

Constructions of Degree Modification in English and Japanese: A Semantic Functional Analysis*

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1. Introduction

In generative grammar of the 1970's, the syntax of degree modification, together with the syntax of comparative constructions, was analyzed in detail especially in terms of such syntactic categories as "Quantifier Phrase" (QP) and "Degree Phrase" (DegP). The syntactic category QP was introduced by Bresnan (1973) to refer to a phrase headed by such words as *much*, *many*, *little*, and *few*; the syntactic category DegP was introduced by Jackendoff (1977) to refer to a phrase headed by such words as *more*, *less*, *as*, and *too*.¹ These two categories have since been employed in many generative-syntactic analyses of degree modification (e.g. Pinkham (1985), Abney (1987), Bowers (1988), Baker (1989)).

In terms of traditional grammar (e.g. Jespersen (1924, 1933)), however, such words as *much* and *little* are simply adjectives or adverbs and such words as *as*, *too*, and *more* (as in *more beautiful*) are simply adverbs. Taking this into account and assuming a strict division between syntactic categories and their semantic functions, we might say that a QP is syntactically an Adjective Phrase (AP) or Adverb Phrase (AdvP) which semantically functions as an expression of quantity or degree, while a DegP is syntactically an AdvP which semantically functions as a degree modifier.

This paper attempts to account for constructions of degree modification without postulating such syntactic categories as QP and DegP. I will show that what we need toward that end is the notions of degree and comparison as semantic categories and certain semantic rules involving these notions. In section 2, I argue that constructions of degree modification are in need of semantic functional generalizations that are independent of particular syntactic categories and the lexical/phrasal distinction. In order to make such generalizations possible, I propose in sections 3 and 4 a novel analysis of degree modification based on semantic functional categories and rules that are necessary independently of syntactic categories and phrase structure rules.² In

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¹ The category Deg itself was used earlier by Bowers (1975), who did not speak of "Degree Phrase", however.

² In this paper, I do not discuss the syntax and semantics of comparative *as*- and *than*-clauses, on which see, for example, Hirose (2007) and references cited there.

section 5, I demonstrate that the proposed analysis is general enough to apply to degree modification in a language such as Japanese which, unlike English, has no explicit formal distinction between the positive and comparative degrees of adjectives and adverbs. Section 6 is a short conclusion.

2. The Necessity of Semantic Functional Generalizations

In this section, I present four arguments that constructions of degree modification are in need of semantic functional generalizations.

First of all, there is the problem of capturing semantic commonalities between different syntactic categories. Observe the following examples:

- (1) We need your help more. (VP)
- (2) Your help is more necessary for us. (AP)
- (3) We are more in need of your help. (PP)
- (4) We have more need of your help. (NP)

Apart from slight differences in style, these sentences convey virtually the same meaning. It should be noted that in (1)-(4) different syntactic categories are compared; as indicated in the parentheses above, what is compared is VP in (1), AP in (2), PP in (3), and NP in (4). Thus, in order to capture the semantic commonality between (1)-(4), we need some semantic notion that is independent of syntactic categories.

Second, there is the problem of capturing semantic commonalities between lexical and phrasal expressions. For example, compare the two sentences in (5).

- (5) a. I like tea better (than coffee).
- b. I prefer tea (to coffee).

These sentences are synonymous. The common meaning is expressed by the phrasal expression *like better* in (5a) and the word *prefer* in (5b). Thus, in order to capture the semantic commonality between the two sentences in (5), we need some semantic notion that is neutral with respect to the lexical/phrasal distinction.

In this connection, a pair of examples like the following is worth noticing:

- (6) a. three years old
- b. three years older

These phrases are different as to whether the adjective is in positive or comparative form, and they accordingly have different meanings. In the standard transformational account, the difference between (6a) and (6b) is reduced to a difference in syntactic structure. Phrase (6a) is assumed to have a simple structure like (7), where the adjective *old* is modified by the NP *three years*.

(7) [AP [NP three years] old]

As for (6b), Bresnan (1973) would give it a structure like (8), using the category QP (whose head is *much*), while Jackendoff (1977) would give it a structure like (9), using the category DegP (whose head is *more*).

(8) [AP [QP [NP three years] -er much] old] (cf. Bresnan (1973))

(9) [AP [DegP [NP three years] more] old] (cf. Jackendoff (1977))

Technical details aside, what is common to these analyses is the idea that the comparative form *older* is derived from a phrasal structure containing the positive form *old*. According to this idea, the semantic difference between (6a) and (6b) corresponds to their difference in syntactic structure. In fact, in such cases as the pair *beautiful* vs. *more beautiful*, the difference between the positive and the comparative form manifests itself as a syntactic difference of word vs. phrase.

But this kind of analysis fails to account for examples like (10).

(10) He is three years senior to me.

Here the adjective *senior* is synonymous with comparative *older*, but there is no English word corresponding to its positive degree. It is therefore impossible to postulate a structure like (8) or (9) for this example. Syntactically, the underlined part of (10) has the following structure:

(11) [AP [NP three years] senior]

This structure is the same as (7), although the underlined part of (10) has a different meaning from *three years old*.

This observation suggests that it would be neither revealing nor satisfactory to account for the difference between the positive and comparative degrees of adjectives and adverbs by reducing it to the syntactic difference of word vs. phrase. Instead, it

should be treated as reflecting a certain semantic difference which is neutral with respect to the lexical/phrasal distinction.

I note parenthetically that this kind of view is essential especially in analyzing the structure of degree modification in languages such as Japanese where there is no formal distinction between the positive and comparative degrees of adjectives. Thus in the following Japanese examples,

- (12) a. John wa wakai.
 John TOP young
 ‘John is young.’
 b. John wa Bill yori wakai.
 John TOP Bill than young
 ‘John is younger than Bill.’

the adjective *wakai* ‘young’ does not “inflect” according to the positive/comparative distinction, which, in a language like Japanese, is purely semantic in nature, rather than morphosyntactic.³

Third, there is the problem of distinguishing multiple semantic functions of a single word. Consider the examples in (13).

- (13) a. John has more bread.
 b. John is more intelligent.

Bresnan (1973) assumes that the *more* in (13a) and the *more* in (13b) are the same in that both of them are comparatives of *much*. Based on this assumption, she gives *more bread* and *more intelligent* the following parallel syntactic structures:

- (14) a. [NP [QP -er much] bread]
 b. [AP [QP -er much] intelligent]

³ In translation from English (and other Western languages), the word *yori* is often used as a sort of degree modifier to express the comparative meaning conveyed by English *-er* and *more*; thus, *younger* and *more interesting* can be translated as *yori wakai* and *yori omosiroi*, where *yori* is an adverb that modifies the adjectives *wakai* and *omosiroyi*. As illustrated in (12b), the word *yori* is essentially a postpositional particle that expresses the standard of comparison, as does English *than*; in (12b) it forms a constituent with the preceding NP *Bill*. In “translationese” Japanese, however, especially when the standard of comparison is tacitly assumed, as in English sentences like *John is younger* and *This book is more interesting*, the word *yori* can be “reanalyzed” and used as a degree modifier in order to explicitly signal that the adjective it modifies should be interpreted as comparative. This relatively new usage of *yori* is said to have resulted from attempting to compensate for the lack of formal equivalents in Japanese of English *-er* and *more* (see also Hirose (2007)).

If the quantifier *much* underlies every occurrence of *more*, such phrases as (15a, b) should be acceptable along with those in (13) (see Jackendoff (1977) and Brame (1986) for related discussion).

- (15) a. much bread
 b. *much intelligent
 c. much different

In fact, however, while *much bread* is well-formed, *much intelligent* is not. By contrast, an adjective such as *different* can take *much*, as shown in (15c).

To account for the ill-formedness of examples like (15b), Bresnan (1973) postulates a rule called *Much Deletion*, which is supposed to delete *much* immediately before adjectives and adverbs.⁴ But this rule is quite ad hoc because it is devised only to save the claim that every occurrence of *more* derives from *much*; it is also descriptively inadequate because it fails to account for the grammaticality difference between, say, **much intelligent* and *much different*. (We will see later that their grammaticality difference can be explained straightforwardly in semantic functional terms.) The problem with Bresnan's analysis suggests that it is not plausible to syntactically assume that a QP underlies every comparative.

This means, in the present context, that the *more* in (13a) and the *more* in (13b), though formally the same, should be treated differently in semantic terms, that is, as having different semantic functions. The same is also true of the *much* of *much bread* and the *much* of *much different*, which should be viewed as having different semantic functions. This kind of problem is not one that is peculiar only to such words as *more* and *much*. Rather, it is essentially a problem that is generally treated in semantics under the rubric of polysemy (i.e. one form associated with multiple senses or functions). What we need here, then, is an analysis that can provide a basis for describing multiple semantic functions of *more* and *much*. Such an analysis will be presented below.

⁴ In Bresnan's analysis, *Much Deletion* applies after a rule, called *-Er Encliticizing*, to the following effect:

- (i) $-er\ Q \rightarrow Q-er$

This rule converts structure (14b) to a structure like (ii), which in turn is converted to the surface form in (iii) by a rule of suppletion.

- (ii) [AP [QP \emptyset much-er] intelligent]
 (iii) [AP [QP more] intelligent]

Bresnan assumes that *Much Deletion* does not apply to (ii) because of the intervention of *-er*.

Fourth, there is the problem of restricting the way in which syntactic constituents combine with each other. Generally, degree modification is recursively possible, as illustrated in (16).

- (16) tall, too tall, much too tall, as much too tall

The question then arises as to how syntactic constituents combine with each other. Take *much too tall* as an example. Jackendoff (1977) gives it a structure like (17a), where *much* and *too* form a constituent DegP, which modifies the adjective *tall*; on the other hand, it is also logically possible to give it a structure like (17b), where *too* and *tall* form a constituent AP, which is modified by *much*.⁵

- (17) a. [[much too] tall]
 b. [much [too tall]]

To see which is the right structure, consider the following examples:

- (18) a. four pounds too heavy
 four inches too tall
 b. too heavy by four pounds
 too tall by four inches

(18a) and (18b) are paraphrases of each other and can be taken to have the same modification structure in relevant respects. Note that in (18b) *too heavy* and *too tall* are postmodified by measure phrases. This suggests that the constituent structure of *four pounds too heavy*, for example, is not (19a) but rather (19b), where *too heavy* is a constituent.

- (19) a. [[four pounds too] heavy]
 b. [four pounds [too heavy]]

Since *much too tall* parallels *four pounds too heavy* and *four inches too tall* in constituent structure, it follows that its appropriate structure is not (17a) but (17b), where *too tall* is modified by *much*.⁶

⁵ In fact, (17b) is the type of structure assumed in Bresnan's (1973) analysis.

⁶ Jackendoff (1977) argues that structure (17b) should be eliminated because it is not compatible with the fact that most adjectives do not take quantifiers (e.g. **much tall*). But this argument is inadequate. It is indeed true that most adjectives do not take *much* when they are in positive form. But this fact is independent of whether *too tall* as a unit can be modified by *much*,

Why this is so is the question to be answered. From a syntactic point of view, it seems almost impossible to give it a principled answer. The best that a syntactic approach can do would be to devise or revise a phrase structure rule so that it can describe the given fact the way it is.

On the other hand, a careful look at the structure of degree modification from a semantic functional point of view will reveal that the fact that *much too tall* must have the structure in (17b) is semantically motivated. As we will see in detail later, the structure of degree modification is subject to certain semantic rules of selectional restriction, which serve eventually to restrict the way in which syntactic constituents combine with each other.

3. Degree and Comparison as Semantic Categories

In this and the following sections, I will present an analysis that provides an explanatory basis for the problems pointed out in section 2 concerning degree modification. What we need first and foremost to that end is the notions of degree and comparison as semantic categories.

With respect to the notion of degree, I define it as a general semantic category to which belong various scalar or gradable concepts, whether concrete or abstract. The notion of quantity is gradable and hence is a subtype of degree. This is clear from the fact that in Japanese, for instance, “what degree of” can mean “how many” and “how much”, as illustrated by the following examples:

- (20) a. *Dono teido no hito ga paatii ni kimasita ka?*
 what degree of person NOM party to came Q
 ‘How many people came to the party?’
- b. *Dono teido no biiru o nomimasita ka?*
 what degree of beer ACC drank Q
 ‘How much beer did (you) drink?’

since, as we have just seen, *too heavy* as a unit can be modified by the measure phrase *four pounds*, despite the fact that the adjective *heavy* itself cannot take a measure phrase (i.e. **four pounds heavy*). Similarly, the adjective *short* as the antonym of *tall* cannot take a measure phrase:

- (i) John is five feet {tall/*short}.

But *too short* as well as *too tall* can be modified by a measure phrase:

- (ii) John is four inches {too tall/too short}.

Hence there is no reason to suppose, as Jackendoff does, that the unacceptability of **much tall* provides evidence as to the constituent structure of *much too tall*.

Degree concepts are typically expressed by adjectives and adverbs, but can also be expressed by nouns, verbs, and prepositions, as pointed by, among others, Bolinger (1972). With this in mind, I introduce the following terminology to talk generally about the relation between a semantic concept and a form in which it is realized:

- (21) a. A word or phrase that expresses a semantic concept X is called an “X expression”.
- b. A word or phrase that modifies a semantic concept X is called an “X modifier”.

Following this terminology, we can say that a word or phrase that expresses a semantic concept of degree is a degree expression, whatever its syntactic category is; thus, concerning the examples in (1)-(4), we can look upon the verb *need*, the adjective *necessary*, the prepositional phrase *in need of*, and the noun *need* as all degree expressions that are related to the same degree concept of necessity. Likewise, a word or phrase that modifies a semantic concept of degree is a degree modifier, whatever its syntactic category is.

Degree expressions are, by definition, modifiable by degree modifiers. Degree modifiers, or DMs, can be divided into two classes, “relative” and “nonrelative”. Nonrelative degree modifiers (NDMs) correspond, roughly, to intensifiers in the sense of Bolinger (1972); that is, they are modifiers that nonrelatively locate a degree somewhere on a given scale. For example, the underlined expressions in (22) are NDMs.⁷

- (22) very tall, terribly hot, a perfect idiot, a bit of an idiot

Note that *much* in (23) is a degree expression modified by *very* and at the same time is an NDM modifying the degree expression *loves her*.

- (23) He loves her very much.

⁷ NDMs (or intensifiers) can be divided into a few further subclasses according to the region of the scale that they occupy. Here I will not go into this point, on which see Bolinger (1972:17-18) and also Quirk et al. (1985:445-450). Note in passing that different scales can be associated with one type of degree expression. For instance, when we speak of a big elephant and a big ant, we normally have different scales of size in mind. This is a case of the relativity of scales. On the other hand, the distinction between relative and nonrelative degree modifiers is made when one and the same scale is presupposed.

As we will see later, this dual function of *much* plays an important role in the semantic functional structure of degree modification.

On the other hand, relative degree modifiers (RDMs) locate a degree somewhere on a scale in relation to a given standard. For example, words such as *more*, *less*, *as*, *too*, and *enough* function as RDMs. In the case of *more*, *less*, and *as*, the given standard is expressed by a *than*-phrase or *as*-phrase. *Too* and *enough*, which can form what Jespersen (1933:226) terms a “latent comparative”, presuppose as the standard a certain degree that is necessary for a given purpose; thus in (24) and (25), the (a) examples can be paraphrased as the (b) examples.

- (24) a. John is too intelligent (for the job).
 b. John is more intelligent than is necessary for the job.
- (25) a. John is intelligent enough (for the job).
 b. John is as intelligent as is necessary for the job.

What is particularly important about RDMs is that they can map the notion of degree into the notion of comparison. We will return to this point shortly.

Turning now to the notion of comparison, I define it as a general semantic category concerned with points of likeness and difference between two (or more) things.⁸ Here again, if we follow the terminology given in (21), we can say that a word or phrase that expresses a semantic concept of comparison is a comparison expression, whatever its syntactic form is. This enables us to say that comparison

⁸ As Huddleston (1984:406-407) points out, comparisons can be cross-classified along two dimensions: One is the traditional distinction between “equal” and “unequal” comparisons, and the other is the distinction between what Huddleston calls “scalar” and “non-scalar” comparisons. Scalar comparisons are concerned with degree, as in (i), while nonscalar comparisons are concerned with identity, as in (ii).

- (i) a. John is as intelligent as Bill.
 b. John is {more/less} intelligent than Bill.
- (ii) a. My watch is the same as yours.
 b. My watch is different from yours.

Also, (ia) and (iia) are examples of equal comparison, while (ib) and (iib) are examples of unequal comparison.

There is another type of comparative construction, exemplified in (iii), which Pinkham (1985) calls a “metacomparative”.

- (iii) John is more angry than sad.

This sentence describes the relative appropriateness of using the linguistic expressions *angry* and *sad* to talk about John; so it has a different semantic structure than an ordinary comparative like *John is more angry than Bill*. For detailed discussion of the semantics of metacomparatives, see Hirose (2001).

expressions need not take a so-called comparative form. There are in fact comparison expressions that are not in comparative form. For example:

- (26) the same, different; senior, junior; superior, inferior; prior; prefer, preferable; alike, similar

If we postulate the semantic category of comparison, it is no longer necessary to syntactically derive a simple comparative like *older* from an unnatural underlying structure such as *[[^{-er} much] old]* or *[[^{more}] old]*. Morphologically, the word *older* has the structure *[old + -er]*, but syntactically, it is simply an adjective with the semantic property COMPARISON, as are *different* and *senior*.

Moreover, we can assume that periphrastic comparatives such as (27) are given the property COMPARISON by the semantic rule in (28).

- (27) {more/less/as/too} intelligent
 (28) RDM + DEGREE = COMPARISON

That is, a degree concept, when modified by an RDM, constitutes a comparison concept. Thus, *more intelligent* has the following semantic functional structure, where COMP and DEG stand for the semantic categories COMPARISON and DEGREE:

- (29) [COMP [RDM more] [DEG intelligent]]

It should be noticed here that the word *more* has (at least) two different semantic functions. On the one hand, it is used as a comparison expression corresponding to the degree expression *much*, as exemplified by the *more of more bread*. On the other hand, it is used as an RDM to map degree into comparison, as exemplified by the *more of more intelligent*. These two semantic functions are not necessarily mutually exclusive, however, because *more* can function as an RDM whenever it modifies a degree expression. Thus, in the sentence *He loves her more*, for example, *more* is not only the comparison expression of *much* but also an RDM that turns the degree expression *loves her* into a comparison expression.

This kind of analysis, based on the semantic rule in (28), enables us to capture quite straightforwardly the semantic commonality between sentences (1)-(4). Recall that the verb *need*, the adjective *necessary*, the prepositional phrase *in need of*, and the noun *need* are all degree expressions that are related to the same degree concept of necessity. Given the function of *more* as an RDM and the semantic rule in (28), we

can say that all these expressions express practically the same comparison concept when modified by *more*. Hence sentences (1)-(4), though different in syntactic structure, have the following parallel semantic functional structures in relevant respects:

- (30) We [COMP [DEG need your help] [RDM more]]
 (31) Your help is [COMP [RDM more] [DEG necessary for us]]
 (32) We are [COMP [RDM more] [DEG in need of your help]]
 (33) We have [COMP [RDM more] [DEG need of your help]]

By the same token, the verb phrase *like...better* in example (5a) can be considered under the present analysis to be a comparison expression corresponding to the degree verb *like*.⁹ English has a verb that lexicalizes the meaning of the comparison expression *like better*, that is, *prefer*, which is lexically specified as having the property COMPARISON. This accounts for the semantic commonality between (5a) and (5b).¹⁰ More generally, since the semantic property COMPARISON is independent of syntactic categories and neutral with respect to the lexical/phrasal distinction as well, it may either be associated with a particular word directly in the lexicon or be given to a phrasal expression by the semantic rule in (28).

Just as degree expressions are modifiable by degree modifiers, so comparison expressions are modifiable by comparison modifiers. Comparison modifiers, or CMs for short, are divided into equal-comparison modifiers and unequal-comparison modifiers. Unequal-comparison modifiers express how large the difference in comparison is, as illustrated by the underlined expressions in (34).

- (34) a. John is {much/even/far/still/yet/way} more intelligent.
 b. John is three inches taller than Bill.

⁹ I am assuming here that the word *better*, like *more*, can function not only as a comparison expression but also as an RDM.

¹⁰ Note, though, that *prefer* is not completely synonymous with *like better*. For example, sentence (i) below, unlike (5a), cannot be paraphrased by a sentence containing *prefer*.

- (i) I like tea better than John (does).
 (ii) *I prefer tea to John. (* on the same reading as (i))

That is, *prefer* has a more restricted and specific meaning than *like better*. This kind of semantic relation is commonly observed between other periphrastic and corresponding lexical expressions as well, such as *cause to die* vs. *kill* and *put paint on* vs. *paint*. See, for example, McCawley (1978) and Horn (1984) for discussion.

On the other hand, equal-comparison modifiers express in what sense the equality in comparison holds; for example, *exactly* in (35a) indicates that it holds in an exact sense; *almost* and *much* in (35b) indicate that it holds in an approximate sense; and *three times* in (35c) indicates that it holds in a multiplied sense.

- (35) a. These pictures are exactly alike.
 b. My watch is {almost/much} the same as yours.
 c. This table is three times as long as that one.

Let us now consider the word *much* again. As observed in example (23), this word can function both as a degree expression and as a DM. Furthermore, as is clear from examples (34a) and (35b), it can also function as a CM. Therefore, *much* has (at least) three different semantic functions.

Note that it is this many-sided character of words like *much* that is responsible for the fact that degree modification is recursively possible. More specifically, such phrases as {*as/too*} *much more intelligent* are possible because the aspect of *much* as a CM allows it to modify the comparison expression *more intelligent* and at the same time its aspect as a degree expression allows it to be modified by DMs like *as* and *too*. I will discuss this point in more detail in the next section.

4. Semantic Restrictions on the Structure of Degree Modification

We have seen in the preceding section that degree expressions and comparison expressions are modifiable by DMs and CMs, respectively. Based on this fact, I propose the following rules of selectional restriction, which apply to DMs and CMs:

- (36) a. A degree modifier (DM), whether relative (RDM) or nonrelative (NDM), must semantically select a degree expression (DEG).
 b. A comparison modifier (CM) must semantically select a comparison expression (COMP).

These selectional restrictions follow naturally from the relationship between the general concepts of “X expression” and “X modifier” defined in (21).¹¹ In what follows, I will show that the rules in (36) provide semantic well-formedness conditions on the structure of degree modification, making it possible to rule out ill-formed strings

¹¹ Here I am taking a so-called rule-based approach. But my basic idea is also consistent with a construction-based approach, in which the selectional restrictions in question can be formulated roughly as follows: In the degree-modifier construction, the modifier-head relation must be DM + DEG, while in the comparison-modifier construction, it must be CM + COMP.

of words in a principled way and without recourse to such syntactic categories as QP and DegP.

Consider first the following examples, each of which consists of an adjective preceded by an adverb, and whose semantic functional structures are indicated in square brackets:

- (37) a. very tall
[NDM + DEG]
b. *very taller
[NDM + COMP]
- (38) a. much taller
[CM + COMP]
b. *much tall
[CM + DEG]
c. much different
[CM + COMP]
d. very different
[NDM + DEG]
- (39) a. {as/too} tall
[RDM + DEG]
b. *{as/too} taller
[RDM + COMP]

All the ungrammatical examples here violate one of the selectional restrictions in (36). In (37) *very* is a DM and must select a DEG, but *taller* is a COMP; hence the ill-formedness of **very taller*. In (38), by contrast, *much* as a CM must select a COMP. While *taller* and *different* are COMPs, *tall* is a DEG; hence the grammaticality contrast between *much {taller/different}* and **much tall*.¹² Note that *different* can be modified by *very* as well as *much*. The same is also true of *alike*; i.e. *{much/very} alike*. This is because *different* and *alike* have two semantic aspects: They may be construed as COMPs in one way and as DEGs in another.¹³ So we can say that in (38d) the aspect of *different* as a DEG allows it to be modified by *very*. In

¹² When *much* is construed as a DM, **much tall* is given the semantic functional structure [DM + DEG], which itself is semantically well-formed. But *much* as a DM is subject to a syntactic restriction to the effect that it must select a syntactic category other than an adjective or adverb. It is because of this restriction that **much tall* is ruled out even when it is interpreted as [DM + DEG]. By contrast, the syntactic restriction in question does not rule out adjective phrases such as *much taller* and *much different*. This is precisely because in these cases *much* functions as a CM, not as a DM.

¹³ This sort of DEG/COMP ambiguity is quite common with degree expressions in a language like Japanese, as we will see later.

(39) *as* and *too* are DMs and must select a DEG, but *taller* is a COMP; hence the ill-formedness of *{*as/too*} *taller*.

The selectional restrictions in (36) also provide an explanatory basis for the problem, pointed out in section 2, of restricting the way in which syntactic constituents combine with each other. Taking *much more beautiful* as an example, we can say under the present analysis that its constituent structure must be (40a), rather than (41a), because (40a) is associated with a well-formed semantic functional structure like (40b), while (41a) is associated with an ill-formed semantic functional structure like (41b).

- (40) a. [much [more beautiful]]
 b. [CM + [RDM + DEG]]
 [COMP] (by rule (28))
- (41) a. [[much more] beautiful]
 b. [[CM + RDM] + DEG]

In (40) the DEG *beautiful* is modified by the RDM *more*, and by rule (28) they form a COMP, which is modified by the CM *much*. Hence there is no problem with the semantic functional structure (40b). In (41b), on the other hand, the underlined part has a problem, because the CM *much* selects the RDM *more*, thus violating the selectional restriction on CMs. As long as (41b) is ill-formed, the syntactic structure associated with it, namely (41a), is ruled out as ill-formed, too.

Exactly the same argument applies to *much too tall*. We saw in section 2 that its appropriate constituent structure is [[*much [too tall]*] (= (17b)), and not [[*much too tall]*] (= (17a)). The reason should now be clear; that is, while the former has an appropriate semantic functional structure parallel to (40b), the latter has an inappropriate one parallel to (41b).

As a more complex example, let us consider *as much too tall*. Here again, we can say that its constituent structure must be (42a), rather than (43a), because (42a), but not (43a), is associated with a well-formed semantic functional structure.

- (42) a. [[as much] [too tall]]
 b. [[RDM + DEG] (= [COMP])
 [CM] + [RDM + DEG]]
 [COMP] (by rule (28))
- (43) a. [[[as much] too] tall]
 b. [[[RDM + DEG] (= [COMP])
 [CM] + RDM] + DEG]

In (42) *as much* is composed of the RDM *as* plus *much* as a DEG, thus constituting a COMP; similarly, the RDM *too* and the DEG *tall* form a COMP; and this COMP is modified by *much* as a CM. Hence there is no problem with the semantic functional structure (42b). On the other hand, (43b) has a selectional-restriction violation in the underlined part, where *much* as a CM modifies the RDM *too*.

This way the selectional restrictions in (36) serve to restrict possible constituent structures on a principled basis. Moreover, the present analysis can dispense with such syntactic categories as QP and DegP; so it is much simpler and hence more desirable than any syntactic analysis that has recourse to these categories.

5. Degree Modification in Japanese

Finally, I would like to argue briefly that my semantic functional analysis of degree modification is also applicable to a language such as Japanese which, unlike English, does not formally distinguish between the positive and comparative degrees of adjectives and adverbs. As illustrated in section 2 with the examples in (12), the Japanese adjective *wakai* is potentially ambiguous between “young” and “younger”. Thus, the following Japanese sentence can be used as an answer either to the question “Who is young?” or to the question “Who is younger, John or Bill?”:

- (44) John ga wakai.
 John NOM young
 (a) ‘John is young.’
 (b) ‘John is younger.’

The ambiguity of (44) can be accounted for by saying that *wakai* is construed as a DEG in one context and as a COMP in the other. That is, (44) has two different semantic functional structures, (45a) and (45b), which are parallel to (46a) and (46b) in English.

- (45) a. John ga [DEG wakai]
 b. John ga [COMP wakai]
 (46) a. John is [DEG young]
 b. John is [COMP younger]

Now, Japanese is similar to English in that it has two different classes of modifiers, namely, DMs and CMs. For example, adverbs such as *hizyooni* and *kiwamete* are DMs (more strictly, NDMs) that correspond to English *very* and *extremely*, while adverbs such as *motto* and *sarani* are CMs that correspond to English words like *much*, *even*, and *still*. Thus, *{hizyooni/kiwamete} wakai* ‘{very/extremely}

young' and *{motto/sarani} wakai* '{much/even} younger', which are the same in syntactic structure, are given the following different semantic functional structures:

- (47) a. [DM *hizyooni*] [DEG *wakai*]
 b. [DM *kiwamete*] [DEG *wakai*]
 (48) a. [CM *motto*] [COMP *wakai*]
 b. [CM *sarani*] [COMP *wakai*]

These are parallel to English cases like (49) and (50).

- (49) a. [DM *very*] [DEG *young*]
 b. [DM *extremely*] [DEG *young*]
 (50) a. [CM *much*] [COMP *younger*]
 b. [CM *even*] [COMP *younger*]

In English, as we have already seen, a phrase like **very younger* is ruled out as ill-formed because the DM *very* modifies the COMP *younger* in violation of the selectional restriction.

In Japanese, too, the same selectional restriction can be shown to be operative. Consider the following sentence, given as (12b) in section 2.

- (12b) John wa Bill yori wakai.
 John TOP Bill than young
 'John is younger than Bill.'

In this sentence *wakai* is unambiguously a COMP because of the presence of the *yori*-phrase, which, like a *than*-phrase in English, expresses the standard of comparison. It is then predicted that *wakai* in (12b) can be modified by the CMs *motto* and *sarani*, but not by the DMs *hizyooni* and *kiwamete*. In fact, this prediction is borne out by the grammaticality contrast between (51) and (52).

- (51) a. John wa Bill yori motto wakai.
 John TOP Bill than much young
 'John is much younger than Bill.'
 b. John wa Bill yori sarani wakai.
 John TOP Bill than even young
 'John is even younger than Bill.'

- (52) a. *John wa Bill yori hizyooni wakai.
 John TOP Bill than very young
 ‘*John is very younger than Bill.’
- b. *John wa Bill yori kiwamete wakai.
 John TOP Bill than extremely young
 ‘*John is extremely younger than Bill.’

The sentences in (52) are ungrammatical exactly because they have a selectional-restriction violation, as in the case of **very younger* and **extremely younger* in English.¹⁴

6. Conclusion

In this paper, I have proposed a semantic functional analysis of degree modification, which consists mainly of the following concepts and rules:

- (53) a. degree (DEG) and comparison (COMP) as semantic categories
 b. distinction between degree modifiers (DMs) and comparison modifiers (CMs)
 c. semantic rule that maps DEG into COMP: $RDM + DEG = COMP$
 d. selectional restrictions: A DM must semantically select a DEG; a CM must semantically select a COMP.

I do not mean to say, of course, that these are sufficient to account for every aspect of the structure of degree modification. A more detailed and comprehensive analysis will require further semantic concepts and rules, together with some syntactic rules and restrictions.

But, as I have argued, it is at least clear that my analysis overcomes a number of problems with previous syntactic analyses that have recourse to such syntactic

¹⁴ For more on comparative constructions in Japanese, see Hirose (2006, 2007). See also Sano (1998) and references cited there for discussion of the semantics of particular Japanese words employed as CMs. It is worth noting in this regard that, unlike in English, measure phrases in Japanese serve exclusively as CMs when modifying adjectives, as illustrated by the following example, which only has a comparative reading.

- (i) Kono hon wa hyaku peezi nagai.
 this book TOP hundred page long
 ‘This book is 100 pages longer.’

This point is investigated from a semantic point of view by Hasegawa et al. (2008), from which example (i) is taken.

categories as QP and DegP.¹⁵ I have also shown, though briefly, that my analysis makes it possible to capture cross-linguistic generalizations about degree modification between typologically different languages like English and Japanese. I believe the line of linguistic research taken in this paper will lead to truly significant generalizations about form-meaning correspondences in language.

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¹⁵ Incidentally, Bowers (1988) makes the interesting observation that comparatives like *angrier*, *more angry*, and *as angry* are similar to definite noun phrases in that they form a syntactic island with respect to extraction and scope interpretation, which leads him to claim that both comparatives and definite noun phrases are members of the same syntactic category, called "Determiner Phrase" (DP). In Hirose (2002) I argue against the DP analysis of comparatives and show that what the DP analysis attempts to account for can be better accounted for in terms of a semantic notion like presupposition (for further details see the article). The point I want to emphasize here is that, generally, just because two or more kinds of syntactic units appear to behave similarly with respect to certain linguistic phenomena, that does not prove that they belong to the same syntactic category; there still remains the possibility of explaining the linguistic phenomena in question in terms of a semantic or pragmatic factor or factors which may range over different syntactic categories.

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