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Adjectives

1 INTRODUCTION

In *The Cambridge Grammar of the English Language*, adjectives are characterized as expressions "that alter, clarify, or adjust the meaning contributions of nouns", in order to allow for the expression of "finer gradations of meaning" than are possible through the use of nouns alone (Huddleston and Pullum 2002, p. 526). At a general level, adjectives gain this capability in virtue of two main characteristics, one of which is semantic and one of which is syntactic. On the semantic side, they introduce properties. (Whether they actually denote properties is a question we will address in detail below.) On the syntactic side, they are able to function as modifiers, and so may (with some restrictions) combine recursively with nouns. The result of this combination is a new property which is typically (though not always) true of a subset of the entities that the original properties are true of, thereby providing a "finer gradation of meaning" than is possible using the noun alone. This simple picture hides many important and interesting complexities, however, which provide insights on several topics of central interest to both linguists and philosophers, including: vagueness, contextualism, relativism, compositionality, and the semantic analysis of significant phenomena such as modality. I begin with an examination of the distributional properties of adjectives, then summarize the most prominent analyses of their meanings, and finally conclude with a look at some of the roles that adjectives have played in reasoning about the issues and phenomena mentioned above.

2 DISTRIBUTION

As it turns out, determining exactly what is constitutive of the grammatical category 'adjective' is not entirely straightforward. There are a number of distributional tests that distinguish adjectives from other categories, as we will see below, but it is not the case that all terms that are traditionally classified as adjectives in a particular language satisfy all of these tests, and it is likewise not the case that the tests apply uniformly across languages to terms that otherwise share the semantic properties that are traditionally thought to be associated with adjectives. To keep

things simple, I will focus primarily in this section on adjectives in English, with a few comments here and there about the behavior of adjectives in other languages. The reader should keep keep in mind, however, that although all languages have terms that share the semantic properties of English adjectives, the distributional patterns of these terms can vary. (See Dixon and Aikenvald 2004 for a detailed discussion of the cross-linguisic properties of adjectives.) The resulting picture is one that raises a number of significant questions about the generality of certain mappings between meaning and form, which I will come back to at the end of the chapter.

The first identifying feature of adjectives involves their use as predicate terms. Like verbs, adjectives may supply the main predicate term in a sentence, and may even introduce their own arguments, as shown by examples like (1) and (2). (I'll assume here that the verb *be* in (1a) and (2a) is just providing a host for tense and agreement information, and is not playing a central role in the meaning of the predicate. Many languages do not require expression of this element in sentences like these.)

(1) a. That stone is weighty.
    b. That stone weighs a lot.

(2) a. The country is dependent on foreign oil.
    b. The country depends on foreign oil.

However, only adjectives can serve as the complements of the epistemic verbs *seem* and *appear*, as shown by the following contrasts (* denotes syntactic ill-formedness):

(3) a. That stone seems/appears weighty.
    b. * That stone seems/appears weigh a lot.

(4) a. The country seems/appears dependent on foreign oil.
    b. * The country seems/appears depend on foreign oil.

This test doesn't uniquely pick out adjectives, however: nouns (or rather noun phrases) can sometimes appear as the complement of *seem* and *appear*, especially when their meanings are in some sense scalar or evaluative. This is illustrated nicely in the following lines from *The Ship of Fools* by Sebastian Brandt (which appear on p. 294 of the 1962 edition of Edwin Zeydel's 1944 translation, published by Dover):

(5) He seems a burden, seems a pest
    To all his brood, a hateful guest,
    And yet it almost serves him right,
    For he's a dull and witless wight.

A second diagnostic, which distinguishes adjectives from both nouns and verbs, is the possibility of direct composition with degree words like *rather, very, too, so, enough, how*. For example, of the related terms *dependent, depend* and *dependence*, only the first can directly combine with the excessive degree marker *too*:

(6) a. The country is too dependent on foreign oil.
b. * The country too depends on foreign oil.
c. * The country has too dependence on foreign oil.

(6b-c) can be repaired by first combining *too* with *much* (and in the case of (6b), moving the whole thing to the left of the verb, deriving *depends too much on foreign oil* or *depends on foreign oil too much*), but this only serves to illustrate the point that it is only the adjectival form *dependent* that can directly combine with the degree word. It should be emphasized, though, that adjectives accept composition with degree words only to the extent that they are associated with concepts that are, or can be, thought of as scalar, in a sense to be discussed below.

Perhaps the most central diagnostic for the class of adjectives is the one that is implicit in Huddleston and Pullum's functional/semantic characterization of adjectives as expressions that "alter, clarify, or adjust the meaning contributions of nouns": adjectives can directly compose recursively with nouns, forming more complex constituents, which may then combine with other elements (e.g., a determiner or possessive nominal) to form a noun phrase, as in (7a-c).

(7) a. a blue ball
b. a round blue ball
c. a large round blue ball

Such uses of adjectives are referred to as instances of ATTRIBUTIVE MODIFICATION. In some languages, adjectives may only be used attributively. For example, in the Yanaria language of New Guinea, adjectives may directly combine with nouns, as in (8a), but they may provide the main predicate of a sentence only if they compose first with a nominal element meaning 'thing, matter', as shown in (8b); omission of this element results in ungrammaticality.

(8) a. haga' dote'na
tasty food
'tasty food'
b. ma'i egemo haga-na-e'
this banana tasty-thing-PRED
'This banana is tasty.' (Lit. *This banana is a tasty thing.*)

Even English includes a number of adjectives that have only attributive uses, such as *former, mere, principal* and *main*:

(9) a. This is our former/principal/main objective.
b. * This objective is former/principal/main.

The existence of expressions like these has led some researchers to hypothesize that the attributive use of adjectives is in some important sense basic, a point to which we will return in detail below. However, like the other tests, this one also has exceptions, though they are few and appear to be systematic. For example, there is a class of adjectives which includes *asleep, awake, alone* (sometimes called *a*-adjectives, for obvious reasons) which can appear as complements of *seem* and *appear*, but are barred from attributive position:

(10) a. * Kim photographed two asleep/alive polar bears.
b. Kim photographed two sleeping/living polar bears.

There are, in addition, languages which require noun-modifying adjectives to first combine with a predicative element, effectively turning them into relative clauses (and calling into question their status as adjectives to begin with; see Baker 2003).

Cases like these show that the possibility of attributive modification is not a necessary condition for adjective status, but it is generally agreed that it is a sufficient one. Nevetheless, some care must still be taken in applying this test. Nouns may also combine directly with nouns, as in *eyeball*, *tennis ball*, *home run ball*, or *medicine ball*, but in a way that is different from adjectives in two respects. First, the interpretation of such structures (referred to as NOUN-NOUN COMPOUNDS) is variable and often context dependent: an eyeball is a part of the body that has the shape of a ball; a tennis ball is a ball used for playing tennis; a home run ball is a ball that was hit for a home run (e.g., *Barry Bonds' 756th home run ball was auctioned for $752,467*); a *medicine ball* could be a ball of medicine, a ball used to deliver medicine, or a piece of gym equipment. Attributive adjective modification, in contrast, gives rise to much more systematic and restricted interpretations, as we will see in detail below.

Second, attributive adjectives are different from nouns in compounding structures in that the former cannot occur outside the latter:

(11) a. a majestic towering home run ball
b. * a majestic home run towering ball
c. * a home run majestic towering ball

In contrast, attributive adjectives can often be reordered without compromising syntactic well-formedness:

(12) a. a majestic towering home run
b. a towering majestic home run

Interestingly, it is not the case that attributive adjective ordering is fully unrestricted. For example, the default order of the adjectives *numerous, inefficient* and *American* as attributive modifiers is as in (13a); orders in which *numerous* is non-initial are ungrammaticsal (13b-c); and an order in which *American* precedes *inefficient* is acceptable just in case *American* is understood contrastively or in focus. For example, (13d), with stress on *American* (indicated by capitalization), would be acceptable as an answer to the question *Are there a lot of inefficient cars on the road?*

(13) a. There are numerous inefficient American cars on the road.
b. * There are inefficient numerous American cars on the road.
c. * There are inefficient American numerous cars on the road.
d. There are numerous AMERICAN inefficient cars on the road (but not so many JAPANESE ones).

These ordering restrictions are robust cross-linguistically, holding both in languages like English, where adjectives precede nouns, and in a mirror-image fashion in languages in which nouns precede adjectives, though the underlying reasons for the distribution are not well-understood (see Demonte 2008, Svenonius 2008 and Cinque 2010 for recent discussion).

Sometimes multiple orders are possible, but result in significant differences of interpretation. For example, *wild Minnesotan rice* denotes quantities of uncultivated or unruly rice, which stands in some relation to Minnesota (most likely it was grown there, though other interpretations are possible), while *Minnesotan wild rice* denotes quantities of zizania palustris (which is in fact not a species of rice). The relative order of the adjective and the noun, when two orders are possible, can also affect meaning. Consider, for example, (14), in which the adjective can either be interpreted nonrestrictively, as in (14a), or restrictively, as in (14b) (Bolinger 1967; Larson and Marušič 2004).

(14) All of his unsuitable remarks will be eliminated from the final text.
a. All of his remarks will be eliminated; they are unsuitable.
b. All (and by implication, only) those of his remarks that are unsuitable will be eliminated.

When the adjective occurs postnominally, however, only the restrictive interpretation is available:

(15) All remarks unsuitable (for publication) will be eliminated from the final text.

The examples in (16), discussed originally by Bolinger (1967) (see also Larson 1998, Cinque 1993, 2010, Demonte 2008, and Morzycki 2008), show a similar sensitivity to the relative order of the noun and the adjective.

(16) a. The visible stars include Capella, Betelgeuse and Sirius.
b. The stars visible include Capella, Betelgeuse and Sirius.

(16a) is truth-conditionally ambiguous: it can be understood as a claim about which stars are visible at the time of utterance, or as a claim about which stars are intrisically visible (e.g., capable of being seen by the naked eye). At noon on a sunny day, (16a) would (normally) be false on the first reading and true on the second. (16b), in contrast, is unambiguous: it has only the 'currently visible' reading, and would be false in the sunny day context. This suggests that the ambiguity in (16a) does not reflect an ambiguity in *visible*, but rather has something to do with composition. This conclusion is further strengthened by the contrast between (17a) and (17b).

(17) a. The invisible visible stars include Betelgeuse.
b. ?? The visible invisible stars include Betelgeuse.

(17a) means that Betelgeuse is among the stars which can generally be seen but are currently invisible, which is a perfectly coherent thing to say. (17b), on the other hand, sounds a bit odd (indicated by the '??'), because it involves definite reference to a set of stars that are currently visible and intrinsically invisible, which is a combination of properties that is difficult to have, and possibly even contradictory. As pointed out by Larson (1998), these facts show that the 'current' vs. 'intrinsic' distinction is not (or not only) a function of the relative ordering of the adjective and the noun, but (also) reflects more subtle facts about adjective-noun composition.

Taken together, examples like these show that subtle differences in structure can affect the truth conditions of sentences with attributive adjectives, a fact that must be kept in mind when constructing arguments — either linguistic or philosophical — based on the interpretations of such constructions. Superficially simple structures sometimes hide an underlying complexity, which must be taken into account by reasoning based on the meanings of those constructions and the elements they contain.

3 MEANING

I said above that adjectives introduce properties. Two kinds of facts suggest that adjectives also denote properties. First, as we have already seen, adjectives may

provide the main predicate in a sentence. Second, we often see entailments from the attributive form to the predicative form, as in (18).

(18) a. Cosmo is a hairy brown dog.
b. Cosmo is hairy.
c. Cosmo is brown.

We do not need to know anything about dogs to know that (18a) entails (18b-c). If we later learn that Cosmo is not merely a dog, but also a Westminster Kennel Club champion, we may also justifiably conclude from (18a) that he is a hairy brown Westminster Kennel Club champion. If (18a) involves the ascription of three properties to Cosmo (being a dog, being brown and being hairy), these patterns of reasoning follow.

Adjectives that give rise to such reasoning patterns are often referred to as INTERSECTIVE. Not all adjectives are intersective, however, a fact that introduces challenges for the idea that adjectives as a class denote properties. Consider the following examples, from Partee 1995. Knowing that (19a) is true does not justify the conclusion in (19b), because it could be the case that the only respect in which Francis is skillful is in his role as a surgeon, in which case we would accept the former but most likely deny the latter.

(19) a. Francis is a skillful surgeon.
b. Francis is skillful.

(20) a. Francis is a violinist.
b. Francis is a skillful violinist

Similarly, the combined truth of (19a) and (20a) do not license the conclusion in (20b): Francis could be a very skillful surgeon and still have only limited facility with the violin. Intuitively, *skillful* in (19a) and (20b) picks out just the subset of surgeons and violinists who are skillful *as surgeons* and *as violinists* respectively. As a result, we cannot conclude from the truth of e.g. (19a) that Francis is skillful in any other way. Partee (1995) labels adjectives like *skillful* SUBSECTIVE, since composition of the adjective with a nominal constituent returns a subset of the denotation of the nominal, but in a way that does not support the same inferences as with intersective adjectives: all intersective adjectives are subsective, but not all subsective adjectives are intersective.

In addition to intersective and subsective adjectives, there is a third group of what Partee calls NONSUBSECTIVE adjectives including *former, alleged, fake, possible, ersatz* and so forth, which are neither intersective nor subsective. The set of objects that satisfy the description *former president of the United States* is neither

the intersection of the set of former things (if that even makes sense) with the set of presidents, nor is it a subset of the set of presidents. Similarly, a *fake identification* is arguably not an identification at all. (Nonsubsective adjectives like *fake* which imply exclusion from the noun meaning are sometimes called PRIVATIVE.)

A number of researchers, including Lewis (1970), Wheeler (1972), Cresswell (1973) and Montague (1974), have taken the existence of non-intersective interpretations of adjectives as evidence that adjectives do not denote properties, but rather must be analyzed as expressions that map properties into new properties. (Others have adopted a more nuanced view whereby attributive uses involve such a meaning, while predicative uses denote properties; see Siegel 1976 for a sophisticated implementation of this kind of account, and the kind of linguistic data that can be brought to bear to support it). In some cases (the intersective adjectives), the output is just the conjunction of the input with a property introduced by the adjective; in others (the non-intersective ones), the adjective determines the output property in a more complex way, as we have seen. Furthermore, apparent predicative uses of adjectives are analyzed as deriving from an underlying attributive source, so that what is predicated of the subject in e.g. (19b) is not the property of being skillful, but rather the property of being *a skillful one*, where the value of the anaphor *one* is filled in contextually. English is thus analyzed on a par with languages like Yagaria (see (8b) above), the only difference being that the surface syntax obscures rather than reflects the the underlying form.

The attributive analysis of adjectives represents a kind of "generalization to the worst case" strategy, which can be found elsewhere in compositional analyses of English (cf. the analysis of proper names as generalized quantifiers in Montague 1974). The advantage of such an approach is that it allows for a general theory of lexical types and compositional operations, and if the general goal is to show that the semantic properties of natural language can be accounted for within a compositional framework, the strategy is a reasonable one. (Though see Kamp 1975 for a critical assessement of the explanatory power of the attributive analysis.) The disadvantage of such an approach is that in effectively building noun-dependency into the meaning of the adjective, the uniformity hypothesis doesn't leave much space for complex structural effects on meaning of the sort we observed in the previous section for adjectives like *visible*. At the same time, it can lead to an over-simplistic assessment of the data, when a more sophisticated analysis of both noun and adjective meaning can provide us with ways of explaining patterns like those above without adopting the attributive analysis of adjective meaning.

Consider, for example, (21a), which is ambiguous between the reading in (21b), in which the adjective is subsective, and the one in (21c), in which the adjective is intersective.

(21) a. Lee is a beautiful singer.
b. Lee sings beautifully.
c. Lee is a singer who is beautiful.

Larson (1998) shows that this ambiguity can be captured straightforwardly without positing an attributive semantics for adjectives — i.e., by maintaining the hypothesis that adjectives denote properties — by extending Davidson's (1967) well-established analysis of adverbial modification in action sentences to adjectival modification. Specifically, nouns like *singer* are analyazed as relations between events and individuals, and adjectives are analyzed as properties of either events or individuals. In some cases, the syntax of the surface form determines exactly what kind of argument the adjective has: in (21b) it is an event, and in (21c) it is an individual. (The addition of the suffix *-ly* is also syntactically conditioned.) In others, such as (21a), the syntax is compatible with either option, resulting in ambiguity. Depending on which option we choose for the adjective, we derive the truth conditions in (22a-b) for the sentence, which correspond to the readings in (21b-c), respectively.

(22) a. $\exists e[\textbf{beautiful}(e) \wedge \textbf{singer}(\textbf{lee}, e)]$
b. $\exists e[\textbf{beautuful}(\textbf{lee}) \wedge \textbf{singer}(\textbf{lee}, e)]$

Larson's analysis shows how one kind of subsectivity can be handled by appealing to a more sophisticated theory of noun meaning; a different kind of subsectivity, manifested by adjectives that encode scalar concepts, referred to as GRADABLE ADJECTIVES, can be handled by appealing to a more complex view of adjective meaning. Consider, for example, the adjective *tall*. The truth of (23a) does not guarantee the truth of (23b); likewise, knowing that (23a) is true and knowing that Julian is a basketball player does not allow us to conclude (23c).

(23) a. Julian is a tall jockey.
b. Julian is tall.
c. Julian is a tall basketball player.

Facts like these lead to the conclusion that *tall* does not denote a property on its own; instead, *tall* comes to denote a property only after determing a "threshold" or STANDARD of height that an object must reach in order to count as tall, which is itself computed on the basis of a relevant set of objects, or COMPARISON CLASS (Kamp 1975; Klein 1980; Kennedy 2007). To say that Julian is a tall jockey, in other words, is to say that he is a jockey who is tall relative to the standards for jockeys, which does not entail that he is tall relative to some other standard or comparison class. In particular, this does not entail that he is a tall relative to whatever standard

is appropriate for basketball players, so we are not licensed to conclude (23c), even if we know that Julian is a basketball player.

One way of accounting for facts like those in (23) is to adopt an attributive analysis of adjectives, whereby the noun provides the comparison class for the adjective. On this view, *tall* denotes a function from properties to properties of the form in (24), where **stnd** picks out an appropriate value from the set of heights we get by applying the **height** function to the objects in the denotation of the noun (cf. Klein 1980; Heim and Kratzer 1998; a proper version of this analysis would need to intensionalize the comparison class, of course).

(24) $\lambda P \lambda x.\textbf{height}(x) \succeq \textbf{stnd}\{\textbf{height}(y) \mid P(y)\}$

However, a closer look at the distributional properties of adjectives like *tall* shows that this is not the only possible analysis of their meanings, or of facts like those in (23). As the following examples show, a central characteristic of gradable adjectives is that they can appear in a variety of constructions are linked semantically by encoding different notions of degree: relations to measures, comparison relations, relations of sufficiency and excess, and so forth.

(25) a. Julian is four feet tall.
b. Julian is taller than Sterling.
c. Julian is as tall as we expected him to be.
d. Julian is too tall to fit in the box.
e. Julian is tall enough to reach the ceiling.
f. Julian is so tall that he has to buy special clothes.

These kinds of facts have led many researchers to hypothesize that gradable adjectives do not express relations between properties (or whatever the proper semantic conception of noun meanings is) and properties, but rather relations between more abstract representations of measurement, or DEGREES, and properties (see e.g. Bartsch and Vennemann 1973; Seuren 1973; Cresswell 1976; von Stechow 1984; see Klein 1991 and Bale 2009 for detailed discussions of how degrees can be related to equivalence classes of individuals). The most common implementation of this view posits the denotation in (26) for *tall*, where d is a degree of height.

(26) $\lambda d \lambda x.\textbf{height}(x) \succeq d$

On this view, the function of the complex constituents that combine with the adjective in the examples in (25) is to fix the value of the degree argument, thereby providing a standard of comparison, and turning the adjective into a property that holds of an object if its height exceeds the relevant standard. The predicate in

(25a), for example, denotes the property of having a height that exceeds the degree denoted by *four feet*; the comparative construction in (25b) denotes the property of having a height that exceeds the degree of Sterling's height; and so on. Importantly, the complex constructions denote properties, and indeed behave intersectively in attributive position: (27a) entails (27b), and if Sterling and Julian are basketball players as well as jockeys, we may also draw the conclusion in (27c). (Prenominal comparatives also presuppose that the nominal predicate applies to both the target and standard of comparison, but this is an independent fact which follows from the syntax and compositional semantics of comparatives; see Bresnan 1973.)

(27) a. Julian is a taller jockey than Sterling.
b. Julian is taller than Sterling.
c. Julian is a taller basketball player than Sterling.

Paradoxically, in this kind of analysis, it is unmodified occurrences of gradable adjectives of the sort seen in (23a-c) that present the trickiest analytical challenge, since there is no constituent in the surface form to saturate their degree arguments and turn them into properties. The usual approach is to hypothesize a phonologically null, "positive degree" morpheme which does this job, by existentially binding the degree argument and imposing the restriction that it come from a degree on the scale above a certain threshold. How exactly this threshold is identified, and the extent to which it is determined based on discourse context and linguistic context (e.g., by the fact that an adjective is used attributively vs. predicatively, or by lexical semantic properties related to the kind of scale the adjective uses), are issues that are resolved differently in different analyses (see Kennedy 2007 for a comparison of approaches). The end result is that non-intersectivity in examples like (23a-c) is accounted for not by hypothesizing a function-argument relation between the adjective and the noun, but by hypothesizing a more complex semantic analysis of the adjective (phrase).

That said, it should be acknowledged that, like the attributive analysis, this approach also gives up on the idea that adjectives (the gradable ones, at least) denote properties. Instead, gradable adjectives denote relations between individuals and scalar values (degrees), and come to denote properties only through composition with something that saturates their degree arguments. This has the analytical advantage of providing a ready account of complex constructions like those in (27) (though such constructions have also been analyzed in non-degree analyses, which begin from semantic assumptions about adjective meaning on a par with (24); see below for details). It also has certain theoretical advantages in the analysis of phenomena of interest to philosophers, such as vagueness and context-dependence, a point I return to below. However, it has a significant disadvantage from a purely

linguistic perspective: if gradable adjectives do not directly denote properties, but come to do so only through composition with special degree-saturating morphology, then why is it the case that in all the languages of the world that we know of, the linguistic form that we think of as introducing the "core" property associated with the word — the property of being tall, large, rich, happy, and so forth — is never marked by overt morphology? This is a question which so far has not been given a satisfactory answer by proponents of degree-based semantic analyses of gradable adjectives.

4 PHILOSOPHICAL INTEREST

Adjectives have played a prominent role in a number of philsophical discussions of aspects of human language, as I will document in this section, but perhaps the most prominent is their role in the characterization and analysis of vagueness (chapter 4.13). The problem of vagueness is essentially the problem of being unable or unwilling to say of any single point along an ordering generated by the meaning of a particular term whether that point separates the things that the term is true of from the things that it is false of. Vagueness is not a feature of adjectives alone, but adjectives provide a particularly rich empirical ground for investigating it, because so many of them fall into the class of gradable adjectives discussed in the previous section, and so (in their basic, unmodified forms) introduce properties that are true of false of objects depending on their position on a scale.

A central question in work on gradable adjectives and vagueness is whether vagueness is the defining characteristic of the class, with their other significant properties, such as the possibility of forming comparative constructions like those in (25), arising as a result of this feature, or whether vagueness is derived. The first view is seen in the work of Wheeler (1972), Kamp (1975), Klein (1980), van Benthem (1982), and most recently by van Rooij (in press), who provide compositional semantic analyses of various kinds of comparative constructions in terms of an initial analysis of gradable adjectives as vague property terms. This approach has the advantage of explaining the apparent morphological universal mentioned at the end of the previous section: if there is a difference in morphosyntactic complexity between the positive and comparative form of an adjective, it is always the latter that is complex. (Though it should be noted that many languages — probably the majority — do not make a morphosyntactic distinction between the forms; see Ultan 1972.)

The second view is associated with degree-based analyses of gradable adjectives of the sort discussed in the previous section: since adjectives do not denote properties at all, but rather relations between individuals and degrees, there is no

sense in which the basic meanings of the terms are vague. Instead, vagueness is introduced compositionally through the mapping of such relations to properties. In particular, if this mapping is achieved through composition with a phonologically null "positive" morpheme, as described above, this opens up the analytical possibility of associating vagueness with the particular semantic features of this morpheme, a move advocated and justified by Fara (2000) and Kennedy (2007, in press).

Adjectives have also played an important role in discussions of the implications of variable judgments about truth for theories of meaning. Recent work on semantic relativism (see chapter 4.15) has focused extensively on differences in truth judgments of sentences containing adjectives of personal taste like *tasty* and *fun* (see e.g. Richard 2004; Lasersohn 2005; MacFarlane 2005; Stephenson 2007; Cappelen and Hawthorne 2009), and researchers interested in motivating contextualist semantic analyses have often used facts involving gradable adjectives (recall the judgments in (23) which show that the threshold for what "counts as" tall can change depending on whether we are talking about jockeys or basketball players) to develop arguments about the presence (or absence) of contextual paramters in other types of constructions, such as knowledge statements (see e.g. Unger 1975; Lewis 1979; Cohen 1999; Stanley 2004, and chapters 3.7 and 4.14). Other researchers have attempted to account for the apparent context sensitivity of these examples without importing context dependence into the semantics (see e.g. Cappelen and Lepore 2005).

More radically, Charles Travis (1997; 1985; 1994) has used judgments about the truth of sentences containing color adjectives to argue against the view that sentences determine truth conditions. Instead, according to him, the semantic value of a sentence at most imposes some necessary conditions under which it may be true (as well as conditions under which it may be used), but those conditions need not be sufficient, and the content of the sentence does not define a function from contexts to truth. However, Travis' argument goes through only if it is the case if the truth conditional variability introduced by color adjectives cannot be linked to a context-dependent element in its logical form or to an underlying ambiguity. And indeed, there are responses to his work which argue for each of these positions based on careful and sophisticated linguistic analysis of color adjectives (see e.g. Szabó 2001; Rothschild and Segal 2009; Kennedy and McNally 2010).

The significance of adjectives for general questions about compositionality in language goes well beyond cases like Travis'. Two additional kinds of phenomena are of particular interest. The first involves sentences like the following, in which the adjective *slow* seems to be contributing a different shade of meaning depending on the sort of thing it is predicated of: a slow quarterback is one who runs (or maybe executes plays) slowly; a slow road is one on which traffic moves slowly; a slow song is one with a slow tempo; and a slow book is one that takes a long time

to read.

(28) a. Tom Brady is a slow quarterback.
b. Lake Shore Drive is a slow road during rush hour.
c. *Venus in Furs* is a slow song.
d. *Remembrance of Things Past* is a slow book.

In each case, the meaning contributed by the adjective appears to be systematically related to a kind of activity that is conventionally associated with the meaning of the noun. This has led some researchers to hypothesize that the compositional relation between adjectives and nouns can be even more complex than what we saw above for *beautiful singer*, and in particular that it requires a highly articulated lexical semantic structure for nouns (see e.g. Pustejovsky 1991, 1995; see Fodor and Lepore 1998 for an opposing view).

The second kind of case involves examples in which prenominal adjectives appear to have interpretations outside of the noun phrases in which they appear. For example, adjectives like *occasional, sporadic* and *rare* can syntactically compose with a noun but have a sentence-level interpretation as an adverb of quantification, as in the following passage from a 1989 article in the *Chicago Tribune* (where the adverbial occurrence in the third sentence highlights the fact that the adjectival use in the second sentence has a sentence-level meaning):

(29) "I used to be a pretty good Scotch drinker," [Tower] said. "I haven't tasted Scotch in 12 years. After that I had only wine and perhaps an occasional martini, occasionally a little vodka with smoked salmon or caviar or something like that. But that was just occasionally."

Prenominal *average* provides an even more striking example of this kind of phenomenon: (30a) (from a post on answers.bloglines.com) means that the average number of people in an American family is 3.14, and so does not give rise to the bizarre inference that there are actual families which contain 3.14 people, in contrast to (30b), which does give rise to this inference.

(30) a. The average American family consists of 3.14 people.
b. # The typical/normal/usual American family consists of 3.14 people.

The fact that (30a) has the meaning that it does indicates that *average* can somehow compose at the sentence level with the numeral and a measure function (which returns the number of whole people in an American family), rather than directly with the property denoted by *American family*. The analytical challenge presented by these cases is to show that the actual meanings can be compositionally derived from

the surface forms without resorting to ad hoc stipulations and construction-specific rules; this project is undertaken by Stump (1981); Larson (1998); Gehrke and McNally (2009) for *occasional* and related terms, and by Carlson and Pelletier (2002) and Kennedy and Stanley (2009) for *average*. While the analyses advocated in these different papers are distinct, they collectively illustrate a theme that is present in much of the work on adjectives described in this paper: that the semantic properties of adjectival constructions are often more complex than superficial appearances indicate, and must be interpreted against the backdrop of a sophisticated linguistic analysis.

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