

Izyoo(ni)- and Gurai-comparatives: Comparisons of Deviation in Japanese

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Abstract: This paper investigates the syntax and semantics of Japanese comparative constructions that make use of words like *izyoo(ni)* ‘more than’ and *gurai* ‘roughly equal to’, which are functionally analogous to the English *more-* and *as-*comparatives. I argue that they are necessarily interpreted as comparisons of deviation in the sense of Bierwisch (1989) and Kennedy (2001). In explaining why these constructions cannot express comparisons of the absolute projections of two objects on a scale, as the English comparatives do, this paper advocates the line of thinking pursued by Fukui (1986) and Snyder et al. (1994) that AdjP in Japanese is impoverished in such a way that it lacks the position to host a degree variable or constant.*

Key words: comparisons of deviation, *izyoo(ni)*, *gurai*, gradable adjectives

1. Introduction

In generative grammar, the Japanese *yori*-comparative construction, exemplified in (1), has been extensively studied in comparison with the English *more-* and *as-*comparatives. However, other types of Japanese comparatives have hardly received attention.

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- (1) [Context: Mary is famous for purchasing expensive things.]
 John-wa [[Mary-ga katta] **yor**i] takai kuruma-o katta.
 John-TOP Mary-NOM bought than expensive car-ACC bought
 ‘(Lit.) John bought a [more] expensive car than Mary bought.’

With a view to building a platform for the comparative study of comparatives across languages, this paper investigates the syntax and semantics of other types of Japanese comparatives, namely, *izyoo(ni)*- and *gurai*-comparatives, exemplified in (2a) and (2b).

- (2) [Context: Mary is famous for purchasing expensive things.]
 a. John-wa [[Mary-ga katta] **izyoo(ni)**] takai kuruma-o katta.
 John-TOP Mary-NOM bought more expensive car-ACC bought
 ‘(Lit.) John bought a more expensive car than Mary bought.’
 b. John-wa [[Mary-ga katta] **gurai**] takai kuruma-o katta.
 John-TOP Mary-NOM bought as expensive car-ACC bought
 ‘(Lit.) John bought as expensive a car as Mary bought.’

The investigation of these constructions is of interest in the context of addressing the issue of whether Japanese has constructions analogous to the English *more*- and *as*-comparatives, for at first sight they appear to resemble the English comparatives more than *yor*i-comparative. For example, *izyoo(ni)*- and *gurai*-comparatives pattern with the English *more*- and *as*-comparatives, inducing locality effects (cf. Chomsky 1977), unlike *yor*i-comparative (cf. Beck et al. 2004, Hayashishita to appear),¹ see (3)–(5).²

¹ Kikuchi (1989) maintains that *yor*i-comparative always induces locality effects, just as the English *more*- and *as*-comparatives do (cf. Ishii 1991), and seems to assume that it is analyzed on a par with the English comparatives. Although the examples Kikuchi puts forth in support of the generalization are all unacceptable, I reject his generalization because of examples like (3). See Hayashishita (to appear) for a discussion about the reason why Kikuchi’s examples are not acceptable while examples like (3) are.

² Some speakers might find (3a) to be difficult to accept, thus failing to detect the contrast between (3a) on one hand, and (3b) and (3c) on the other. I suspect that such speakers are having difficulty in processing a long string of sounds in the *yor*i-clause, which prevents them from extracting the information that is compared with John’s car being the car purchased by the politician. I suggest that the speakers who fail to detect the contrast under discussion compare (i-a) with (i-b) and (i-c), which are minimally different from (3a), (3b), and (3c) in that the gap positions include a “resumptive pronoun”, *sore* ‘it’. As pointed out by Taro Kageyama (p.c. December 2006), the contrast between (i-a) on one hand, and (i-b) and (i-c) on the other, is clear even to those who did not detect the contrast in (3).

- (i) [Context: Mary is very patient, and does not normally complain about what others do.]
 a. John-wa [[Mary-ga [[sore-o katta] seizika]-o] zeikin doroboo
 John-TOP Mary-NOM it-ACC bought politician-ACC tax robber
 to nonositta] yori] takai kuruma-o katta.
 COM accused than expensive car-ACC bought

- (3) [Context: Mary is very patient, and does not normally complain about what others do.]
- a. (= Hayashishita (to appear) [6a])
 John-wa [[Mary-ga [[__ katta] seizika]-o zeikin doroboo
 John-TOP Mary-NOM bought politician-ACC tax robber
 to nonositta] **yori**] takai kuruma-o katta.
 COM accused than expensive car-ACC bought
 '(Lit.) John bought a [more] expensive car than Mary accused of stealing tax money the politician who bought __.'
- b.*John-wa [[Mary-ga [[__ katta] seizika]-o zeikin doroboo
 John-TOP Mary-NOM bought politician-ACC tax robber
 to nonositta] **izyoo(ni)**] takai kuruma-o katta.
 COM accused more expensive car-ACC bought
 '(Lit.) John bought a more expensive car than Mary accused of stealing tax money the politician who bought __.'
- c.*John-wa [[Mary-ga [[__ katta] seizika]-o zeikin doroboo
 John-TOP Mary-NOM bought politician-ACC tax robber
 to nonositta] **gurai**] takai kuruma-o katta.
 COM accused as expensive car-ACC bought
 '(Lit.) John bought as expensive a car as Mary accused of stealing tax money the politician who bought __.'
- (4) a. John bought a more expensive car than Mary did.
 b.*John bought a more expensive car than Mary accused of stealing tax money the politician who did.
- (5) a. John bought as expensive a car as Mary did.
 b.*John bought as expensive a car as Mary accused of stealing tax money the politician who did.

In the rest of the paper, with *izyoo(ni)*- and *gurai*-comparatives, I refer to the constructions schematized in (6a) and (6b), respectively, where *a* and *b* are the two

'(Lit.) John bought a [more] expensive car than Mary accused of stealing tax money the politician who bought it.'

- b.*John-wa [[Mary-ga [[sore-o katta] seizika]-o zeikin doroboo
 John-TOP Mary-NOM it-ACC bought politician-ACC tax robber
 to nonositta] izyoo(ni)] takai kuruma-o katta.
 COM accused more expensive car-ACC bought
 '(Lit.) John bought a more expensive car than Mary accused of stealing tax money the politician who bought it.'
- c.*John-wa [[Mary-ga [[sore-o katta] seizika]-o zeikin doroboo
 John-TOP Mary-NOM it-ACC bought politician-ACC tax robber
 to nonositta] gurai] takai kuruma-o katta.
 COM accused as expensive car-ACC bought
 '(Lit.) John bought as expensive a car as Mary accused of stealing tax money the politician who bought it'

objects under comparison.^{3,4}

- (6) a. $[[_{XP} \dots a \dots] \mathbf{izyoo}(\mathbf{ni})] [_{IP} \dots b \dots]$
 b. $[[_{XP} \dots a \dots] \mathbf{gurai}] [_{IP} \dots b \dots]$

For the sake of concreteness, I assume, following Cresswell (1976), Hellan (1981), and Pinkal (1989), among others, that gradable adjectives are characterized as expressions that map objects to abstract representations of measurement (scales), which are sets of points (degrees) that are totally ordered along a dimension determined by the adjective.⁵ Following Cresswell (1976), von Stechow (1984), and Heim (1985), among others, I adopt (7) for the denotation of a gradable adjective, which expresses a relation between individuals and degrees.⁶

- (7) Let A be a gradable adjective
 $[[A]] = \lambda d \lambda x \delta_A(x) = d$, where δ is a function from objects to degrees.

According to the standard analysis of the above English comparatives (cf. Bresnan 1973, von Stechow 1984), (4a) for example, is analyzed as (8), where the crossed-out parts in (8a) are not phonologically realized, and MAX in (8b) is the maximum operator in the sense of von Stechow (1984) and Rullmann (1995), which is defined as (9).

³ Thus, sentences like (i-a) and (i-b) will not be referred to as *izyoo(ni)* and *gurai*-comparatives. I will discuss these types of sentences later in Section 5.

- (i) a. John-wa 5kg **izyoo**-no (omosa-no) sakana-o turiageta.
 John-TOP more-GEN weight-GEN fish-ACC pulled-up
 'John caught a fish that weighs more than 5kg.'
 b. John-wa 10m **gurai**-no (nagasa-no) turizao-o katta.
 John-TOP as-GEN length-GEN fishing:rod-ACC bought
 'John bought a fishing rod that is 10m long.'

⁴ Throughout the paper, I use *XP* and *YP* to refer to phrases whose status I leave open.

⁵ Several researchers, however, argue that degrees are represented on a scale as intervals instead of points (e.g., Kennedy 1999, 2001, Schwarzschild & Wilkinson 2002). My choice of degrees as points is merely to achieve a simpler exposition. The arguments and discussions presented in this paper do not depend on this choice.

⁶ The alternative to (7) is the definition in (i), which treats gradable adjectives as functions from individuals to degrees (cf. Bartsch and Vennemann 1973, Kennedy 1999).

- (i) Let A be a gradable adjective
 $[[A]] = \lambda x (\delta_A(x))$, where δ is a function from objects to degrees.

The content of this paper is not concerned about the choice between (7) and (i), except Section 5 where I suggest a parameter to account for the difference between English and Japanese regarding gradable adjective phenomena, crucially making reference to (7). Thus, to the extent that my suggestion in Section 5 is on the right track, (7) is preferred to (i).

(8) a. LF representation:

$$[[_{IP1} [_{DegP} [_{Deg} er] [_{CP} \text{than} [_{IP4} Op_2 [_{IP5} \text{Mary did} [_{DP2} a [_{AdjP2} t_2 [_{Adj} \text{expensive}} \\ \text{pensive}]] \text{car}]]]]]]] [_{IP2} Op_1 [_{IP3} \text{John bought} [_{DP1} a [_{AdjP1} t_1 [_{Adj1} \text{expensive}]] \\ \text{car}]]]]]]]$$

b. Semantic composition:

$$[[IP_2]] = \lambda d_1 \exists x [\delta_{\text{expensive}}(x) = d_1 \wedge \text{car}(x)] \text{bought}(j, x)$$

$$[[CP]] = [[IP_4]] = \lambda d_2 \exists y [\delta_{\text{expensive}}(y) = d_2 \wedge \text{car}(y)] \text{bought}(m, y)$$

$$[[Deg]] = \lambda P_{\langle dt, t \rangle} \lambda Q_{\langle dt, t \rangle} \exists d_1 [d_1 > \text{MAX}(P)] Q(d_1)$$

$$[[IP_1]] = \exists d_1 [d_1 > \text{MAX}(\lambda d_2 \exists y [\delta_{\text{expensive}}(y) = d_2 \wedge \text{car}(y)] \text{bought}(m, y))] \exists x \\ [\delta_{\text{expensive}}(x) = d_1 \wedge \text{car}(x)] \text{bought}(j, x)$$
(9) $\text{MAX}(D) = \{d \in D. \forall d' [d' \in D] d \geq d'\}$, where D is a totally ordered set of degrees

In this analysis, the DegP headed by *er* is of type $\langle dt, t \rangle$, undergoing QR, and the *than*-clause involves degree-operator movement, expressed by the $\langle Op_2, t_2 \rangle$ chain. The degree morpheme *er* compares the absolute projections of two objects on a scale: the maximum degree to which Mary's car is expensive (i.e., the price of Mary's car) and some degree to which John's car is expensive.

In this paper, I will argue that the standard analysis of the English comparatives cannot be extended to *izyoo(ni)*- and *gurai*-comparatives by demonstrating that they are necessarily interpreted as comparisons of deviation in the sense of Bierwisch (1989) and Kennedy (2001), which compare two objects in terms of the degrees of deviation from the standard(s) on the scale(s) relevant to a context.⁷

⁷ *Yori*-comparative, on the other hand, compares the absolute projections of two objects on a scale. But a number of facts indicate that the standard analysis of the English comparatives is not suitable for *yori*-comparative (see Beck et al. 2004, Kennedy 2005, and Hayashishita to appear). One piece of such evidence comes from examples like (i-a) whose intended meaning is (i-b), pointed out by Hayashishita (to appear).

(i) (= Hayashishita (to appear) [60a])

- a. John-wa [[Mary-ga senzitu yooroppa-ni ryokoosita] **yori**]
John-TOP Mary-NOM recently Europe-DAT traveled than
ookina nimotu-o gakkou-ni mottekita.
large bag-ACC school-DAT brought.

'(Lit.) John brought a large[er] bag to school than Mary traveled to Europe recently.'

- b. 'John brought to school a bag that is bigger than the bag Mary traveled to Europe with recently.'

The acceptable status of (i-a) indicates that for *yori*-comparative, (a) the determination of the degree serving as the standard of the comparison (e.g., the size of Mary's travel bag in the case of (i-a)) may not involve a gradable adjective, and (b) the object relevant for the determination of the standard of the comparison (e.g., Mary's travel bag in (i-a)) may not be syntactically projected.

In this paper, I will not discuss the analysis of *yori*-comparative any further, referring the readers to Beck et al. (2004), Kennedy (2005), and Hayashishita (to appear). I will, however, insert examples of *yori*-comparative in footnotes from time to time in order to contrast (a)

Informally, (2a) and (2b) are analyzed as (10a) and (10b), respectively.

- (10) a. The degree to which the price of John's car exceeds a standard price is greater than the degree to which the price of Mary's car exceeds the standard price.
 b. The degree to which the price of John's car exceeds a standard price is roughly equal to the degree to which the price of Mary's car exceeds the standard price.

In the standard analysis of the English comparatives, the locality effects observed in (4b) and (5b) are attributed to the degree-operator movement corresponding to λ -abstraction over degrees to which a given object possesses the relevant property. I argue that the locality effects we have observed with *izyoo(ni)*- and *gurai*-comparatives are due to the degree-operator movement which corresponds to the λ -abstraction over degrees of deviation.

The rest of this paper is organized as follows. In Section 2, I establish that *izyoo(ni)*- and *gurai*-comparatives are instances of comparisons of deviation, providing two sets of empirical materials, having to do with entailment and total adjectives in the sense of Yoon (1996) and Rotstein and Winter (2004) (cf. Kennedy and McNally 2005). In Sections 3 and 4, I put forward my compositional analysis of the constructions under discussion, along with additional confirming evidence. Finally, in Section 5, I consider the implications of my proposal in the context of gradable adjective phenomena in general and support Snyder et al.'s (1994) thesis that AdjP in Japanese is impoverished in such a way that it lacks the position to host a degree variable or constant (cf. Fukui 1986).

2. *Izyoo(ni)*- and *Gurai*-comparatives Being Instances of Comparisons of Deviation

Let me first establish that *izyoo(ni)*- and *gurai*-comparatives are instances of comparisons of deviation.

2.1. Entailment

Comparisons of deviation in English are first discussed by Bierwisch (1989), and more recently by Kennedy (1999, 2001) as a counterexample to cross-polar anomaly. One such instance is illustrated in (11), whose meaning is paraphrased as (12).

- (11) (= Kennedy 2001 [15a])
 [The Red Sox] will be scrutinized as closely as the Orioles to see whether they are any more legitimate than the Orioles are fraudulent [New York Times, Summer 1998 (exact date unknown)]
 (12) (= Kennedy 2001 [16])
 The degree to which the Red Sox exceed a standard of legitimacy is greater

comparisons of deviation, expressed by *izyoo(ni)*- and *gurai*-comparatives, with (b) comparisons of the absolute projections of two objects.

than the degree to which the Orioles exceed a standard of fraudulence.

As noted above, the comparisons expressed by the standard comparatives or equatives, on the other hand, compare the absolute projections of two objects on a scale. For example, the most natural paraphrase of (13) is (14).

(13) (= Kennedy 2001 [17])

It was a squarish hole, as deep as a ten-story building is tall, cut down into the hard and uncooperative earth. [Reynolds, W.J., 'The Lost Boys', in Hillerman, T.: 1994, *The Mysterious West*, Harper Collins, New York, p. 223]

(14) (= Kennedy 2001 [18])

The depth of the hole is at least as great as the height of a ten-story building.

Crucially, comparisons of deviation entail that the properties predicated of the compared objects are true in the absolute sense, while the standard absolute comparisons do not. We can thus distinguish them by observing their entailment patterns, as in (15).

(15) (= Kennedy 2001 [19])

a. #The Red Sox are more legitimate than the Orioles are fraudulent, but they're not legitimate.

b. The hole is deeper than a two-year old is tall, but it is not deep.

Provided that a given comparative is an instance of either the standard comparison or a comparison of deviation, we can thus apply this entailment test to *izyoo(ni)-* and *gurai-*comparatives to determine what they are. The test result indicates that *izyoo(ni)-* and *gurai-*comparatives are instances of comparisons of deviation. For example, (16) is understood to mean that John is smarter than Mary.

(16) John-wa [Mary **izyoo(ni)**] kasikoi.

John-TOP Mary more smart

'John is smarter than Mary.'

As I will demonstrate, however, (16) entails that John and Mary are both smart.

First, consider (17).

(17) #Kono test kara, John-wa [Mary **izyoo(ni)**] kasikoi koto,

this test from John-NOM Mary more smart fact

sikasi (John-wa) kessite kasikoku-nai koto-ga wakatta.

but John-TOP at:all smart-NEG fact-NOM understood

'From these exam results, we came to understand that John is smarter than Mary, but he is not smart at all.'

This example shows that (16) cannot co-occur with the proposition that John is not smart at all, leading us to conclude that (16) entails that John is smart.

This conclusion is further supported by the fact that (18) is acceptable, contrast-

ing with (17). The acceptability of (18) is expected since the proposition that *John is not extraordinarily smart* does not exclude the possibility that John is smart.⁸

- (18) Kono test kara, John-wa [Mary **izyoo(ni)**] kasikoi koto,
 this test from John-NOM Mary more smart fact
 sikasi (John-wa) tobinukete kasikoku-nai koto-ga wakatta.
 but John-TOP extraordinarily smart-NEG fact-NOM understood
 ‘From these exam results, we came to understand that John is smarter than Mary, but he is not extraordinarily smart.’

Second, (19) and (20) similarly indicate that (16) also entails that Mary is smart.⁹

- (19) #Kono test kara, John-wa [Mary **izyoo(ni)**] kasikoi koto,
 this test from John-NOM Mary more smart fact
 sosite Mary-wa kessite kasikoku-nai koto-ga wakatta.
 and Mary-TOP at:all smart-NEG fact-NOM understood
 ‘From these exam results, we came to understand that John is smarter than Mary, and Mary is not smart at all.’
- (20) Kono test kara, John-wa [Mary **izyoo(ni)**] kasikoi koto,
 this test from John-NOM Mary more smart fact
 sosite Mary-wa tobinukete kasikoku-nai koto-ga wakatta.
 and Mary-TOP extraordinarily smart-NEG fact-NOM understood

⁸ As expected, the *yori*-comparative counterpart of (16) does not entail that John is smart. This is illustrated by the fact that (i) below is acceptable as (ii). I thank Sanae Tamura for making me aware of the contrast between *yori*-comparative on one hand, and *izyoo(ni)*- and *gurai*-comparatives on the other in terms of their entailment patterns (p.c., September 2005).

- (i) Kono test kara, John-wa [Mary **yori(-wa)**] kasikoi koto, sikasi (John-wa) kessite kasikoku-nai koto-ga wakatta.
 ‘From these exam results, we came to understand that John is smart[er] than Mary, but he is not smart at all.’
- (ii) Kono test kara, John-wa [Mary **yori(-wa)**] kasikoi koto, sikasi (John-wa) tobinukete kasikoku-nai koto-ga wakatta.
 ‘From these exam results, we came to understand that John is smart[er] than Mary, but he is not extraordinarily smart.’

⁹ The *yori*-comparative counterpart of (16) also does not entail that Mary is smart. Indeed, both (i) and (ii) are equally acceptable.

- (i) Kono test kara, John-wa [Mary **yori(-wa)**] kasikoi koto, sosite Mary-wa kessite kasikoku-nai koto-ga wakatta.
 ‘From these exam results, we came to understand that John is smart[er] than Mary, and Mary is not smart at all.’
- (ii) Kono test kara, John-wa [Mary **yori(-wa)**] kasikoi koto, sosite Mary-wa tobinukete kasikoku-nai koto-ga wakatta.
 ‘From these exam results, we came to understand that John is smart[er] than Mary, and Mary is not extraordinarily smart.’

‘From these exam results, we came to understand that John is smarter than Mary, and Mary is not extraordinarily smart.’

A similar story holds with *gurai*-comparative. For example, (21) is understood to mean that John is as smart as Mary.

- (21) John-wa [Mary **gurai**] kasikoi.
 John-TOP Mary as smart
 ‘John is as smart as Mary.’

But it entails that John is smart, as illustrated in (22) and (23).

- (22) #Kono test-no kekka kara, John-wa [Mary **gurai**] kasikoi koto,
 this test-GEN result from John-TOP Mary as smart fact
 sikasi (John-wa) kessite kasikoku-nai koto-ga wakatta.
 but John-TOP at.all smart-NEG fact-NOM understood
 ‘From these exam results, we came to understand that John is as smart as Mary, but he is not smart at all.’

- (23) Kono test-no kekka kara, John-wa [Mary **gurai**] kasikoi koto,
 this test-GEN result from John-TOP Mary as smart fact
 sikasi (John-wa) tobinukete kasikoku-nai koto-ga wakatta.
 but John-TOP extraordinarily smart-NEG fact-NOM understood
 ‘From these exam results, we came to understand that John is as smart as Mary, but he is not extraordinarily smart.’

In addition, (24) and (25) indicate that (21) also entails that Mary is smart.

- (24) #Kono test-no kekka kara, John-wa [Mary **gurai**] kasikoi koto,
 this test-GEN result from John-TOP Mary as smart fact
 sosite Mary-wa kessite kasikoku-nai koto-ga wakatta.
 and Mary-TOP at.all smart-NEG fact-NOM understood
 ‘From these exam results, we came to understand that John is as smart as Mary, and Mary is not smart at all.’

- (25) Kono test-no kekka kara, John-wa [Mary **gurai**] kasikoi koto,
 this test-GEN result from John-TOP Mary as smart fact
 sosite Mary-wa tobinukete kasikoku-nai koto-ga wakatta.
 and Mary-TOP extraordinarily smart-NEG fact-NOM understood
 ‘From these exam results, we came to understand that John is as smart as Mary, and Mary is not extraordinarily smart.’

We have thus observed one piece of evidence that *izyoo(ni)*- and *gurai*-comparatives are instances of comparisons of deviation.

2.2. Incompatibility with total adjectives

As noted by a number of researchers, sentences like (26) could be true in one context and false in another (cf. Sapir 1944, McConnell-Ginet 1973, Kamp 1975, Klein 1980, Ludlow 1989, Kennedy 1999). Following the standard practice (cf.

von Stechow 1984), I refer to the construction exemplified by (26), whose main predicate is an unmodified adjective, as *positive*.

(26) (= Kennedy 2001 [1])

The Mars Pathfinder mission was expensive.

As stated in Kennedy (2001:33), “in a context in which the discussion includes all objects that have some cost value associated with them, [(26)] would most likely be judged true, since the cost of spending a spacecraft to Mars is far greater than the cost of most things (e.g., nails, dog food, a used Volvo, etc.) In a context in which only missions involving interplanetary exploration are salient, however, [(26)] would probably be judged false, since a unique characteristic of the Mars Pathfinder mission was its low cost compared to other projects involving the exploration of outer space.”

It is widely assumed by the field that the interpretation of positive compares the degree to which the subject has the predicated property to an appropriate standard of comparison. In most cases, the appropriate standard varies depending on the context where it is used, i.e., depending on what are included in the comparison set, and therefore the truth condition of positive turns out to be context-dependant, as we have just witnessed with (26).

Yoon (1996), Rotstein and Winter (2004), and Kennedy and McNally (2005), however, point out that certain classes of gradable adjectives behave in such a way that when positives are constructed with them, the appropriate standard of comparison is fixed independently from the context. They come in two categories: *total adjectives* and *partial adjectives*. If positive is constructed with a gradable adjective of the former class, the standard of comparison is necessarily the maximum degree of the scale under consideration, and the sentence is true only if the entity denoted by the subject has the predicated property to the degree as large as the maximum degree. If a gradable adjective of the latter is used, on the other hand, the standard must be the minimum degree of the scale (i.e., 0 degree), and the sentence is true as long as the entity denoted by the subject has the predicated property to some degree that is larger than the minimum degree. One example of a total adjective is (*is*) *clean*, which is true of an object if it has the maximum degree of cleanliness. For example, if there is a tiny spot of dirt in a room, the room is not said to be clean. Partial adjectives include (*is*) *dirty*, which is true of an object if it has some degree of dirtiness. If there is even a tiny bit of dirt in a room, we say that the room is dirty. Some examples of total and partial adjectives are listed here, together with ‘regular’ gradable adjectives.

(27) a. Total adjectives:

dry, full, flat, closed, straight, clean, etc.

b. Partial adjectives:

wet, awake, visible, open, bent, dirty, etc.

c. ‘Regular’ gradable adjectives:

tall, short, new, old, smart, stupid, small, large, expensive, inexpensive, etc.

These distinctions of gradable adjectives are semantically significant because they account for the following entailment patterns (cf. Cruse 1986, Rotstein and Winter 2004).

- (28) (= Kennedy & McNally 2005 [39a, b])
 a. The door is not open (closed). \models The door is closed (open).
 b. The table is not wet (dry). \models The table is dry (wet).
 (29) (= Kennedy & McNally 2005 [40a, b])
 a. The door is not large (small). $\not\models$ The door is small (large).
 b. The table is not expensive (inexpensive). $\not\models$ The table is inexpensive (expensive).

Assuming that pairs of antonyms share the same scales, we expect that for any given antonyms pair consisting of total and partial adjectives, the positive constructed with one member entails the negation of the positive with the other member, and vice versa; hence (28). If a pair of antonyms consists of 'regular' gradable adjectives, on the other hand, such entailment patterns are not expected, since the truth condition of the positive constructed using a 'regular' gradable adjective is context-dependant.

The same entailment patterns can be illustrated in Japanese:

- (30) a. Doa-ga aitei-nai (simattei-nai) \models Doa-ga simatteiru (aiteiru).
 'The door is not open (not closed)' \models 'The door is closed (open).'
 b. Kono sao-wa massuguzya-nai (magattei-nai) \models Kono sao-wa
 'This rod is not straight (not bent)' \models 'This rod is
 magatteiru (massugu da).
 bent (straight).'
 (31) a. Doa-ga okiku-nai (tiisaku-nai). $\not\models$ Doa-ga tiisai (ookii).
 'The door is not large (not small)' $\not\models$ 'The door is small (large).'
 b. Kono sao-wa atarasiku-nai (huruku-nai). $\not\models$ Kono sao-wa
 'This rod is not new (not old)' $\not\models$ 'This rod is
 hurui (atarasii).
 old (new).'

Let us now turn to *izyoo(ni)*- and *gurai*-comparatives. First, consider (32).

- (32) a. Kono yuka-wa [ano kauntaa **izyoo(ni)**] atarasii.
 this floor-TOP that counter more new
 'This floor is newer than that counter.'
 b. Kono yuka-wa [ano kauntaa **gurai**] atarasii.
 this floor-TOP that counter as new
 'This floor is as new as that counter.'

If *izyoo(ni)*- and *gurai*-comparatives are instances of comparisons of deviation, as I have been assuming, (32a) and (32b) for example, are informally analyzed as (33a) and (33b), respectively.

- (33) a. The degree to which the newness of this floor exceeds a standard level of newness is greater than the degree to which the newness of that counter exceeds the standard level of newness.
 b. The degree to which the newness of this floor exceeds a standard level of newness is roughly equal to the degree to which the newness of that counter exceeds the standard level of newness.

Schematically, (33a) and (33b) are represented as (34a) and (34b), respectively.

- (34) Let d_1 , d_2 , and d_s be degrees in a newness scale, corresponding to this floor, that counter, and the appropriate standard, respectively.
 a. $d_1 - d_s > d_2 - d_s$
 b. $d_1 - d_s \approx d_2 - d_s$

The predicate I used with the sentences in (32) is a ‘regular’ gradable adjective, *atarasii* ‘new’, as shown in (31b). Suppose that the predicate is replaced with a total adjective. Then, we would necessarily have the interpretations in (35), i.e., the contradiction with *izyoo(ni)*-comparative and the tautology with *gurai*-comparative; thus, the resultant sentences are predicted to be infelicitous.¹⁰ I am assuming here that subtraction is defined relative to a finite scale with no negative values.

- (35) a. The interpretation of *izyoo(ni)*-comparative with total adjectives:
 $d_1 - \max > d_2 - \max \rightarrow 0 > 0$
 b. The interpretation of *gurai*-comparative with total adjectives:
 $d_1 - \max \approx d_2 - \max \rightarrow 0 \approx 0$

On the other hand, we expect that *izyoo(ni)*- and *gurai*-comparatives are compatible with partial adjectives, as they are interpreted as (36).

- (36) a. The interpretation of *izyoo(ni)*-comparative with partial adjectives:
 $d_1 - \min (\text{i.e., } 0) > d_2 - \min (\text{i.e., } 0) \rightarrow d_1 > d_2$
 b. The interpretation of *gurai*-comparative with partial adjectives:
 $d_1 - \min (\text{i.e., } 0) \approx d_2 - \min (\text{i.e., } 0) \rightarrow d_1 \approx d_2$

The predictions are indeed borne out. As (37) and (38) illustrate, *izyoo(ni)*- and *gurai*-comparatives are not compatible with *simatteiru* ‘to be closed’ a total adject-

¹⁰ An anonymous reviewer raises the possibility that the incompatibility of *gurai*-comparative with total adjectives may not be attributed to the resultant interpretation being tautology; for the statement “7 = 7” is, for example, a tautology, yet felicitous. The alternative explanation the reviewer suggests is one based on the implication that the equality need not be absolute. For instance, the sentence “7 = 7” sounds much better than the sentence “7 ≈ 7”, despite the fact that literally speaking the latter is also true. That is because the latter incorrectly implies that the former does not hold (i.e., the standard Gricean implicature). *Gurai*-comparative constructed with total adjectives faces a similar situation; it would necessarily be taken to mean that two degrees that are exactly the same are nearly equal, hence found to be infelicitous. In this paper, I do not resolve the issue of which explanation is more suitable.

tive, but can accommodate *aiteiru* ‘to be open’ a partial adjective.¹¹

- (37) a.??Kono mado-wa [ano mado **izyoo(ni)**] simatteiru.
 this window-TOP that window more closed
 ‘This window is more closed than that window.’
 b.??Kono mado-wa [ano mado **gurai**] simatteiru.
 this window-TOP that window as closed
 ‘This window is as closed as that window.’
- (38) a. Kono mado-wa [ano mado **izyoo(ni)**] aiteiru.
 this window-TOP that window more open
 ‘This window is more open than that window.’
 b. Kono mado-wa [ano mado **gurai**] aiteiru.
 this window-TOP that window as open
 ‘This window is as open as that window.’

The same point can be illustrated with a different pair of total and partial adjectives; cf. (39) and (40).

- (39) a.??Kono sao-wa [ano sao **izyoo(ni)**] massugu da.
 this rod-TOP that rod more straight COPULA
 ‘This rod is straighter than that rod.’
 b.??Kono sao-wa [ano sao **gurai**] massugu da.
 this rod-TOP that rod as straight COPULA
 ‘This rod is as straight as that rod.’
- (40) a. Kono sao-wa [ano sao **izyoo(ni)**] magatteiru.
 this rod-TOP that rod more bent
 ‘This rod is more bent than that rod.’
 b. Kono sao-wa [ano sao **gurai**] magatteiru.
 this rod-TOP that rod as bent
 ‘This rod is as bent as that rod.’

We have thus further confirmed that *izyoo(ni)*- and *gurai*-comparatives are instances of comparisons of deviation.

3. Proposal

We are now in a position to consider the semantic composition of *izyoo(ni)*- and

¹¹ Incidentally, as pointed out by Kennedy (2005), *yori*-comparative can accommodate both total and partial adjectives, see (i) below. This is consistent with the assumption that *yori*-comparative can compare the absolute projections of two objects on a scale.

- (i) a. Kono mado-wa [ano mado **yori(-wa)**] simatteiru.
 this window-TOP that window than-TOP closed
 ‘This window is [more] closed than that window.’
 b. Kono mado-wa [ano mado **yori(-wa)**] aiteiru.
 this window-TOP that window than-TOP open
 ‘This window is [more] open than that window.’

gurai-comparatives. Before doing so, I would like to point out the fact that these constructions may involve two distinguished gradable adjectives and hence two different scales in their two conjuncts.¹² For example, consider (41).

- (41) [Context: Pairs of boys and girls are competing for a contest. John and Mary constitute a team.]
- a. [[John-ga baka de aru] **izyoo(ni)**] Mary-ga kasikoi (node,
John-NOM stupid COPULA more Mary-NOM smart because
kono tiimu-wa heikin ten yori ii ten-o toru daroo.)
this team-TOP average score than good score-ACC get probably
'Since how smart Mary is exceeds how foolish John is, this team could probably score above the average.'
- b. [[John-ga baka de aru] **gurai**] Mary-ga kasikoi (node,
John-NOM stupid COPULA as Mary-NOM smart because
kono tiimu-wa heikin ten atari-o toru daroo.)
this team-TOP average score around-ACC get probably
'Since how smart Mary is corresponds to how foolish John is, this team could probably score the average.'

In these examples, the scale involved in the matrix clause is a smartness scale, and that involved in the embedded clause is a foolishness scale. With one interpretation, the standard value of the smartness scale is the average intelligence level of the girls, and that of the foolishness scale is the average intelligence level of the boys. What are compared are thus the degree to which Mary's smartness exceeds the average intelligence level of the girls and the degree to which John's foolishness exceeds the average foolishness level of the boys.

Similarly, to interpret the examples in (42), two distinguished scales and two different standard values might be involved.

¹² Needless to say, when *izyoo(ni)*- and *gurai*-comparatives involve two distinguished scales, they must be commensurable; thus the contrast between (i) and (41) is expected.

- (i) [Context: Pairs of boys and girls are competing for a contest. John and Mary constitute a team.]
- a. *[[John-ga baka de aru] **izyoo(ni)**] Mary-ga genkina
John-NOM stupid COPULA more Mary-NOM lively
(node, kono tiimu-wa heikin ten-wa toru daroo.)
because this team-TOP average score-TOP get probably
'Since how lively Mary is exceeds how foolish John is, this team could probably score above the average.'
- b. *[[John-ga baka de aru] **gurai**] Mary-ga genkina
John-NOM stupid COPULA as Mary-NOM lively
(node, kono tiimu-wa heikin ten atari-o toru daroo.)
because this team-TOP average score around-ACC get probably
'Since how lively Mary is corresponds to how foolish John is, this team could probably score the average.'

- (42) [Context: We are building a house that has several windows and doors. We bought a certain grain of wood to cover both windows and doors.]
- a. [[Kono doa waku-no haba-ga hiroi] **izyoo(ni)**] ano
 this door frame-GEN width-NOM wide more that
 mado waku-no tate-ga mizikai (node, tabun
 window frame-GEN height-NOM short because probably
 koredake-no ki-de tariru daroo.)
 this:much-GEN timber-with sufficient probably
 ‘Since that window frame’s height is shorter than this door frame’s width is wide, the amount of timbers we bought would probably suffice.’
- b. [[Kono doa waku-no haba-ga hiroi] **gurai**] ano mado
 this door frame-GEN width-NOM wide as that window
 waku-no tate-ga mizikai (node, tabun koredake-no
 frame-GEN height-NOM short because probably this:much-GEN
 ki-de tariru daroo.)
 timber-with sufficient probably
 ‘Since that window frame’s height is as short as this door frame’s width is wide, the amount of timbers we bought would probably suffice.’

In building the analyses of *izyoo(ni)*- and *gurai*-comparatives, I take examples like (41) and (42) as basic cases and assume that *izyoo(ni)*- and *gurai*-comparatives involve the computation of a degree of deviance in both the matrix and embedded clauses, independently from each other, even when the gradable adjective in the embedded clause does not surface as in the cases we have discussed above. For example, I assume that (43a) and (43b) are equivalent to (44a) and (44b), respectively.

- (43) a. Susan-ga [Mary **izyoo(ni)**] utukusii (to siyoo).
 Susan-NOM Mary more beautiful that suppose
 ‘(Suppose that) Susan is more beautiful than Mary.’
- b. Susan-ga [Mary **gurai**] utukusii (to siyoo).
 Susan-NOM Mary as beautiful that suppose
 ‘(Suppose that) Susan is as beautiful as Mary.’
- (44) a. Susan-ga [[Mary-ga utukusii] **izyoo(ni)**] utukusii (to siyoo).
 ‘(Lit.) (Suppose that) Susan is more beautiful than Mary is beautiful.’
- b. Susan-ga [[Mary-ga utukusii] **gurai**] utukusii (to siyoo).
 ‘(Lit.) (Suppose that) Susan is as beautiful as Mary is beautiful.’

Given that *izyoo(ni)*- and *gurai*-comparatives involve the computation of a degree of deviance from an appropriate standard in both the matrix and embedded clauses, the first issue we must address is how to encode the appropriate standards. Two options are conceivable.

The first one is to assume that both conjuncts have a gradable adjective occurring with an extended version of *pos* (for *positive*) in the sense of von Stechow 1984. *Pos* is appositely postulated in order to capture the assumption that the inter-

pretation of positive compares the degree to which the subject has the predicated property to a contextually-determined appropriate standard. As an implementation of the idea, Kennedy & McNally (2005) adopt (45), where **standard** is the relation that holds of a degree d just in case it meets a standard of comparison for an adjective P with respect to a comparison class determined by C , a variable over properties of individuals.

$$(45) (= \text{Kennedy \& McNally 2005 [13]}) \\ \llbracket \textit{pos} \rrbracket = \lambda P \lambda x \exists d [\textbf{standard}(d)(P)(C) \wedge P(d)(x)]$$

Kennedy & McNally (2005) assume that the specification of **standard** is determined by the lexical property of each gradable adjective; thus, the three-way distinctions of gradable adjectives, discussed in Section 2.2, are encoded in the lexicon. When *pos* is combined with a ‘regular’ adjective like *expensive*, **standard**(d)(P)(C) holds if and only if d is larger than d_s , where d_s is an appropriate standard on the scale determined by P , computed based on C . Since the members of C change, depending on the context, the truth condition of positive constructed with a ‘regular’ gradable adjective is expected to be context-dependant. The denotation of (*is*) *expensive*, the combination of *pos* and *expensive*, for example, becomes (46).

$$(46) \llbracket \textit{pos} \rrbracket(\llbracket \textit{expensive} \rrbracket) = \lambda x \exists d [d > d_s \wedge \delta_{\textit{expensive}}(x) = d], \text{ where } d_s \text{ is the appropriate standard on the expensiveness scale relevant to the context}$$

If *pos* is combined with a total or partial adjective, C is not utilized; the standard of comparison necessarily becomes the maximum or minimum point on the scale. The denotations of ‘(is) dry’ and ‘(is) wet’ become (47a) and (47b), respectively, where $\max(S_{\textit{dry}})$ is the highest point on the dryness scale, and $\min(S_{\textit{wet}})$ the lowest point on the wetness scale.

$$(47) \text{ a. } \llbracket \textit{pos} \rrbracket(\llbracket \textit{dry} \rrbracket) = \lambda x \exists d [d = \max(S_{\textit{dry}}) \wedge \delta_{\textit{dry}}(x) = d], \text{ where } S_{\textit{dry}} \text{ stands for the dryness scale} \\ \text{ b. } \llbracket \textit{pos} \rrbracket(\llbracket \textit{wet} \rrbracket) = \lambda x \exists d [d > \min(S_{\textit{wet}}) \wedge \delta_{\textit{wet}}(x) = d], \text{ where } S_{\textit{wet}} \text{ stands for the wetness scale}$$

We still need to tailor the definition of *pos* in (45) in such a way that the compositional analyses of *izyoo(ni)*- and *gurai*-comparatives are achieved. But assuming that both conjuncts have a gradable adjective occur with *pos*, we have a way to encode the appropriate standards for each conjunct. Under this approach, the LF presentations of (i) (43a) and (44a) and (ii) (43b) and (44b) include at least (48a) and (48b), respectively.

$$(48) \text{ a. } [_{\text{XP}} [_{\text{IP}} \text{Mary} [\textit{pos} \textit{utukusii}] \textit{izyoo}(\textit{ni})] [_{\text{IP}} \text{Susan-ga} [\textit{pos} \textit{utukusii}]] \\ \text{ b. } [_{\text{XP}} [_{\text{IP}} \text{Mary} [\textit{pos} \textit{utukusii}] \textit{gurai}] [_{\text{IP}} \text{Susan-ga} [\textit{pos} \textit{utukusii}]]$$

The second option is to assume and manipulate a null comparative morpheme, corresponding to English *er*. Beck et al. (2004) assume that (49), for instance, compares Sally’s height and some height salient in a given context. In other words, (49)

is analyzed as (50), which is a slightly adapted version of what Beck et al. provide.

(49) Sally is taller.

(50) a. LF representation:

$[_{IP1} [_{DegP} [_{Deg} er] d'_s] [_{IP2} Op_1 [_{IP3} Sally\ is\ [_{AdjP} t_1 [_{Adj} tall]]]]]$, where d'_s is a degree salient in the context

b. Semantic composition:

$[[IP_2]] = \lambda d_1 \delta_{tall}(s) = d_1$
 $[[Deg]] = \lambda d_2 \lambda P \exists d_1 [d_1 > d_2] P(d_1)$
 $[[DegP]] = \lambda P \exists d_1 [d_1 > d'_s] P(d_1)$
 $[[IP_1]] = \exists d_1 [d_1 > d'_s] \delta_{tall}(s) = d_1$

We can thus capture the assumption that *izyoo(ni)*- and *gurai*-comparatives involve the computation that makes reference to appropriate standards relevant to the context, by assuming that both conjuncts contain the null comparative morpheme and a contextually salient degree, which happens to correspond to the appropriate standard on the relevant scale. In this approach, the LF representations of (i) (43a) and (44a) and (ii) (43b) and (44b) at least include (51a) and (51b) respectively, where d'_s and d_s coincide with the standards on the scales relevant for the comparison.

(51) a. $[_{XP} [_{IP} [_{DegP} [_{Deg} er] d'_s] [_{IP} Op_2 [_{IP} Mary-ga\ [_{AdjP} t_2 [_{Adj} utukusii]]]]]]$
 $izyoo(ni)] [_{IP} [_{DegP} [_{Deg} er] d'_s] [_{IP} Op_1 [_{IP} Susan-ga\ [_{AdjP} t_1 [_{Adj} utukusii]]]]]]]$
 b. $[_{XP} [_{IP} [_{DegP} [_{Deg} er] d'_s] [_{IP} Op_2 [_{IP} Mary-ga\ [_{AdjP} t_2 [_{Adj} utukusii]]]]]]\ gurai]$
 $[_{IP} [_{DegP} [_{Deg} er] d'_s] [_{IP} Op_1 [_{IP} Susan-ga\ [_{AdjP} t_1 [_{Adj} utukusii]]]]]]]$

We are now in a position to choose one option over the other, and our choice depends on the answers to the following questions. The first question is whether there is evidence for (52a) and (52b).

(52) a. Japanese has *pos*.

b. Japanese has a null degree morpheme corresponding to *er*.

To the extent that we may assume the three-way distinctions of gradable adjective, discussed in Section 2.2, to be captured with *pos* (cf. Kennedy & McNally 2005), the existence of such distinctions in Japanese indicates (52a). However, it is not clear (52b) is reasonable.

Given that *izyoo(ni)*- and *gurai*-comparatives compare two degrees of deviance from an appropriate standard on a relevant scale, the second question is if (53a) and (53b) are feasible assumptions.

(53) a. The projection of *pos* hosts a degree d_d , corresponding to the degree of deviance from an appropriate standard on a scale, i.e., $[_{XP} d_d [_X pos]]$.

b. The projection of a null degree morpheme hosts a degree d'_d , corresponding to the degree of deviance from an appropriate standard on a scale, i.e., $[_{DegP} d'_d [_{Deg} er] d'_s]$.

Since the overt degree morpheme co-occurs with the degree of deviance, as illus-

trated in (54), (53b) is reasonable. However, it is not obvious if (53a) can be maintained.

(54) Sally is 5cm taller.

Since these two questions are closely related, I would like to answer both at once. Beck et al. (2004) claim that Japanese indeed has a null degree morpheme; in particular, *yor*i-comparative necessarily involves it.¹³ Their argument is that the distribution of *yor*i-comparative (e.g., (55)) resembles that of *more*-comparative (e.g., (56a) and (56b)) more than the English positive (e.g., (56c)) and its subspecies (e.g., (56d)), in terms of the ability of expressing differential values.

(55) (= Beck et al. (2004) [130], slightly adapted)

John-wa [Bill **yor**i] 5cm se-ga takai.
 John-TOP Bill than back-NOM tall
 'John is 5cm tall[er] than Bill.'

(56) (= Beck et al. (2004) [129] & [131], slightly adapted)

- a. John is 5cm taller than Bill.
- b. Compared to Bill, John is 5cm taller.
- c. #John is 5cm tall.
- d. #Compared to Bill, John is 5cm tall.

It is true that the differential reading is not possible in the English positive and

¹³ One might say that *motto* 'more' is a degree morpheme, but Beck et al. (2004) reject the possibility, pointing out that (i-b), in contrast with (i-a), presupposes that Bill is smart (cf. (ii)).

(i) (= Beck et al. (2004) [127])

- a. Sally-wa Bill **yor**i kasikoi.
 Sally-TOP Bill than smart
- b. Sally-wa Bill **yor**i *motto* kasikoi.
 Sally-TOP Bill than more smart

(ii) Sally is smarter than Bill.

In addition, given the perfectly acceptable status of (iii), Ishii's (1991) observation that the addition of *motto* to (iv-a) does not improve the acceptability, as illustrated in (iv-b), is consistent with the view that *motto* is not a degree morpheme. (The provided acceptability judgments are Ishii's.)

(iii) John bought a longer umbrella than Mary did yesterday.

(iv) a. (= Ishii 1991: Section 3 [160], slightly adapted)

?*John-wa [[Mary-ga kinoo katta] **yor**i] nagai kasa-o katta.
 John-TOP Mary-NOM yesterday bought than long umbrella-ACC bought
 '(Lit.) John bought a long[er] umbrella than Mary bought yesterday.'

b. (= Ishii 1991: Section 3 [161], slightly adapted)

?*John-wa [[Mary-ga kinoo katta] **yor**i] *motto* nagai
 John-TOP Mary-NOM yesterday bought than more long
 kasa-o katta.
 umbrella-ACC bought
 '(Lit.) John bought a long[er] umbrella than Mary bought yesterday.'

its subspecies, but a different picture emerges in Japanese. Namely, these constructions in Japanese do allow the above reading that is under discussion. For example, consider (57).

- (57) [Context: The requirement height of becoming a jockey is no taller than 160cm, and John is 165cm tall.]
 John-wa 5cm se-ga takai (node, kisyu-ni-wa narenai.)
 John-TOP back-NOM tall because jockey-DAT-TOP unable:become
 '(Lit.) (Because) John is 5cm tall, (he cannot become a jockey).'

If (57) is uttered against the provided context, it can be understood to mean that John is 5 cm taller than the required height. Similarly, (58) is taken to mean that John is 5 cm taller than Bill.

- (58) John-wa [Bill to kuraberu to] 5cm se-ga takai.
 John-TOP Bill with compare COMP back-NOM tall
 '(Lit.) Compared to Bill, John is 5cm tall.'

One may argue that (57) and (58) are associated with such readings because (57) and (58) can be analyzed on a par with (59a) and (59b), respectively, using a null degree morpheme.

- (59) a. John is 5cm taller.
 b. Compared to Bill, John is 5cm taller.

Such a claim cannot be maintained, however, because it fails to explain the status of (60).

- (60) [Context: We are wondering who is taller, John or Bill.]
 #John-{wa / ga} se-ga takai.
 John-TOP/NOM back-NOM tall.
 '(Lit.) John is tall.'

If Japanese has a null comparative morpheme, (60) should be able to be analyzed as (61), predicting (60) to be felicitous, contrary to the fact.

- (61) John is taller.

Takeo Kurafuji (p.c., July 2006) and an anonymous reviewer independently pointed out that (60) can be felicitously uttered in response to (62), indicating that John is taller than Bill.

- (62) John to Bill to de-wa dotira-ga se-ga takai?
 John and Bill and COPULA-TOP which-NOM back-NOM tall
 'Which one is taller, John or Bill?'

This fact does not indicate that (60) is analyzed as (61), however. In the context in which (62) is uttered, the speaker would like to choose either John or Bill for some purposes. Assuming that questions denote a set of possible answers (cf. Hamblin 1971, Karttunen 1977), (62) denotes (63).

- (63) {(i) that John is tall, (ii) that Bill is tall}

We may thus understand that the speaker, uttering (62), would like to decide which proposition is correct, (i) or (ii) in (63), taking the appropriate standard to be some height lower than John's height but higher than Bill's height. Uttering (60) in response to (62) then indicates that (i) is true but not (ii), implying that John is taller than Bill. In short, the fact that (60) in response to (62) is taken to mean that John is taller than Bill is consistent with the view that (60) is taken to be positive. I wish to reiterate that if Japanese had a null degree morpheme, (60) should be able to be analyzed as (61), and uttered felicitously in the provided context, even without following a question like (62).

Two things are clear from the above discussion. First, what appear to be positive or its subspecies in Japanese are what they are and do not involve a null degree morpheme, and at the same time have the ability to express differential values. Second, given that the availability of the differential reading does not depend on the presence or absence of a degree morpheme, the parallelism between *yor*i-comparative and *more*-comparative in terms of the availability of the reading under discussion does not constitute evidence that *yor*i-comparative involves a null degree morpheme. Thus, we are yet to see evidence for the existence of a null degree morpheme in Japanese. I would also think that not admitting a null degree morpheme into the grammar of Japanese is theoretically advantageous, because it can explain the status of (60). In summary, both (52a) and (53a) are supported. However, (52b) is not tenable; thus, (53b) is not a question.

Given that (52b) cannot be maintained, we are led to reject the second approach, as it makes crucial use of the null degree morpheme. There is also a serious problem with the second approach. In Section 2.2, we observed that *izyoo*(*ni*)- and *gurai*-comparatives are not compatible with total adjectives. If we adopt the second approach, we are forced to state that whenever *izyoo*(*ni*)- or *gurai*-comparative that is constructed with a total adjective is uttered, the contextually salient degrees necessarily correspond to the maximum points of the scales relevant for the comparison. This is not ideal of course, because the appropriate standards for total adjectives are determined independently from the context. With the first approach, the generalization under discussion is not problematic because it utilizes *pos*; as Kennedy and McNally (2005) illustrate in effects (see (46) and (47) above), it allows us to attribute the three-way distinctions of gradable adjectives to their lexical properties.

We are thus led to adopt the first option. To incorporate the assumption in (53a) that the projection of *pos* hosts a degree d_{i1} corresponding to the degree of deviance from an appropriate standard on a scale, I alter the definition of *pos* above to be (64), where **standard** is the relation that holds of a degree d_i just in case it exceeds by a degree d_2 the appropriate standard of comparison for an adjective *P* with respect to a comparison class determined by *C*.¹⁴

$$(64) \llbracket pos \rrbracket = \lambda d_2 \lambda P \lambda x \exists d_i [\mathbf{standard}(d_i)(d_2)(P)(C) \wedge P(d_i)(x)]$$

¹⁴ I leave open the issue of whether (64) can be maintained also in English.

With the proposed definition, *John-wa 5 cm se-ga takai* in (57) is analyzed as (65).

(65) a. LF representation:

$$[{}_{\text{IP}} \text{John is } [{}_{\text{AdjP}_1} [{}_{\text{XP}} 5\text{cm } [{}_{\text{X}} \text{pos}]]] [{}_{\text{AdjP}_2} \text{tall}]]]$$

b. Semantic composition:

$$\llbracket \text{X} \rrbracket = \lambda d_2 \lambda P \lambda x \exists d_1 [\text{standard}(d_1)(d_2)(P)(C) \wedge P(d_1)(x)]$$

$$\llbracket \text{XP} \rrbracket = \lambda P \lambda x \exists d_1 [\text{standard}(d_1)(5\text{cm})(P)(C) \wedge P(d_1)(x)]$$

$$\llbracket \text{AdjP}_2 \rrbracket = \lambda d \lambda x \delta_{\text{tall}}(x) = d$$

$$\llbracket \text{AdjP}_1 \rrbracket = \lambda x \exists d_1 [\text{standard}(d_1)(5\text{cm})(\llbracket \text{tall} \rrbracket)(C) \wedge \delta_{\text{tall}}(x) = d_1]$$

$$\llbracket \text{IP} \rrbracket = \exists d_1 [\text{standard}(d_1)(5\text{cm})(\llbracket \text{tall} \rrbracket)(C) \wedge \delta_{\text{tall}}(j) = d_1]$$

In the context of (57), the appropriate standard is identified as the maximum height of a jockey, namely 160 cm. Thus, $\llbracket \text{IP} \rrbracket$ in (65) turns out to be equivalent to (66).

$$(66) \exists d_1 [d_1 = 5\text{cm} + 160\text{cm} \wedge \delta_{\text{tall}}(j) = d_1]$$

When no differential value is explicitly mentioned, I assume that the projection of *pos* hosts a free variable, which is to be existentially bound by existential closure in the sense of Heim (1982), in the position where a differential value normally occurs. For example, (67) is analyzed as (68), and the final result turns out to be (69).

(67) John-wa se-ga takai.

John-TOP back-NOM tall

'John is tall.'

(68) a. LF representation:

$$[{}_{\text{IP}} \text{John is } [{}_{\text{AdjP}_1} [{}_{\text{X}'} d_2 [{}_{\text{X}} \text{pos}]]] [{}_{\text{AdjP}_2} \text{tall}]]]$$

b. Semantic composition:

$$\llbracket \text{X} \rrbracket = \lambda d_2 \lambda P \lambda x \exists d_1 [\text{standard}(d_1)(d_2)(P)(C) \wedge P(d_1)(x)]$$

$$\llbracket \text{X}' \rrbracket = \lambda P \lambda x \exists d_1 [\text{standard}(d_1)(d_2)(P)(C) \wedge P(d_1)(x)]$$

$$\llbracket \text{AdjP}_2 \rrbracket = \lambda d \lambda x \delta_{\text{tall}}(x) = d$$

$$\llbracket \text{AdjP}_1 \rrbracket = \lambda x \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{tall} \rrbracket)(C) \wedge \delta_{\text{tall}}(x) = d_1]$$

$$\llbracket \text{IP} \rrbracket = \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{tall} \rrbracket)(C) \wedge \delta_{\text{tall}}(j) = d_1]$$

\exists -closure applies \longrightarrow

$$\llbracket \text{IP} \rrbracket = \exists d_2 \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{tall} \rrbracket)(C) \wedge \delta_{\text{tall}}(j) = d_1]$$

(69) $\exists d_2 \exists d_1 [d_1 = d_2 + d_s \wedge \delta_{\text{tall}}(j) = d_1]$, where d_s is the appropriate standard on the tallness scale relevant to the context

A similar story holds when positive is constructed with a total or partial adjective. Unlike the case of a regular adjective (e.g., (67)), however, *C* does not play a role in the determination of the appropriate standard; instead of d_s in (69), the highest point of a scale is used for a total adjective and the lowest point for a partial adjective. In addition, the difference value in the *pos* projection combined with

a total adjective becomes necessarily 0; otherwise, the degree to which the object under discussion has the predicated property (i.e., d_i in (69)) cannot be defined.

A couple of additional assumptions are needed to complete the compositional analysis. I claim that the denotations of *izyoo(ni)* and *gurai* are (70a) and (70b), respectively.

- (70) a. $\llbracket \text{izyoo}(\text{ni}) \rrbracket = \lambda P_{\langle dt \rangle} \lambda Q_{\langle dt \rangle} (\text{MAX}(Q) > \text{MAX}(P))$
 b. $\llbracket \text{gurai} \rrbracket = \lambda P_{\langle dt \rangle} \lambda Q_{\langle dt \rangle} (\text{MAX}(Q) \approx \text{MAX}(P))$

I also assume that λ -abstraction over differential degrees takes place in both conjuncts of *izyoo(ni)*- and *gurai*-comparatives.

Putting all together, (i) (43a) and (44a) and (ii) (43b) and (44b), for example, are analyzed as (71) and (72), respectively. (43) is repeated here for convenience.

- (43) a. Susan-ga [Mary **izyoo(ni)**] utukusii (to siyoo).
 Susan-NOM Mary more beautiful that suppose
 ‘(Suppose that) Susan is more beautiful than Mary.’
 b. Susan-ga [Mary **gurai**] utukusii (to siyoo).
 Susan-NOM Mary as beautiful that suppose
 ‘(Suppose that) Susan is as beautiful as Mary.’

- (71) a. LF representation:
 $\llbracket_{\text{IP}_1} \llbracket_{\text{YP}} \llbracket_{\text{IP}_4} \text{Op}_2 \llbracket_{\text{IP}_5} \text{Mary-ga} \llbracket_{\text{AdjP}_3} \llbracket_{\text{XP}_2} \text{t}_2 \llbracket_{\text{X}_2} \text{pos} \rrbracket \rrbracket_{\text{AdjP}_4} \text{utukusii} \rrbracket \rrbracket \llbracket_{\text{Y}} \text{izyoo}(\text{ni}) \rrbracket \rrbracket \llbracket_{\text{IP}_2} \text{Op}_1 \llbracket_{\text{IP}_3} \text{Susan-ga} \llbracket_{\text{AdjP}_1} \llbracket_{\text{XP}_1} \text{t}_1 \llbracket_{\text{X}_1} \text{pos} \rrbracket \rrbracket_{\text{AdjP}_2} \text{utukusii} \rrbracket \rrbracket \rrbracket$
 b. Semantic composition:
 $\llbracket \text{X}_2 \rrbracket = \lambda d_2 \lambda P \lambda x \exists d_1 [\text{standard}(d_1)(d_2)(P)(C) \wedge P(d_1)(x)]$
 $\llbracket \text{XP}_2 \rrbracket = \lambda P \lambda x \exists d_1 [\text{standard}(d_1)(d_2)(P)(C) \wedge P(d_1)(x)]$
 $\llbracket \text{AdjP}_4 \rrbracket = \lambda d \lambda x \delta_{\text{beautiful}}(x) = d$
 $\llbracket \text{AdjP}_3 \rrbracket = \lambda x \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(x) = d_1]$
 $\llbracket \text{IP}_5 \rrbracket = \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(m) = d_1]$
 $\llbracket \text{IP}_4 \rrbracket = \lambda d_2 \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(m) = d_1]$
 $\llbracket \text{Y} \rrbracket = \lambda P \lambda Q (\text{MAX}(Q) > \text{MAX}(P))$
 $\llbracket \text{YP} \rrbracket = \lambda Q (\text{MAX}(Q) > \text{MAX}(\lambda d_2 \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(m) = d_1]))$
 $\llbracket \text{IP}_2 \rrbracket = \lambda d_2 \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(s) = d_1]$
 $\llbracket \text{IP}_1 \rrbracket = \text{MAX}(\lambda d_2 \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(s) = d_1]) > \text{MAX}(\lambda d_2 \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(m) = d_1])$

- (72) a. LF representation:
 $\llbracket_{\text{IP}_1} \llbracket_{\text{YP}} \llbracket_{\text{IP}_4} \text{Op}_2 \llbracket_{\text{IP}_5} \text{Mary-ga} \llbracket_{\text{AdjP}_3} \llbracket_{\text{XP}_2} \text{t}_2 \llbracket_{\text{X}_2} \text{pos} \rrbracket \rrbracket_{\text{AdjP}_4} \text{utukusii} \rrbracket \rrbracket \llbracket_{\text{Y}} \text{gurai} \rrbracket \rrbracket \llbracket_{\text{IP}_2} \text{Op}_1 \llbracket_{\text{IP}_3} \text{Susan-ga} \llbracket_{\text{AdjP}_1} \llbracket_{\text{XP}_1} \text{t}_1 \llbracket_{\text{X}_1} \text{pos} \rrbracket \rrbracket_{\text{AdjP}_2} \text{utukusii} \rrbracket \rrbracket \rrbracket$
 b. Semantic composition:
 $\llbracket \text{X}_2 \rrbracket = \lambda d_2 \lambda P \lambda x \exists d_1 [\text{standard}(d_1)(d_2)(P)(C) \wedge P(d_1)(x)]$
 $\llbracket \text{XP}_2 \rrbracket = \lambda P \lambda x \exists d_1 [\text{standard}(d_1)(d_2)(P)(C) \wedge P(d_1)(x)]$
 $\llbracket \text{AdjP}_4 \rrbracket = \lambda d \lambda x \delta_{\text{beautiful}}(x) = d$
 $\llbracket \text{AdjP}_3 \rrbracket = \lambda x \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(x) = d_1]$
 $\llbracket \text{IP}_5 \rrbracket = \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(m) = d_1]$

$$\begin{aligned}
\llbracket \text{IP}_4 \rrbracket &= \lambda d_2 \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(m) = d_1] \\
\llbracket \text{Y} \rrbracket &= \lambda P \lambda Q (\text{MAX}(Q) \approx \text{MAX}(P)) \\
\llbracket \text{YP} \rrbracket &= \lambda Q (\text{MAX}(Q) \approx \text{MAX}(\lambda d_2 \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \\
&\quad \delta_{\text{beautiful}}(m) = d_1])) \\
\llbracket \text{IP}_2 \rrbracket &= \lambda d_2 \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(s) = d_1] \\
\llbracket \text{IP}_1 \rrbracket &= \text{MAX}(\lambda d_2 \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(s) = d_1]) \approx \\
&\quad \text{MAX}(\lambda d_2 \exists d_1 [\text{standard}(d_1)(d_2)(\llbracket \text{beautiful} \rrbracket)(C) \wedge \delta_{\text{beautiful}}(m) = d_1])
\end{aligned}$$

The proposed analysis straightforwardly accounts for the generalization that *izyoo(ni)*- and *gurai*-comparatives induce locality effects, attributing its cause to the λ -abstraction over differential degrees. Here I provide another set of examples to illustrate the locality effects.

- (73) [Context: Mary is famous for purchasing expensive things.]
- a. John-wa [[Mary-ga katta] **izyoo(ni)** takai kuruma-o
 John-TOP Mary-NOM bought more expensive car-ACC
 katta. (= (2a))
 bought
 '(Lit.) John bought a more expensive car than Mary bought.'
- b. *John-wa [[Susan-ga [[Mary-ga katta] to] omotteiru]
 John-TOP Susan-NO Mary-NOM bought COMP think
izyoo(ni) takai kuruma-o katta.
 more expensive car-ACC bought
 '(Lit.) John bought a more expensive car than Susan thinks Mary bought.'
- (74) [Context: Mary is famous for purchasing expensive things.]
- a. John-wa [[Mary-ga katta] **gurai** takai kuruma-o
 John-TOP Mary-NOM bought as expensive car-ACC
 katta. (= (2b))
 bought
 '(Lit.) John bought as expensive a car as Mary bought.'
- b. *John-wa [[Susan-ga [[Mary-ga katta] to] omotteiru]
 John-TOP Susan-NOM Mary-NOM bought COMP think
gurai takai kuruma-o katta.
 as expensive car-ACC bought
 '(Lit.) John bought as expensive a car as Susan thinks Mary bought.'

4. Further Confirmation

According to the proposed analysis, *izyoo(ni)* and *gurai* compare two sets of degrees that are created by the λ -abstraction over differential degrees. In this section, I will present another generalization whose explanation requires this aspect of the analysis.

First consider the examples in (75), which are acceptable.

- (75) a. John-wa [[Mary-ga kasikoi **izyoo(ni)**] kasikoi.
 John-TOP Mary-NOM smart more smart
 ‘(Lit.) John is smarter than Mary is smart.’
 b. John-wa [[Mary-ga kasikoi **gurai**] kasikoi.
 John-TOP Mary-NOM smart as smart
 ‘(Lit.) John is as smart as Mary is smart.’

What is of interest is that the examples in (75) become unacceptable once the matrix predicates are negated. This is illustrated in (76).

- (76) a. ?*John-wa [[Mary-ga kasikoi **izyoo(ni)**] kasikoku-nai.
 John-TOP Mary-NOM smart more smart-NEG
 ‘(Lit.) John is not smarter than Mary is smart.’
 b. ?*John-wa [[Mary-ga kasikoi **gurai**] kasikoku-nai.
 John-TOP Mary-NOM smart as smart-NEG
 ‘(Lit.) John is not as smart as Mary is smart.’

We can provide a similar illustration using attributive cases, see (77)–(78).¹⁵

- (77) [Context: Mary is famous for purchasing expensive things.]
 a. John-wa [[Mary-ga katta] **izyoo(ni)** takai kuruma-o
 John-TOP Mary-NOM bought more expensive car-ACC
 katta. (= (2a))
 bought
 ‘(Lit.) John bought a more expensive car than Mary bought.’
 b. John-wa [[Mary-ga katta] **gurai** takai kuruma-o
 John-TOP Mary-NOM bought as expensive car-ACC
 katta. (= (2b))
 bought
 ‘(Lit.) John bought as expensive a car as Mary bought.’
- (78) [Context: Mary is famous for purchasing expensive things.]
 a. ?*John-wa [[Mary-ga katta] **izyoo(ni)** takai kuruma-o
 John-TOP Mary-NOM bought more expensive car-ACC
 kawa-nak-atta.
 buy-NEG-PAST
 ‘(Lit.) John did not buy a more expensive car than Mary bought.’

¹⁵ As illustrated in (i), *yori*-comparative contrasts with *izyoo(ni)*- and *gurai*-comparatives, indicating that the unacceptable statuses of (78a) and (78b) cannot be attributed to the nature of comparatives in general.

(i) John-wa [[Mary-ga katta] **yori**] takai kuruma-o kawa-nak-atta.
 John-TOP Mary-NOM bought than expensive car-ACC buy-NEG-PAST
 ‘(Lit.) John did not buy a [more] expensive car than Mary bought.’

- b. ?*John-wa [[Mary-ga katta] **gurai**] takai kuruma-o
 John-TOP Mary-NOM bought as expensive car-ACC
 kawa-nak-atta.
 buy-NEG-PAST
 '(Lit.) John did not buy as expensive a car as Mary bought.'

Thus, the generalization we must explain is:

- (79) The matrix predicate of *izyoo(ni)-* or *gurai-comparatives* cannot be negated.

Examples like (80a) and (80b) are acceptable, but do not constitute counterexamples to (79) since they are possible only if meta-linguistic negation is involved. That is, they can be interpreted as (81a) and (81b), but not as (82a) and (82b).

- (80) a. John-wa [Mary **izyoo(ni)**] kasikoku-nai.
 John-TOP Mary more smart-NEG
 'John is not smarter than Mary.'
 b. John-wa [Mary **gurai**] kasikoku-nai.
 John-TOP Mary as smart-NEG
 'John is not as smart as Mary.'
- (81) a. The degree to which John's unintelligence level exceeds a standard unintelligence level is larger than the degree to which Mary's unintelligence level exceeds the standard unintelligence level.
 b. The degree to which John's unintelligence level exceeds a standard unintelligence level is as large as the degree to which Mary's unintelligence level exceeds the standard unintelligence level.
- (82) a. It is not the case that the degree to which John's intelligence level exceeds a standard intelligence level is larger than the degree to which Mary's intelligence level exceeds the standard intelligence level.
 b. It is not the case that the degree to which John's intelligence level exceeds a standard intelligence level is as large as the degree to which Mary's intelligence level exceeds the standard intelligence level.

Indeed, the acceptable statuses of (80a) and (80b) are not surprising since (83a) and (83b) are acceptable and interpreted as (81a) and (81b), respectively.

- (83) a. John-wa [[Mary-ga kasikoku-nai] **izyoo(ni)**] kasikoku-nai.
 '(Lit.) John is not smarter than Mary is not smart.'
 b. John-wa [[Mary-ga kasikoku-nai] **gurai**] kasikoku-nai
 '(Lit.) John is not as smart as Mary is not smart.'

I will demonstrate below that the generalization in (79) can be explained by the proposed analysis if we assume (84).

- (84) The *izyoo(ni)-* and *gurai-*phrases are adjoined to a place higher than their clause-mate negation.

Before moving onto the demonstration, therefore, I will establish (84). For this purpose, first consider (85).

- (85) a. John-wa kasikoku-nai sooda.
 John-TOP smart-NEG heard
 ‘I heard that John is not smart.’
 b. John-wa takai kuruma-o kawa-nak-atta sooda.
 John-TOP expensive car-ACC buy-NEG-PAST heard
 ‘I heard that John did not buy an expensive car.’

When the negation occurs in the same clause with a modal-like operator like *sooda* ‘I heard’ as in (85), the former must take narrow scope with respect to the latter. (85a), for example, is understood to mean (86a), but not (86b), and similarly, (85b) allows only (87a).

- (86) a. I heard that John is not smart.
 b. I did not hear that John is smart.
 (87) a. I heard that John did not buy an expensive car.
 b. I did not hear that John bought an expensive car.

Under the assumption that the scope relation between them mirrors their c-command relation at LF, these facts indicate that the modal-like operator is located in a place higher than the negation at LF.

Now consider (88).

- (88) a. John-wa [Mary **izyoo(ni)**] kasikoi sooda.
 John-TOP Mary more smart heard
 ‘I heard that John is smarter than Mary.’
 b. John-wa [Mary **gurai**] kasikoi sooda.
 John-TOP Mary as smart heard
 ‘I heard that John as smart as Mary.’

Crucially, the sentences in (88) must be interpreted in such a way that the speaker learned about John’s intelligence level by hearing from someone else, but knew about Mary’s intelligence level prior to the hearing. In other words, the information regarding Mary’s intelligence level must be outside the scope of *sooda* ‘I heard’. Thus, we can observe the following contrasts.

- (89) a. John to Mary to iyuu gakusei-ga ite, #sono John-wa
 John and Mary COMP say student-NOM exist that John-TOP
 [sono Mary **izyoo(ni)**] kasikoi sooda.
 that Mary more intelligent heard
 ‘There exist students called John and Mary, and he is more intelligent than she is, I heard.’
 b. John to Mary to iyuu gakusei-ga ite, #sono John-wa
 John and Mary COMP say student-NOM exist that John-TOP
 [sono Mary **gurai**] kasikoi sooda.
 that Mary as intelligent heard
 ‘There exist students called John and Mary, and he is as intelligent as she is, I heard.’

- (90) a. John to iyuu gakusei-ga ite, sono John-wa [Mary
John COMP say student-NOM exist that John-TOP Mary
izyoo(ni)] kaisikoi sooda.
more intelligent heard
'There exists a student called John, and he is more intelligent than Mary
is, I heard'
- b. John to iyuu gakusei-ga ite, sono John-wa [Mary
John COMP say student-NOM exist that John-TOP Mary
gurai] kaisikoi sooda.
as intelligent heard
'There exists a student called John, and he is as intelligent as Mary is, I heard'

In the context of (89), the speakers came to know the existence of both John and Mary after hearing from someone else, and hence also Mary's intelligence level. But the information about Mary's intelligence level must be outside the scope of *sooda* 'I heard'; hence the discourse is not felicitous. By contrast, the discourse in (90) is compatible with the situation where the speaker knew about her intelligence level prior to the hearing, hence felicitous. I take this as indicating that the *izyoo(ni)*- and *gurai*-clauses must be outside the scope of *sooda* 'I heard', hence being higher than it at LF.¹⁶

We have thus obtained the following two propositions, and by transitivity they entail (84), repeated here.

- (91) a. Modal-like operators like *sooda* 'I heard' are located in a place higher than their clause-mate negation at LF.
b. The *izyoo(ni)*- and *gurai*-phrases are situated in a position higher than their clause-mate modal-like operator like *sooda* 'I heard' at LF.
- (84) The *izyoo(ni)*- and *gurai*-phrases are adjoined to a place higher than their clause-mate negation.

Once (84) is adopted, (76a) and (76b) are necessarily analyzed as (92) and (93), respectively.

- (92) a. LF representation:

$$\begin{aligned} & [_{IP} [_{YP} [_{IP} Op_2 [_{IP} \text{Mary-ga} [_{AdjP3} [_{XP2} t_2 [_{X2} \text{pos}]]] [_{AdjP4} \text{kaisikoi}]]]]] \\ & [_{Y} \text{izyoo(ni)}] [_{IP} Op_1 [_{NegP} \text{Neg} [_{IP} \text{John-ga} [_{AdjP1} [_{XP1} t_1 [_{X1} \text{pos}]]] \\ & [_{AdjP2} \text{kaisikoi}]]]]]]] \end{aligned}$$

¹⁶ This scope property cannot be attributed to comparatives in general, since if *izyoo(ni)*-comparative in (89a) is replaced by *yor*-comparative, the discourse becomes acceptable, see (i).

- (i) John to Mary to iyuu gakusei-ga ite, sono John-wa
John COMP Mary COMP say student-NOM exist that John-TOP
[sono Mary **yor**] kaisikoi sooda.
that Mary than intelligent heard
'There exist students called John and Mary, and he is [more] intelligent than she is, I heard.'

- (96) a. John-wa 5kg **izyoo**-no (omosa-no) sakana-o turiageta.
 John-TOP more-GEN weight-GEN fish-ACC pulled-up
 'John fished a fish that weighs more than 5kg.'
- b. John-wa 10m **gurai**-no (nagasa-no) turizao-o katta.
 John-TOP as-GEN length-GEN fishing:rod-ACC bought
 'John bought a fishing rod that is 10m long.'

In (96a), the entire weight of the fish John caught is compared to 5 kg. Similarly, in (96b), the entire length of John's fishing rod is compared to 10 m. Thus, the examples in (96) demonstrate that *izyoo(ni)* and *gurai* can compare two absolute projections on a scale.

Now, given that *izyoo(ni)* and *gurai* can compare the two absolute projections on a scale, the fact that *izyoo(ni)*- and *gurai*-comparatives ought to be interpreted as comparisons of deviation suggests that the Japanese grammar pertaining to gradable adjective phenomena is restricted in such a way that (44a) and (44b), repeated below, for example, cannot be analyzed as (97) and (98), respectively.

- (44) a. Susan-ga [[Mary-ga utukusii] **izyoo(ni)**] utukusii (to siyoo).
 '(Lit.) (Suppose that) Susan is more beautiful than Mary is beautiful.'
- b. Susan-ga [[Mary-ga utukusii] **gurai**] utukusii (to siyoo).
 '(Lit.) (Suppose that) Susan is as beautiful as Mary is beautiful.'
- (97) a. LF representation:
 [[Op₂ [Mary-ga [_{AdjP} t₂ [_{Adj} utukusii]]]] *izyoo(ni)*] [Op₁ [Susan-ga [_{AdjP} t₁ [_{Adj} utukusii]]]]
- b. After semantic composition:
 $\text{MAX}(\lambda d \delta_{\text{beautiful}}(s) = d) > \text{MAX}(\lambda d \delta_{\text{beautiful}}(m) = d)$
- (98) a. LF representation:
 [[Op₂ [Mary-ga [_{AdjP} t₂ [_{Adj} utukusii]]]] *gurai*] [Op₁ [Susan-ga [_{AdjP} t₁ [_{Adj} utukusii]]]]
- b. After semantic composition:
 $\text{MAX}(\lambda d \delta_{\text{beautiful}}(s) = d) \approx \text{MAX}(\lambda d \delta_{\text{beautiful}}(m) = d)$

In an attempt to capture the restricted nature of Japanese gradable adjective phenomena, several hypotheses have been put forth. Snyder et al. (1994), following Fukui (1986), claim that AdjP in Japanese is impoverished in such a way that it lacks the position to host a degree variable or constant, as schematized in (99).¹⁷

- (99) a. English [_{AdjP} – [_{Adj} A]] b. Japanese [_{AdjP} A]

On the other hand, Beck et al. (2004) claim (100) and assume that Japanese is among the group of the languages that do not have binding of degree variables in the syntax.¹⁸

¹⁷ See Mukai (2005) for an alternative way of capturing the restricted nature of Japanese gradable adjective phenomena, making reference to Fukui's (1986) general hypothesis.

¹⁸ Kennedy (2005) also suggests the parameter of whether or not a language allows what he

(100) (= Beck et al. (2004) [120])

Degree Abstraction Parameter (DAP)

A language {does/does not} have binding of degree variables in the syntax.

Both hypotheses equally disallow (44a) and (44b) to be analyzed as (97) and (98), respectively. But Beck et al.'s DAP cannot be maintained since Japanese does allow λ -abstraction over degrees, as we have witnessed with *izyoo(ni)*- and *gurai*-comparatives. Snyder et al.'s hypothesis on the other hand is appealing since it rules out the possibility of λ -abstraction over degrees whose corresponding variable is in the spec of AdjP while allowing λ -abstraction over degrees in general.

In addition, Snyder et al.'s hypothesis is advantageous over Beck et al.'s DAP when we consider the fact, pointed out by Snyder et al, that (101a) cannot be understood to mean (101b).

(101) a. (= Snyder et al. (1994) (13), slightly adapted)

#John-wa se-ga 2 meetoru takai.
John-TOP back-NOM meters tall

b. John is 2 meters tall.

Since λ -abstraction over degrees does not play a role in (101a), Beck et al.'s DAP has nothing to say about this example. Snyder et al.'s hypothesis, on the other hand, can account for its unacceptability, assuming the definition of a gradable adjective to be (7) repeated here, as this paper assumes.

(7) Let A be a gradable adjective

$A = \lambda d \lambda x \delta_A(x) = d$, where δ is a function from objects to degrees.

Under Snyder et al.'s hypothesis, *2 meetoru* in (101a) cannot be in the spec of the AdjP since the position does not exist; it must be a part of some other projection. Assuming that all arguments must be within a categorically identified position, it thus follows that *2 meetoru* cannot be the first argument of the predicate, and the interpretation under discussion cannot be achieved.

calls *degree comparison* as opposed to *individual comparison*. Following Heim (1985), Kennedy (1999) claims based on binding phenomena that for cases like (i) the degree morpheme is combined with an individual rather than a degree after being combined with the gradable adjective (i.e., individual comparison), while for cases like (ii), the degree morpheme is combined with a degree after put together with the gradable adjective (i.e., degree comparison).

(i) a. Mars is less distant than Saturn. (= Kennedy 1999 [200])

b. Neptune is as bright as Uranus. (= Kennedy 1999 [202])

(ii) a. Mars is less distant than Saturn is.

b. Neptune is as bright as Uranus is.

Assuming that the complement of the *yori*-phrase in *yori*-comparative always denotes an individual (cf. Ueyama 1998, 2004, Beck et al. 2004), Kennedy (2005) claims that Japanese is a language that does not allow degree comparison. However, this parameter cannot be maintained for the reasons similar to the ones that lead us to reject Beck et al.'s (2004) DAP below; i.e., it does not account for the fact that Japanese does allow degree comparison, as we witnessed with *izyoo(ni)*- and *gurai*-comparatives, and (101a) below cannot be understood to mean (101b).

Pursing Snyder et al.'s hypothesis is promising since it provides us with a room to explain why *izyoo(ni)*- and *gurai*-comparatives are necessarily interpreted as comparisons of deviation. Given the definition of a gradable adjective in (7), their hypothesis leads us to expect that it is always the case that a Japanese gradable adjective is combined with some phrase which semantically serves as a function that takes the adjective as an argument. Suppose that among such phrases, the phrase headed by *pos* only is a covert one.¹⁹ Then, it is necessarily the case that both conjuncts of the *izyoo(ni)*- and *gurai*-comparatives have a gradable adjective next to a *pos* projection. If the projection of *pos* has a position to host a differential value, as I have assumed, and the semantics of *izyoo(ni)* and *gurai* I have proposed are on the right track, it is not surprising that *izyoo(ni)*- and *gurai*-comparatives are necessarily interpreted as comparisons of deviation.

Finally, I would like to suggest that Snyder et al.'s hypothesis provides us with guidelines in identifying parameters to account for the difference between Japanese and English, regarding gradable adjective phenomena. The hypothesis crucially entails that all the degree-related phenomena in Japanese do not make use of the spec of AdjP. For example, the Japanese positive behaves exactly in the same way as the English positive. That would mean that unlike the English DegP headed by *er* or *as*, the projection of *pos* is not located in the spec of AdjP even in English.

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¹⁹ Hayashishita (to appear) claims that the *yori*-phrase of *yori*-comparative is best understood as an overt manifestation of the *pos* projection.

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[要旨]

「以上(に)」「ぐらい」を用いた比較構文
—日本語におけるComparisons of Deviation—

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本稿では、日本語の「以上(に)」「ぐらい」を用いた比較構文は、機能的には英語の *more ... than* や *as ... as* を用いた比較構文と対応するように思えるのであるが、実際にはこれらとは異なり、常に comparisons of deviation (cf. Bierwisch 1989, Kennedy 2001) として分析されなければならないことを主張する。つまり、日本語のこれらの構文は、二つの要素に関して、単にそれらがどれだけ当該の特性を有するかを比較するものではなく、その特性を有する度合いについて、両者がどれだけ平均基準を超えているかを比べる表現なのである。本稿では、「日本語の形容詞句は、本来 degree variable or constant が占めるはずの specifier 位置を欠いている」という Fukui 1986, Snyder et al. 1994 の仮説を援用することにより、この特性を説明することができることを論じる。