PHRASAL COMPARATIVES AND THEIR COMPOSITION

Koji Kawahara

Abstract

This paper shows that Japanese, which does not have a comparative morpheme, can build comparative constructions in a compositional way. Specifically, my focus is on phrasal comparatives, where the complement of yori ‘than’ is NP. I first discuss the semantics of comparatives, introducing a measure function analysis. Specifically, I show that the direct interpretation of phrasal comparatives is necessary. I then discuss the external and internal syntax of phrasal comparatives, concluding that the yori phrase is selected by an abstract comparative morpheme -er/more. The scopal interaction with other quantificational expressions will also be focused, arguing that comparatives must not take scope over negation.

1. Introduction

It is controversial whether languages without an overt degree morpheme adopt the same kind of strategies as languages that have explicit comparative morphemes to express ordering relations. Japanese does not have a degree morpheme and does not show several characteristics that are associated with the comparative constructions in English, which has degree morphemes. For example, there is no morphological distinction in the gradable adjective takai ‘high’ whether it is used in the absolute construction or the comparative construction. Note the contrast in (1).

(1)  a. Fujisan-wa takai.
    Mt.Fuji-TOP high
    ‘Mt.Fuji is high.’
  b. Fujisan-wa Kitadake yori takai.
    Mt.Fuji-TOP Kitadake than higher
    ‘*Mt.Fuji is high.’
    ‘Mt.Fuji is higher than Kitadake.’

Beck, Oda, and Sugisaki (2004), based on the semantic characteristics of comparatives, claim that Japanese does not have an option to produce comparative constructions in an explicit manner. The primary purpose of this paper is, however, to discuss phrasal comparatives in Japanese, concluding that Japanese provides comparatives in a compositional manner. I will show that the yori phrase is compositionally related to the host gradable adjective via an abstract comparative morpheme. The proposed analysis indicates that a fundamental characteristic of UG is reflected even though it is not learnable. The organization of this paper is as follows. Section 2 discusses the properties of phrasal comparatives in English and then provides a measure function analysis of comparatives, demonstrating that the semantics of phrasal comparatives in English, whether they compose a sentential structure or not, are correctly described. Section 3 discusses the syntactic status of the yori phrase. Externally, it must precede the host gradable adjective and it must...
be somehow local to the host gradable adjective. I then analyze the internal syntax of the yori phrase, based on the binding phenomena. I will show that the sentential structure is not available in the complement of yori, concluding that the yori phrase is a postpositional phrase and the direct interpretation provided in section 2 is required. Section 4 investigates the quantificational interference exhibited by phrasal comparatives. I will argue that the quantificational interference is nicely captured by introducing the constraint on representation and show that comparatives cannot take scope over negation. Finally, I briefly address alternative analyses, concluding that the composition between the comparative constituent and the gradable adjective is best analyzed by the measure function analysis.

2. Measure Function Analysis

The primary semantic constituents in comparatives are composed of the followings: a reference value, a standard value and a degree relation that defines a relation between the reference value and the standard value. A standard of comparison in comparative constructions is linguistically explicit. For example, a standard of comparison in comparatives of superiority in English is introduced by than. The complement of than can be either a clausal structure or a single constituent. My focus here is on a phrasal comparative, where a single constituent is a complement of than exemplified in (2a). The sentential counterpart called ‘comparative deletion constructions’, where a compared constituent at least as large as degree phrases is missing, is shown in (2b). The clausal structure is indicated by the copular is and the compared degree phrase high is deleted from the surface form, where the struck-through indicates a deleted material.

(2) a. Mt. Fuji is higher than Kitadake.¹
    b. Mt. Fuji is higher than Kitadake is high.

The question here is whether the phrasal comparative composes the same abstract representation at LF as the comparative deletion structure. Following Bhatt and Takahashi (2007); Lechner (2004), I first show that phrasal comparatives in English compose a sentential structure at LF. Second, I will also show that phrasal comparatives at least in some cases do not compose a sentential representation at LF. If both a sentential structure and a single constituent are correct representations at LF for phrasal comparatives, it follows that it is necessary to provide two entries for the semantics of degree morphemes. In 2.2, following the measure function analysis by Kennedy (1999), I provide a semantic entry for the clausal structure, where a description of degree or a standard of comparison is derived from the meanings of gradable adjectives. I then introduce a second entry that maps an object to degrees that are interpreted as a standard of comparison. I will call the second entry a ‘direct’ interpretation, because it directly interprets the complement of than.

2.1. Phrasal Comparatives in English

Given that the than-phrase composes a full clause, it is expected that the than-phrase produces an independent binding domain. Therefore, binding phenomena can be adopted as diagnostics that show the independent clausal structure at the complement of than.
I will use the following examples in (3-6) from Bhatt and Takahashi (2007) to examine the clausal structure at the complement of than. If phrasal comparatives are derived from the sentential source, the ellipsis at the complement of than deletes all the constituents, leaving the remnant behind. Hence, the deleted portion in the than-clause corresponds to the elements in the matrix clause. (3a) is not grammatical, because the R-expression Peter is c-commanded by the co-indexed pronoun him, causing a condition C violation. The LF is schematized in (3b) and the strike-through indicates the deleted portion.

(3) a. * More people recommended him, to Sally than to Peter’s, sister.
   b. * More people recommended him, to Sally
      [than many people recommended him, to Peter’s, sister]

Both the examples in (4) and (5) are grammatical, because the pronoun his and him do not c-command Peter at LF, respectively.

(4) a. More people recommended Peter, to Sally than to his, sister
   b. More people recommended Peter, to Sally
      [than many people recommended Peter, to his, sister]

(5) a. ? More people recommended Sally to him, than Peter’s, sister.
   b. ? More people recommended Sally to him,
      [than many people recommended Peter’s, sister to him,]

The satisfaction of the Condition A in (6) is also captured by recovering the elided material.

(6) a. More people recommended him, to Sally than to himself,.
   b. More people recommended him, to Sally
      [than many people recommended him, to himself,]

Since both the Condition A and the Condition C effects in phrasal comparatives can be captured by recovering the sentential structure, it follows that phrasal comparatives compose a clausal structure at LF. This means both phrasal comparatives and comparative deletion constructions can be treated in a unified manner, because they compose the same representation at LF.

However, it also must be pointed out that phrasal comparatives in English are sometimes not derived from sentential structures. Hankamer (1973); Kennedy (1999) observe that phrasal comparatives in English sometimes require a direct analysis: a clausal structure is not available at LF. For example, Hankamer (1973) points out that the reflexive itself is licensed in (7a). Assuming that the than-phrase is a prepositional phrase, not constituting an independent binding domain, the contrast below is readily captured.

(7) a. No star is brighter than itself.
   b. * No star is brighter than itself is

Hankamer (1973) further observes that the extracted element can be interpreted as the subject of an missing predicate. Extraction from a clausal constituent is impossible as shown in (8b), because a comparative clause is an extraction island. In this case, than is a complementizer. Hence, the extractability in (8a) shows that the extracted element is a complement of the preposition than, not composing an independent clause.
(8) a. You finally met somebody you’re taller than.

b. * You finally met somebody you’re taller than is.

Based on the observation that the complement of *than* in some phrasal comparatives is a single constituent at all stages of the derivation, Kennedy (1999) claims that phrasal comparatives are directly interpreted, with the meaning of the *than*-phrase being derived by applying the function of the meanings of gradable adjectives to the complement of *than*. I support the direct analysis of phrasal comparatives in English by Hankamer (1973); Kennedy (1999). Hence, I provide two entries for English phrasal comparatives in the next subsection.

Bhatt and Takahashi (2007) claim that the direct interpretation must be assumed for phrasal comparatives in Hindi-Urdo but not for English. In section 3, I claim that Japanese phrasal comparatives are directly interpreted on a par with Hindi-Urdo ones, because the *yori*-phrase is a postpositional phrase.

2.2. Comparative Deletion

It is widely accepted in semantic literature that individuals and truth-values are basic denotations (Chierchia and McConnell-Ginet 2000; Heim and Kratzer 1998). Following the tradition of Montague (1974), I employ the labels ‘e’ and ‘t’ for these basic types. A widely held view about gradable adjectives is that a semantic ontology of degree is required as well as the ontology of individuals and truth-values.³ A consequence of the ontology of degree is that we can capture the distribution and behaviour of gradable adjectives by semantic properties of gradable adjectives, without postulating a semantic primitive for each construction.

Specifically, Kennedy (1999, 2002) treats gradable adjectives as measure functions that take objects to map onto the abstract representations of measurement or degrees and claims that degree morphemes such as *more* and *too* combine with gradable adjectives to denote properties of individuals. Hence, the meaning of *high* can be represented as (9), where the measure function *high* is a function from objects to degrees on a scale of linear extent.

(9) $\text{high} = \lambda x. \text{high}(x)$

For an illustration of the measure function analysis, I analyze the semantics of the predicative comparative deletion construction in (10).

(10) Mt. Fuji is higher than Kitadake is.

The reference value the main subjectMt. Fuji possesses is derived through the measure function *high* and the standard value is explicitly realized by the comparative clause *Kitadake is*. Throughout this paper, I adopt Hazout (1995); Heim (1985, 2000); Izvorski (1995); Kennedy (1999); Rullmann (1995); Russell (1905); von Stechow (1984)’s assumption that the comparative clause denotes a definite description of a maximal degree. The comparative clause denotes a set of degrees that is supplied as the argument of the maximality operator represented as $\text{max}$ that returns the maximal element of an ordered set of objects. Following Kennedy (1999), I assume that the degree of the comparative
clause is derived from the meanings of gradable adjectives, because the gradable adjective *high* can be recovered from the antecedent and the existence of the copular *is* indicates the sentential structure. The semantics of (11) is applied to (10), where \( G \) is a function from objects to degrees, \( Q \) is a function from properties to truth values, and \( \text{max} \) is a maximality operator.

\[
\begin{align*}
(11) \quad \text{a.} & \quad \text{Deg}^0 = \lambda G \lambda Q. \text{max}\{d \mid Q(\lambda x. G(x) \geq d)\} \\
& \quad \text{b.} & \quad \text{max}(P) = \{d \in D \mid \forall d' \in D : d \geq d'\}
\end{align*}
\]

I further assume that the gap of the comparative deletion structure in (10) is derived through movement of \( \text{DegP} \) to Spec CP plus deletion as shown in (12).

\[
(12) \quad \text{Mt. Fuji is higher than } \text{Kitadake is high.}
\]

The standard value of the comparative clause can be transformed through lambda conversion in (13).

\[
\begin{align*}
(13) & \quad \text{CP:} \text{max}\{d \mid Q(\lambda x. \text{high}(x) \geq d)\} \\
& \quad \text{DegP:} \lambda Q. \text{max}\{d \mid Q(\lambda x. (\lambda x. G(x)) \geq d)\} \\
& \quad \text{Deg}^0: \lambda G \lambda Q. \text{max}\{d \mid Q(\lambda x. G(x) \geq d)\} \\
& \quad \emptyset \quad \text{Kitadake is high.}
\end{align*}
\]

The comparative morpheme *-er* denotes a partial ordering between the reference value and the standard value. Hence, the degree relation expressed by the comparative morpheme is (14).

\[
(14) \quad \text{more/-er} = \lambda G \lambda x. G(x) \succ d
\]

Following Abney (1987); Corver (1990, 1997); Grimshaw (1991), Kennedy (1999) claims that an extended functional category projects over the gradable adjective and the comparative constituent *than Kitadake is* is adjoined to \( \text{DegP} \). Since \( \text{DegP} \) is a head that imposes selectional requirements on comparative constituents, *than* is selected by the comparative morpheme *more/-er*. The syntactic structure of (10) is illustrated in (15).
According to the syntactic structure in (15), the transparent mapping between syntax and semantics is straightforwardly captured. The denotation of AP is a measure function and \( \text{Deg}^0 \) combines with AP to generate a function from standard values to individuals. \( \text{Deg}' \) then combines with PP, generating a function from individuals to truth values, with the result that \( \text{DegP} \) denotes a property of individuals.

After combining the three semantic constituents, that is, the reference value, the standard value and the degree relation, the semantics of (16a) is provided and it correctly reflects the truth condition of this sentence in (16b). Since the reference value expressed by the matrix clause exceeds the standard value expressed by the comparative clause, the ordering relation is correctly established.

(16)  
\begin{align*}
\text{a.} & \quad \text{high}(\text{Mt. Fuji}) \succ \text{max}\{d \mid \text{high}(\text{Kitadake}) \succeq d\} \\
\text{b.} & \quad \text{the height of Mt. Fuji} \succ \text{the height of Kitadake}
\end{align*}

Bhatt and Takahashi (2007); Lechner (2004) claim that phrasal comparatives in English are derived from the clausal source. If their analysis is correct, the semantics of comparative deletion constructions can be directly applied to phrasal comparatives, because these two types of comparative constructions compose the same representation at LF. Hence, the phrasal comparative in (17) has exactly the same LF representation as the corresponding comparative deletion structure. However, at least in some cases a clausal source is not available for phrasal comparatives as shown in (7) and (8). If a clausal structure is not available for phrasal comparatives, the semantics of comparative deletion construction cannot be applied, because the meaning of gradable adjectives, which is not available, is required to derive the standard value. To this end, Kennedy (1999) provides an another entry for the comparative morpheme that derives the standard value directly from the complement of \textit{than}. The problem here is that the meaning of a predicate cannot be derived, because the phrasal comparative in (17) lacks the predicate at LF. Hence, it is required for the comparative morpheme to derive the description of degree from the individual denoting constituent \textit{Kitadake} as shown in (18a).

(17)  
\text{Mt. Fuji is higher than Kitadake.}

(18)  
\begin{align*}
\text{a.} & \quad \text{Deg}^0 = \lambda G \lambda y. \text{max}\{d \mid G(y) \succeq d\}
\end{align*}
b. \( \text{more/er} = \lambda G \lambda d \lambda x. G(x) \succ d^0 \)

Lambda conversion for the phrasal comparative can be simply described as follows and the same result is obtained at the semantic component.

\[
(19) \quad \text{CP:} \max \{ d \mid \text{high(Kitadake)} \succeq d \}
\]

Based on phrasal comparatives in Hindi-Urdu, Bhatt and Takahashi (2007) claim that they should be directly interpreted. I will show that the direct composition is required for phrasal comparatives in Japanese in section 3. If the complement of \textit{yori} in phrasal comparatives is NP, the degree morpheme takes an argument of type \( e \) in Japanese phrasal comparatives.\(^{10} \)

Therefore, the complement of \textit{yori} directly receives an interpretation to derive the standard value. If the direct interpretation is available, the semantics of the phrasal comparative in Japanese will be (20).

\[
(20) \quad \text{a.} \quad \text{Fujisan-wa Kitadake yori takai.} \\
\text{Mt.Fuji-TOP Kitadake than higher} \\
\text{‘Mt. Fuji is higher than Kitadake’.} \\
\text{b.} \quad \text{Deg}^0 = \lambda G \lambda y. \max \{ d \mid G(y) \succeq d \} \\
\text{c.} \quad \text{more/er} = \lambda G \lambda d \lambda x. G(x) \succ d \\
\text{d.} \quad \text{high(Mt. Fuji)} \succ \max \{ d \mid \text{high(Kitadake)} \succeq d \}
\]

To summarize the discussion, under the measure function analysis, the standard value expressed by the comparative constituents is derived from the meanings of the comparative morpheme. If the complement of \textit{than} composes a sentential structure or is a comparative deletion construction, the standard value is derived from the meanings of a predicate. By contrast, phrasal comparatives are problematic. First, if the LF representation is identical to its counterpart of sentential representation, phrasal comparatives and comparative deletion constructions can be treated in a unified manner. Second, if the sentential portion cannot be recovered, it is required that the comparative constituents are directly interpreted, because predicative portion is not available at LF. Based on the observation by Hankamer (1973); Kennedy (1999), I claim that the direct interpretation at least in some cases is necessary for English phrasal comparatives. Section 3 addresses the structure of phrasal comparatives in Japanese, showing that the direct interpretation is required.

3. Phrasal Comparatives in Japanese

Beck et al. (2004) claim that Japanese does not build comparatives in a compositional way, but the \textit{yori} constituent is a counterpart of \textit{compared to} that is an adverb phrase and functions as a context setter. Hence, the relationship between the \textit{yori} constituent and gradable adjectives is indirect. For example, the semantics of the phrasal comparative (21a) is illustrated in (21b), where \( c \) expresses a contextually derived standard of comparison. The \textit{yori} phrase is an overt realization of the contextual information and can replace \( c \).

\[
(21) \quad \text{a.} \quad \text{Fujisan-wa Kitadake yori takai.} \\
\text{Mt.Fuji-TOP Kitadake than higher} \\
\text{‘Mt. Fuji is higher than Kitadake’}.
\]
b. \( \text{max}(\lambda d. \text{Mt.Fuji is } d\text{-high}) \succ c \)
\[
c = \text{the degree of height made salient by the context} \\
= \text{the degree to which Kitadake is high}
\]

This section shows that the composition between the yori constituent and gradable adjectives are closely related via an abstract comparative morpheme -er/more contra Beck et al. (2004).

3.1. Locality in Phrasal Comparatives

Phrasal comparatives in Japanese can appear in a variety of positions. Takusan is an adjective of number or amount that can be interpreted as either ‘many/much’ or ‘more’, because Japanese does not have an overt degree morpheme to build comparative constructions. All the examples in (22) are grammatical, but (22c) is not a comparative, where yori is translated into ‘rather’. The generalization is that takusan is interpreted as a comparative when it is preceded by the yori phrase. Free word order of the yori-phrase follows from the fact that Japanese is a scrambling language.

(22) a. Ichiro-ga Kyoko yori takusan-no hon-o kat-ta. Ichiro-NOM Kyoko than *many/more-GEN book-ACC buy-PAST ‘Ichiro bought more books than Kyoko’.


I propose that the yori phrase is a comparative constituent selected by an abstract comparative morpheme -er. Alternatively, it can be said that a [+Deg] feature is contained in yori, because Japanese lacks a comparative morpheme. I also assume that DegP is attached to NP and attributive adjectives are left-adjointed to nouns (Svenonius 1994). The structure assigned to (22a) is illustrated in (23).
The abstract comparative morpheme is parasitic on *yori* constituents and they must be somehow contiguous to host gradable adjectives. A comparative reading is derivable from (22b), because the *yori* phrase can be reconstructed. However, the *yori* phrase and the host gradable adjective cannot be adjacent in (22c). First, the *yori* phrase cannot right-adjoin to the noun phrase as in (24a), because rightward-scrambling is not possible in Japanese (Saito 1985, 1992, 2003). Second, scrambling of *takusan-no hon-o* is not possible as in (24b), because it is movement from N' to NP, violating a locality condition like the A-over-A principle (Chomsky 1964.12) (22c) does not receive a comparative interpretation, because the relation between the comparative morpheme and the host gradable adjective cannot be established. Hence, the *yori* phrase is simply right-adjoined to *takusan-no hon-o*, deriving an ‘absolute’ reading.

(24) a. *Ichiro-ga [\text{NP} [\text{DegP} (-er) _t] [\text{N'} [\text{AP takusan-no} \text{ hon-o} [\text{PP Kyoko yori}]_t] \text{kat-ta.}]

b. *Ichiro-ga [\text{NP} [\text{N'} [\text{AP takusan-no} \text{ hon-o} [\text{DegP} (-er) [\text{PP Kyoko yori}]_t]_t\text{kat-ta.}}

It is widely assumed that the *yori*-phrase should be treated as an adjunct, and there is not much discussion about the status of the *yori* phrase. I show that locality effects of the *yori*-phrase indicate that the syntactic status of the *yori* phrase is a complement.

It is observed that extraction of pure adjuncts is basically bounded (Saito 1985). *Riyuu-mo naku* ‘without any reason’ in (25b) cannot modify the predicate *kat-ta* ‘bought’ in the embedded clause. For (25b) to be grammatical, *riyuu-mo naku* must modify the predicate in the matrix clause, *sinzi-te iru* ‘believe’.

‘Yuki believes that Ichiro bought many books without any reason’.

   buy-PAST COMP believe-TE IRU

‘Yuki believes that Ichiro bought many books without any reason’.

While non-local extraction of adjuncts is not possible, the extractability of the * yori-phrase shows that it should not be categorized as a pure adjunct. I claim that the * yori-phrase is selected by an abstract comparative morpheme, although Japanese lacks an overt degree morpheme. The examples in (26) show that the * yori phrase Kyoko yori can be extracted from the embedded clause.

   COMP believe-TE IRU

‘Yuki believes that Ichiro bought more books than Kyoko’.

   buy-PAST COMP believe-TE IRU

‘Yuki believes that Ichiro bought more books than Kyoko’.

Kyoko yori in (27b) is moved by scrambling, not base-generated in the sentence initial position. Since scrambling is subject to subjacency constraints, extraction of the * yori-phrase is constrained by syntactic islands. Both Complex NPs and adjuncts are strong islands for scrambling, but wh-clauses are not strong. Hence, it is expected that the scrambling of Kyoko yori is not possible from Complex NPs and Adjuncts but it is marginally permitted in the wh-island in (29)(14). The prediction is borne out as shown in (27)-(29).

(27) Complex NPs

   COMP rumor-ACC believe-TE IRU

‘Yuki believes the rumor that Ichiro bought more books than Kyoko’.

   buy-PAST COMP rumor-ACC believe-TE IRU

‘Yuki believes the rumor that Ichiro bought more books than Kyoko’.

(28) Adjuncts

‘Yuki left the store before Ichiro bought more books than Kyoko’.

b. * Kyoko yori, Yuki-ga [CP Ichiro-ga t, takusan-no hon-o kau Kyoko than Yuki-NOM Ichiro-NOM more-GEN book-ACC buy maeni ] mise-o de-ta. before store-ACC leave-PAST

‘Yuki left the store before Ichiro bought more books than Kyoko’.

(29) Wh-islands


‘Yuki asked whether Ichiro bought more books than Kyoko’.


‘Yuki asked whether Ichiro bought more books than Kyoko’.

My claim is that an abstract comparative morpheme selects *yori* constituents. Therefore, the structure of Japanese predicative phrasal comparatives that would correspond to (15) should be (30).

(30)

To summarize the discussion, the *yori* phrase is a constituent that is selected by an abstract comparative morpheme. The distribution of the *yori* phrase is rather free, but it must precede the comparative morpheme that is ‘parasitic’ on gradable adjectives to compose comparative constructions. The precedence indicates that the *yori* phrase is compositionally related to an abstract comparative morpheme and gradable adjectives. The *yori* phrase
can be extracted from embedded clauses, but not from syntactic islands. Since extraction shows locality effects, it follows that the *yori* phrase must be a clause-mate with the abstract comparative morpheme that is left-adjoined to a constituent containing a gradable adjective in its base-generated position. The characteristics above indicate that the *yori* phrase and the comparative morpheme are a constituent contra Beck et al. (2004), where the *yori* phrase is neither syntactically related to a comparative morpheme nor gradable adjectives and the semantic composition between the *yori* phrase and the host gradable adjective is indirect. The next subsection will address the internal structure of the *yori* phrase, demonstrating that the *yori* phrase does not compose a sentential structure.

### 3.2. Internal Structure of Phrasal Comparatives in Japanese

There are several sets of facts that show the clausal constituent is not reflected in phrasal comparatives in Japanese. I claim that the *yori*-phrase is a postpositional phrase and does not form an independent binding domain.

All the examples in (31) are not grammatical, because the bound variable expression *so* contained in *soko-no kogaisya ‘its subsidiary’* demands an antecedent that c-commands it (Hoji 1995). Note also that *soko-no kogaisya* corresponds to an indirect object because of the dative case marker *ni* and the *yori* phrase precedes the host gradable adjective *takusan*.

\[(31)\]
\[
\begin{align*}
\text{a.} & \quad \text{Soko-no kogaisya-ni yori takusan-no hito-ga Honda-ni it-GEN subsidiary-DAT than more-GEN people-NOM Honda-DAT Mazda-ACC} \text{ recommend-PAST} \\
& \quad \text{‘More people recommended Mazda to Honda than to its subsidiary’}. \\
\text{b.} & \quad \text{Soko-no kogaisya-ni yori Honda-ni takusan-no hito-ga it-GEN subsidiary-DAT than Honda-DAT more-GEN people-NOM Mazda-J-0} \text{ suisensi-ta.} \\
& \quad \text{Mazda-DAT recommend-PAST} \\
& \quad \text{‘More people recommended Mazda to Honda than to its subsidiary’}. \\
\text{c.} & \quad \text{Soko-no kogaisya-ni yori Mazda-J-0 takusan-no hito-ga it-GEN subsidiary-DAT than Mazda-ACC more-GEN people-NOM Honda-ni suisensi-ta.} \\
& \quad \text{Honda-DAT recommend-PAST} \\
& \quad \text{‘More people recommended Mazda to Honda than to its subsidiary’}. \\
\text{d.} & \quad \text{Soko-no kogaisya-ni yori Honda-ni Mazda-J-0 takusan-no it-GEN subsidiary-DAT than Honda-DAT Mazda-ACC more-GEN} \\
& \quad \text{hito-ga suisensi-ta.} \\
& \quad \text{people-NOM recommend-PAST} \\
& \quad \text{‘More people recommended Mazda to Honda than to its subsidiary’}. \\
\text{e.} & \quad \text{Soko-no kogaisya-ni yori Mazda-J-0 Honda-ni takusan-no it-GEN subsidiary-DAT than Mazda-ACC Honda-DAT more-GEN} \\
& \quad \text{hito-ga suisensi-ta.} \\
& \quad \text{people-NOM recommend-PAST}
\]
‘More people recommended Mazda to Honda than to its subsidiary’.

The examples in (32) are grammatical and the antecedent of *soko-no kogaisya* is Mazda, because it c-commands *soko-no kogaisya*.

   ‘More people recommended Mazda to Honda than to its subsidiary’.

   b. Mazda-j-o soko-no kogaisya-j-ni yori Honda-j-ni takusan-no Mazda-ACC it-GEN subsidiary-DAT than Honda-DAT more-GEN hito-ga people-NOM suisensi-ta. recommend-PAST
   ‘More people recommended Mazda to Honda than to its subsidiary’.

If both Honda and Mazda c-command *soko-no kogaisya*, either of them can be an antecedent depending on the context of utterance.

   ‘More people recommended Mazda to Honda than to its subsidiary’.

   ‘More people recommended Mazda to Honda than to its subsidiary’.

If the clausal source were available in phrasal comparatives in Japanese, *soko-no kogaisya* would not be licensed wherever it appears, because the indirect object is structurally higher than the direct object (Hoji 1985; Tada 1993; Takano 1996; Ura 2000). (34) is the schematic structure at LF if a clausal source were available. Since the remnant *soko-no kogaisya* cannot be c-commanded within its binding domain of the *yori* clause, it cannot be licensed, contrary to fact.

(34) Takusan-no-hito-ga Honda-ni Mazda-o suisensi-ta more-GEN-people-NOM Honda-DAT Mazda-ACC recommend-PAST
   [takusan-no-hito-ga soko-no kogaisya-ni Mazda-o many-GEN-people-NOM it-GEN subsidiary-DAT Mazda-ACC suisensi-ta yori ] recommend-PAST than
   ‘More people recommended Mazda to Honda than to its subsidiary’.

Even if the grammatical function of the *yori* phrase is a direct object, a clausal structure cannot be detected. When the indirect object *Honda-ni* c-commands *soko-no kogaisya*, *soko-no kogaisya* can take *Honda* as an antecedent, because the requirement on *so* is satisfied.
(35) a. \( \text{Honda}_i \text{-ni soko-no kogaisya}_i \text{ yori takusan-no hito-ga} \text{ Mazda}_j \text{-o} \text{ Honda-DAT it-GEN subsidiary than more-GEN people-NOM Mazda-ACC suisensi-ta.} \text{ recommend-PAST} \) 

‘More people recommended Mazda to Honda than its subsidiary’.

b. \( \text{Honda}_i \text{-ni soko-no kogaisya}_i \text{ yori Mazda}_j \text{-o takusan-no hito-ga} \text{ Honda-DAT it-GEN subsidiary than Mazda-ACC more-GEN people-NOM suisensi-ta.} \text{ recommend-PAST} \) 

‘More people recommended Mazda to Honda than its subsidiary’.

If both Honda and Mazda c-command \( \text{soko-no kogaisya} \), \( \text{soko-no kogaisya} \) can take either of them as an antecedent.

(36) a. \( \text{Honda}_i \text{-ni Mazda}_j \text{-o soko-no kogaisya}_i/-j \text{ yori takusan-no} \text{ Honda-DAT Mazda-ACC it-GEN subsidiary than more-GEN hito-ga suisensi-ta.} \text{ people-NOM recommend-PAST} \) 

‘More people recommended Mazda to Honda than its subsidiary’.

b. \( \text{Mazda}_j \text{-o Honda}_i \text{-ni soko-no kogaisya}_i/-j \text{ yori takusan-no} \text{ Mazda-ACC Honda-DAT it-GEN subsidiary than more-GEN hito-ga suisensi-ta.} \text{ people-NOM recommend-PAST} \) 

‘More people recommended Mazda to Honda than its subsidiary’.

Again, if the clausal source were available for phrasal comparatives, \( \text{soko-no kogaisya} \) would be licensed by the indirect object Honda wherever it appears. The recovered sentential structure would satisfy the requirement on \emph{so} irrespective of the position of the \emph{yori} phrase, contrary to fact.\(^{18}\)

(37) \( \text{Takusan-no-hito-ga Honda-ni Mazda-o} \text{ suiensi-ta} \text{ more-GEN-people-NOM Honda-DAT Mazda-ACC recommend-PAST} \text{ [takusan-no-hito-ga Honda-ni soko-no kogaisya(-o) many-GEN-people-NOM Honda-DAT it-GEN subsidiary-ACC suiensi-ta yori]} \text{ recommend-PAST than} \) 

‘More people recommended Mazda to Honda than its subsidiary’.

Summarizing the discussion, \( \text{soko-no kogaisya} \) in the complement of \emph{yori} can take an antecedent only if it is c-commanded on its surface form. The structural hierarchy is important, because it indicates that the \emph{yori} phrase is a postpositional phrase and does not form an independent binding domain. If a clausal source were available for phrasal comparatives, a requirement on \emph{so} should not be affected by the word order of the \emph{yori} phrase, contrary to fact. Binding phenomena indicate that phrasal comparatives in Japanese do not compose a sentential structure and thus it is required that phrasal comparatives are directly interpreted. An abstract comparative morpheme in the matrix clause takes the
*yori* phrase as its complement and the *yori* phrase directly receives an interpretation. Of importance is the fact that comparative constituents are compositionally related to the comparative morpheme and host gradable adjectives to provide an appropriate semantics.

The next question to be addressed is whether there is a diagnostic to show that the composition is syntactically related. I claim that the scopal domain of comparatives is determined by the surface position, demonstrating that the composition should be stated in terms of syntactic perspectives.

4. Quantificational Interference

How quantificational expressions are licensed and interpreted is one of the most important issues in current linguistic theory. Specifically, the interference phenomena between *wh*-phrases and negative polarity items have received much attention. Beck and Kim (1997) observe that a *wh*-phrase must not be c-commanded by negation. They suggest that LF movement across negation is prohibited (Minimal Negative Structure Constraint). Descriptively, Negation Induced Barrier (NIB) is the first node that dominates both NPIs and negation marker. For example, the sentence in (38a) is ungrammatical, because the *wh*-phrase moves to Spec CP at LF and the movement is across the NIB that is represented by the bracket. The example in (38b) shows that NPIs are usable in *wh*-interrogatives as long as LF-movement is not constrained.

(38) Korean

a. * [NIB Amuto muôs-ûl sa-chi anh]-ass-ni?
   anybody what-ACC buy-NOMINALIZER/COMP NEG-do-PAST-Q
   ‘What did no one buy?’

b. Muôs-ûl, [NIB amuto t̄ sa-chi anh]-ass-ni?
   what-ACC anybody buy-CHI NEG-do-PAST-Q
   ‘What did no one buy?’


The quantificational interference between NPIs and *wh*-interrogatives is observable in German.

(39) German

a. * Wer hat niemanden wo angetroffen?
   who has nobody where met
   ‘Who didn’t meet anybody where?’

b. Wer hat wo niemanden angetroffen?
   who has where nobody met
   ‘Who didn’t meet anybody where?’


This generalization holds for Japanese.

(40) a. * Dare-mo nani-o kawa-nakat-ta no?
   anybody what-ACC buy-NEG-PAST Q
   ‘Nobody buys what?’
Based on the observation in Japanese and Korean, Tanaka (1997) claims that the quantificational interference between NPIs and wh-phrases should be analyzed in terms of the linearity condition. Tanaka proposes the Linear Crossing Constraint (LCC), where nesting \( \bar{A} \)-dependencies (41a) are possible, while crossing \( \bar{A} \)-dependencies (41b) are not. Note that it is assumed that an operator moves rightward in Japanese and Korean, because these languages are strict head final languages.

\[
\begin{align*}
\text{(41)} & \quad \text{a. } t_i \ldots t_j \ldots Op_j \ldots Op_i \\
& \quad \text{b. } * t_i \ldots t_j \ldots Op_i \ldots Op_j
\end{align*}
\]

According to the LCC, (38a) and (40a) are ruled out, because \( \bar{A} \)-dependencies between NPIs and wh-phrases have crossed. I assume that NPIs moves rightward to Spec of Neg and wh-phrases to Spec CP. The examples in (38b) and (40b) are grammatical, because they compose nesting \( \bar{A} \)-dependencies. The configurations assigned to them are illustrated in (42), respectively.

\[
\begin{align*}
\text{(42)} & \quad \text{a. } * [CP t_i [\text{NegP} t_j kawa-nakat[dare-mo]_i]-ta no[nani-o]_j] \\
& \quad \text{b. } [CP t_i [\text{NegP} t_j kawa-nakat[dare-mo]_j]-ta no[nani-o]_i]
\end{align*}
\]

As Tanaka (2002) discusses, the LCC is empirically superior to the Negation-induced barrier’s theory by Beck and Kim (1997), because surface word order in Japanese and Korean is crucial in scopal interpretations.\(^\text{19}\) Note that although the regulation of LCC is dependent on linearity, it is based on the configurational structure by postulating that the head of functional categories, \( C^0 \) and Neg\(^0 \) here, occupies the sentence final position. I will show that the constraint on representation illuminates the syntactic composition of phrasal comparatives, proposing that the comparative constructions are analyzed in terms of the syntactic operation.

4.1. Negation and Comparison

A widely held view about comparatives under the scalar analysis, where gradable adjectives denote relations between objects and degrees, treats comparatives as quantificational expressions that quantify over degrees. For example, Heim (1985) analyzes comparatives as indefinite degree descriptions. If a comparative element is a type of quantificational expressions, it is expected that it participates in scope ambiguities with other quantificational expressions. Contrary to this expectation, a comparative does not take scope over negation.

The main predicate of (43) is the gradable adjective takai. As has already been discussed in section 3, the yori phrase can be scrambled to precede the subject Mt.Fuji-ga.

\[
\begin{align*}
\text{(43)} & \quad \text{a. } \text{Mt.Fuji} \text{-NOM Kitadake yori takai.} \\
& \quad \text{Mt.Fuji-NOM Kitadake than high} \\
& \quad \text{‘Mt.Fuji is higher than Kitadake’}
\end{align*}
\]
b. Kitadake yori, Fujisan-ga tu takai.
   Kitadake than Mt.Fuji-NOM high
   ‘Mt.Fuji is higher than Kitadake’.

The comparatives can be negated and the scrambling of the *yori* phrase is also possible. Note that the comparative meaning in both the Japanese examples and English translations must take scope under negation.

\[(44)\]

\[\begin{align*}
   \text{a. } & \quad \text{Kitadake-ga Fujisan yori takaku-nai.} \\
   & \quad \text{Kitadake-NOM Mt.Fuji than high-NEG} \\
   & \quad \text{‘Kitadake is not higher than Mt.Fuji’}. \\
   \text{b. } & \quad \text{Fujisan yori, Kitadake-ga tu takaku-nai.} \\
   & \quad \text{Mt.Fuji than Kitadake-NOM high-NEG} \\
   & \quad \text{‘Kitadake is not higher than Mt.Fuji’}.
\end{align*}\]

The examples in (44) are true just in case it is not true that for some degree *d* which exceeds the degree of Fujisan’s height *d(C)*, Kitadake is *d* high. This is an accurate interpretation of (45a). On the wide scope interpretation by (45b), which is expected to be derived if the comparative is a type of quantificational expressions, (45b) would be true if there is a degree *d* which exceeds the degree of Fujisan’s height *d(C)* and it is not the case that Kitadake is *d* high. However, this incorrectly predicts that the examples in (44) could be true in a situation where Kitadake’s height actually exceeds the degree to which Fujisan is high, because there is a degree that exceeds the degree to which Kitadake is high and it is not the case that Fujisan is at least as high as that. The scale structure for this interpretation is schematized in (46). Hence, it is concluded that a comparative meaning does not participate in scopal interactions with negation.\(^{20}\)

\[(45)\]

\[\begin{align*}
   \text{a. } & \quad \neg \exists d [d > \text{max } (d'_{(C)})][\text{high(Kitadake, d)}] \\
   \text{b. } & \quad \exists d [d > \text{max } (d'_{(C)})][\neg \text{high(Kitadake, d)}]
\end{align*}\]

\[(46)\]

\[
\text{height: } 0 - d_{\text{Fujisan}} - d_{\text{Kitadake}} - d \rightarrow \infty
\]

I show that comparatives cannot take scope over the domain of NPIs. First, I assume that NP + *sika*, an NPI, moves rightward to Spec Neg that is right-adjoined to Neg\(^0\), because Japanese is a strict head final language and negation marker is attached to the main predicate. Second, I assume that NegP projects over VP and the subject *Fujisan-sika* occupies Spec VP. I also assume that the subject remains in Spec VP, following Fukui (1986); Kuroda (1988).\(^{21}\) I claim that the scopal domain created by NPIs depends on the surface structure following NIB by Beck and Kim (1997) and LCC by Tanaka (1997). I also assume that the scopal domain of comparatives is composed by the comparative constituent and the comparative morpheme.\(^{22}\) Descriptively, the first node that c-commands both the NPI and negation marker is a domain of negative scope that corresponds to NegP, and the first node that c-commands both the comparative constituent and the comparative morpheme is a comparative domain that corresponds to Deg’. As is schematized, the LF representation of (47) is licit, because the comparative scope is within the negative scope:

\[(47)\]

\[\begin{align*}
   \text{a. } & \quad \text{Fujisan-sika Kitadake yori takaku-nai.} \\
   & \quad \text{Mt.Fuji-NOM Kitadake than high-NEG} \\
   & \quad \text{‘Only Mt.Fuji is higher than Kitadake’}.
\end{align*}\]
Scrambling of the *yori* phrase from (47a) is not admissible, because the comparative domain must not scope over the negative domain. The scopal domain of the comparative is XP, which is above NegP that indicates the negative scopal domain in (48b). Hence, the representation predicts that the comparative takes scope over the negation.

   Kitadake than Mt.Fuji-NOM high-NEG
   ‘Only Mt.Fuji is higher than Kitadake’.

b. If the present analysis is correct, it is expected that NPIs are possible as long as the
comparative does not take scope over the negative scopal domain. I show that this predication is correct. The comparatives in (49) are acceptable in negation. Note that the complement of yori, Kyoko is compared with Yuki by the existence of the dative case marker ni.

(49)  

give-NEG-PAST  
‘Ichiro did not give more books to Yuki than to Kyoko’.

give-NEG-PAST  
‘Ichiro did not give more books to Yuki than to Kyoko’.

give-NEG-PAST  
‘Ichiro did not give more books to Yuki than to Kyoko’.

By contrast, if NPIs appear, the counterpart of (49a) is not acceptable, because the comparative domain takes scope over the negative domain. The scopal domains are schematized, respectively.

(50)  

a. * Ichiro-ga [Comp Kyoko-ni yori ] [Neg Yuki-ni-sika takusan-no Ichiro-NOM Kyoko-DAT than Yuki-DAT-only more-GEN hon-o ] age-nakat-ta ].  
book-ACC give-NEG-PAST  
‘Ichiro gave more books only to Yuki than to Kyoko’.

b. Ichiro-ga [Comp Kyoko-ni yori takusan-no hon-o ] [Neg Ichiro-NOM Kyoko-DAT than more-GEN book-ACC Yuki-ni-sika age-nakat-ta ].  
Yuki-DAT-only give-NEG-PAST  
‘Ichiro gave more books only to Yuki than to Kyoko’.

c. Ichiro-ga [Neg Yuki-ni-sika ] [Comp Kyoko-ni yori takusan-no Ichiro-NOM Yuki-DAT-only Kyoko-DAT than more-GEN hon-o ] age-nakat-ta ].  
book-ACC give-NEG-PAST  
‘Ichiro gave more books only to Yuki than to Kyoko’.

Even if the complement of yori is compared with the subject Ichiro, the generalization holds. First, the comparatives in (51) are acceptable.

(51)  

a. Ichiro-ga Kyoko yori Yuki-ni takusan-no hon-o age-nakat-ta.  
Ichiro-NOM Kyoko than Yuki-DAT more-GEN book-ACC give-NEG-PAST  
‘Ichiro did not give more books to Yuki than Kyoko (gave)’.
‘Ichiro did not give more books to Yuki than Kyoko (gave)’.

‘Ichiro did not give more books to Yuki than Kyoko (gave)’.

NPIs determine the negative scope. Hence, the example in (52a) is not acceptable, because the comparative domain takes scope over the negation.

(52) a. *Ichiro-ga [Comp, Kyoko yori] [Neg, Yuki-ni-sika takusan-no hon-o Yuki-DAT only more-GEN book-ACC]
   [age-nakat-ta],
give-NEG-PAST
   ‘Ichiro gave more books only to Yuki than Kyoko (gave)’.

b. Ichiro-ga [Comp, Kyoko yori takusan-no hon-o]
   Ichiro-NOM Kyoko than more-GEN book-ACC
   Yuki-ni-sika age-nakat-ta, Yuki-DAT only give-NEG-PAST
   ‘Ichiro gave more books only to Yuki than to Kyoko (gave)’.

c. Ichiro-ga [Neg, Yuki-ni-sika] [Comp, Kyoko yori takusan-no hon-o Ichiro-NOM Yuki-DAT only more-GEN book-ACC]
   [age-nakat-ta],
give-NEG-PAST
   ‘Ichiro gave more books only to Yuki than Kyoko (gave)’.

To summarize the discussion, not only NPIs and wh-interrogatives, but NPIs and phrasal comparatives shows quantificational interference. This indicates that the composition between the comparative constituent and the abstract comparative morpheme that is dependent on the host gradable adjective is ‘close’. Specifically, if the dependencies between the *yori* phrase and the comparative morpheme can be analyzed in terms of syntactic operations, it provides strong support that Japanese builds comparative constructions in a compositional way. Locality effects and quantificational interferences cannot be expected under Beck et al. (2004)’s analysis, where the *yori*-phrase is just a prepositional phrase independent of the comparative morpheme and the host gradable adjective. In the next subsection, it will be shown that comparatives are not affected by wh-interrogatives.

4.2. Wh-interrogatives and Comparisons

It is well known that Japanese is a wh-in-situ language, where wh-phrases do not need to occupy the sentence initial position. It is widely assumed that wh-phrases in Japanese move covertly, showing the properties that are typically associated with the displacement properties (Nishigauchi 1990; Takahashi 1993; Tanaka 1999; Watanabe 1992). If the analysis is correct, it follows that wh-phrases constitute an Ā-dependency. I will show that the comparative scope is not affected by wh-scope.23

The examples in (53) show that comparatives are available in interrogatives.
Wh-phrases are acceptable in comparatives. I assume that the wh-phrase covertly moves to Spec CP and the movement is rightward.

The yori phrase can be scrambled over the subject. Given that the comparative scope is XP, which is higher than CP, it follows that the comparative scope is not blocked by wh-scope.
Other examples show that the comparative scope is not affected by the $\bar{A}$-dependency created by $wh$-interrogatives. The examples in (56) show that comparatives can be questioned. Note again that the complement of $yori$, $Kyoko$ is compared with the indirect object $Yuki$.


‘Did Ichiro give more books to Yuki than to Kyoko?’


‘Did Ichiro give more books to Yuki than to Kyoko?’


‘Did Ichiro give more books to Yuki than to Kyoko?’

Even if $Yuki$ is replaced by a $wh$-phrase, the grammaticality is not different. The scopal domain is schematized.

(57) a. Ichiro-ga $\text{[Comp}_{\text{Kyoko-ni yori [Wh}_{\text{dare-ni takusan-no hon-o }]}}$ Ichiro-NOM Kyoko-DAT than who-DAT more-GEN book-ACC age-ta no]? give-PAST Q
‘To whom did Ichiro give more books than to Kyoko?’

b. Ichiro-ga \[\text{Comp} \text{Kyoko-ni yori takusan-no hon-o} \] [\text{Wh dare-ni Ichiro-NOM Kyoko-DAT than more-GEN book-ACC who-DAT age-ta no}]?
‘To whom did Ichiro give more books than to Kyoko?’

c. Ichiro-ga [\text{Wh dare-ni Ichiro-NOM Kyoko-ni yori takusan-no hon-o} ] [\text{Comp Kyoko-DAT than more-GEN book-ACC age-ta no}]?
‘To whom did Ichiro give more books than to Kyoko?’

The comparison between subjects are possible in interrogatives.

(58) a. Ichiro-ga Kyoko yori Yuki-ni takusan-no hon-o age-ta no? Ichiro-NOM Kyoko than Yuki-DAT more-GEN book-ACC give-PAST Q ‘Did Ichiro give more books to Yuki than Kyoko (gave)?’
b. Ichiro-ga Kyoko yori takusan-no hon-o Yuki-ni age-ta no? Ichiro-NOM Kyoko than more-GEN book-ACC Yuki-DAT give-PAST Q ‘Did Ichiro give more books to Yuki than Kyoko (gave)?’
c. Ichiro-ga Yuki-ni Kyoko yori takusan-no hon-o age-ta no? Ichiro-NOM Yuki-DAT Kyoko than more-GEN book-ACC give-PAST Q ‘Did Ichiro give more books to Yuki than Kyoko (gave)?’

Again, if Yuki is replaced by a \textit{wh}-phrase, composing an Â-dependency, the grammaticality is not affected.

(59) a. Ichiro-ga \[\text{Comp Kyoko yori [Wh dare-ni takusan-no hon-o} \] Ichiro-NOM Kyoko than \[\text{wh dare-ni who-DAT book-ACC age-ta no}]?\]
give-PAST Q
‘To whom did Ichiro give more books than Kyoko (gave)?’
b. Ichiro-ga \[\text{Comp Kyoko yori takusan-no hon-o} \] [\text{Comp Kyoko yori takusan-no hon-o} ] [\text{Wh dare-ni Ichiro-NOM Kyoko-DAT than more-GEN book-ACC who-DAT age-ta no}]?
give-PAST Q
‘To whom did Ichiro give more books than Kyoko (gave)?’
c. Ichiro-ga [\text{Wh dare-ni Ichiro-NOM Kyoko yori takusan-no hon-o} ] [\text{Comp Kyoko-NOM Kyoko-DAT than more-GEN book-ACC who-DAT age-ta no}]?
give-PAST Q
‘To whom did Ichiro give more books than Kyoko (gave)?’

To summarize the discussion, the quantificational interference in \textit{wh}-interrogatives and comparisons cannot be found. This shows that the interference is only observable
between comparatives and negation. I argue that the interference is caused by semantic reasons: to negate comparatives, negation must take scope over comparatives, because comparatives are monotonic with respect to degrees on a scale. The detailed discussion must await another occasion for the reason of space. In the next section, I will briefly discuss an alternative analysis.

5. Quantification Over Degree Analysis

I have adopted the measure function analysis to describe the meanings of comparative constructions, but there is another way to treat comparatives. I will call the alternative analysis as the quantification over degree analysis. I introduce the basic mechanism and then show that it does not capture the interference with negation.

Under the alternative analysis, it is assumed that the degree morpheme combines with two degree predicates. Following Bhatt and Takahashi (2007); Heim (1985), I call the following lexical entry of more/-er as a two-place degree operator. The assumption states that the than-phrase is a description of degree derived from the clausal source at LF (Bhatt and Takahashi 2007; Bresnan 1973; Hazout 1995; Heim 1985; Lechner 2004; Lees 1961; Lerner and Pinkal 1995; Smith 1961).

(60) \[-er] = \lambda P_{dt}. \lambda Q_{dt}. \exists d [Q(d) \land \neg P(d)]

The description of degree of the clausal structure is derived as follows: The than-phrase contains a null gradable adjective of which the semantic type is \(<d, <e, t>>\) by introducing the ontology of degree, and the degree argument of the null gradable adjective is abstracted over by a null operator in the than-clause. A second argument of -er, a description of degree, is created by QR of -er. The LF structure is schematized in (61b).

(61) a. Mt.Fuji is higher than Kitadake is.
   b. \[[-er]_{\text{CP}} \text{than} \lambda d_{1}. [\text{Kitadake is } d_{1}\text{-high }][\lambda d_{2}. [\text{Mt.Fuji is } d_{2}\text{-high }]]\]

If the counterpart of the phrasal comparative is treated in a unified fashion by introducing the 2-place degree operator, it would be conceptually desirable, because it would not be necessary to postulate a separate lexical entry for the degree operator in phrasal comparatives. In fact, Lechner (2004) claims that phrasal comparatives in English are derived from the sentential structure that undergoes ellipsis. However, as have been discussed in 2.1, at least in some cases a clausal source is not available for phrasal comparatives. The direct interpretation of phrasal comparatives is possible by introducing a three-place degree operator in (62) (Bhatt and Takahashi 2007; Heim 1985), where the degree operator takes two individuals, one predicate of individuals and degrees as its arguments.

(62) \[-er] = \lambda x. \lambda P_{det}. \lambda y. \exists d [P(y,d) \land \neg P(x,d)]

It is assumed that a constituent of a predicate of individuals is made by the vacuous movement of Mt.Fuji to a clausal edge, and the degree operator and the yori-phrase form a constituent, moving to a clausal edge to solve the type mismatch but lower than Mt.Fuji from which the complex degree operator quantifies over the degree variable contained in the gradable adjective takai ‘high’ in (63).

Hence, the moved compound generates an operator-variable structure.
(63) a. Fujisan-wa Kitadake yori takai.
   Mt.Fuji-TOP Kitadake than higher
   ‘Mt. Fuji is higher than Kitadake’.

b. \[\text{TP Mt.Fuji [-er [than Kitadake]]} \lambda \alpha. [\alpha \text{ is d-tall}]\]

Under the quantification over degree analysis, the QR of the degree constituents is required to solve the type mismatch. Therefore, this analysis cannot capture the interference, because it is predicted that all the LF representations provided by this analysis need to take scope over negation. In fact, it is possible to postulate movement of the comparative phrase to Spec DegP, instead of the clausal edge, but the amalgamation of the degree morpheme and the yori phrase needs to move to a sentence initial position after all. I will not adopt this approach for this reason.

6. Conclusion

It was shown that the yori-phrase is compositionally related to the host gradable adjective via an abstract comparative morpheme. I discussed the properties of phrasal comparatives in English, where a sentential source is detectable. This is confirmed by the binding phenomena discussed by Bhatt and Takahashi (2007); Lechner (2004). On the other hand, at least in some cases a sentential structure must not be postulated for phrasal comparatives in English. Following Kennedy (1999), I showed that the two semantic entries for phrasal comparatives are necessary to describe the meanings of phrasal comparatives in English. I then analyzed the locality effects exhibited by the yori phrase, concluding that the yori phrase is selected by an abstract comparative morpheme that must be contiguous to host gradable adjectives. I also discussed the internal syntax of the yori phrase based on binding phenomena, concluding that it does not compose an independent sentential structure. Since the sentential portion is not available, the direct interpretation is necessary for phrasal comparatives in Japanese to derive a standard value. It was also shown that comparatives cannot take scope over negation, but it is not affected by the A-dependency created by wh-interrogatives. The scopal domain is determined by the surface structure and it indicates that the composition between the comparative constituent and the host gradable adjective is closely related. The analysis was shown to provide an explanation for the mapping between syntax and semantics in Japanese phrasal comparatives in terms of the measure function analysis and shows that comparative constructions can be built irrespective of the realization of the comparative morpheme.

Acknowledgements

Portions of this paper were presented at the 18th Colloquium on Generative Grammar at the Universidade de Lisboa, April 2008. I would like to thank the audiences there. I would also like to thank Steve Harlow, Heather Marsden, Bernadette Plunkett, Hidekazu Tanaka, George Tsoulas, and Eytan Zweig for extremely valuable comments on, and discussion of, the material presented here. I am also indebted to YPL reviewers and editors. Any errors, inconsistencies and shortcomings that have persisted are my responsibility. This paper is partially supported by the Nigel Moors Studentship.
Notes

1. Mt. Fuji is the highest mountain and Kitadake is the second highest mountain in Japan.
2. I assume the remnant first moves to the edge of CP and the remaining constituent is a target of ellipsis.
3. An alternative analysis is that the semantic type of gradable adjectives is the same as that of non-gradable adjectives. Hence, the semantic function of gradable adjectives is a function from objects to truth values (Kamp 1975; Klein 1980, 1982, 1991; Larson 1988; McConnell-Ginet 1973). For the critical discussion on this approach, see Kennedy (1999). I believe that the scalar analysis does not suffer from the problems this alternative cannot solve based on incommensurability, cross-polar anomaly, and comparisons of deviation.
4. The definition of the maximality operator is from Kennedy (1999: 57).
5. The semantics of the comparative clause is determined by the semantics of the degree morpheme in the matrix clause in predicative comparative deletion constructions. Kennedy (1999) describes the meaning of the comparative deletion as follows, where MORE expresses an ordering relation. The meaning of the degree morpheme in the matrix clause and the degree morpheme in the comparative clause are separately described here for perspicuity.
   i. \[
   \text{more/-er} = \lambda G \lambda Q \lambda x [\text{MORE}(G(x))(Q(G))]
   \]
6. Since than constituents are adjuncts, the selectional requirement here is exceptional. The postulation is based on wh-extraction. The contrast between (i) and (ii) shows that extraction of arguments is possible, while extraction of adjuncts is not out of the nonfinite clause, a pattern detectable in wh-extraction out of adjuncts (Huang 1982; Rizzi 1990).
   i. Who was John angry enough to criticize?
   ii. * How harshly was John angry enough to criticize his boss?

Under the assumption that the nonfinite clauses in degree constructions and than constituents occupy the structurally similar positions, the contrast supports the claim that than constituents are adjuncts (Kennedy 1999; Kennedy and Merchant 1997). In addition, extraction of an argument from the than clause is impossible, because the than clause constitutes an adjunct island.
   i. * Which planet is Neptune brighter than is?

Bresnan (1973) claims that comparative constituents are complements selected by the comparative morpheme and the obligatory rightward movement of comparative constituents is stipulated. However, if we assume that than-constituents are complements of -er/more, the morphological incorporation between -er and gradable adjectives cannot be explained, because the adjacency between them is broken by than-constituents.

Bhatt and Pancheva (2004) postulate that comparative-constituents are complements selected by the comparative morpheme. Their discussion is based on scopal interpretations in comparatives and concludes that comparative constituents are late-merged. This is theoretically problematic, because late-merger is possible only for adjuncts (Chomsky 1995; Fox 2000, 2002; Lebeaux 1990; Takahashi 2006a). For these reasons, I assume comparative constituents are adjuncts in English. However, I will show that comparative
constituents are selected by an abstract comparative morpheme in Japanese in section 3, whereby I treat the yori phrase as a complement.
7. Where the copular is will not be discussed. Whether it is in TP or VP does not affect the present discussion.
8. See also the discussion in Heim (1985), where Heim also claims that an another entry for the comparative morpheme is necessary. This will be discussed in section 5.1.
9. Again, the semantics of the degree morpheme is determined by the semantics of the degree morpheme in the matrix clause. Hence, the meaning of phrasal comparatives can be alternatively described as follows:
   i. \[ \text{more/-er} = \lambda G \lambda y \lambda x \text{MORE}(G(x))(G(y)) \]
10. Since Japanese lacks lexical determiners, NP can be treated as an individual.
11. Quite a few speakers find comparative readings for (22c), but a non-comparative interpretation is preferable even for them.
12. See also the discussion by Harada (1974); Kikuchi (1987). They attribute the preceding condition on comparatives to the Proper Binding Condition (Fiengo 1977).
13. Japanese has an aspect marker called ‘te iru’ form that expresses an on-going process or a result state. I simply gloss as TE IRU here. For a semantic analysis of this aspect marker, see Ogihara (1998)
14. See the discussion in Takahashi (1993) in particular, where the scrambling of wh-phrase is regarded as overt wh-movement.
15. I assume anywhere condition, where the expression so is licensed if it is c-commanded by its antecedent at some stage of the derivation. For the discussion of the Condition A in Japanese, see also Saito (2003)
16. As I mentioned in footnote 6, I tentatively assume that the remnant first moves to Spec CP and then the remaining TP is the target of ellipsis. Wherever soko-no kogaisya-ni receives an interpretation, it cannot be c-commanded.
   i. \[ CP \text{soko-no kogaisya-ni}, \text{takusan-no hito-ga} \text{Honda-ni-t suiens-i-ta} \text{yori} \]
17. The remnant movement does not affect the present discussion, but a general assumption is that a constituent can be a target of syntactic operations.
18. In fact, soko-no kogaisya without an overt case marker can also be an indirect object, but I ignore that interpretation here.
19. I again assume that the remnant moves to Spec CP and the remaining TP is the target of ellipsis.
   i. \[ CP \text{soko-no kogaisya(-o)}, \text{takusan-no hito-ga} \text{Honda-ni-t suiens-i-ta} \text{yori} \]
20. The LCC is not adequate for the quantificational interferences in German. The quantificational interference in German should be analyzed by postulating inner islands. This is pointed out by Hidekazu Tanaka (p.c.)
21. Alternatively, it can be assumed that NegP projects over TP, but another assumption will be required, because negative morpheme precedes tense marker in Japanese. I do not decide which view is correct here.

22. Alternatively, it can be hypothesized that the yori phrase is a complement of the abstract degree morpheme and the compound of the yori phrase and the degree morpheme can late merge at the surface position directly à la Bhatt and Pancheva (2004). For the present purpose, it is enough to say that the surface position of the yori phrase determines the scopal domain.

23. Ishii (1999) observes the quantificational interference in wh-interrogatives and comparisons. Ishii assumes an operator, the function of which is totally unclear, is base-generated in Spec of DP. The operator moves to Spec of the yori-phrase. Again, what elements are bound by the operator is not discussed. Ishii further claims that the trace at Spec of DP must satisfy the Proper Binding Condition. If his analysis is correct, it follows that the example (i) does not receive a comparative interpretation because of the violation of the Proper Binding Condition.

i. Ichiro-wa [DP ti takusan-no hon-o] [PP Opi Daisuke yori] Kyoko-ni
Ichiro-TOP many-GEN book-ACC Daisuke than Kyoko-DAT
age-ta.
give-PAST
‘Ichiro gave many books to Kyoko rather than Daisuke’.

ii. Ichiro-wa [PP Opi Daisuke yori] Kyoko-ni [DP ti takusan-no hon-o]
Ichiro-TOP Daisuke than Kyoko-DAT more-GEN book-ACC
age-ta.
give-PAST
‘Ichiro gave more books to Kyoko than Daisuke’.

I will not adopt his analysis for the following reasons. First, I do not find any informant that finds the quantificational interference between wh-interrogatives and comparisons. Second, the repeated simple example could not be generated under his analysis unless the status of the operator is made clear. It would need to assume a mysterious operator is base-generated at Spec of the adjective takai.

i. Fujisan-wa Kitadake yori takai.
Mt.Fuji-TOP Kitadake than higher
‘Mt.Fuji is higher than Kitadake’.

Third, given that the operator that is base-generated in the matrix clause can move to Spec of yori, it would complicate the theory of comparative constructions. As Ishii (1991); Kikuchi (1987) observe, comparative deletion constructions, where the complement of yori composes a sentential structure and a null operator in the sentential complement of yori moves to Spec of yori, are possible. In that case, it would need to assume two operators move to Spec of yori under Ishii (1999)’s analysis. Moreover, the operator movement is peculiar in that it moves from the matrix clause to the embedded clause.

24. The ‘tucking in’ movement by Richards (1997) is assumed.
References


---

Koji Kawahara  
Department of Language and Linguistic Science  
University of York  
email: kk512@york.ac.uk