Markedness and Antonymy
Author(s): Adrienne Lehrer
Source: *Journal of Linguistics*, Vol. 21, No. 2 (Sep., 1985), pp. 397-429
Published by: Cambridge University Press
Stable URL: http://www.jstor.org/stable/4175794
Accessed: 28/01/2010 18:20

J. Linguistics **21** (1985), 397–429. Printed in Great Britain

Markedness and antonymy*

ADRIENNE LEHRER

University of Arizona

(Received 20 February 1985)

1. Introduction

Standard treatments of antonymy regularly state that of a pair of antonyms, one member is marked while the other one is unmarked. Certain semantic and syntactic properties are predicated of the unmarked (or in some cases of the marked) member of the pair. A few examples are given, usually 20 or so, which bear out the predictions.

In this paper I will investigate a large number of antonym pairs to see to what extent the properties which are true of the commonest antonym pairs also hold of the larger class. I hope to show that some results follow from the meaning and structural relationship of the words themselves.

First I will list the senses of markedness relevant to the study of antonyns and give those properties which have been predicated of one member of the antonym pair. Then I will evaluate each of these properties with respect to my database before I discuss the implications. The ultimate aim is to understand better the nature of lexical–semantic structures. Finally I will discuss the relevance of this study to more general issues in semantics and pragmatics. By semantics I refer to entailments and non-cancellable implications, whereas pragmatics includes implicatures, cancellable implications, affective meaning, and beliefs about the world.

The term 'antonymy' is used for a number of different kinds of oppositions, each with a different kind of structure. (Geckeler, 1980, presents a survey of such categories.) The semantics of reversives (e.g. *tie–untie*) is completely different from that of gradable antonyms (often called contraries), such as *big–small*. In this paper I shall deal only with gradable antonyms, by which I include a category Cruse has called gradable complementaries, a term explained later.

Gradable antonyms are words, typically adjectives, that name opposite parts, usually ends, of a single dimensional scale. The scale has a middle point, usually a middle interval. Gradability refers to the ability of the word to be modified by a class of qualifiers such as *more*, *somewhat*, *very*, and the superlative, which specify the position and/or direction of the word on the scale with respect to the middle point. (Lehrer & Lehrer, 1982, present formal definitions of antonyms.)

* I wish to thank Tom Larson and anonymous reviewers for *JL* for comments on an earlier draft, and Keith Lehrer and Barbara Hollenbach for assistance with the data analysis.

Therefore, the opposition I am interested in excludes pairs such as *man–woman, tie–untie, buy–sell, present–absent*, etc. because there is no scale involved. Many of the scales I deal with are perhaps not completely single-dimensional, but are rather a cluster of qualities that can be mapped on to a single-dimensional scale. An example would be *masculine–feminine*, which I presume consists of a complex of qualities, and just what those qualities are would differ, depending on the referent and the context (including the non-linguistic context). Reference is contextually determined. For instance, no particular age can be assigned to *old* or to *young*; it all depends on the context to determine the relevant norm.

2. Markedness

Lyons (1977) points out that markedness is an 'extremely important concept' in linguistics, which unfortunately 'covers a number of disparate and independent phenomena' (p. 305). Moreover, there is some inconsistency in the terminology concerning *marked* and *unmarked.* Most writers on the subject describe one member of an antonym pair as marked (e.g. *small*) and the other as unmarked (e.g. *large*). This is the general terminological policy I will follow. However, some writers talk about a word as having a marked and unmarked sense. Therefore, *big* has an unmarked sense in

(1) How big is your house?

but a marked sense in

(2) My, but your house is big!

2.1 *Criteria for markedness*

The most general criterion is neutralization of the unmarked member in questions and nominalizations (Greenberg, 1966; Lyons, 1977; Zwicky, 1978; Waugh, 1982; Bolinger, 1977; Van Overbeke, 1975; Dubois, 1984; and others). Neutralization of an opposition occurs in questions of the form, *How X is it (he, she)*? or *Is it (he, she) X*? Stress must go on the adjective, not the *how* (Ljung, 1974). In such questions, the unmarked form carries no supposition as to which part of the scale is involved, while the marked form does carry a supposition.[1]

In nominalizations, if the scale is nominalized by a morphologically related form, it will be related to the unmarked member. Contrast

(3) (a) I was amazed by the length of the table. (It was only 3 feet.)
(b) I was amazed by the shortness of the table. (It was only 3 feet.)

The (b) sentence supposes that the table is short, whereas the (a) sentence does not imply that it is long.

[1] Presupposition is too strong a notion. I have used 'supposition' to convey the fact that the speaker holds certain assumptions.

2.2. Another criterion of markedness relevant to antonyms is that the unmarked member of an opposition can appear in more contexts than the marked term (Waugh, 1982). A third property is, therefore, that only the unmarked member of an antonym pair may appear in measure phrases of the form: Quantity Measure Adjective. Thus expressions like *5 feet tall* and *8 years old* are normal, but *5 feet short* and *8 years young* are odd.

Limitations on nominalization contexts can also be noted.

(4) The length of the table was 3 feet.

is fully acceptable, but

(5) The shortness of the table is 3 feet.

is less so.

2.3. Another criterion of markedness which has been proposed is frequency. Greenberg (1966) and Zwicky (1978) mention that the unmarked member of an opposition is more frequent than the marked member. Although this may be true, I think that we can agree with Waugh (1982) that frequency cannot be part of the definition of markedness but rather follows from other principles. Since the unmarked member may occur in a wider range of contexts and will appear when the contrast is neutralized, it will also be more frequent.

2.4. A fourth general criterion of markedness is that if one term has an overt marker, it is the marked member (Greenberg, 1966, and Zwicky, 1978). Applied to antonyms, this means that if one member of an antonym pair has an affix added to the other member, it is the marked form with the additional material. Thus *happy* is unmarked, while *unhappy* is marked.

It may be peculiar to suggest the possibility that the unmarked form could have an affix attached to the marked form (i.e. that *unhappy* could be unmarked), since the additional material would seem to make something marked by definition. However, it is important to discover whether all the predicated properties go together or whether one member of an antonym pair is unmarked with respect to one criterion but marked with respect to another.

2.5. There are several other properties which are special to antonyms and are not general properties of markedness found in morphology, phonology, etc.

Among antonyms proportions and ratios can be used only with the unmarked member.

(6) (a) John is $\left\{\begin{matrix}\text{twice}\\ \text{half}\end{matrix}\right\}$ as tall as Bill.

(b) *Sally is $\left\{\begin{matrix}\text{twice}\\ \text{half}\end{matrix}\right\}$ as short as Sue.

In looking at the evaluative or connotative 'meaning', the unmarked member has a positive connotation and the marked member has a negative

one. Thus *happy*, *clean* and *friendly*, which come out as unmarked according to the criteria listed above, have favourable connotations, while their antonyms, *sad*, *dirty* and *unfriendly* have negative connotations.

Unmarked members of an antonym pair denote more of a quality, while the marked member denotes less. According to the previous criteria, *big*, *tall*, *heavy* and *old* are unmarked and indeed these terms denote more size, height, weight and age than their corresponding antonyms *small*, *short*, *light* and *young*.

There may be asymmetries in entailments.

The chicken is worse than the steak

entails

The steak is better than the chicken

but the reverse entailment does not hold if both the *steak* and *chicken* are good. (At least, this inference is misleading.) Or consider the following:

(7) (a) The steak is better than the chicken, but both are bad.
(b) *The chicken is worse than the steak, but both are good.

Table I summarizes the predicted markedness properties of antonyms.

Before looking at the data, let me make some caveats. First, judgments among groups of speakers are highly variable, and within each individual

---

I Neutralization of an opposition in questions by *unmarked* member.

II Neutralization of an opposition in nominalizations by *unmarked* member.

III Only the *unmarked* member appears in measure phrases of the form Amount Measure Adjective (e.g. three feet tall).

IV If one member of the pair consists of an affix added to the antonym, the affix form is *marked.*

V Ratios can be used only with the *unmarked* member (e.g. Twice as old).

VI The *unmarked* member is evaluatively positive; the *marked* is negative.

VII The *unmarked* member denotes more of a quality; the *marked* denotes less.

VIII If there are asymmetrical entailments, the unmarked member is less likely to be 'biased' or 'committed'. Cf.
A is better than B. A and B could be bad.
B is worse than A. B must be bad, and A may be as well.

Table I

Markedness properties of antonym pairs

there is inconsistency. Writers on antonymy frequently preface their list of good and bad sentences with comments such as 'The following reflect my own idiolect.' This is apparently a warning to the effect that uniform judgments cannot be expected. I frequently disagree with those judgments. Moreover, as I was making judgments on expressions containing the words in my antonymy list, I often changed my mind. Barbara Hollenbach, a research associate in linguistics who also evaluated the words with respect to many of these properties, experienced the same inconsistency.

Secondly, the judgments about words in neutral sentences are easily overridden by pragmatic factors. This is especially true for affective or connotative meaning. I will have many cases where pragmatic principles override judgments.

3. Evaluation of the properties

In this section I will go through the predictions, examining them in the light of my own database, and drawing on others' observations as well. I have selected just over 150 pairs of antonyms, including most of those that other investigators have used in their own lists. Some involve a word with more than one possible antonym, such as *happy–sad, happy–unhappy*, therefore a word may appear in more than one pair. In some cases, matching up antonyms is non-trivial. For example, when there is a cluster of partial synonyms *dumb, stupid, unintelligent* opposed to *smart, clever, intelligent*, it is not always obvious how to make the matches. The properties are arranged in terms of their relatedness to each other.

3.1. The first property is that in questions the unmarked member may appear without any supposition, that is, the contrast is neutralized. To make this a fair test, we have to pick neutral nouns. Some nouns are inherently marked for a quality, in which case an associated adjective sounds normal (Ljung, 1974; Bolinger, 1977; H. Clark, 1969; Cruse, 1976).

(8) (a) How dumb is that moron?
(b) How cruel is that tyrant?
(c) How bad was the flood?

These sentences sound normal, because morons are inherently below normal intelligence, tyrants are inherently cruel, and floods are inherently bad. Therefore, it is necessary to find a neutral context to apply the question test.[2]

The property of neutralization in questions is very general. In my sample of 150+ antonym pairs, 80% have a neutralizable member. Besides five

[2] As mentioned before, we must also try to rule out overriding pragmatic factors. *Big* is certainly unmarked by most criteria, e.g. 'How big is your house?' 'Is your house big?' Such questions are neutral. However, a shoe salesman, in a culture which values small feet on women, might hesitate to ask a female customer, 'How big are your feet?'

abstract/concrete	ferocious/meek	innocent/guilty
austere/lush	feminine/masculine	lush/barren
beautiful/ugly	graceful/awkward	peaceful/violent
delicate/rugged	graceful/clumsy	reassuring/frightening
dominating/submissive	harsh/mild	reassuring/threatening
dry/sweet	hot/cold	positive/negative
dry/wet	impulsive/restrained	pungent/bland
fat/thin		

List 1

Pairs of antonyms in which neither member is neutral in questions

several borderline cases there are 25 pairs which I felt had no unmarked member. These are given in List 1.

Klooster (1972) distinguishes between objective gradables (like *heavy* or *old*) for which there are standard measures and subjective gradables (like *beautiful* or *pleasant*) for which there is none. He says that no subjective gradable may be used in a neutral sense. My sample (according to my intuitions), however, does not bear this out. There are many gradables for which there is no measurement system, but none the less these adjectives are neutral in questions: *interesting, generous, good, ambitious, friendly, kind,* and many more. For example, sentences like *How good/interesting was the film? How friendly/kind/ambitious are the Australians*? are (relatively) neutral, but there is no measurement system for the properties in question.

Since this property – neutralization of the unmarked member in questions – is the most general, I shall use it as the 'defining' features for the other correlations. If I refer to the unmarked member, I mean the one used in neutral questions.

3.2. Before attempting to give an explanation for a few of the 'doubly marked' pairs, that is, antonymy pairs in which neither member is neutral in questions, let me mention a second property, since Cruse has predicted that it should correlate with unmarked questions. This has to do with entailments and their bidirectionality.

If you say *X is A-er than Y* does it follow that X is A? This is a problem that plagued the early transformational grammarians, who wanted to derive a sentence like

(9) Joan is more beautiful than Sandra.

from *Joan is beautiful, Sandra is beautiful,* plus some other structure. However, if we replace *beautiful* with *tall,* as in *Joan is taller than Sandra,* the entailment fails.

Cruse has proposed the term 'committed' for those antonym pairs where reversability of comparatives is impossible, and where the comparative entails

the base form of the adjective. Bolinger uses the term 'biased'. Thus in *long* and *short* neither term is committed (or biased). The following are acceptable:

(10) (a) X is longer than Y → Y is shorter than X.
(b) X is longer than Y but both are short.
(c) Y is shorter than X but both are long.

For the pair *beautiful–ugly*, both terms are committed (biased).[3] The following are not acceptable:

(11) (a) *X is more beautiful than Y → Y is uglier than X.
(b) *X is more beautiful than Y, but both are ugly.
(c) *Y is uglier than X but both are beautiful.

For some pairs, the entailments hold in only one direction. That is, only one member of the antonym pair is committed. An example would be *good–bad.*

(12) X is worse than Y → Y is better than X

This implication holds, but the following does not necessarily hold:

(13) Y is better than X → X is worse than Y

We can say

(14) Y is better than X, but both are bad.

but not

(15) *X is worse than Y, but both are good.

Cruse predicts that it is possible to have a neutral question only if one term of an antonym pair is uncommitted (unbiased). Let us strengthen the claim: a neutral question is possible if and only if one member of an antonym pair is uncommitted (unbiased).

Let us take the first part. If only one member of an antonym pair is uncommitted, it occurs in a neutral question. This prediction is largely borne out in my sample. I found only five counterexamples, where at least one term was uncommitted but where it was not neutral in questions. These are presented in List 2.
I accept the following:

(16) (a) Wine A is sweeter than wine B, but both are dry.
(b) Wine B is dryer than wine A, but both are sweet.
(c) A's solution to the problem is more concrete than B's solution, but both are abstract.

---

[3] Cruse suggests that doubly marked antonyms (where neither term is neutralizable) form a small group, but in my sample, there are as many pairs where both members are committed as there are pairs where neither member is committed.

abstract/concrete	impulsive/restrained
dry/sweet	relaxed/tense
dry/wet	

List 2

Pairs of antonyms where neither member is neutral in questions, but at least one member is uncommitted

But I do not find the following questions neutral, however.

(17) (a) How dry (sweet) is the wine?
(b) Is the wine dry (sweet)?
(c) How abstract (concrete) is his solution to the problem?
(d) Is his solution to the problem concrete (abstract)?

Turning to the other part of the prediction, if one member of a pair is unmarked in questions, then it must be uncommitted. However, in my sample, I found a few more counterexamples to this prediction, given in List 3. That is, I find the questions

(18) (a) How happy is that man?
(b) Is that man happy?

to be neutral, but I would not accept either of the following:

(19) (a) A is happier than B but both are sad.
(b) B is sadder than A but both are happy.

In other words, *happy* and *sad* are both committed (biased), but *happy* is unmarked in questions.

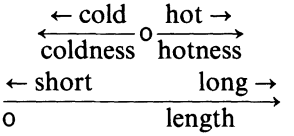
There is, in spite of these counterexamples, a strong correlation between markedness in questions and committedness. Cruse suggests that the two

aggressive/defensive	happy/sad	transparent/opaque
calm/violent	just/unjust	true/false
dynamic/static	nice/nasty	useful/useless
flexible/rigid	nice/awful	valuable/cheap
full/empty	powerful/powerless	valuable/worthless
	shrewd/naïve	

List 3

Pairs of antonyms where both terms are committed, but one member is unmarked in questions

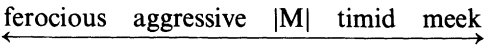
phenomena should correlate because they are different aspects of the same property – the ability of a word to name the whole antonym scale or only a part of it. *Hot* and *cold* name different parts of the scale, whereas *long* can name the whole scale.



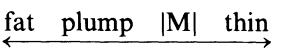
(Cruse, 1976:291)

It does seem that the part of the scale being named accounts for some of the antonym pairs in which both terms are committed (biased), namely those cases where the term does not even mark the area between the midpoint and one end. If a term does not even name an entire half of a scale, it will not name the entire scale. One test of whether or not a word names only a part of a half scale or the entire half scale is that the half scale is divided up so that there are different words, each applying to a different portion. For example, *hot* and *cold* name outer ends, with *warm* and *cold* in between.

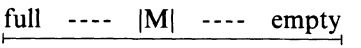
Similarly, we have

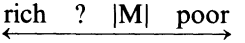


And maybe



Fat may be associated with contemporary attitudes such that fat is bad, in people, in foods, etc. (In another age or culture, intuitions might be different.) In some cases I have not been able to find a word between an outer part of the scale and the middle





Of course, phrases can be found, even if no single word is available, e.g. *half-full, partly full; well-to-do*, etc.

It is rather tempting and speculative to appeal to a notion of semantic space, where we can specify how much of a scale and what part of it are named by a term, but there is an obvious danger of circularity, e.g. saying that *rich* must name only half of the positive side because it is biased, and is not neutral in questions.

I have carried out some preliminary investigations with the help of Tom Larson, asking subjects to judge the part of the antonym scale that is covered by a word. Subjects were presented with stimuli such as the following:

5 4 3 2 1 0 1 2 3 4 5

excellent terrible

Subjects were to draw a line through the number to show how far from the middle of the antonym scale something must be to be excellent or terrible. Respondents judged the following words to name the outer part of the relevant scale, where 'outer' is defined operationally as 3 or more on the 5-point scale: *fat, aggressive, barren, ferocious, pretty, rich, hot.* In fact, all of the terms in List 1 which were included in the pilot study were judged to belong to the outer part of the scale. However, the number of subjects is too small to be significant, and moreover, since some subjects tended to place most items away from the middle, but others placed relatively few there, some sort of standardization metric would be desirable.

I will return to this problem later in the paper, while discussing quantity.

3.3. A third predicted property of antonyms is that the opposition is neutralized in nominal forms which are morphologically related to the unmarked member. There are actually a whole cluster of issues to be examined when we look at nominals. First, is there a morphologically related nominal at all? And secondly, does the nominal neutralize the opposition?

With respect to the first question, most words in my sample (both marked and unmarked) have a morphologically related nominal, but where there are

Gap	Suppletive nominal	Antonym
*bigness	size	*littleness
*largeness	size	?smallness (OK with metaphorical sense)
*farness	distance	nearness
*oldness	age	newness, youth
*fastness	speed	slowness
?tallness	height	shortness
?lateness	tardiness	?earliness
?smartness	intelligence, cleverness	dumbness ('muteness')
?fullness	—	emptiness (OK with metaphorical sense)
?*usualness	—	
*manyness	amount, quantity	*fewness
*outgoingness		shyness
*fancyness		plainness

List 4

Words without a morphologically related nominal: unmarked in questions

Gap	Suppletive nominal	Antonym
?smallness	size	—
*littleness	size	—
earliness	—	—
?awfulness	—	niceness
?cheapness	—	value, ?valuableness
*unbias, ?unbiasedness	—	—
*unsuccess, ?unsuccessfulness	—	—
*?lowness (better if metaphorical)	—	—
*youngness	youth	—
*unusualness	—	—
*fewness	—	—

List 5

Words without a morphologically related nominal: marked in questions

lexical gaps they are as likely to occur for the unmarked form as for the marked.[4] See Lists 4 and 5.

Some of these gaps can be explained in terms of the morphology of English. Since *many* and *few* are quantifiers and not adjectives, they do not nominalize. *Un-* cannot be pefixed to nouns, hence *unbias* and *unsuccess* are out.

Although most of the nominals are nominalizations, that is, formed by adding an affix to the adjective, in a few cases it is the noun which serves as a stem for the adjective. In such cases the noun may have a slightly different meaning. Compare, for example,

(19) (a) We observed the children behave in a controlled manner.
(b) We observed the control of the children.

(20) (a) We were surprised by how relaxed the people were.
(b) We were surprised by the relaxation of the people.

[4] Some of the starred words are listed in the *OED*, but I would reject them on the basis of my intuitions. Riddle (1984) suggests that a narrowing in the meaning of *-ness* led to the obsolescence of words like *wideness, deepness, strongness*, etc. The Old English suffix could be used to denote concrete or abstract entities as well as traits, but only the 'trait' meaning exists in modern English.

(21) (a) It surprised us that the books were interesting.
(b) The interest $\left\{\begin{matrix}\text{of}\\\text{in}\end{matrix}\right\}$ those books surprised us.

In some cases there is a related nominal, but the distribution is more limited than the associated adjective. Although *lateness* was marked with a question mark in List 4, one can perhaps say

(22) (a) The lateness of the hour surprised us.

but

(b) John's lateness at dinner annoys me.

sounds worse. *Heaviness* is more appropriate in metaphoric contexts than in ones where weight measurement is being discussed.

(23) (a) The heaviness of my heart prevents me from acting.
(b) ?The heaviness of these rocks I am carrying prevents me from running.

(24) (a) The richness of the food bothers me.
(b) The $\left\{\begin{matrix}\text{*richness}\\\text{wealth}\end{matrix}\right\}$ of those people bothers me.

The second question is more interesting (and problematic), however. Does the nominalization neutralize the opposition? The answer depends in part on the sentence frames used. There are two kinds of test frames that I will examine. The first is a measure phrase, e.g.

(25) The length of the board is 2 feet

and the second is non-measure frames.

The number of adjectives which involve measurement systems is limited (a point discussed below in Section 6). We get a semantic neutralization of the opposition only with the following nouns (morphologically related to unmarked adjectives):

(26) (a) The *depth* of the water was 3 metres.
(b) The *width* of the door was 1 metre.
(c) The *height* of the tree was 10 metres.
(d) The *thickness* of the pencil was 1 cm.
(e) The *breadth* of the strip was 2 metres.

In addition, we have

(f) The value of the picture is two dollars.

the technical use of *strength* as in

(g) The strength of the rope is 20 pounds per square inch.

and a few more marginal cases, such as

(h) ?The freshness of the bread is 12 days.
(i) ?The accuracy of the test was fifty per cent.
(j) ?The purity of the soap is 99 $\frac{44}{100}$%.

There are other cases where a nominalization of the adjective exists, but it cannot be used in measure phrases because of a shift (or restriction) in meaning:

(27) (a) The $\left\{\begin{matrix}\text{*richness} \\ \text{wealth}\end{matrix}\right\}$ of the man is one million dollars.

(b) The $\left\{\begin{matrix}\text{*expense} \\ \text{cost}\end{matrix}\right\}$ of the trip was $250.

In the following sentences, a nominal which is morphologically related to the adjective is possible in a measure phrase, but the opposition is not neutralized.

(28) (a) The warmth of the water is 1 °C.
(b) The heat of the water is 33 °F.

Since neither *warm* nor *hot* is neutral in questions, we would not expect the related nominals to be either.

Turning now to non-measure constructions, whether a nominalization neutralizes an opposition depends on the sentence frame. I have selected the following frames as being relatively neutral.

(29) (a) I reported to him on NP.
(b) The NP was reported to me.

All of the adjective which are marked in questions are marked (non-neutral) in these frames.

(30) I reported to him on the shallowness of the water.

We understand that the water is shallow.

(31) The stupidity of the children was reported to me.

We assume that the children are stupid.

However, most of the adjectives which are unmarked in questions are NOT neutral in these frames.

(32) (a) I reported to him on the friendliness of the natives.
(b) The friendliness of the natives was reported to me.

Both sentences imply that the natives are friendly. If the next sentence were to be

(33) They were hostile

friendliness would be interpreted as ironic. Compare the following two sentences: one with *tell* and one with an embedded question:

(34) He told me about the $\left\{\begin{matrix}\text{friendliness of the natives}\\ \text{difficulty of the course}\end{matrix}\right\}$.

(35) He asked me about the $\left\{\begin{matrix}\text{friendliness of the natives}\\ \text{difficulty of the course}\end{matrix}\right\}$.

In (35) (and generally), nominalizations in embedded questions act much like their related adjectives in questions, that is, they (more-or-less) neutralize the opposition.

The explanation for a lack of neutralization in assertive nominal contexts follows from some modifications of Gricean maxims: 'Do not say what is misleading'. (Cf. Grice: 'Do not say what you believe is false'.) If the people spoken of are unfriendly, do not talk about their friendliness (unless you want to express irony). The maxim of quantity may also be applicable. 'Say the strongest relevant thing appropriate to the context.'

(36) I told him about the heat of the water.

is more informative than

(37) I told him about the temperature of the water.

The latter might be used when the hearer knows or does not care whether the water was hot. The only relevant information is that John was told something.

We might also consider the effects of the phonological similarity of adjective and related nominals. A phrase like *the friendliness of the people* almost certainly causes the hearer to think of *friendly*, and while a typical mature adult speaker–hearer knows that *wide* is related to *width* perhaps one can process *width* without being forced to think of *wide*. In other words, perhaps the vowel alteration between the adjectives in (26) and their corresponding nominals plays a minor role in the neutralization.

The relatively few nominalizations in which the opposition is neutralized in the test frames above are *depth*, *width*, *height*, *breadth*, *strength* and *thickness*. In other cases, it is perhaps more a matter of degree of neutralization rather than a sharp dichotomy between neutral and non-neutral. But the following are possible candidates for relative neutrality,[5] and the following sentence in parentheses is not supposed to evoke surprise.

(38) He reported on the
- (a) activity of the children. (They were very passive)
- (b) freshness of the bread. (It was stale)
- (c) value of the paintings. (They were worthless)
- (d) power of the leaders. (They were almost powerless)

[5] Note that nominalizations such as *valuableness*, *powerfulness*, *expensiveness* and *comfortableness* would not be neutral.

(e) comfort of the furniture. (It was uncomfortable)
(f) expense of the trip. (It was cheap)
(g) conformity of the students. (They were individualistic)
(h) stability of the rock pile. (It was unstable)

3.4. A fourth claim about markedness is that the unmarked term is evaluatively positive, while the marked one is evaluatively negative. This is a criterion easily overridden by pragmatic factors. *Clean*, for example, is evaluatively positive and *dirty* is evaluatively negative, but the editors of a pornographic publication might say something like, 'This article is wonderfully dirty. Our readers will love it' (example based on Bolinger, 1977:30).

In correlating the marked member with evaluative connotation, about two-fifths were evaluatively neutral, the rest were negative. We do not find complete symmetry. One member of a pair might be neutral and the other either positive or negative. For example, in *fat–thin*, I judge *fat* as negative and *thin* as neutral (at least in some contexts), and I judge *sturdy* and *valuable* as positive but *fragile* and *cheap* as neutral, again subject to contextual factors.

3.5. A fifth prediction is that if one form consists of an overt marker, added to the other form, it will be the marked form. I had only 30 pairs in my sample with an affix added to the other pair, but the process of creating opposites, primarily with *un-*, is productive (Zimmer, 1964).[6]

There are only two exceptions in my small sample: *impartial–partial* and the almost synonymous *unbiased–biased.* I find that *impartial* and *unbiased* are the unmarked members in questions, and *partial* and *biased* produce a marked question.

(39) How partial (biased) is that man?

supposes a bias. Possibly the evaluative property of the words overrides the morphological marking.

3.6. The sixth property associated with markedness is the possiblity of occurrence in measure phrases, of the structure: Quantity Measure Adjective, as in *five feet tall, two years old* or *three metres wide.* The prediction is that only the unmarked member can occur in such structures.

First of all, this kind of construction is highly limited (Jackendoff, 1977). My sample yields only the following:

deep	tall	late/early	high
thick	old	wide/broad	long
Peripheral:	full/empty		
	strong		

List 6

Words that appear in the construction: Quantity Measure Adjective

[6] For note 6 see over.

Of the peripheral items, $\frac{3}{4}$ *full* is completely acceptable, as is $\frac{3}{4}$ *empty*; however, *3 bags full, 3 litres full* are at best marginal, and *empty* is impossible in this construction. We find *strong* and *pure* only in structures like

(40) (a) The army is 50,000 men strong.
(b) This soap is 99 $\frac{44}{100}$% pure.

The adjectives that occur in these constructions are associated with measuring systems. But so are many adjectives that cannot occur in them: *heavy, fast, warm, large*, etc. The following sentences are ungrammatical:

(41) (a) *The book is 1 kilo heavy.
(b) *He ran 10 k.p.h. fast.
(c) *It is 30° warm.
(d) *The ball is 30 c.c. large.
(e) *It's $10 expensive.

Givón (1978) suggests that there may be a long cultural lag between the emergence of a measuring system and the use of a term in such measure phrases. 'Precise quantification and measure phrases may be an extension of some subcomponent of a culture long before they are present in the semantic structure of quality adjectives' (822). Hence loudness, light, intensity, energy, are not modified in this way (822).

To examine the actual productivity of these constructions, a questionnaire with sentences involving these newer concepts (e.g. *ten decibels loud*) was sent to a group of physicists and to a group of linguists. I hypothesized that the physicists would find such constructions more acceptable than would the linguists, since the former would be more familiar with the measures, but in fact the physicists were more conservative in their judgments than the linguists. The results are presented in Appendix I.

The restriction of constructions of the Measure Quantity Adjective sort can perhaps be explained in terms of the Gricean maxim: 'Be brief. Avoid unnecessary prolixity'. For most measures the relevant thing being measured is already incorporated into the meaning of the word. *Degree* implies temperature, *lumen* implies brightness, *decibel* implies loudness, and *kilo* implies weight. Most of the adjectives that do occur in this construction are those that use the same measurement system, namely linear measures:[7]

(42) 10 feet wide (deep, tall, high, long, broad).

[6] Zimmer (1964) is concerned primarily with the productivity of negative affixes and the constraints on forming new words, e.g. *unintelligible* is all right, but *unshort* is bad. My concern is somewhat different. Given the existence of antonyms, one member of which is a negation of the other, what are the proportions of the pair?

[7] This was pointed out by a member of the audience, I think F. Braun, at a colloquium I presented to the Linguistics Department at the Technical University of Berlin.

Early and *late* both occur, and the adjectives are used to show which term applies. (43) is incomplete.

(43) *John arrived five minutes.

Thus only *old* remains as a redundant adjective.

(44) My son is 8 years.

Sentence (44) is not as incomplete as (43), and one can even find contexts where *old* contrasts with other possible adjectives:

(45) Sally is three months old.

versus

(46) Sally is three months pregnant.[8]

Since these constructions (Measure Quantity Adjective) are marginally productive, we can see why a sentence like

(47) My aunt is 80 years young.

would be effective. It violates the grammatical as well as the semantic patterns.

Of course, if we change the linguistic environment to

Quantity Measure *too* Adjective

many more adjectives, including marked ones, are possible.

(48) (a) This board is 2 feet too short.
(b) He is 5 years too young to be president.
(c) It is 30 pounds too heavy.
(d) The water is 10° too cold.

If this meaning is intended, the *too* may be omitted.

(49) The board was supposed to be 8 feet long, but it was 1 foot short (i.e. 7 feet) (Bolinger, 1977)

3.7. Related to the property of measure phrases is that of whether these terms can occur in expressions such as *twice as X* or *half as X*. It is predicted that only the unmarked member of a pair can occur.

(50) Twice as long, wide, tall

are acceptable but

(51) *Twice as short, narrow

[8] *Pregnant* was not included in my sample because it and its opposite do not show a gradable structure. The expression *a little bit pregnant* is intended as a joke, as a case of prototypical inappropriate collocation.

are not (Bierwisch, 1967; Horn, 1972; Cruse, 1976). Cruse points out, and my inquiry has confirmed, that when people are asked to interpret sentences like the following:

> A's height is 6 feet. B is twice as short. What is B's height?

some speakers interpret *short* as equal to *tall* and say 12 feet; others say 3 feet, apparently reasoning as follows: 'If A is taller than B, then B is shorter than A, therefore B must be less than A.' It's more puzzling with *half*, as *A is half as short as B.*

People can even be tripped up with puzzles like the following:

> The temperature now is 20°. What would the temperature be if it were twice as warm?

Many will say 40°. If one continues the questioning with

> What would the temperature be if it were half as warm?

A few will say 10°. Then if people are asked,

> If the temperature is −20°, what would it be if it were twice as warm?

Then usually speakers see the problem. Mathematical operations like doubling and halving are not appropriate when the zero on the scale is not absolute zero.

On the other hand, many antonym pairs do permit *twice as* for both members.

(52) A is twice as $\left\{\begin{matrix}\text{good}\\\text{bad}\end{matrix}\right\}$ as B

$\left\{\begin{matrix}\text{clever}\\\text{stupid}\end{matrix}\right\}$

$\left\{\begin{matrix}\text{happy}\\\text{sad}\end{matrix}\right\}$

$\left\{\begin{matrix}\text{early}\\\text{late}\end{matrix}\right\}$

$\left\{\begin{matrix}\text{kind}\\\text{cruel}\end{matrix}\right\}$

In fact, in my sample, over a third of the sentences sounded all right with both members of the antonym pair – without much reflection. Other writers in the field also accept such sentences. Sentences like

(53) A is twice as stupid as B

sound fine until one starts to think about what they mean, in truth-conditional terms.

To see what is going on here, we have to look at measurement systems more carefully. Expressions like *twice as, half as*, to be understood literally, should correlate with the kind of scale. There are three kinds of scales: nominal,

interval and ratio. In nominal scales there is only a rank ordering. In interval scales there is an ordering, plus a numerical system such that each interval is equal to every other interval. In a ratio scale, in addition to equal intervals there is a zero point. Proportional expressions, such as *twice as*, *ten times as*, etc. should only be possible with ratio scales, or at least they should only be literally interpretable with ratio scales.

Therefore, I correlated the kind of scale for each word in my sample with their acceptability in proportional sentences, and I also looked at whether there was a standard measurement system. Hence, sentences such as

(54) Ann is twice as { beautiful / ugly / interesting / boring } as Betty, and

Carol is 10 times more { beautiful / ugly / interesting / boring }

are interpretable in some non-literal (or at least some mathematical) way, for example:

(55) A is X-er than B and C is very much more X.

About one-quarter of the antonym pairs have ratio scales (and therefore measurement systems). Most of these permit *twice as* with the form used in unmarked questions, but not with the marked form. The explanation follows rather directly from the semantic structure. The zero point or endpoint of the measurement scale does not coincide with the midpoint or mid-interval of the antonym scale. Graphically, using *long* and *short* as examples, the zero point for length is no extension whatsoever, but that is not the dividing line between *long* and *short*.

0 1 2 3 4 5 6 7 8 etc.
short M long

Hence there is a conflict over where the zero belongs. Now if we can make the two scales coincide, interpretation becomes easy. In isolation, *twice as cheap* is puzzling to me. Suppose that the normal price for a coat is $100. Store A has a sale on coats and the price is $90, which we agree is cheap. If store B sells an identical coat for $80, then the price at store B is twice as cheap. Or if I need a board 10 metres long, and John brings me a board that is 9 metres long, while Fred brings me one that is 8 metres long, Fred's board is twice as short as John's. But that means 'twice too short' or 'twice as much too short'.[9]

[9] Some speakers interpret *twice as cheap* as equivalent to *half as expensive*. Greg Guy has pointed out (personal communication) that a sentence like

Computers are now three times smaller and
ten times cheaper than they used to be

is rather easily interpreted to mean that computers are $\frac{1}{3}$ the size and $\frac{1}{10}$ the price.

Early and *late*, both of which allow modification with *twice as* are not a problem, because the norm can be set anywhere. There is no absolute zero. And Bolinger points out that when terms such as *small*, *short*, etc. are used metaphorically, the marked one can appear in proportions.

(55) When the boss scowls at me I feel small, but when he yells at me I feel twice as small.

Twice as must here be interpreted as a comparative.

Let me add a word about interval scales. Common temperature scales (Centrigrade, Fahrenheit) are of this type. They have a zero, but it is not absolute zero, as with the Kelvin scale. As I have mentioned before, since we are dealing in numbers, one can be misled into thinking that one can double or halve them. Consider something like an intelligence scale (although it is not clear that the intervals are equal). I could stipulate that what I mean by *A is twice as intelligent as B* is that on a particular IQ test, with a mean of 100 and a standard deviation of 15, A's IQ is twice the standard deviation of B's IQ. For example, if B's IQ is 115, and A's is 130, then A is twice as intelligent as B. However, speakers do not typically operate this way with interval scales.

3.8 This brings us to the property of quantity. The unmarked member is said to denote more of a quality and the marked member less. Clark & Clark (1977) propose as a universal of perception: 'We conceive of things having extent as positive, those lacking extent as negative. Thus of adjective pairs, more of something is positive and hence unmarked' (p. 533). (See also Givón, 1978.) Their terms *positive* and *negative* are ambiguously used – (1) for evaluation, as we have seen, and (2) for quantity. The assumption is that more is better.

The fact that the term used in unmarked questions is also the one denoting more of a quality is the case with those pairs referring to measurements – size, age, weight, etc. But this does not hold true for the whole set of antonym pairs. Cruse (1980) has shown that there are many pairs where the marked member denotes more. Consider the pair *clean–dirty*. The quality involved is *dirt*, and *dirty* is more of it. *Clean* is the absence of that quality. Cruse calls this class of pairs gradable complementaries. From the terminology, I assume that the defining properties of this class are (1) that the words are gradable (like ordinary antonyms) and (2) they are complementaries – there is no middle interval where neither term applies (in contrast to antonyms), but only a midpoint. Some examples of gradable complementaries are *clean–dirty*, *safe–dangerous*, *sober–drunk*, *pure–impure*, *accurate–inaccurate*. Thus if X is not clean, it is dirty; if X is not dirty, it is clean. Nothing can be neither clean nor dirty, but rather in-between. My own judgements on the complementarity of such pairs do not always coincide with those of Cruse. For some pairs which he judges to be complementaries, I can find a mid-interval.

However, more interesting to the issue at hand is that of quantity. The term which is unmarked according to the question test (How X is it?) and

Gradable Complementaries

Unmarked in Questions

+Evaluative

clean | *dirty* midpoint, no midinterval

more →

Regular Antonyms

Unmarked in Questions

+Evaluative

deep |M| *shallow* midinterval

← more

Figure 1. Based on Cruse (1980).

evaluation, denotes the absence or lack of a quality. In other words, the unmarked member approaches zero and the marked member (according to other criteria) extends indefinitely. Let us return to *clean* and *dirty*. As I said, if something is clean there is an absence of dirt. One would not say of something dirty that it lacks the quality of cleanliness. The same is true of *sober* and *drunk*. When someone is sober, there is an absence of drunkenness (i.e. alcohol). It is not the case that when someone is drunk there is an absence of a positive property we call *sobriety*. (However, judgement differs on this point.)

According to Cruse, we should expect to find the following cluster of properties:

A. For gradable complementaries:
   1. No mid-interval. Test: it is not acceptable to say X is neither A or B but in-between (where A and B are opposites).
   2. The neutralized member in questions and the evaluatively positive member denotes LESS of a quality. The end of the scale which approaches zero is the unmarked member of the pair of antonyms.

B. For 'regular' antonyms:
   1. There is a middle interval, not just a 'cut'.
   2. The neutralized member in questions denotes MORE of quality. The endpoint which approaches zero is named by the marked member.

In my sample of antonym pairs I found 32 pairs which I judged to be complementaries (with no middle interval). Of those, 21 conformed to Cruse's predictions. List 7 gives the pairs of words that I do NOT consider to be complementaries, but where the marked member denotes more of a quality.

austere/lush	dry/sweet
calm/agitated	dry/wet
calm/violent	peaceful/violent
serious/humorous	

List 7

Pairs where the marked member denotes more of a property, but where there is a mid-interval

And in List 8 I give those pairs which I consider to be complementaries but where the unmarked member denotes more. That is, the marked member denotes the absence of the quality. I agree with Cruse that there is a special subclass of oppositions involved, but I do not agree that the defining property of this class is complementarity.[10]

distinct/vague	important/unimportant	practical/impractical
dynamic/static	mature/immature	stable/unstable
helpful/unhelpful	organized/disorganized	successful/unsuccessful

List 8

Complementaries where the unmarked member denotes more of a quantity

Finally, if there is an endpoint which approaches zero, it should not be possible to use proportional expressions. We can say:

(56) X is twice as { inaccurate / dangerous / drunk / dirty / impure } as Y.

but not (or at least not as easily):

(57) Y is twice as { accurate / safe / pure / clean / sober } as X.

[10] Zimmer (1964) considers the question of whether the addition of negative affixes will produce a contrary (regular antonym) or contradictory (complementary). He finds that such affixes occur with both kinds of opposition. In my sample of 30 pairs, one of which contains a negative affix added to the other, 21 are complementaries, 7 are regular antonyms, and 2 are undecided.

Of course, where there is no measurement system, the interpretation must be non-literal and interpreted as 'more' or 'much more'. This correlation seems to hold, but in many cases I cannot decide if there is an endpoint or not. If a numerical measuring system has been or could be developed, e.g. to rate drivers as safe or dangerous, or to evaluate restaurants as clean or dirty, it would seem more natural to use a system of 'demerits' (which is equivalent to measuring the presence of the quality named by the marked member of the antonym pair). For measuring driving ability, for instance, many driver's tests give points for doing things wrong. Thus if driver A has 10 demerits and B has 20 demerits, we might say that B is twice as dangerous as A. (There may be some threshold level, however, so that 5 points off is still in the area of *safe*.)

Turning to the other antonyms, those which are not complementaries, it is predicted that the marked member is the absence of the unmarked, e.g. that shortness is the absence of length. (We have seen, however, that this property does not correlate perfectly with there being a middle interval, such that neither term applies.) Of the 80+ pairs, where the marked term could be characterized as the absence of the quality, only about a half seemed to have endpoints. Those with endpoints include those with measuring systems, but in many cases I found it hard to decide if there is an endpoint. Can something be so unripe or plain that nothing could be more unripe or plainer? Can someone be so powerless or unsociable that he couldn't be more so?

Before leaving the topic of quantity, it should be pointed out that not every pair of antonyms can be characterized such that one member of the pair denotes a quality and the antonym denotes the absence of that quality. In List 9 I have listed some of the pairs where it seems that each member implies the presence of some quality.

Consider *beautiful* and *ugly*, as applied to a garden or a park. A beautiful park has well-maintained trees, flowers, grass, and maybe some pieces of sculpture. (The exact application is pragmatic and subjective.) An ugly park

aggressive/defensive	friendly/hostile	pleasant/unpleasant
altruistic/egoistic	good/bad	pleasant/annoying
beautiful/ugly	happy/sad	pleasing/displeasing
dominating/submissive	kind/cruel	positive/negative
dominant/subordinate	late/early	pretty/homely
extroverted/introverted	nice/nasty	reassuring/frightening
feminine/masculine	nice/awful	reassuring/threatening
	optimistic/ pessimistic	

List 9

Neither member of the pair denotes the absence of the other

does not merely lack these things but has qualities of its own – perhaps litter, broken glass, billboards, and rusted-out automobiles.

This lengthy discussion on quantity shows that it is not a general property of antonyms that the unmarked member (according to other criteria) denotes more of a quality. There is a significant subgroup where the marked term denotes more. Cruse has called these 'gradable complementaries', but my sample suggests that complementarity is an independent parameter. And in other cases, both members of the pair have some contrasting qualities – it cannot be said that either one is the absence of the other.

3.9 Scalability and intensification. I will comment briefly on the scalability of the words in my sample and on the sample and on the kinds of intensifying modifiers they can take. Two syntactic/semantic tests I used were *very* and *absolutely*, to see if each of these intensifiers could modify each member of the antonym pair. Concerning *very*, since I was interested in gradable antonyms (and gradable complementaries), all the terms in my sample should be modifiable by *very*. In some cases, however, there is an asymmetry, so that one member of the pair allows *very* but the other does not. Another restriction is that *very* does not sound completely natural with adjectives that name the extreme part (or end) of a scale. *Very large* (*big, good, bad, small*) sound fine, but *very excellent, huge, terrible, miniscule* sound less good.

Absolutely and intensifiers such as *completely, perfectly, utterly* are appropriate for words at the extreme end but not good for words that name a half scale or the inner part of the scale from the middle, such as *warm* and *cool*. *Absolutely marvellous*, (*spotless, filthy, awful, huge, minuscule*) are much better than *absolutely good, bad, large, small, dirty* (Horn, 1972:115).

Where there is an asymmetry in the pair, we might expect that the member of the antonym pair that approaches zero would permit modification with *absolutely*, while the other member, with no endpoint, would not. In general there is a high correlation between using *absolutely* as a modifier and the adjective being one that approaches zero as a limit. Therefore, we can say *absolutely clean* (*safe, quite, dark*), more easily than *absolutely dirty* (*dangerous, noisy, bright*), where there does not seem to be a natural limit.

There are several classes of exception to this generalization. (1) For some of the core measure antonyms (*small, light, short*, etc.) zero is a theoretical limit, but if zero is reached, the quality does not apply at all. *Absolutely small, short, light* are unacceptable. (2) *Absolutely* is used in a 'quasi-technical' way to show that a certain criterial limit is reached. *Absolutely crazy* (*mad, drunk, guilty, false*) do not mean that the thing or person cannot be or have more of that quality, but that what it/he has suffices for being put in that class. If a theory is absolutely false, we do not mean that it could not be more false, only that, for our purposes, there is enough wrong with it so that we are not interested in further gradations of falsity. (3) Sometimes an adjective sounds all right with *absolutely*, even if there is no zero or endpoint, but *absolutely*

is not being used literally – it has the meaning rather of 'very, very', as in *absolutely pungent* (*dominating, egoistic, impractical*). (4) Finally, there may be some lexical exceptions. It sounds odd to say *A and B are absolutely similar.* English seems to lexicalize this concept as *the same* or *identical.* One says instead, *A and B are absolutely identical.*

As I mentioned, since gradability was a criterion for inclusion in my sample, most pairs of words are modifiable by *very.* List 10 presents the pairs which do not sound completely natural, although they can be processed by pragmatic strategies. When one hears *very useless*, one reasons that *useless* is being treated as gradable rather than categorical, comparable to *very unique, very perfect.*

Marked (by question criterion)

awful	insane	subordinate
empty	mad	useless
false	opaque	worthless
	powerless	

Unmarked in questions

impartial
unbiased

Neither is unmarked in questions

innocent	inferior
guilty	superior

List 10
Words which resist *very* as a modifier

Although my list does not include *true*, I am not sure whether *very true* differs in meaning from *perfectly true* or *completely true. Innocent–guilty, true–false* and *superior–inferior* are rather straightforward complementaries.

4. Summary and conclusion

We have looked at eight properties of markedness that have been predicted of antonyms. However, we see that markedness is not a general structural property of antonymy; rather it consists of a number of independent properties that are imperfectly correlated. However, none of these is in fact true of all antonym pairs. Neutralization of one member of the pair in questions is the commonest of the properties. Most of the statements can at best be taken as implicational; if one member of a pair exhibits property P, it will be the marked (or unmarked) member.

Some properties seem to follow from other facts about the meaning of the

words and/or the semantic structure. Proportional expressions, such as *twice as*, would be an example of this kind. I have also suggested that committedness (or bias), which marks as odd expressions like

(58) X is uglier than Y but both are beautiful.

might be explained by taking very seriously the notion of semantic space, where some words name a large part of a scale, sometimes the whole scale, while other words name only a small part of one end. Moreover, we must look more closely at what the quality in question is: sometimes a word denotes the presence of a quality, and at other times merely the absence of the quality named by the antonym. The kinds of modifiers permitted also seem to be related to the part or amount of the scale named.

Some of the properties have very weak effects and are easily overridden. An example would be evaluative connotation. And some properties are restricted to a small (relatively closed) set of words, e.g. measure phrases like *3 feet tall.*

Finally we can expect a residue – brute facts about antonym pairs which do not seem to follow from more general principles. Some of the facts involving committedness (or bias) seem to be of this sort. One issue related to committedness is whether this is a semantic or pragmatic problem. It is not clear to me whether a sentence like

(59) A is uglier than B.

Used when both A and B are beautiful and when B is more beautiful is false or simply misleading. If *uglier* → *ugly*, the inference is semantic. If the inference can be cancelled, as in (60),

(69) A is uglier than B, but I don't mean to imply that either is ugly.

it would be pragmatic. However, we can state the relevant information in the lexicon, leaving to future research the decision on whether it is semantic or pragmatic.

One question is: what should we do with these facts? (*Or*: how should we describe this information?) A more important question is, however: why should we bother with this kind of information? Is it of any interest in the process of understanding the structure and use of language?

With respect to the first question, how we should describe this information, one problem has to do with the proper component of the grammar. In recent years, philosophers and those linguists who follow philosophers have construed semantics very narrowly to a component that deals only with truth and reference. Therefore, these markedness properties would not be placed in semantics. Such facts would have been relegated to pragmatics as a wastebasket category. But for the most part, pragmatic theories have been concerned largely with speech acts and presuppositions. However, a promising line of development is Larson's use theory of language, where recognition is

given to all sorts of things we know about words: facts such that some words are rare, archaic, technical, slang, pejorative, etc. These kinds of facts are mentioned in unabridged dictionaries but neglected in contemporary semantic and pragmatic theory because linguists have not known what to do with them. Larson's theory could be expanded to include markedness information on antonym pairs. A lexical entry for each word with an antonym would include a cross-reference to that antonym and would state whether and when neutralization of the opposition occurs, just in those cases where the possibility of neutralization does not follow from general principles. In addition, the lexical entry for each term would state which part of the scale was covered by the term. This information would show that *hot* applies to just the outer part of the temperature scale and that *warm* applies to the portion between the middle interval and the part covered by *hot*. (See Lehrer & Lehrer, 1982 for a formal account of the semantics.) General principles will predict that *hot* will never be unmarked in questions or nominalizations and that it will be committed (biased).

The deeper question – why this sort of information is worth studying and describing – has to do with the kinds of inference that hearers make. An example can be found in the neutralization of the uncommitted (unbiased) words in comparatives. *X is taller* (*sweeter, narrower, friendlier*) *than Y* would not imply that *X is tall* (*sweet, narrow, friendly*). Other entailments depend on the structure and type of antonym. In the case of complementaries, e.g. *pure* and *impure*, the sentence *X is not impure* entails *X is pure*. In the case of contraries, as with *big* and *small*, *X is not big* does not entail *X is small*.

Of course, given the subtlety of many of these judgments, we can expect considerable variation among speakers, and I would conjecture that some misunderstandings occur when the inferences which a hearer makes do not match up with those the speaker makes (and expects the hearer to make).

An even deeper question is: why do some antonym pairs (those which Bolinger has called 'core') have a special privilege in that they satisfy all of the predicted properties of markedness outlined at the beginning of the paper? Answers to this question might be facilitated by looking at antonym pairs in a wide variety of languages to see whether the same phenomena exist, and to see whether the same semantic oppositions are neutralized under similar conditions. At least we would find out whether such neutralization is universal. (Hale's work on Walbiri (1970) suggests that it may be widespread.)

Answers to the very deepest question remain the most elusive: why do markedness distinctions exist at all anywhere in language: in phonology and syntax as well as in semantics? Perhaps when this question is answered in a satisfactory way we will be able to predict better the conditions under which neutralization of an opposition will occur, and which items will be affected.

APPENDIX I

Givón (1978) has suggested that there may be a lag between the emergence of a measuring system and the use of a term in phrases of the form Measure Quantity Adjective: *8 years old, three feet tall.* To see if those experts who regularly talk about these newer concepts use them in measure phrases, I sent a questionnaire to some members of the Physics Department at my university, asking them to judge the acceptability of sentences like

(1) (a) The music is 100 decibels loud.
(b) The air is 40% humid.

I also included sentences which, according to marking theory, everyone should reject, such as

(2) The sound is 10 decibels soft.

My hypothesis was that if the construction correlates with the existence of technical measures, then the experts who regularly deal with these measures

	Physicists ($N = 14$)		Linguists ($N = 10$)	
	No.	%	No.	%
The air is 40% humid	1+1	14	3	30
The air is 2% dry	1	7	2	20
The rock is 8 mohs hard	1	7	4	40
The pitch is 3000 Hertz high	0	0	3	30
The metal is 6.5 dense	0	0	0	0
The lamp is 100 lumens bright	4+1	36	6	60
The lamp is 1 lumen dim	1	7	1	10
The sandpaper is 100 grains coarse	2	14	2	20
The sandpaper is 400 grains fine	3	21	3+1	40
The sound is 100 decibels loud	1+1	14	5	50
The sound is 10 decibels soft	1	7	0	0
The metal is 0.7 reflective	3	21	4	40
The rope is 300 lb. per sq. inch strong	2	14	4+1	50
The view is 60 miles visible	0	0	0	0

* Numbers are for respondents who judged the sentences as normal (left) or as between normal and odd (right of '+').

Table 2
Questionnaire on acceptability judgments

would be more likely to use the new constructions than others. For comparison, the questionnaire was sent to a group of linguists.

Respondents were asked to make one of three judgments: sounds normal, sounds odd, sounds outlandish. Some respondents, however, placed their judgments in between two of the categories.

Sixteen physicists and ten linguists responded, and the results are presented in Table 2. (The order of sentence in the questionnaire was randomized and not that of the order of sentences in Table 2.) The numbers in the left-hand column for each group of respondents are for those who judge the sentence normal, and the number after the + is for those who judge it between normal and odd.

It is interesting that the linguists found these sentences more acceptable than did the physicists. (Perhaps thinking about ungrammatical and unacceptable sentences is an occupational hazard that increases one's toleration of marginal sentences.)

	Physicists	Linguists
Respondents who accepted 0 sentences	8	1
1	1	0
2	1	1
3	3	3
4	0	1
6	0	4
9	1	0

Table 3

Number of sentences (of possible 14) judged acceptable by each subject

Table 3 shows the number of sentences judge to be normal or between normal and odd by the two groups. Except for one physicist who accepted 9 of the 14 sentences, all respondents accepted less than half.

Appendix II

Analysis of Data

The symbols in the table are as follows: Y = Yes; N = no; ? = borderline; T = technical; P = peripheral; G = good; B = bad; R = ratio; I = interval; O (column 5) = ordinal; D (Columns 10 and 20) = neutral.

Columns 1–7 refer to the antonym pair; 8–17 refer to the unmarked member of the pair in questions (if there is one) and 18–27 refer to the marked member.

The tests are as follows (the members of the antonym pair which has the most unmarked properties appear first).
Col. 1 Is there an unmarked question?
Col. 2 Is there a mid-interval?
Col. 3 Does one member consist of a negative affix added to the other?
Col. 4 Is there a standard measurement system?
Col. 5 What kind of scale is involved?
Col. 6 Does the member on the left denote the absence of the property named by the member on the right?
Col. 7 Does the member on the right denote the absence of the property named by the member on the left?
Cols. 8 and 18 Can the form be modified by very?
Cols. 9 and 19 Can the form be modified by absolutely?
Cols. 10 and 20 What is the evaluative connotation?
Cols. 11 and 21 Is there an endpoint?
Cols. 12 and 22 Can form appear in Quantity Measure Adjective construction?
Cols. 13 and 23 Is the adjective committed (biased)?
Cols. 14 and 24 Can the form be used with twice as?
Cols. 15 and 25 Is there a morphologically related nominal?
Cols. 16 and 26 Is the form neutral in 'He told me about the —'?
Cols. 17 and 27 Can the form be used in measure phrases (NP be Measure Phrase) e.g. the table is three feet long?

	1–7		8–17			18–27			
	12345	67	8901	234	567	8901	234	567	Notes
ABSTRACT/CONCRETE	NNNNO	YN	YNON	NN?	Y?N	Y?OY	NYN	Y?N	
ABUNDANT/SCARCE	YYNYR	NY	YNGN	NYY	Y?N	YNBY	NNY	YNN	
ACCURATE/INACCURATE	YNY?R	YN	YYGY	NYY	YYN	YNBN	NNY	YYN	
ACTIVE/PASSIVE	YYNNO	NY	YNON	NYY	YNN	YYOY	N?N	YNN	
AGGRESSIVE/DEFENSIVE	YYNNO	NN	YNON	NNY	YNN	YNON	NNY	YNN	
AGILE/CLUMSY	YYNNO	NY	YNGN	NYY	YNN	YNBN	NNY	YNN	
AGGRESSIVE/TIMID	YYNNO	?Y	YNON	NYY	YNN	YNBN	NNY	YNN	
ALTRUISTIC/EGOISTIC	YYNNO	NN	YNGN	NYY	Y?N	YYBN	N?Y	Y?N	
AMBITIOUS/UNAMBITIOUS	YYYNO	NY	YNGN	NYY	Y?N	YYBY	NNN	?NN	a
AUSTERE/LUSH	NYNNO	YN	YYOY	NNY	YNN	YNGN	NNY	YNN	
BEAUTIFUL/UGLY	NYNNO	NN	YYGN	NNY	YNN	YYBN	NNY	YNN	
BIG/LITTLE	YYNNR	NY	YNON	NYY	N	YNOY	NYN	N	
BRAVE/COWARDLY	YYNNO	NY	YNGN	NYY	YNN	YNBN	NNY	YNN	
BRAVE/TIMID	YYNNO	NY	YNGN	NYY	YNN	YNBN	NNY	YNN	
BRIGHT/DARK	YYNTR	NY	YNGN	NYY	YNT	YYBY	NYN	YNN	
CALM/VIOLENT	YYNNO	YN	YYGN	NNY	YNN	YNBN	NNY	YNN	
CALM/AGITATED	YYNNO	YN	YYGY	NYY	YNN	YNBN	NNY	YNN	
CLEAN/DIRTY	YNNNO	YN	YYGY	NYN	YNN	YNBN	NNY	YNN	
CLEAR/HAZY	YNNTR	YN	YYGY	NYY	YYN	YNBN	NNY	YNN	
CLEVER/STUPID	YHNTI	NY	YNGN	N?Y	YNN	YNB?	NNY	YNN	
COLOURFUL/DRAB	YYNNO	NY	YNGN	N?Y	YNN	YNBY	NNY	YNN	
COMPACT/DIFFUSE	YNNNR	YN	YYOY	NYY	YNN	YNON	NNY	YNN	
COMFORTABLE/UNCOMFOARTABLE	YNYNO	NN	YNGN	NYY	YYN	YNBN	NNY	YNN	b
COMPLEX/SIMPLE	YYNNO	NY	YNON	NYY	YNN	Y?O?	NY?	YNN	
CONTROLLED/IMPULSIVE	YYNNO	Y?	YYGY	N?N	Y?N	Y?O	N?Y	YNN	
CONFORMIST/NONCONFORMIST	Y?YNO	NY	YYOY	NYN	YYN	YNON	NN?	YNN	
COORDINATED/CLUMSY	YYNNO	NY	YYGN	N?Y	Y?N	YNBN	NNY	YNN	
DEEP/SHALLOW	YYNYR	NY	YNON	YYY	YYY	YNOY	NYN	YNN	
DELICATE/RUGGED	NYNNO	NY	YNGN	NNY	YNN	YNON	NNY	YNN	
DIFFICULT/EASY	YYNNO	NY	YNON	NYY	Y?N	YNG?	NYY	YNN	
DISTINCT/VAGUE	YNNNO	NY	YYGY	NYN	Y?N	YNBN	NN?	YNN	

	1–7		8–17			18–27			
	12345	67	8901	234	567	8901	234	567	Notes
DOMINATING/SUBMISSIVE	NYNNO	NN	YYON	NNY	YNN	YYO?	NNY	YNN	
DOMINANT/SUBORDINATE	YYNNO	NN	YYO?	NYY	YNN	NYO?	NNN	YNN	
DRY/WET	NYNNR	YN	YYOY	NYN	Y?N	YNOY	NNY	YNN	
DRY/SWEET	NYNTR	YN	YYOY	NYN	Y?N	YNON	NYY	YNN	
DYNAMIC/STATIC	YNNNO	NY	YNGN	NNY	?NN	?YOY	NNN	?NN	
EVEN/UNEVEN	YNYNI	YN	YYOY	NYN	Y?N	YNON	NNY	YNN	
EXPENSIVE/CHEAP	YYNYR	NY	YNON	NYY	YYN	YNOY	NYN	YNN	c
EXTROVERTED/INTROVERTED	YYNNO	NN	YNON	NYY	YNN	YNON	NNY	YNN	
FAIR/UNFAIR	YNYNO	YN	YYGY	NYN	Y?N	YNBN	NNY	YNN	
FAITHFUL/UNFAITHFUL	YNYNO	N?	Y?GN	NY?	Y?N	YNBN	NNY	YNN	
FANCY/PLAIN	YYNNO	NY	YNGN	NYY	?NN	YYO?	NYY	YNN	
FAR/NEAR	YYNYR	NY	YNON	NYY	N	YNOY	NYN	YNN	
FAST/SLOW	YYNYR	NY	YNON	NYY	N	YNOY	NYN	YNN	
FAST/QUICK	YYNYR	NY	YNON	NYY	N	YNOY	NYN	YNN	
FAT/THIN	NYNYR	NY	YNBN	NNY	YNN	YNOY	NNN	YNN	
FEMININE/MASCULINE	NYNNO	NN	YNON	NNN	YNN	YNON	NNN	YNN	
FEROCIOUS/MEEK	NYNNO	N?	YNBN	NNY	YNN	YYO?	NNY	YNN	
FINE/COARSE	?YNTR	??	YNG?	NYY	YNN	YNON	NYY	YNN	
FLEXIBLE/RIGID	Y?NTO	??	YNON	NNY	YYN	YNOY	NN?	YNN	
FRESH/STALE	YYNNO	NY	YYGY	NY?	YYN	YNBN	NNY	YNN	
FRIENDLY/HOSTILE	YYNNO	NN	YNGN	N?Y	YNN	YNBN	NNY	YNN	
FRIENDLY/UNFRIENDLY	YYYNO	N?	YNGN	N?Y	YNN	YNBN	NNY	YNN	
FULL/EMPTY	YYNYR	N?	YYOY	YNN	YN?	?YOY	NNN	YNN	d
GENEROUS/SELFISH	YYNNO	N?	YNGN	NYY	YNN	YNBY	NNY	YNN	
GENEROUS/SKIMPY	YYN?R	NY	YNGN	NYY	YNN	YNBY	NNN	YNN	
GENEROUS/STINGY	YYNYR	NY	YNGN	NYY	YNN	YNBN	NN?	YNN	
GOOD/BAD	YYNNO	NN	YNGN	NYY	YNN	YNBN	NNY	YNN	
GRACEFUL/AWKWARD	NYNNO	NY	YNGN	NNY	YNN	YNBN	NNY	YNN	
GRACEFUL/CLUMSY	NYNNO	NY	YNGN	NNY	YNN	YNBN	NNY	YNN	
HAPPY/SAD	YYNNO	NN	YNGN	NNY	YNN	YNBN	NNY	YNN	
HARSH/MILD	NYNNO	NY	YNBN	NNY	YNN	YNGN	NNN	YNN	
HARD/EASY	YYNNO	NY	YNON	NYY	??N	YNON	NYY	YNN	e
HARD/SOFT	YYNTI	NY	Y?O?	NYY	Y?N	YNON	NYY	YNN	
HEALTHY/SICK	YNNNO	YN	YYGY	NYN	YYN	YNBN	NN?	YNN	
HEAVY/LIGHT	YYNYR	NY	YNON	NYY	YNN	YNON	NYN	YNN	
HELPFUL/UNHELPFUL	YNYNO	NY	YNGN	N?Y	YNN	YNBY	NNN	YNN	
HIGH/LOW	YYNYR	NY	YNON	YYY	YYY	YNON	NYN	N	
HONEST/DISHONEST	YNYNO	YN	YYGY	NYN	Y?N	YNBN	NNY	YNN	
HOT/COLD	NYNYI	NY	YNON	NNY	YNN	YNOY	NNY	YNN	
IMPARTIAL/PARTIAL	YNYNO	YN	NYGY	N?N	Y?N	YNBN	NNY	YNN	
IMPORTANT/TRIVIAL	YYNNO	NY	YNGN	N?Y	YNN	YYBN	NNY	YNN	
IMPORTANT/UNIMPORTANT	YNYNO	NY	YNGN	N?Y	YNN	YNBN	NNY	YNN	
IMPULSIVE/RESTRAINED	NYNNO	??	YNON	NYY	YNN	YYOY	NNN	YNN	
INDUSTRIOUS/LAZY	YYNNO	NY	YNGN	NYY	YNN	YNBY	NNY	YNN	
INTERESTING/BORING	YYNNO	NY	YNGN	NYY	YYN	YNBN	NNY	YNN	
INTELLECTUAL/ UNINTELLECTUAL	Y?YNO	NY	YNGN	NYY	YNN	YYBN	NNN	YNN	
JUST/UNJUST	YNYNO	YN	YNGY	NN?	Y?N	YNBN	NNY	YNN	
KIND/CRUEL	YYNNO	NN	YNGN	NYY	YNN	YNBN	NNY	YNN	
LARGE/SMALL	YYNYR	NY	YNON	NYY	N	YNOY	NYN	N	
LATE/EARLY	YYNYR	NN	YNON	YYY	YNN	YNON	YYY	?NN	
LIGHT/DARK	?YNTR	NY	YNO?	NYN	YYT	YYOY	NYY	YNN	
LONG/SHORT	YYNYR	NY	YNON	YYY	YYY	YNOY	NYN	YNN	
LOUD/SOFT	YYNTR	NY	YNON	NYY	YNN	YNO?	NYN	YNN	
LUSH/BARREN	NYNNO	NY	YNGN	NNY	YNN	YYBY	NNY	YNN	
MANY/FEW	YYNYR	NY	YNON	NYY	N	YNOY	NYN	N	
MATURE/IMMATURE	YNYNO	NY	YNGN	NY?	YYN	YYBY	NN?	YNN	
MORAL/IMMORAL	YNYNO	YN	YNGY	NYN	YYN	YNBN	NNY	YNN	
NEAT/MESSY	Y?NNO	YN	YNGN	NYY	YNN	YNBN	NNY	YNN	
NICE/NASTY	YYNNO	NN	YNGN	NNY	?NN	YNBN	NNY	YNN	
NICE/AWFUL	YYNNO	NN	YNGN	NYY	?NN	NNBN	NNY	?NN	
NOISY/QUIET	YYNTR	NY	YNBN	NYY	YNN	YYOY	NYN	YNN	
OBVIOUS/SUBTLE	Y?NNO	NY	YYOY	N??	YNN	YNON	NN?	YNN	
OLD/NEW	YYNYR	NY	YNON	YYY	N	YYOY	NYN	YNN	
OLD/YOUNG	YYNYR	NY	YNON	YYY	N	YNOY	NYN	?NN	
OPTIMISITIC/PESSIMISTIC	YYNNO	NN	YNGN	NYY	YNN	YNBN	NNY	YNN	
ORGANIZED/DISORGANIZED	YNYNO	NY	YYGN	NYN	??N	YNBN	NNY	YNN	f
OUTGOING/SHY	YYNNO	N?	YNGN	NYY	N	YNON	NN?	YNN	
PEACEFUL/VIOLENT	NYNNO	YN	YNGY	NNN	YNN	YNBN	NNY	YNN	
PLEASANT/UNPLEASANT	YYYNO	NN	YNGN	N?Y	YNN	YNBN	NNY	YNN	
PLEASANT/ANNOYING	YYNNO	NN	YNGN	NYY	YNN	YNBN	NNY	YNN	

	1–7		8–17			18–27			
	12345	67	8901	234	567	8901	234	567	Notes
PLEASANT/DISPLEASING	YYYNO	NN	YNGN	NYY	?NN	YNBN	NNY	?NN	
PLENTIFUL/SCARCE	YYNYR	NY	YNGN	NYY	YNN	YNBY	NNN	YNN	g
POSITIVE/NEGATIVE	NYNNO	NN	YNGN	N?N	YNN	YNBN	NNN	YNN	
POWERFUL/POWERLESS	YYYNO	NY	YNGN	NNY	YYN	YNBY	NNN	YNN	h
PRACTICAL/IMPRACTICAL	YNYNO	NY	YNGN	NYY	YYN	YYBN	NNY	YNN	
PRETTY/HOMELY	?YNNO	NN	YNGN	NNY	YNN	YNBN	NNY	YNN	
PUNGENT/BLAND	NYNNO	NY	YYON	N?Y	YNN	YYBY	NNN	YNN	
PURE/IMPURE	YNYNO	YN	YYGY	NYN	YY?	YNBN	NNY	YNN	
REASSURING/FRIGHTENING	NYNNO	NN	YNGN	NNY	YNN	YNBN	NNY	YNN	
REASSURING/THREATENING	NYNNO	NN	YNGN	NN?	YNN	YNBN	NNY	YNN	
RELAXED/TENSE	NNNNO	YN	YYGY	NY?	?NN	YNBN	NN?	YNN	
RICH/POOR	NYNYR	NY	YNGN	NNY	YNN	YNBY	NNN	YNN	
RIPE/GREEN	YYNNO	NY	Y?G?	NY?	Y?N	YYOY	NN?	YNN	
RIPE/UNRIPE	Y?YNO	NY	YYGY	NYY	YNN	Y?B?	NNN	YNN	
SAFE/DANGEROUS	Y?NNO	YN	YYGY	NYN	YYN	YNBN	NNY	YNN	
SANE/INSANE	YNYNO	YN	YYGY	NYY	Y?N	NYBN	NN?	YNN	
SANE/MAD	YNNNO	YN	YYGY	NYN	Y?N	?YBN	NN?	YNN	
SANE/CRAZY	YNNNO	YN	YYG?	NYN	Y?N	YYBN	NNY	YNN	
SERIOUS/HUMOROUS	?YNNO	YN	YYO?	NYY	Y?N	YNON	NNY	YNN	
SHARP/DULL	YYNNO	NY	YNGN	NYY	Y?N	Y?BY	NNN	YNN	
SHARP/BLUNT	YYNNO	NY	YNGN	NYY	YNN	YNB?	NNN	YNN	
SHINY/DULL	YYNTR	NY	YNON	NYY	YNN	YNO?	NNN	YNN	
SHREWD/NATIVE	YYNNO	Y?	YNON	NNY	YNN	YYBN	NNY	YNN	
SIMILAR/DIFFERENT	YNNNO	YN	YNOY	NYN	Y?N	YNON	NYN	YNN	
SMART/DUMB	YYNTI	NY	YNGN	NYY	?NN	YNBN	NNY	YNN	i
SMART/STUPID	YYNTI	NY	YNGN	NYY	?NN	YNBN	NNY	YNN	
SMOOTH/ROUGH	??NNO	?N	YYGY	NY?	YNN	YNBN	NNY	YNN	
SOBER/DRUNK	Y?NTR	YN	YYGY	NYN	Y?N	Y?BN	NNY	YNN	
SOCIABLE/UNSOCIABLE	YYYNO	NY	YNGN	NYY	Y?N	YNBY	NNN	YNN	
STABLE/UNSTABLE	YNYNO	NY	YYGY	NYN	YYN	YNBN	NNN	YNN	
STEADY/CAPRICIOUS	Y?NNO	?N	YYGN	NYY	YNN	YNON	N?Y	YNN	
STRAIGHT/CROOKED	Y?NTR	?N	YYGY	NYN	Y?N	YNBN	NNY	YNN	
STRONG/WEAK	YYNNI	NY	YNGN	NYY	YYP	YNB?	N?N	YNN	
STRICT/LENIENT	Y?NNO	NY	YNON	NYY	YYN	YNON	NYN	YNN	
STURDY/DELICATE	YYNNO	NY	YNGN	NYY	YNN	YNGN	NNY	YNN	
STURDY/FRAGILE	YYNNO	NY	UNGN	NYY	YNN	YNON	NNY	YNN	
SUCCESSFUL/UNSUCCESSFUL	YNYNO	NY	YNGN	NYY	Y?N	YNB?	NNN	?	j
TALL/SHORT	YYNYR	NY	YNON	YYY	?NN	YNOY	NYN	YNN	
THICK/THIN	YYNYR	NY	YNON	YYY	YYY	YNOY	NYN	YNN	
TIGHT/LOOSE	YYNNO	NY	YNO?	NY?	YNN	YNON	NY?	YNN	
TRANSPARENT/OPAQUE	YNNTI	YN	YYOY	NNN	YNN	NYOY	NNY	YNN	
TRUE/FALSE	YNNNO	YN	?YGY	NNN	YYN	NYBN	NN?	YNN	
UNBIASED/BIASED	YNYNO	YN	NYG?	N?N	?NN	Y?BN	NNN	?NN	k
USEFUL/USELESS	Y?YNO	NY	YNGN	NNY	YYN	NYBY	NNN	YNN	
USUAL/UNUSUAL	YNYNO	YN	YNOY	NYY	?NN	YNON	NYY	?NN	
VALUABLE/CHEAP	YYNYR	NY	YNGN	NNY	YY?	YNOY	NNN	YNN	l
VALUABLE/WORTHLESS	YYNNR	NY	YNGN	NNY	YY?	NYBY	NNN	YNN	
WARM/COOL	?YNYI	NY	YNGN	NYY	YNN	YNON	NYY	YNN	
WIDE/NARROW	YYNYR	NY	YNON	YYY	YYY	YNOY	NYN	YNN	
WISE/FOOLISH	YYNNO	N?	YNGN	NYY	YNN	Y?B?	NNY	YNN	
The following pairs are included for comparison, although they do not conform to the criteria for gradability set forth in this paper.									
BLACK/WHITE	NYNT	NN	YYBY	NNN	YNN	YYGY	NNN	YNN	
HEAVENLY/HELLISH	NYNNO	NN	NYGN	NNN	YNN	NYBN	NN?	YNN	
INNOCENT/GUILTY	NNNNO	YN	NYGY	NNN	YNN	?YBN	NN?	YNN	
PROFANE/SACRED	NNNNO	YN	?YON	NNN	YNN	YYGN	NNN	YNN	
SUPERIOR/INFERIOR	NYNNO	NN	?NGN	NNN	YNN	YNBN	NNN	YNN	

a Unambitiousness is marginal.
b Comfort is neutral; comfortableness is not.
c Expense is neutral; expensiveness is not.
d Empty = 'lack of something', but not lack of fullness. ¾ full/empty is acceptable; 3 bags full is marginal.
e Difficulty is a more neutral term than hardness.
f The most salient meaning for organization differs from that of the adjective.
g Plenty has a limited distribution.
h Power is neutral; powerfulness is not.
i The most salient meaning of dumbness is 'mute'.
j Strong appears peripherally in measures, as '10,000 men strong'.
k Unbiasedness is marginal.
l Unsuccessfulness is marginal.

REFERENCES

Bierwisch, M. (1967). Some semantic universals of German adjectivals. *FL* **3**. 1–36.

Bolinger, D. (1977). *Neutrality, norm, and bias*. Bloomington: IULC.

Clark, H. (1969). Linguistic processes in deductive reasoning. *Psychological Review* **76**. 387–404.

Clark, E. & Clark, H. (1977). *Psychology and language: an introduction to psycholinguistics*. New York: Harcourt, Brace, Jovanovich.

Cruse, D. A. (1976). Three classes of antonyms in English. *Lingua* **38**. 281–292.

Cruse, D. A. (1980). Antonyms and gradable complementaries. In Kastovsky, D. (ed), *Perspektiven der lexikalischen Semantik: Beitrage zum Wuppertaler Semantikkolloquium vom 2–3 Dezember, 1977*. Bonn. 14–25.

Dubois, J. (1964). Distribution, ensemble et marque dans le lexique. *Cahiers de Lexicologie* **4**. 5–16.

Ducháček, O. (1965). Sur quelques problèmes de l'antonyme, Cahiers de Lexicologie **5**. 55–56.

Geckler, H. (1980). Die Antonymie im Lexicon. In Kastovsky, D. (ed.), *Perspektiven der lexikalischen Semantik: Beitrage zum Wuppertaler Semantikkolloquium vom 2–3 Dezember*, 1977, Bonn. 42–69.

Givón, T. (1978). Negation in language: pragmatic, function, and ontology. In *Syntax and semantics: pragmatics*, Vol. 9.

Greenberg, J. (1966). *Language universals*. The Hague: Mouton.

Grice, P. (1975). Logic and conversation. In Cole, P. & Morgan, J. L. (eds), *Syntax and Semantics: Speech Acts*. New York: Academic Press. 41–58.

Hale, K. (1970). A note on a Walbiri tradition of antonymy. In Steinberg, D. & Jakobovits, L. (eds.), *Semantics: an interdisciplinary reader*, Cambridge: Cambridge University Press.

Horn, L. (1972). *On the semantics of logical operators* in English, UCLA Ph.D. dissertation. IULC, 1974.

Jackendoff, R. (1977). *$\bar{X}$ syntax: a study of phrase structure*. Cambridge, Ma: MIT Press.

Klooster, W. G. (1972). *The structure of underlying measure phrase sentences*. Dordrecht: Reidel.

Larson, T. (1983). A theory of non-illocutionary use. University of Arizona Dissertation. Bloomington: IULC, 1984.

Lehrer, A. & Lehrer, K. (1982). Antonymy. *Linguistics and Philosophy* **5**. 483–501.

Ljung, M. (1974). Some remarks on antonymy. *Lg* **50**. 74–88.

Lyons, J. (1968). *Introduction to theoretical linguistics*. Cambridge: Cambridge University Press.

Lyons, J. (1977). *Semantics*. Cambridge: Cambridge University Press

Pohl, J. (1970). Remarques sur les antonymes. In Cohen, D. (ed.), *Mélanges Marcel Cohen*. The Hague–Paris: Mouton, 185–192.

Riddle, E. M. (1984). A historical perspective on the productivity of the suffixes *-ness* and *-ity*. IVth International Conference on Historical Linguistics: Historical Semantics/Historical Word-Formation, Błazejewko.

Sapir, E. (1944). Grading: a study in semantics. In Mandelbaum, D. (ed.), *Selected writings*, Berkeley: University of California Press, 1951.

Van Overbeke, M. (1975). Antonymie et gradation. *La Linguistique* **11**. 135–54.

Waugh, L. (1982). Marked and unmarked – a choice between unequals. *Semiotica* **38**. 299–318.

Zimmer, K. (1964). *Affixal negation in English and other languages* (supplement) *Word* **20**. Monograph No. 5.

Zwicky, A. (1978). On markedness in morphology. *Die Sprache* **24**. 129–42.