant difference between *a/an* and Ø for both. With two or more referents, both scored very high on pl (4.72 and 4.84 respectively), and pl scored significantly higher than Ø for both. These findings indicate that the threefold condition of deformation and expansibility does not force a mass reading. Count nouns resist count-to-mass shifting and resort to pl when there are two or more referents.

Table 6. Threefold condition of deformation and expansibility

	1 referent		2 or more referents	
	a/an	Ø	Ø	pl
shattered bottle	3.44	3.44	3.04	4.72
t (24) =	0, ns		5.629, p<.001	
	3.572, p<.01 (*a/an*-pl)			
shattered toy	3.56	3.24	2.88	4.84
t (24) =	0.778, ns		5.336, p<.001	
	4.15, p<.001 (*a/an*-pl)			

3.3.4. Expansibility and Acceptability of *a/an* and Ø

In this section, the influence of expansibility on the acceptability of *a/an* will be examined. It was predicted that the acceptance of *a/an* would be higher when the condition of expansibility is removed from (18). The adverbial phrase '*all over the driveway*' is replaced with '*left on the driveway*' in (19), and the space for expansibility is reduced to a trash bag in (20).

As shown in Table 7, the acceptance of *a/an* for both 'bottle' and 'toy' scored significantly higher on both 'left on the driveway' (4.44 and 4.56 respectively) and 'in it' (4.64 and 4.60 respectively) than 'all over the driveway' (3.44 and 3.56 respectively). On the other hand, there was no significant difference between 'left on the driveway' and 'in it' for both 'bottle' and 'toy.' These findings indicate that expansibility influences the acceptability of *a/an*. The smaller the space for expansibility, the higher the acceptability of *a/an*.

18') (After I ran over the bottle/toy with our car)

　　There was $\begin{bmatrix} \text{a shattered bottle} \\ \text{a shattered toy} \end{bmatrix}$ all over the driveway.

19) (After I ran over the bottle/toy with our car)

　　There was $\begin{bmatrix} \text{a shattered bottle} \\ \text{a shattered toy} \end{bmatrix}$ left on the driveway.

20) He grabbed the trash bag with $\begin{bmatrix} \text{a shattered bottle} \\ \text{a smashed toy} \end{bmatrix}$ in it.

Table 7. Expansibility and the acceptability of *a/an*

	17）*all over the driveway*	18）*left on the driveway*	19）*in it*
bottle	3.44	4.44	4.64
t（24）=	2.500, p<.02		0.655, ns
	2.969, p<.01（17：19）		
toy	3.56	4.56	4.60
t（24）=	3.162, p<.01		0.135, ns
	2.463, p<.05（17：19）		

The influence of expansibility on the acceptability of Ø and pl is examined for 'shattered bottle' and 'shattered/smashed toy' in the context of 'all over the drive way' (21) and 'in it (a trash bag)' (22, 23). As Table 8 shows, 'bottle' and 'toy' scored very high on pl for both 'all over the driveway' (4.72 and 4.84 respectively) and 'in it' (4.80 and 4.76 respectively), and there was no significant difference between 'all over the driveway' and 'in it.' This suggests that expansibility does not influence the acceptability of pl. The acceptance of Ø is not very high for both nouns in both contexts (2.04-3.44). No significant difference was found between 'all over the driveway' and 'in it' on the acceptance of Ø for 'bottle' regardless of the number of the referents while there was a significant difference on the acceptability of Ø for 'toy' with both one referent and two or more referents. These findings suggest that expansibility may influence the acceptability of Ø but it does not force a count-to-mass shift.

21）(After I ran over the/those bottle/toy/s with our car)

$$\text{There} \begin{bmatrix} \text{was} \\ \text{was} \\ \text{was} \\ \text{were} \end{bmatrix} \begin{bmatrix} \text{a shattered bottle/toy} \\ \text{Ø shattered bottle/toy} \\ \text{Ø shattered bottle/toy} \\ \text{shattered bottles/toys} \end{bmatrix} \text{all over the driveway.}$$

22）He grabbed the trash bag with $\begin{bmatrix} \text{a shattered bottle} \\ \text{Ø shattered bottle} \\ \text{shattered bottles} \end{bmatrix}$ in it.

23）He grabbed the trash bag with $\begin{bmatrix} \text{a smashed toy} \\ \text{Ø smashed toy} \\ \text{smashed toys} \end{bmatrix}$ in it.

Table 8. Expansibility and the acceptance of Ø and pl

			all over the driveway	*in it*	t（24）=
bottle	1 referent	Ø	3.44	3.24	0.594, ns
	2 or more referents	Ø	3.04		0.894, ns
		pl	4.72	4.80	0.464, ns
toy	1 referent	Ø	3.24	2.04	3.618, p<.01
	2 or more referents	Ø	2.88		2.254, p<.05
		pl	4.84	4.76	0.572, ns

（Note: The number of referents in（22）and（23）is not known.）

Count nouns are resistant to count-to-mass shifting even in a context that demands a mass reading of the noun. Neither expansibility nor deformation forces a count-to-mass shift. Even a threefold condition of expansibility and deformation does not force a shift. Expansibility, however, influences the use of the indefinite article. The smaller the space for expansibility, the higher the acceptability of *a/an*. When preceded by premodification that indicates deformation of a referent（e.g. *shattered, smashed*, etc.）, the premodifier gives the meaning of deformation and the count noun does not have to resort to Ø to show count-to-mass shifting. A count noun can remain a count noun with a mass meaning.

3.4. Domain shift

In this section, the acceptability of the count-to-mass shifting of the domain shift type is examined. The following sentences show shifting from an animate being（baby, cat, skunk）to its smell. The shape of an animate being is irrelevant in these examples, since the focus of attention is not on a baby, a cat or a skunk as a living being, but on its smell, which gives a mass meaning to the noun.

l) It smells like new *baby* here.（Upon entering a car）　（Reid 1991: 88）
m) There's a smell of *cat* in this room.　　　　　　　　（Taylor 2002: 378）
n) The whole neighbourhood is full of *skunk*.　　　　　（Radden and Dirven 2007: 73）

I asked eight native speakers of English in the pilot survey if they would say the sentences （l）and（m）, and all of them answered YES on both. Also, they all answered YES on the plural forms of 'baby' and 'cat' as well, but they split over the indefinite article singular form 'a baby' and 'a cat': 5 YESses and 3 NOes on 'a baby,' 2 YESses and 6 NOes on 'a cat.' Some left comments 'a specific new baby,' 'the baby is there' on 'a baby,' and 'new baby in general' on 'Ø baby' and 'babies.' Similar comments were made on each form of 'cat': 'specific cat' on 'a cat' and 'general smell associated with cats' on 'Ø cat' and 'cats.' It seems that count-to-mass shifting of the domain shift type is highly likely to be accepted unlike the deformation type. In the following sections, the acceptability of *a/an*, Ø and pl in the verb phrase 'to smell（of）+ cat' and the noun phrase 'smell of + cat' is examined.

3.4.1. VP 'to smell of + cat'

The verb phrase 'to smell of' means 'to have a particular smell' as in 'The apartment smelled of paint.' In the object position following the preposition 'of' comes a particular quality of smell, not an entity that causes the smell. 'Onions' in 'My hands smell of onions' does not refer to physical objects, but to the onion smell, whose shape and boundary are irrelevant. It was predicted that the verb phrase 'to smell of' would be followed by Ø, but not *a/an* or pl.

Table 9 shows that the acceptability of Ø was very high (4.84) as expected and significantly higher than *a/an* (3.72) in the context of one cat. In the context of more than one cat, both Ø and pl scored very high (4.76 and 4.72 respectively), and there was no significant difference between them. These findings indicate that the verb phrase is highly likely to accept both Ø and pl, and it does not force a mass noun in the object position. On the other hand, 'to smell of' is less likely to accept *a/an*, which is probably due to the fact that the indefinite article suggests one referent whether it is specific indefinite ('a book' in 'Joseph bought a book for his girlfriend.') or generic indefinite ('a book' in 'A book makes a great gift.') (Master 1995: 219). 'Her apartment smells of a cat' is expected to mean that 'Her apartment has the cat smell in general (as opposed to the dog smell or other types of smell), and probably some participants found the generic reading of 'a cat' difficult in this context.

Table 9. VP 'to smell of + cat'

				t (24)		
				a/an-Ø	Ø-pl	*a/an*-pl
(She keeps a cat.)						
24	*a/an*	Her apartment smells of a cat.	3.72	3.855, p<.001		
25	Ø	Her apartment smells of cat.	4.84			
(She keeps many cats.)						
26	Ø	Her apartment smells of cat.	4.76		0.196, ns	
27	pl	Her apartment smells of cats.	4.72			

3.4.2. NP 'the smell of + cat'

It was predicted that the noun phrase (or determiner phrase) 'the smell of' would be likely to be followed by a mass noun in the same way as the verb phrase 'to smell of' was expected. The acceptability of the sentences (28-32) scored high on all noun forms (4.29-4.71) and there was no significant difference between any pair of *a/an*, Ø and pl. The context of the sentences (31-32) is more concrete than that of (28-30), but there was no significant difference on *a/an* between (28) and (31) and on Ø between (29) and (32). The sentences (33-35) are in a context where there is one cat and its particular nature is emphasized. The acceptance of both *a/an* and pl scored 4.84 while that of Ø was 2.12. There was a significant difference between *a/an* and Ø and between pl and Ø. These findings suggest that Ø is likely to be avoided when you have a particular cat in mind and refer to its smell, for example, a cat that you have just shampooed. Ø may be chosen when you refer to a particular type of

smell that comes from shampooed cats in general. One of the respondents in my pilot survey gave a comment that Ø could be used "if it suggests that 'shampooed cat' is an identifiable scent." When you have a cat in mind, whether the cat is specific or generic, *a/an* is likely to be chosen. When you refer to the cat smell in general, Ø is likely to be the choice.

Table 10. NP 'the smell of + cat'

				t (23)		
				a/an-Ø	Ø-pl	*a/an*-pl
28	*a/an*	The smell of a cat causes fear in mice.	4.50	0.707, ns		0.866, ns
29	Ø	The smell of cat causes fear in mice.	4.29		1.926, ns	
30	pl	The smell of cats causes fear in mice.	4.71			
（Borrowing a cat for an afternoon）				t (24)		
31	*a/an*	The smell of a cat will make any mice move out.	4.36	1.063, ns		
32	Ø	The smell of cat will make any mice move out.	4.60			
				t (24)		
28	*a/an*	The smell of a cat causes fear in mice.	4.50	0.641, ns		
31	*a/an*	The smell of a cat will make any mice move out.	4.36			
				t (23)		
29	Ø	The smell of cat causes fear in mice.	4.29	1.621, ns		
32	Ø	The smell of cat will make any mice move out.	4.63			
				t (24)		
33	*a/an*	I love the smell of a cat that has just been shampooed.	4.84	9.148, p<.001		0.000, ns
34	Ø	I love the smell of cat that has just been shampooed.	2.12		8.981, p<.001	
35	pl	I love the smell of cats that have just been shampooed.	4.84			

3.4.3.　VP 'to smell + cat'

The verb 'to smell' has two meanings as a transitive: (i) 'to notice or recognize a particular smell' (e.g. *Do you smell gas?*, *The dog had smelt a rabbit*); (ii) 'to put your nose near something and breathe in so that you can discover or identify its smell' (e.g. *I bent down to smell the flowers*). Care was taken in the questionnaire to prevent the object reading of 'cat' in the way, for example, the test sentence '*I can smell a cat, a dog, a cow, etc.*' is accompanied by the sentence '*Each animal has a specific odor*' so that the focus of attention should be on the smell, not on the animal.

This section will see if types of subjects (agents) influence the acceptability of *a/an*, Ø and pl. It was predicted that the acceptability of Ø would be lower than *a/an* and pl when 'mouse' is the subject, since it is very important for a mouse to know if they have a cat nearby. As Table 11 shows, Ø scored 3.92, which is significantly lower than *a/an* and pl (both 4.96) and there was no significant difference between *a/an* and pl.

Table 11. Subject (mouse) + 'to smell + cat'

				t (24)		
				a/an-Ø	Ø-pl	a/an-pl
36	a/an	Mice will leave if they smell a cat.	4.96	3.375, p<.01		
37	Ø	Mice will leave if they smell cat.	3.92		3.375, p<.01	0.000, ns
38	pl	Mice will leave if they smell cats.	4.96			

Compared to a mouse, a person does not place much importance on the existence of a cat nearby. It was predicted that there would not be much difference between the acceptability of *a/an*, Ø and pl when the subject is a person (39-46). As Table 12 shows, there was no significant difference between any pair of *a/an*, Ø and pl except for the pair between *a/an* in (39) and pl in (41). The low score of *a/an* in (39) was probably caused by the context 'Each animal has a specific odor,' which has the attention focused on the smell. In (45) and (46), 'I hope it's a friendly cat' suggests the existence of a cat nearby. There was, however, no significant difference between *a/an* and Ø.

Table 12. Subject (person) + 'to smell + cat'

				t (24)		
(Each animal has a specific odor.)				a/an-Ø	Ø-pl	a/an-pl
39	a/an	I can smell a cat, a dog, a cow, etc.	3.92	1.309, ns		
40	Ø	I can smell cat, dog, cow, etc.	4.32		0.659, ns	2.064, p<.05
41	pl	I can smell cats, dogs, cows, etc.	4.48			
(Upon entering the car)				t (23)		
42	a/an	He asked his wife if she could smell a cat.	4.58	1.022, ns		
43	Ø	He asked his wife if she could smell cat.	4.29		0.245, ns	1.000, ns
44	pl	He asked his wife if she could smell cats.	4.38			
				t (24)		
45	a/an	I smell a cat. (I hope it's a friendly cat.)	4.84	1.429, ns		
46	Ø	I smell cat. (I hope it's a friendly cat.)	4.56			

Table 13 compares the acceptability of *a/an* and Ø between two pairs of sentences, one with a person as a subject and the other with a mouse. There was no significant difference on the acceptance of *a/an* between (45) and (36). On the other hand, there was a significant difference on the acceptability of Ø between (46) and (37). This suggests that the existence of a cat is important for a mouse while humans do not see much difference between the smell coming from a cat nearby and the cat smell in general.

Table 13. Comparison between person and cat as a subject

				t（24）
45	*a/an*	I smell a cat.（I hope it's a friendly cat.）	4.84	0.691, ns
36	*a/an*	Mice will leave if they smell a cat.	4.96	
46	Ø	I smell cat.（I hope it's a friendly cat.）	4.56	2.141, p<.05
37	Ø	Mice will leave if they smell cat.	3.92	

　Unlike the deformation type of count-to-mass shifting, the domain shift type allows a count noun to behave syntactically as a mass noun, but it does not necessarily force a mass reading. 'Cat' can take any form of *a/an*, Ø and pl when it refers to the cat smell. Ø or pl is chosen when 'cat' refers to the cat smell in general, and *a/an* is chosen when the existence of a cat is emphasized.

4. Concluding remarks

　It is often argued that nouns in English can be used as either count or mass depending on how the referent is perceived. Given in a proper context, every noun can have a mass reading, and to support their argument, linguists contrive sentences that cause a syntactic mismatch, which forces a mass reading of a count noun such as 'cat' in 'After the accident, there was cat all over the road' or 'baby' in 'It smells like new baby here.' There are two types of count-to-mass shifting, deformation and domain shift. In the 'cat' type example, the referent loses its physical integrity, turning into a substance, just like a man going through the 'Universal Grinder' (Pelletier 1979: 5-6). The 'baby' type example has the attention focused on a certain aspect of the referent, in which the shape and boundary of the referent are irrelevant.

　The data collected from the questionnaire indicate that count-to-mass shifting does not occur as linguists claim. A syntactic mismatch does not force a mass reading of a count noun. Deformation (or physical disintegration) of a referent does not force a mass reading of the count noun. When preceded by a premodifier that indicates deformation of the referent, the noun does not have to resort to Ø to show count-to-mass shifting. The modifier gives the meaning of indiscreteness (or disintegration) to the count noun, and the noun remains a count noun syntactically while it behaves semantically as a mass noun. Premodifiers like 'shattered' and 'smashed' make it easier for concrete count nouns to accept a mass reading, although they do not fully allow count nouns to behave as count nouns syntactically, except for foodstuffs which can behave as a full count noun or a full mass noun. Count nouns can remain count nouns and resist count-to-mass shifting when preceded by proper modifiers.

　Count nouns are resistant to count-to-mass shifting even in a context that demands a mass reading of the noun. Neither expansibility nor deformation forces a mass reading. Even a threefold condition of expansibility and deformation does not force a mass reading. Expansibility, however, influences the acceptability of the indefinite article. Deformation and

expansibility prevent an object reading with one referent (*a/an*), but it does not force a mass reading. With two or more referents, count nouns resort to pl to avoid count-to-mass shifting.

　The domain shift type of count-to-mass shifting allows a count noun to behave syntactically as a mass noun, but it does not necessarily force a mass reading. For example, the noun 'cat' can take any noun form, *a/an*, Ø or pl when it refers to the cat smell. Ø or pl is likely to be chosen when 'cat' refers to the cat smell in general, and *a/an* is likely to be chosen when the existence of a cat is emphasized. Neither the deformation type nor the domain shift type forces a count-to-mass shift, although the domain shift type fully allows a mass reading depending on how the referent of a noun is perceived.

References

Allan, Keith (1980) 'Nouns and countability.' *Language* 56: 3, 541-567.

Copestake, Ann and Ted Briscoe (1991) 'Lexical Operations in a Unification Based Framework' (ACQUILEX WP NO. 21) *Proceedings of ACL SIGLEX Workshop on Lexical Semantics and Knowledge Representation*, Berkeley, California, pp 88-101.

Cruse, Alan (2011) *Meaning in Language: An Introduction to Semantics and Pragmatics,* 3rd ed. Oxford: Oxford University Press.

Evans, Vyvyan and Melanie Green (2006) *Cognitive Linguistics: An Introduction.* Edinburgh University Press, Edinburgh.

Falkum, Ingrid Lossius (2010) 'Systematic polysemy and the count-mass distinction,' *UCL Working Papers in Linguistics 22.* London: Department of Phonetics and Linguistics, University College London.

Gleason, H. A. (1965) *Linguistics and English Grammar.* New York: Holt, Rinehart & Winston.

Huddleston, Rodney, and Geoffrey Pullum (2002) *The Cambridge Grammar of the English Language.* Cambridge: Cambridge University Press.

Kodera, Masahiro (2009) 'L1 Acquisition of Count-Mass Distinctions in English and the Interplay between Ontology, Semantics, and Syntax.' *Bulletin of Seibo Jogakuin Junior College* 38. Kyoto: Seibo Jogakuin Junior College.

Langacker, Ronald W. (1991) *Concept, Image, and Symbol: The Cognitive Basis of Grammar.* Berlin: Mouton de Gruyter.

Langacker, Ronald W. (2008) *Cognitive Grammar: A Basic Introduction.* Oxford: Oxford University Press.

Master, Peter (1995) *Systems in English Grammar: An Introduction for Language Teachers.* New York: Pearson.

Pelletier, Francis J. (1979) 'Non-singular Reference: Some Preliminaries.' *Mass Terms: Some Philosophical Problems.* Edited by Francis J Pelletier. Dordrecht: D. Reidel Publishing Company.

Quine, W.V.O. (1960) *Word and Object.* Cambridge, MA: MIT Press.

Reid, Wallis (1991) *Verb and Noun Number in English.* Essex: Longman.

Taylor, John R. (2002) *Cognitive Grammar.* Oxford: Oxford University Press.

Wierzbicka, Anna (1985) 'Oats and wheat: the fallacy of arbitrariness'. In John Haiman (ed.), *Iconicity in Language,* 311-42. Amsterdam: Benjamins. Revised version in Wierzbicka (1988: 499-560).

Wierzbicka, Anna (1988) *The Semantics of Grammar.* Amsterdam: Benjamins.

Wisniewski, Edward J., Christopher Lamb, and Erica Middleton (2003) 'On the conceptual basis for the count and mass noun distinction.' *Language and Cognitive Processes,* 18 (5-6), 583-624.