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AGAINST COMPOSITIONALITY: THE CASE
OF ADJECTIVES*

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It is often claimed that natural language is in general compositional, in the sense that the meaning of a complex expression is a function of the meanings of its constituent parts; or, to put this so-called principle of compositionality in other words, in the sense that an expression makes a uniform semantic contribution to all the compound expressions in which it is embedded. Thus formulated, the principle is rather vague, since its exact content depends on the sense of 'function of' or of 'uniform semantic contribution,' as well as on one's understanding of the notion of meaning. Indeed, the principle, which is usually traced back to Frege, appeared in the literature in a variety of versions.¹

An intuitive paradigmatical example of this yet ill-defined principle, is the relationship between an adjective-noun expression and its constituent adjective and noun. The English adjective 'red,' for example, is said to make the same contribution to the meaning of the expression 'a red bird,' 'a red chair,' and any other English sentence in which the word 'red' appears; excluding, of course, idioms and metaphors, and perhaps some other special cases. However, it is exactly this seemingly obvious case of compositionality, namely that of adjectives, which I would like to question in the present paper. I will argue that an examination of how adjectives behave in natural language reveals that their semantic contribution to the meaning of the whole in which they are embedded varies non-systematically across linguistic contexts.

To see this, it is first necessary to make the notion of compositionality more precise. But since it is only adjectives that interest us here, it will suffice to characterize a notion of compositionality with respect to adjectives only, and in a sufficiently broad way so as to cover the majority of the common versions of the principle.

As to the notion of 'meaning' which appears in the principle, I will leave it an open question what meanings are. For the present purpose,

we can use, instead of the problematic notions of meaning and semantic contributions, the notion of the *applicability conditions* of an adjective: the conditions that have to be satisfied by any object under any (correctly ascribed) noun in order for the adjective to correctly apply to that object; for example, the conditions under which an object is describable by 'red N,' for any noun N. After all, it is obvious that if two adjectives differ in their applicability conditions, then they also differ in their meaning (though perhaps not vice versa). Thus, instead of talking of 'a uniform semantic contribution,' we can interpret the principle broadly as requiring at least that every adjective has uniform applicability conditions in all the normal compound expressions in which it appears (excluding, of course special cases). Intuitively speaking, the idea is that the conditions that a table has to meet in order to be describable by 'red table' should be the same conditions that a house or a book has to meet in order to be describable by 'red house' or 'red book.' However, since the meaning of an expression may be context-dependent, the same should go for applicability conditions. The conditions that make something good or unique in one context should be allowed to be different from those that make something good or unique in another context, as long as there is a general rule for each adjective which specifies that context-dependency. Hence, by requiring that the applicability conditions of an adjective be *uniform* across all linguistic contexts, the principle should be understood as requiring that for every adjective there is a general function from contexts to applicability conditions. In that sense of a context-dependent notion of 'uniform,' the compositionality principle with respect to adjectives is the principle that every adjective has uniform applicability conditions across all compound expressions in which it is embedded. I take it that this formulation is broad enough to be accepted by most proponents of the different versions of the principle of compositionality. Intuitively, it says only that for any adjective there should be a general rule that specifies the conditions under which it can be applied to an object under a given noun.

One motivation for the compositionality principle for natural language is that it allows for a theoretically elegant account of the semantics of compound expressions. Another consideration is based on the argument that compositionality is necessary for the learnability of

natural language.² However, in this paper I will not address directly any argument for compositionality. Instead, I will argue that as a matter of fact, adjectives behave in a non-compositional way. This will be, of course, an indirect challenge to such arguments. For, if the conclusion of an argument is false, then the argument cannot be sound.

APPLICABILITY CONDITIONS OF ADJECTIVES

It is well known that the conditions under which many evaluative adjectives such as 'good' or 'beautiful' are applicable, depend on the noun to which the adjective is applied. What is beautiful for a girl is not beautiful for a tree, and what it is for a dog to be good differs from what it is for a couch or an apple to be good.³ I do not refer here to another well known fact, that the applicability conditions of scalar adjectives, that is, ones which denote magnitudes such as 'long' or 'tall,' are scale-relative; that, for example, what is tall for a skyscraper is not tall for a man, and what is old for a turtle is not old for a car. What I have in mind is, rather, that different *types* of conditions, not just different magnitudes of the same condition, count towards the applicability of an adjective. A good knife, for example, is one that is sharp and is made of hard material, but a good man or a good apple is not sharper or blunter or made of a harder or softer material.

Several writers have pointed out isolated examples of other, non-evaluative adjectives whose applicability conditions are also noun-dependent. Quine pointed out that a red apple is red on the outside while a pink grapefruit is pink on the inside, and Partee took that example to be similar to the case of 'flat' which applies differently in 'flat tire,' 'flat beer' and 'flat note' (although it seems to me that it is more reasonable to regard the last two cases as mere metaphorical uses of 'flat').⁴ What is not sufficiently appreciated, however, and sometimes even denied, is that virtually all adjectives behave in much the same way, and there seems to be no one fixed set of criteria determining their applicability to different objects. Keenan and Faltz, for example, explicitly claim that color and shape adjectives are noun-independent.⁵ This, I think, is false, as the following examples will show. I should ask to be excused for the large number of examples that I give here. At the risk of being tedious, I intend them to demonstrate that the phenome-

non of noun-dependence applies to adjectives in general, and not just to isolated special cases.

Consider the adjective 'red.' What it is for a bird to count as red is not the same as what it is for other kinds of objects to count as red. For a bird to be red (in the normal case), it should have most of the surface of its body red, though not its beak, legs, eyes, and of course its inner organs. Furthermore, the red color should be the bird's natural color, since we normally regard a bird as being 'really' red even if it is painted white all over. A kitchen table, on the other hand, is red even if it is only painted red, and even if its 'natural' color underneath the paint is, say, white. Moreover, for a table to be red only its upper surface needs to be red, but not necessarily its legs and its bottom surface. Similarly, a red apple, as Quine pointed out, needs to be red only on the outside, but a red hat needs to be red only in its external upper surface, a red crystal is red both inside and outside, and a red watermelon is red only inside. For a book to be red is for its cover but not necessarily for its inner pages to be mostly red, while for a newspaper to be red is for all of its pages to be red. For a house to be red is for its outside walls, but not necessarily its roof (and windows and door) to be mostly red, while a red car must be red in its external surface including its roof (but not its windows, wheels, bumper, etc.). A red star only needs to appear red from the earth, a red glaze needs to be red only after it is fired, and a red mist or a red powder are red not simply inside or outside. A red pen need not even have any red part (the ink may turn red only when in contact with the paper). In short, what counts for one type of thing to be red is not what counts for another. Of course, there is a feature that is common to all the things which count (non-metaphorically) as red, namely, that some part of them, or some item related to them, must appear wholly and literally redish. But that is only a very general necessary condition, and is far from being sufficient for a given object to count as red.

Color adjectives are not special in the noun-dependence of their applicability conditions. First, to mention them again, evaluative adjectives like 'good' or 'pretty' apply differently to different objects. Second, in the case of adjectives which, like color predicates, denote physical properties, the part of the object relevant to the applicability of the adjective varies across types of objects. A blunt knife, for example, has

a blunt blade regardless of the bluntness of its handle, a flat foot is flat in its bottom surface, and a hot car has a hot engine (or, in other contexts, a hot interior) even though the rest of the car may be freezing cold. What is square in a square face are the contours of the chin, cheeks and forehead as they appear from the front, while a square house is square when looked at from above, and a square screwdriver has a square end. And third, there are many other adjectives that do not clearly fall under any particular category, which behave similarly. A slow animal is one which runs slowly, a slow student is one who grasps slowly, and a slow oven is one which cooks slowly. A tall man is tall regardless of whether he is standing or sitting or lying most of the time, while a tall building is tall only if it stands upright. A sad person is not distinguished by his intonation as is a sad voice, nor does he need to refer to tragic events as does a sad story. And a strong man is not unbreakable like a strong metal bar, and does not blow forcefully as a strong wind does. This is not to deny that there are intimate connections between the ways an adjective applies to different objects. It is only to say that despite the similarity, its applicability conditions differ considerably in different linguistic contexts.

INAPPLICABILITY OF ADJECTIVES

Not only do adjectives apply differently to different objects, furthermore, many adjectives do not apply to many objects at all. Thus, for example, there is no conventional condition under which the expressions 'a straight house,' 'a soft car,' or 'a quiet stone' are applicable; not to mention the more obvious cases in which the noun is abstract while the adjective is not, such as 'a tall love' or 'a red idea,' or vice versa, 'a gradual rat' or 'an intense tree.' Notice, that the point is not that houses are never straight or that trees are never intense in the same way that trees never breath or talk. Rather, we have no agreed upon conception of what it would be for a house to count — or to fail to count — as straight, or for a rat to be gradual.

The fact that many adjectives lack conditions of applicability to some nouns, is well known.⁶ But it is important to see that the reason for it is not that the meanings of the former are somehow inherently incongruent with the meanings of the latter, as in 'a square circle.' For we can

easily imagine simple scripts in which a linguistic community associates non-metaphorical applicability conditions to many expressions which presently lack such conditions. In a community where the front halves of cars are made of varying material, and the softness of the material is regarded as important for safety and as a major factor in the value of the car, the expression 'a soft car' would naturally and literally denote cars whose front halves are made of soft materials. And in a world in which rats are constantly changing in appearance, but some change more abruptly than others, the expression 'a gradual rat' may be naturally applied to the latter. (And don't object that the meaning of the gradualness of a rat in this case is different from what 'gradual' normally means, since as we saw, there is no one simple, fixed meaning common to all applications of an adjective to begin with.)

This implies that the reason that some adjectives do not have conditions of applicability to some nouns is not that there is some intrinsic incongruence between the individual meanings of the noun and the adjective, but simply because we have not had the occasion and interest to assign them applicability conditions. And this suggests again that the applicability conditions of an adjective are a patchwork of merely related, and not uniform, conditions.

APPLICABILITY CONDITIONS AND COMPOSITIONALITY

The noun-dependence of the applicability of adjectives suggests, I think, that adjectives have non-compositional semantics, in the sense that their applicability conditions (and thus their semantic contribution to the expression in which they are embedded) varies from one linguistic context to another in a way that cannot be analyzed in terms of a general (not vacuously disjunctive) rule or function. However, the transition from noun-dependence to non-compositionality is not a trivial step, and *prima facie* there is a natural way to try to avoid it: to absorb the noun-dependence into the meaning, and thus into the applicability conditions of the adjective. This way, the applicability conditions of an adjective would be dependent upon the linguistic context, but would not vary across linguistic contexts.

One version of this idea, suggested by Partee, is to construe the

meaning of an adjective as an enumeration of the different ways it applies to different types of objects.⁷ This view can be called *the enumerative analysis of adjectives*. Alternatively, one may try — as did Ziff, and later Fodor and Pylyshyn — to capture the factors that determine the applicability conditions by making the meaning of an adjective sensitive not to the type of object to which it applies, but to the respect in which the object is most interesting or salient.⁸ The view can therefore be called *the respectival analysis of adjectives*.

The problem with these two analyses is that even if correct, they would not help the cause of compositionality. They only push the threat of non-compositionality one step back. For it can readily be seen that just as an adjective does not have noun-independent applicability conditions, neither do the expressions that are used in the proposed analyses. The analyses therefore leave us with the same noun-dependence with which we started.

1. *The Respectival Analysis of Adjectives*

Let us first examine the respectival suggestion. As Fodor and Pylyshyn express the view: “‘Good NP’ means something like *NP that answers to the relevant interests in NPs*: a good book is one that answers to our interest in books (viz. it’s good to read); a good rest is one that answers to our interest in rests . . . the meaning of ‘good’ is syncategormatic and has a variable in it for relevant interests . . .”⁹

How should this analysis apply to other, non-evaluative adjectives? Perhaps it might be thought that ‘red’ means something like: red in the manner and in the parts whose color is most interesting or salient in this type of object. And ‘square’ means something like: approaching squareness to a larger extent than an average object of this type, with respect to its interesting or salient contours.

That the prospects of this position are not great can be seen from the simple observation that ‘salient’ and ‘interesting’ are themselves adjectives, and as such are noun-dependent. Consequently, although it is hardly deniable that a red house is indeed red in a salient respect or in a respect that interests us, the conditions which make the color of a

house salient or interesting are different from the conditions which make the color of a crystal, pencil, or bird salient or interesting. The analysis therefore fails to provide applicability conditions that are uniform for different types of objects.

More specifically, according to the suggested analysis, the reason red houses are red outside is that the color of their external surface is most interesting or salient. Now, the sense in which a red house is more saliently or interestingly red outside than inside, is that the red covers most of its external appearance, and thus captures the eye when the house is seen from the outside. However, a red crystal is not saliently or interestingly red in that same way. What makes a red crystal red is not just the sensory conspicuousness of its redness, since a crystal whose surface only is red — or worse, which is painted red — is not really a red crystal. Its color is salient or interesting probably in that it determines its type or value. Red houses and red crystals are therefore saliently or interestingly red in different respects: the former in its sensory conspicuousness, while the latter in a more cognitive way, with respect to its geological significance. To try explain the difference between the redness of houses and the redness of crystals in terms of salience or interest therefore only transfers the problem of the multiplicity of respects in which objects may be red to the multiplicity of respects in which objects may be salient or interesting.

One might object that the difference between the redness of houses and that of crystals is not a difference in the *respect* in which the redness is salient or interesting, but only in the *object* of interest or salience. It is simply a result of the fact that different parts interest us in houses and in crystals. But that would not do. We are interested in the color of the interior of a house, that is, in the colors of its rooms, no less than we are interested in the color of its external surface. Nevertheless the color of the inside of houses does not normally count towards the color of the house, whereas the color of the inside of crystals does.

Unlike the cases of houses and crystals, a red pen is red not because its redness is more conspicuous in its appearance, nor because of any geological or chemical interest in it, but because of our interest in its function: producing marks on paper. But on the other hand, a brush is not colorful even though its function is to lay colorful marks on

surfaces, and neither is a potion whose function is to enhance the greenness of plants necessarily green.

The same phenomenon applies to other, non-color adjectives too. A square book is saliently or interestingly square in the sense of sensory conspicuousness; but a square house has many shapes that are not square, such as the shape of its external walls, which are much more conspicuous than its horizontal cross section. The squareness of a house depends, therefore, not on the pure sensory conspicuousness of its shape (unlike its color which is determined by pure sensory conspicuousness), nor on our interest in its function, but on some kind of architectural interest; which, it is worth noting, is not our everyday interest in houses. The strength of a wind is salient or interesting from the point of view of our interest in its effects, while the strength of a metal bar is salient or interesting from the point of view of our interest in its function, and a strong color is strong in the sense of some kind of sensory impression. Even the adjective 'good' does not mean answers our interests in that kind of object, as Ziff and later Fodor and Pylyshyn suggest, since we are normally interested also in properties which do not count towards the goodness of the object. A pornographic book might answer some of our interests in books although we would not regard it as a good book, and an ancient golden knife might answer our interest in cutlery although, being dull, it would not be regarded as a good knife.

More generally, just as there is no unitary respect in which all red objects are red, there is no reason to expect that there is a unitary respect in which all salient or interesting things are salient or interesting. For one thing, different types of interest and salience often conflict with each other, and these conflicts are resolved in different ways for different types of objects. Furthermore, in many cases it is not even clear what type of interest or salience it is which picks out the object's relevant respect. The contours which make a round face round, for example, are clearly not salient or interesting in any functional sense, nor are they more conspicuous in appearance than the profile's contours; and it is far from clear what type of salience or interest determines that a man is fat if his belly rather than his face or legs are fat.

Thus, analyzing adjectives in terms of interest or salience cannot help get rid of the problem of noun-dependence, since what counts as salient or interesting is different for different objects no less than what counts as red or square.

2. *The Enumerative Analysis of Adjectives*

A similar problem applies to the second of the above mentioned analyses, in terms of enumerative meanings: it uses an expression that is no less noun-dependent than the analyzed adjective itself.

The basic idea of the enumerative analysis is that to apply an adjective to an object is to say that depending upon the type of object in question, a certain specified aspect of the object (e.g. its shape, or its function, its part, its environment) has some specified property.¹⁰ The adjective 'red,' for example, is analyzed as meaning something like: having an external surface which is red if it is a non-transparent solid inanimate object, having a red inner volume if it is a fruit whose inside only is edible, etc.

Note that the adjective 'red' is analyzed here in terms of redness (of various parts of the object). But that should not be seen as a problem. For, the redness that is mentioned in the analyses can be construed as redness in some restricted, unitary sense, which does not vary from object to object. Specifically, since it seems that every red object is red in some surface and/or in some volume in it or pertaining to it, we can analyze all 'red' occurrences in terms of this restricted redness — redness in the sense in which a surface or a volume is red. Using the notion of *primitively red* for this sense of redness, a more precise formulation of the enumerative analysis of 'red' would be something like: having an external surface which is primitively red if it is a non-transparent solid inanimate object, having a primitively red inside if it is a fruit whose inside only is edible, etc.

The same should be applicable to other adjectives. To say that something is square, for example, is to say that the contours of its functional part are primitively square if it is a tool, that its contours as seen from above are primitively square if it is a building, and so on. And since the way in which an object's surface or volume is primitively

red does not differ from object to object, it might seem that the analysis does indeed get rid of the noun-dependence of adjectives which threatens compositionality.

However, a closer look will reveal that this not the case. For there is another problematic expression that is used in the suggested analysans. If, as we saw, the idea is to explain away the noun-dependence by analyzing an adjective as meaning something like: having an aspect which is primitively A if the object is a B . . . , then the formulation of the analysans will necessarily consist of an expression denoting an aspect-of relation between the object and its aspect: 'the surface *of* an object,' 'an object *having* a blade which . . . ,' 'its function is . . . ,' 'the object's contours are . . . ,' 'an object *whose* environment is . . . ' In fact, since, as we saw, many analysans must be rather complex, it is clear that in many of them several aspect-of expressions will be used, for example, '*having* walls *whose* external surface is . . . '

But now, the problem is that the applicability conditions of aspect-of expressions — 'of,' 'having' 'its' 'whose,' and their equivalents — are noun-dependent no less than the applicability conditions of the analyzed adjective itself. And if so, then what it is for one thing to be *of* another thing differs from object to object, no less than what it is for something to be describable by 'red' or 'square.' All that the proposed analysis manages to do is push the problem of noun-dependence one step further.

To see this, consider, for example, the expression 'has a primitively red external surface,' which is presumably supposed to be used in the analysis of 'red.' Since I am not concerned here with the compositionality of nouns such as 'surface,' we may grant, for the sake of the argument, that there are uniform conditions which make something count as a surface, or even as an external surface. The question arises, however, what it is that makes a given surface the surface *of* some given object, rather than that of another. After all, there are many surfaces, and even *external* surfaces, in the world, including a great number of them in any given object. To take the example of a bird, the surface of the bird's beak, of its kidneys, of its feathers, and of its brain — not to mention surfaces in the bird's environment — are all surfaces, and even external ones. But although they are in the bird's body, they do not

count as the external surfaces of the bird, but rather as those of its kidney, feather, brain. In virtue of what conditions is a given surface the surface of, say, the kidney, and not of the bird?

Now, the answer to that question should specify the *general* conditions for of-ness relations between any two items, and not only between birds and their surfaces. For, as we saw, an aspect-of expression is supposed to be used in virtually every analysis of an adjective. The analysis will therefore help the cause of compositionality only if aspect-of expressions behave more nicely than adjectives; which is to say, only if what it is for one object to be of another is not different for different types of objects, as is what it is for an object to be red or square.

But now, if we examine the conditions under which one object counts as being of, or being had by, another, we discover that what it is to have one type of object is different from what it is to have another type of object. And that should not be surprising. For although aspect-of expressions are, grammatically speaking, not adjectives but rather prepositions ('of') or verbs ('have'), they are similar to adjectives in their function, in that they express a predicate which applies to objects.

Consider, for example, what it is for something to be *of* a bird. For a surface or a bottom to count as being *of* a bird, it must be part of the bird's body; but a behavior or a nest or a mate *of* a bird need not. Furthermore, even being part of the bird's body is not a sufficient condition for the bird's surface or bottom, since not every surface or bottom in the bird's body is the bird's surface or bottom. As we saw, a surface or a bottom in a bird may be the beak's or the kidney's. As a matter of fact, if we allow science-fiction-like cases, it is not even enough for a feather or a leg to be part of the bird's body in order for them to count as the bird's feather or leg. Some birds may have body cells with tiny feathers, or corpuscles which move around in their blood stream with the help of tiny legs. Clearly, although these would be parts of the bird's body, they would not be the bird's feathers or legs. Note that it is not the fact that these object are too small or too deep inside the bird that disqualifies them from being the bird's. Lungs, for example, are the bird's lungs even though they are inside the bird's body, and so are body cells, even though they are microscopic.

Similarly, if a table is made of (a bird's) wings or (a zebra's) hide, that does not make any part of the table the table's wings or the table's hide. The wipers' motor in a car is not the car's motor, and a tail does not become my tail if I swallow it. Not every wall in a house is the house's wall, and not every shape in a face is the face's shape. In order for something to count as a leg or a head or a wall *of* an object, it has to serve a function specific for the object, or to be situated in the right place in it, or to be connected in the right way to other parts of the object, or in general to satisfy various conditions which vary from object to object. The situation is even worse for aspect-of relationship to aspects that are not parts. It is hard to see anything in common between the of-ness relationships in the case of the function of a knife, the job of a person, his birthday, his friend, and his weight.

It seems, therefore, that whether one object counts as being of another object depends on what type of object they are. And what this means is that the attempt to analyze adjective-noun expressions in terms of aspects of objects cannot eliminate the noun-dependence of applicability conditions. What it is for an object to be describable by 'red' differs for different objects no less than what it is for an object to have a primitively red surface, or primitively square contours.

NOUN-DEPENDENCE AND NATURAL LANGUAGE ANALYSIS

What all this suggests is that neither the enumerative nor the respectival analyses of adjectives can save compositionality from the problem of the noun-dependence of adjectives. What they both do is transfer the noun-dependence of the analyzed adjective to the noun-dependence of the expressions used in the proposed analyses, and thus leave us with the same threat to compositionality with which we started. Is there then some other way to save compositionality? A partial answer is that at the very least it seems that no analysis that captures the meaning of adjectives *by using natural language expressions* can do the job. For, any such natural language expression should comprise no aspect-of expression, no underspecified interest- or salience-adjectives, and more generally no adjective that applies non-primitively to an object. And as far as I can see, no plausible analysis is possible under these restrictions.

One might be tempted to think that an analysis of adjectives that uses

only nouns and verbs might be possible. But this suggestion does not seem to work. One reason for this is that nouns and verbs are not sufficient to capture the meaning of many adjectives. How can one analyze what it is for an object to be red or square without using either adjectives or aspect-of expressions? Of course, you can *define* new nouns or verbs which will capture the meaning of an adjective, for example, define 'a redder' as meaning: an object which is red. But then, the applicability conditions of such newly defined expressions will inevitably inherit noun-dependence from the expressions used in their definition.

Another reason why this suggestion would not work is that at least many verbs are as noun-dependent as adjectives. For a hat to be ruined is for it to have unremovable stains or holes or wrinkles, unlike what it is for a clock or a city to be ruined. Giving someone a glass of water involves handing it without necessarily transferring ownership, unlike giving someone a house or an idea or a name. Opening a door is moving it to uncover an opening which it hides, while opening a box is moving only a part of it to uncover a hollow inside it, and opening a newspaper is spreading its pages, unlike opening a fruit or an eye or a wound.

It must be admitted that there are a number of verbs which at least on the surface do not seem to display noun-dependence. The verb 'walk,' so it seems, applies to anything that moves on its legs on the solid ground, and the verb 'eat' applies to anything that inserts food through its mouth into its digestive system. The same is true for many other verbs denoting human actions. However, it is important to note that what is common to the applicability conditions of such verbs is that they are defined in terms of various functionally characterized organs of the agent. Indeed, when we encounter expressions such as 'the tree walked,' or 'the tree talked,' the only way to make sense of them is to assume that the tree has the relevant organs, namely, legs in the first case and a mouth in the second. But if this is so, and the applicability conditions of such verbs are defined in terms of parts or aspects of the object, then we are back to the problem of noun-dependence of aspect-of expressions. Since the aspect-of relationship is not a uniform relationship, verbs which are defined in terms of it do not have uniform applicability conditions either. Thus, the recourse to verbs not only fails to help compositionality, it even makes it worse, by suggesting that noun-dependence applies to verbs too.

What remains of the suggestion to analyze adjectives by using only compositionally behaving expressions, is that the analysis can use only nouns, and the very few adjectives and verbs that might prove to be an exception to the noun-dependence rule. But those seem to be hardly enough resources for carrying out such a comprehensive analysis of all the adjectives and verbs in natural language. There does not seem to be any way to analyze what it is for an object to be red or square without using adjectives, verbs, or aspect-of relationships.

EXPELLING NOUN-DEPENDENCE FROM SEMANTICS

At this point, it might be tempting to think that if the noun-dependence of adjectives cannot be eliminated, then it can at least be made harmless to the principle of compositionality, by viewing it as belonging to the pragmatics of adjectives, and not to their semantics. An adjective such as 'red,' according to this idea, means something like what I called 'primitively red'; that is, red in the way that only a small number of objects are red, presumably red surfaces or red volumes. Strictly speaking, therefore, only surfaces and transparent bodies can be red. All other objects which in ordinary language we call 'red' — what we call 'red apples,' 'red books,' etc. — are not really red. We *call* them so for various pragmatical reasons, but strictly speaking, inaccurately and falsely. The case can be compared to that of the expression 'there are a thousand people in the audience.' The fact that we often use this expression for audiences that we know are only roughly of a thousand people, does not mean that 'a thousand' means roughly a thousand. It is therefore not part of the semantics of an adjective that we apply it differently to different objects, and so noun-dependence is not a counterexample to the principle of compositionality.

One problem with this suggestion is that if it is to be more than a vacuous trick, a reason has to be given for why so many sentences that we ordinarily take to be true should be viewed as being really inaccurate and false. The presumption should be that what speakers who are in command of the facts take to be true is true, unless shown otherwise. And I can see no good way of showing this in the case of adjectives. In particular, the familiar argument that compositionality is required for the learnability of language will not help here. The learnability of the

problematic behavior of 'red' will not be explained merely by calling it pragmatics rather than semantics.

Furthermore, on the face of it, the suggestion seems rather implausible. When we use an expression such as 'there are a thousand people in the audience' in a way that is strictly speaking false or inaccurate, there must be room for greater accuracy. One can, for example, ask the speaker to be more precise. But there seems to be no parallel in the case of adjectives. If someone describes a car as red or a knife as sharp, then it makes no sense to ask him to be more precise about the way in which it is red or sharp (although it makes sense to ask him to be more precise about *magnitudes*: the exact shade of red, or the degree of sharpness). In fact, if after describing his knife as sharp the speaker adds 'more precisely, the sharpness of my knife is only in its blade, not in its handle,' then that will be accepted at most as a joke. And if there is no room for greater accuracy in the use of the adjective, then no inaccuracy has been there in the first place.

Moreover, when a sentence, such as 'there are a thousand people in the audience,' is used inaccurately and strictly speaking falsely, the hearer can complain that it was misleading. But again, there seems to be no parallel in the case of adjectives. If I tell someone that my knife is sharp, and the hearer, upon seizing the knife, disappointedly complains that I misled him into thinking that the handle of the knife is sharp too, we would ordinarily say that he simply does not understand what 'sharp knife' *means*.

For these reasons, it seems that the noun-dependence of the applicability of adjectives is due to their meaning, and not to the inaccurate way in which we apply them. Admittedly, I rely here on our ordinary linguistic intuitions, which need not be infallible. But until some good reason is given for rejecting them, the idea of banishing noun-dependence to pragmatics seems to be unacceptable.

CONCLUSION

All this is not intended to be a knock-down argument against the compositionality principle, but only to show that the common approaches which are often used to support it are unsatisfactory. This leaves open the possibility that the principle could be defended in some

other way. But as far as I can see, that is possible, if at all, only at the price of ad hoc, unmotivated, or implausible claims.

Specifically, at least three defenses of the principle seem to be still open. First, it might be thought that adjectives in different contexts can be regarded as distinct words with different meanings, so that the lack of uniformity between their applicability is no longer embarrassing. 'Red' in 'red house' and 'red' in 'red apple' are simply two distinct words. Second, it might be thought that even though the uniform applicability conditions (and meaning) of an adjective cannot be satisfactorily analyzed by using natural language expressions, they might still be analyzable in theoretical terms. The common element between all the applicability conditions of an adjective would then be regarded as a theoretical posit, presumably some theoretically specifiable property. And third, the common element between the applicability conditions of an adjective can be construed as a primitive which is properly analyzable neither in theoretical nor in natural language terms.

It remains to be investigated whether any of these approaches, and possibly others, can work. But it seems to me that none of them is very appealing. The first position is especially implausible, since it seems to contradict the obvious fact that the meanings of an adjective across normal linguistic contexts are intimately related. And if the word 'red' in one context is a different word from 'red' in another, then it is unclear how this intimate semantic relationship can be explained. Furthermore, the position also seems to make the learnability of language — the speaker's ability to use his understanding of one 'red' to gain understanding of another 'red' — unexplainable by compositionality alone; which undermines one of the main motivations for the compositionality principle.

As to the other two alternatives for rescuing compositionality, they have the burden of explaining why, if adjectives do have uniform applicability conditions, these conditions systematically escape analysis in natural language terms. Furthermore, if compositionality is to help explain the learnability of natural language, then it has to be assumed that the speaker somehow uses the alleged uniform applicability conditions as criteria for the use of adjectives. But then it is rather mysterious why despite the speaker's mastery of such (alleged) uniform criteria, his natural language resources are systematically insufficient to provide a

uniform characterization of these criteria. It seems more plausible that there simply are no such criteria.

Further discussion is needed to evaluate the plausibility of these positions. But the moral of the discussion is that in any case, compositional meanings of adjectives, even if there are such, can no longer be accounted for in a straightforward way, as simple, isolable semantic building blocks, as it might be tempting to view them. A much more complicated account is required. Indeed, it is my opinion that unless one is willing to believe in such bizarre monsters as adjectives that are individuated by their linguistic contexts, or primitive applicability conditions, adjectives should be construed as having a non-compositional semantics. While the applicability conditions and thus the meanings of an expression in different linguistic contexts ordinarily have a uniform context-independent element, they also have a surprisingly large component that differs non-systematically from context to context.

But there is another *prima facie* reason against those rather forced defenses of the principle of compositionality. Psychologically speaking, it seems quite clear what the cognizer does when applying an adjective in a newly encountered linguistic context: he uses analogies or similarity relationships to go from familiar linguistic contexts to new ones. One can figure out that, for example, a red box is red outside by making an analogy — and not a trivial one — to red houses and balls, but not to red crystals or watermelons. But now, it seems that nowhere in this psychological story is there any room for a uniform mental state which is the apprehension of the applicability conditions of 'red.' The speaker does not seem to use, psychologically speaking, any single criterion for applying 'red.' Now, of course, there is no automatic translation of psychological stories to semantic theories. But it seems that some strong parallel should exist between the two. And if so, then it seems reasonable to expect that what makes a red box or crystal or watermelon red is something that has to do with a network of similarity relationships to paradigmatical cases, and not with some unitary semantic unit. This is of course not a conclusive argument. But it suggests that an account of the semantics of adjectives based on family resemblance or similarity relationships, instead of on compositionally behaving fixed semantic building blocks, might prove better for dealing with the noun-dependence of adjectives.

NOTES

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¹ See for example Frege, G., (1960), Montague, R., (1970), and Janssen, T. M. V., (1986).

² Davidson, D., (1965); Leeds, S., (1979).

³ See for example Ziff, P., (1960), chapter 6, mainly on the adjective 'good'; Austin, J., (1962), chapter 7, on the adjective 'real.'

⁴ Quine, V. W. O., (1960); Partee, B., (1984), pp. 289—290.

⁵ Keenan, E. L., and Faltz, L. M., (1985), pp. 122—123.

⁶ Chomsky, N., (1965), chapter 4.

⁷ Partee, (1984), pp. 289—290.

⁸ Ziff, (1960), chapter 6; Fodor, J. and Pylyshyn, Z. W., (1988), pp. 42—43.

⁹ Fodor and Pylyshyn, (1988), pp. 42—43.

¹⁰ See Partee, (1984), p. 290, who expresses the idea by suggesting that the meaning of an adjective is determined by an enumerative function whose values depend on the properties of the object to which the adjective applies.

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