

## Japanese Superlative Constructions: Evidence for ‘Est’-movement\*

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### 1. Introduction

It has been observed since Ross (1964) that the superlative construction in (1) has two readings: the absolute-reading (A-reading) in (1a), where the heights of the relevant mountains are compared, and the comparative-reading (C-reading) in (1b), where relevant climbers’ achievements of mountain climbing are compared (Szabolcsi 1986).

- (1) John climbed the highest mountain.
- a. The absolute-reading: John climbed the highest mountain among the contextually relevant mountains.
  - b. The comparative-reading: A mountain that John climbed is higher than any of the mountains that the other contextually relevant climbers climbed.

Two theories have been proposed regarding the ambiguity in (1). One theory holds that the ambiguity of this kind is a reflection of two LF structures where the position of the superlative morpheme *-est* differs (Heim 1985, 1999; Szabolcsi 1986). These LF structures are derived by moving *-est*, and thus the theory is addressed as the “movement” theory. Another theory holds that the ambiguity is just a case of context dependency. In particular, only one LF structure is posed, and the two readings are derived by assignment of different values to the context variable *C*, which picks the most salient comparison set from a context. Since *-est* is interpreted within the DP where it is originated, the theory is addressed as the “in-situ” theory.

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As Heim (1999) notes, a choice between these two theories is very hard to make since *-est* never undergoes overt movement in English. In other words, the observation solely on the interpretation of English sentences such as (1) does not provide us with conclusive evidence for the ambiguity in (1) being a result of *-est* movement. To provide more concrete evidence for the above discussion, therefore, this article investigates Japanese superlative constructions such as (2). Specifically, I show that while the sentence in (2a) allows both the A- and the C-reading, the sentence in (2b), where a superlative morpheme *ichiban* ‘most’ overtly moves, allows only the C-reading: the ambiguity disappears. The current observation leads to the conclusion that the movement theory provides a better explanation than the in-situ theory when we treat the ambiguity of superlative constructions in Japanese.

- (2) a. John-ga ichiban takai yama-ni nobot-ta.  
 John-NOM most high mountain-to climb-PAST
- b. Ichiban<sub>i</sub> John-ga t<sub>i</sub> takai yama-ni nobot-ta.  
 most John-NOM high mountain-to climb-PAST  
 ‘John climbed the highest mountain.’

## 2. Previous Studies

### 2.1 Basic Assumptions for the Interpretation of Superlative Constructions

For the purpose of the comparison of the two theories introduced above, let us make the following three assumptions.<sup>1</sup> First, a gradable adjective denotes a function from degrees to  $\langle e, t \rangle$ -functions (Seuren 1973; Cresswell 1976, a.o.). For example the semantics of the adjective *high* is given as follows.

- (3) For any degree  $d$  and individual  $x$ ,  $[[high]](d)(x) = 1$  iff  $x$  is high to degree  $d$  (i.e., iff  $x$ 's maximal height includes  $d$ )

Second, as in (4), a relation  $R$ , which corresponds to the *high*-class adjectives (e.g., *high*, *tall*, *long*, etc.), is downward monotonic (Cresswell 1976). For example, *John climbed a 6000m mountain* entails that John climbed a mountain lower than 6000m (i.e., 5900m, 5800m, etc.), but not higher than 6000m (i.e., 6100m or 6200m).

- (4) A relation  $R$  between objects and degrees is downward monotonic iff:  
 $\forall x, d, d' [R(x, d) \ \& \ d > d' \rightarrow R(x, d')]$

Third, adopting von Stechow's (1994) implementation of the idea of context-dependency, the semantics of *-est* is given in (5) (Heim 1999), where *-est* takes the following three arguments: the context variable  $C$ , which provides a comparison set, a gradable adjective  $R$ , and an individual  $x$ . Application of the *-est* function to these three arguments yields the following truth conditions: there is a degree  $d$  such that the individual  $x$  has property  $R$  to

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<sup>1</sup> Note that each assumption here is not uncontroversial and is still under debate. I summarize the three assumptions here in a theory-neutral way without committing myself to the independent discussions regarding them. The choice made here is a modest one just for the sake of simplicity.

that degree, but all the other contextually relevant individuals don't. Thanks to the monotonicity assumption in (4), although every relevant individual has  $R$  to some degree, no one is  $R$ -er than  $x$ .

$$(5) \quad \llbracket est \rrbracket = [\lambda C . [\lambda R . [\lambda x: x \in C \ \& \ \forall z [z \in C \rightarrow \exists d [R(d)(z)=1]]] . \\ \exists d [R(d)(x)=1 \ \& \ \forall y [y \neq x \ \& \ y \in C \rightarrow R(d)(y)=0]]]]]$$

## 2.2 The In-situ Theory

Having the assumptions in the previous subsection in mind, let us start with the in-situ theory (Heim 1985; Farkas and Kiss 2000; Sharvit and Stateva 2002). The LF of the sentence (1) under this theory is provided in (6a), where *-est* stays within the DP *the highest mountain*. This LF yields the truth conditions in (6b).

- (6) a. LF: John climbed [ the [ *C-est* ] [ high mountain ] ]  
 b. Whenever defined,  $\llbracket (6a) \rrbracket = 1$  iff John climbed the unique  $x$  such that  
 $\exists d [x \text{ is a } d\text{-high mountain} \ \& \ \forall y [y \neq x \ \& \ y \in C \rightarrow y \text{ is not a } d\text{-high mountain}]]$   
 $C$ : A set of relevant mountains (the A-reading)  
 $C$ : A set of mountains climbed by relevant climbers (the C-reading)

The ambiguity in this sentence arises as a contextual ambiguity, keeping a single LF for the A- and the C-reading. The A-reading obtains when the value of the context variable  $C$  happens to be a set of contextually relevant mountains; the C-reading obtains when the value of  $C$  happens to be a set of mountains climbed by one of the contextually relevant climbers; a comparison among such mountains amounts to comparing contextually relevant climbers' achievement of mountain climbing.

## 2.3 The Movement Theory

The movement theory (Heim 1985, 1999; Szabolcsi 1986) allows two different LF-structures for the sentence (1). One is exactly the same "in-situ" LF we saw in (6a) and gives us the A-reading. The other is the "movement" LF in (7a) with the truth conditions in (7b), where *-est* together with the context variable  $C$  moves out of the DP, abstracting over a degree variable in its original position. The definite determiner *the* is replaced with the indefinite determiner *a/an* (represented as ~~*the*~~) in accordance with Szabolcsi's (1986) argument that the DP in the superlative construction is ambiguous between a definite and an indefinite construal.

- (7) a. LF: John [*C-est*]  $\lambda d$  [ climbed [ ~~the~~ [  $d$ -high mountain ] ] ]  
 b. Whenever defined,  $\llbracket (7a) \rrbracket = 1$  iff  $\exists d$  [ John climbed a  $d$ -high mountain &  
 $\forall y [y \neq \text{John} \ \& \ y \in C \rightarrow y \text{ did not climb a } d\text{-high mountain}]]$   
 $C$ : A set of relevant climbers (the C-reading)

According to the semantics of *-est* in (5), the value of the context variable  $C$  is affected by the landing site of superlative movement. When the *C-est* complex moves into the

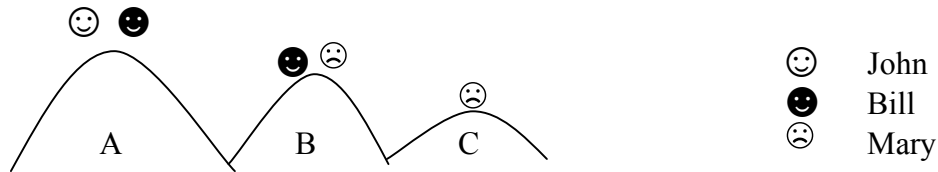
position below the subject in (7a), the value of *C* has to be a set of relevant climbers because the context variable *C* always restricts its external argument.

## 2.4 Difficulties of Arguing for the Movement Theory

In the previous three subsections, we have seen how the movement and the in-situ theories derive the ambiguity of superlative constructions. As observed by Heim (1999), the C-reading under the in-situ theory and the one under the movement theory are practically indistinguishable. Specifically, comparing a set of mountains climbed by the relevant climbers in (6b) amounts to comparing the relevant mountain climbers in (7b). This may lead us to a conclusion that the movement approach should be dispensed with for the sake of simplicity: adopting the movement theory requires extra assumptions that the definite article in superlative constructions is ambiguous, and, above all, that *-est* is interpreted far away from its original position via degree abstraction.

Heim, however, provides a potential argument for the movement analysis by considering a scenario that teases apart the predictions made by the movement theory and the in-situ theory. Her scenario is illustrated as follows.

- (8) Scenario 1: Mountain A is higher than both Mountain B and Mountain C.  
John and Bill both climbed A, Bill and Mary climbed B, and Mary climbed C.



English speakers judge the sentence (1) *John climbed the highest mountain* acceptable here, presumably, thanks to the availability of the A-reading. The comparison under the A-reading is done simply among the contextually relevant mountains, i.e., Mountain A, B and C, and Mountain A, which John climbed, is indeed the highest among the three. When it comes to the C-reading of (1), however, the movement theory predicts the sentence to be false while the in-situ theory predicts it to be true. Specifically, under the in-situ theory, the C-reading with the LF (6a) compares the relevant mountains climbed by the relevant climbers, but not climbers themselves; Mountain A, which John climbed, is indeed higher than the other mountains in this scenario. On the contrary, under the movement theory, the C-reading with the LF (7a) compares the relevant climbers, but not mountains (climbed by the relevant climbers); since both John and Bill climbed Mountain A in (8), John is not the best climber among the relevant ones. Given these predictions, if we could force the C-reading in (1) under the scenario in (8) and speakers rejected it by responding like (9) below, we would have a clear argument for the movement theory.

- (9) John didn't climb the highest mountain: Bill climbed one just as high, in fact the same one. (Heim 1999: 32)

Due to the ambiguity of (1), however, Heim reports that the evidence is “mixed”: many speakers hesitate to reject the sentence (1) by saying (9). If the reason of the mixed evidence is because *-est* movement is invisible in English, one may wonder whether a similar ambiguity is observed in languages with overt *-est* movement. In the next section, I show that Japanese superlative constructions are exactly the case.

### 3. Japanese Superlative Constructions

#### 3.1 The Data

Japanese superlatives are formed with the independent superlative morpheme *ichiban* or *mottomo* (English *most*), which generally appears immediately before its associated degree adjectives<sup>2</sup>. Consider the sentence in (10a), where *ichiban* is base-generated in the position right before the adjective *takai* ‘high’. This sentence allows both the A- and the C-reading like the English counterpart (1). Crucially, the superlative morpheme can undergo movement as in (10b). Although (10a) is ambiguous, the ambiguity disappears in (10b), allowing only the C-reading. The judgments here are clearer compared to the English case we saw above.

- (10) a. John-ga ichiban takai yama-ni nobot-ta.  
John-NOM most high mountain-to climb-PAST  
‘John climbed the highest mountain.’ (A-/C-reading)
- b. Ichiban<sub>i</sub> John-ga t<sub>i</sub> takai yama-ni nobot-ta.  
most John-NOM high mountain-to climb-PAST  
‘John climbed the highest mountain.’ (#A-/C-reading)

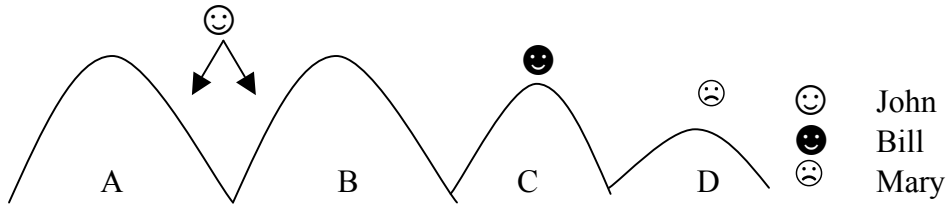
The disambiguation in (10b) is confirmed by considering the scenarios where only one reading is possible. First, consider Scenario 1 in (8) again. Recall that the C-reading under the movement theory came out false in this scenario since there was no unique best climber, i.e., Bill climbed the same height as John did. According to my survey, the sentence (10b) is judged unacceptable in this scenario as expected, which suggests that the speakers interpret (10b) with the C-reading and reject it based on the information given in (8). Since the A-reading, where the relevant mountains in the context are compared (irrespective of whether or not they are climbed by one of the relevant climbers), should be compatible with the scenario in (8), the unacceptability of (10b) also indicates that the sentence lacks the A-reading.

Second, consider Scenario 2 in (11) provided in Sharvit and Stateva (2002) (following a suggestion by Heim). This scenario forces the C-reading because the A-reading comes out a presupposition failure; notice that there is no unique highest mountain in (11), i.e., Mountain A and B have the same height and they are higher than Mountain C and D. Here, (10b) as well as (10a) are judged acceptable. This indicates that the sentence (10b) has the C-reading, where the contextually relevant climbers, not mountains, are compared, and John is the best mountain climber among the three.

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<sup>2</sup> The focus of this article is mainly on superlative constructions involving the lexical item *ichiban*, but the analysis of this item is easily carried over to the case of the other superlative morpheme *mottomo*.

- (11) Scenario 2: Mountain A and B are the same height and are higher than both Mountain C and D. John climbed A and B, Bill climbed C, and Mary climbed D.



The lack of ambiguity in (10b), therefore, indicates that overt superlative movement, in addition to the context dependency, is still necessary to derive the LF for the C-reading in Japanese.

### 3.2 Analysis

Based on the previous studies of English superlatives, the C-reading of the sentence (10b) receives an explanation as follows. First, I assume that the superlative morphemes *ichiban* and *mottomo* come with the same semantics as English *-est* (Heim 1999).

- (12)  $[[ichiban/mottomo]] = [[est]] (=5)$

Second, degree adjectives in Japanese as well as in English are assumed to be downward monotonic. Third, assuming the copy theory of movement (Chomsky 2000, 2001), the *C-ichiban* complex, which is base-generated in (13a), moves to the sentence initial position, leaving a copy behind in every possible landing site, where *C-ichiban* is interpretable type-wise. (13b) is the pre-spell-out structure formed after the series of movement. In PF, the highest copy is chosen for pronunciation; the resulting PF structure in (13c) yields the correct word order. In LF, the second highest copy is chosen for interpretation; the resulting LF structure in (13d) yields the truth conditions for the C-reading.

- (13) a.  $[_{IP} \text{John-ga } [_{VP} [_{DP/NP} \text{C-ichiban takai yama-ni}] \text{ nobot-}]\text{-ta}]$   
           John-NOM                   most       high mountain-to climb-PAST
- b. Pre-Spell-Out:  $[_{IP} \text{C-ichiban } [_{IP} \text{John-ga } \text{C-ichiban } [_{VP} [_{DP/NP} \text{C-ichiban takai yama-ni}] \text{ nobot-}]\text{-ta}]]$
- c. PF:  $[_{IP} \text{C-ichiban } [_{IP} \text{John-ga } \text{C-ichiban } [_{VP} [_{DP/NP} \text{C-ichiban takai yama-ni}] \text{ nobot-}]\text{-ta}]] \rightarrow Ichiban John-ga takai yama-ni nobot-ta. (=10b))$
- d. LF (the C-reading):  
 $[_{IP} \text{C-ichiban } [_{IP} \text{John-ga } \text{C-ichiban } \lambda d [_{VP} [_{DP/NP} d\text{-takai yama-ni}] \text{ nobot-}]\text{-ta}]]$   
 $\rightarrow$  Whenever defined,  $[[13d]] = 1$  iff  $\exists d$ [John climbed a *d*-high mountain  
 &  $\forall y$ [ $y \neq \text{John}$  &  $y \in C \rightarrow y$  did not climb a *d*-high mountain]]

Note that we want to avoid a possible situation where the original copy (i.e., the lowest one) is chosen for interpretation, allowing the LF in (14), which mimics the LF (6a), to yield the A-reading. To do so, I further assume that whenever a superlative morpheme undergoes overt movement, the highest “interpretable” copy has to be chosen. For

example, in the LF (13d), the copy of the superlative above the subject cannot be interpretable because of a type mismatch, i.e., it cannot take an external argument. Therefore the highest interpretable copy here is the copy right below the subject.<sup>3</sup>

(14) LF (the A-reading):

#[~~IP~~ ~~C-ichiban~~ [<sub>IP</sub> John-ga ~~C-ichiban~~ [<sub>VP</sub> [<sub>DP/NP</sub> **C-ichiban** takai yama-ni] nobot]-ta]]

The existence of the intermediate copy (i.e., the copy below the subject) is supported by the existence of overt superlative movement into this position. In (15), for example, since the time adverbial *kinoo* ‘yesterday’ is located between the subject and the VP, the superlative movement is now visible. According to the judgment of the informants, this sentence also allows only the C-reading, a desired result.

(15) John-ga        **C-ichiban**<sub>i</sub>    kinoo [<sub>VP</sub>[<sub>DP</sub> t<sub>i</sub>        takai yama]-ni        nobot]-ta  
 John-NOM        most        yesterday            high mountain-to climb-PAST  
 ‘John climbed the highest mountain yesterday’ (#A-/C-reading)

Furthermore, the current analysis is supported by the fact that an interpretation of superlatives varies according to the position of a pause in a sentence. When the superlative sentence (10a) is uttered with an explicit pause between the subject and the superlative *ichiban*, the sentence allows both the A- and the C-reading. Here, the C-reading of (10a) obtains via context dependency with the in-situ LF. However, when a pause is put between *ichiban* and the adjective *takai*, the ambiguity disappears, allowing only the C-reading. It is generally argued that an intonation boundary cannot be inserted within a syntactic constituent. Thus, the fact that a pause cannot be put between *ichiban* and *takai* suggests that these two elements form a constituent, i.e., *ichiban* does not move out of the DP as in (16a). Moreover, the grammaticality of the sentence where a pause can be put between *ichiban* and *takai* shows that the superlative moves out of the DP vacuously and land below the subject as in (16b). Since *ichiban* undergoes overt (and vacuous) superlative movement in (16b), the lack of ambiguity is explained as expected: the movement LF only allows the C-reading.

(16) a.    John-ga # [ichiban (\*#) takai yama]-ni        nobot-ta  
           John-NOM    most            high mountain-to climb-PAST  
           ‘John climbed the highest mountain.’        (A-/C-reading)  
       b.    John-ga        ichiban<sub>i</sub> # [t<sub>i</sub>        takai yama]-ni        nobot-ta  
           John-NOM    most            high mountain-to climb-PAST  
           ‘John climbed the highest mountain.’        (#A-/C-reading)

Summing up the discussion in this section, I have shown that the interpretations of Japanese superlatives are explained straightforwardly under the movement theory with an

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<sup>3</sup> I believe that the assumption here is not so unreasonable one. I suspect that the interpretation of a chain derived by a semantic movement is subject to some kind of economy consideration, namely “make a good (or maximal) use of a movement chain”. “A good use” here refers to “interpret the highest possible copy as far as semantic interpretation goes without reconstructing it all the way down to its original position.”

additional assumption of movement chain interpretation. Having this conclusion in mind, in the rest of this article, I go over some additional arguments for and against the movement theory in English superlatives and discuss how the movement theory in Japanese superlatives fares with them.

#### 4. Intensional Contexts: the Fifth Reading

Heim (1999) argues that superlatives under intensional contexts provide us with another piece of evidence for the movement theory. Consider the following example.

(17) John<sub>i</sub> needs [PRO<sub>i</sub> to climb the highest mountain].<sup>4</sup>

When the superlative construction appears in the complement clause of the intensional verb *needs*, the sentence gives rise to the following four readings: the absolute/comparative *de re* readings and the absolute/comparative *de dicto* readings. Under the movement theory, these four readings obtain through the combinations of the LF position of *-est* and the DP *the highest mountain*. First, the *de re* readings arise when the DP outscopes the verb *needs*. On top of this, *-est* can stay within the DP in (18), yielding the A-reading, or it can move out of the DP in (19), yielding the C-reading. The former reading compares the height of the relevant actual mountains. The latter reading compares the height of actual mountains climbed by the relevant climbers in their need-worlds, i.e., John is the neediest climber among all.<sup>5</sup>

(18) The absolute *de re*

John needs-@ [1 [PRO climb- $w_1$  [the [C-est [high mountain-@]]]]]

$C = \{x : x \text{ is a relevant mountain in the actual world}\}$

For all worlds  $w$  compatible with John's actual needs, he climbs in  $w$  the unique  $x$  s.t. there is a degree  $d$  s.t.  $\{y \in C : y \text{ is a } d\text{-high mountain in the actual world}\} = \{x\}$ .

(19) The comparative *de re*

John [C-est [1 [5 [[~~the~~  $d_1$ -high mountain-@] [3 [t<sub>5</sub> needs-@ [2 [PRO climb- $w_2$  t<sub>3</sub>]]]]]]]]]

$C = \{x : \text{there is a degree } d \text{ s.t. } x \text{ needs to climb an actual mountain that is } d\text{-high}\}$

There is a degree  $d$  s.t.  $\{y \in C : \text{there is an } x \text{ s.t. } x \text{ is a } d\text{-high mountain in the}$

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<sup>4</sup> In fact, Heim's (1999) original example corresponding to the sentence in (17) involves the intensional verb *want*. The main reason why the other intensional verb *need* is adopted here is because *want* in English is a neg-raising verb. Recall that the semantics of *-est* in (5) involve a negation component. Then, a sentence where *-est* outscopes *want* should be indistinguishable from a sentence where *-est* is interpreted under the scope of *want*: negation in the semantics of *-est* outside the scope of *want* can lower down within the scope of *want*.

<sup>5</sup> In the followings, the LFs and the truth conditions in (18) through (21) for the relevant readings are essentially taken from Sharvit and Stateva (2002: (13) and (14)). The at-mark @ in the LFs is a shorthand of the utterance context, i.e., the actual world, where the subject of the sentence, i.e., *John*, has his own needs. In (20) and (21), the context variable, which is described as  $fw_1$ , is relativised to a set of possible worlds  $w_1$  compatible with John's needs in the actual world.

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actual world and for all worlds  $w$  compatible with  $y$ 's actual needs,  $y$  climbs  $x$  in  $w$  = {John}.

Second, the *de dicto* readings arise when the DP is interpreted in the scope of *needs*. On top of this, *-est* can stay within the DP in (20), yielding the A-reading, or it can move out of the DP in (21), yielding the C-reading. The former reading compares the height of the relevant non-actual mountains, i.e., in all of his need-worlds, John climbs some non-actual mountain which is higher than any other non-actual mountains. The latter reading compares the height of non-actual mountains climbed by the relevant climbers in their need-worlds, i.e., John is the best (non-actual) climber.

(20) The absolute *de dicto*

John needs-@ [1 [PRO climb- $w_1$  [the [ $f_{w_1}$ -est [high mountain- $w_1$ ]]]]]

For all worlds  $w$  compatible with John's actual needs, he climbs in  $w$  the unique  $x$  s.t. there is a degree  $d$  s.t.  $\{y \in f(w) : y \text{ is a } d\text{-high mountain in } w\} = \{x\}$

(21) The comparative *de dicto*

John needs-@ [1 [PRO [ $f_{w_1}$ -est [2 [climb- $w_1$  the  $d_2$ -high mountain- $w_1$ ]]]]]

For all worlds  $w$  compatible with John's actual needs, there is a degree  $d$  s.t.  $\{y \in f(w) : y \text{ climbs in } w \text{ a } d\text{-high mountain in } w\} = \{\text{John}\}$

Crucially, the sentence (17) has the fifth reading that cannot be captured by the four LFs given above (i.e., Szabolcsi 1986; Heim 1999). This reading comes out true in the following scenario.

- (22) Scenario 3: I conduct a survey on how high a mountain the relevant climbers need to climb. Each of the relevant climbers reports his/her desire:

John: "I need to climb a mountain that is 6000m high."

Bill: "I need to climb a mountain that is 1000m high."

Mary: "I need to climb a mountain that is 4000m high."

Then, I report the result of the survey uttering "(17)".

The sentence in (17) under the survey scenario in (22) comes out true even if in some world compatible with John's needs he climbs a mountain that is lower than the ones climbed by Bill or Mary (e.g., John climbs 6000m, Bill 3000m, and Mary 9000m). In other words, when John tells the reporter that he needs to climb 6000m, he does not care about the heights of other (actual or non-actual) mountains climbed by Bill or Mary. The truth conditions of the fifth reading, therefore, require that all the worlds compatible with John's needs are such that he climbs in them a mountain that is not lower than his minimum (i.e. 6000m) and that his minimum be higher than the minimums of the others. Heim argues that the movement theory provides a straightforward account for the fifth-reading: *-est* undergoes long-distance movement above the intensional verb in (23).

(23) The fifth-reading

John [*C-est*]  $\lambda d$ [needs-@  $\lambda w$ [PRO climb-*w* the *d*-high mountain-*w*]]

$C = \{x : \text{there is a degree } d \text{ s.t. } x \text{ needs to climb a } d\text{-high mountain}\}$

There is a degree  $d$  s.t.  $\{y \in C : \text{for all worlds } w \text{ compatible with } y\text{'s actual needs, } y \text{ climbs in } w \text{ a } d\text{-high mountain in } w\} = \{\text{John}\}$

However, Sharvit and Stateva (2002) provide a version of in-situ theory that can deal with the fifth-reading without *-est* movement. A problem is, again, the lack of overt *-est* movement in English. Provided that both Heim and Sharvit and Stateva can deal with the current example, the observation solely on English superlatives under intensional contexts does not provide decisive evidence for either theory.

Significantly, the interpretation compatible with Scenario 3 in (22) is also available in Japanese (24b), where the superlative morpheme *ichiban* undergoes overt movement, but not in (24a), where it stays in-situ.<sup>6,7</sup> Recall that the fifth reading in (22) claims neither that John climbs in his desire worlds the actual/non-actual mountain that is highest (i.e., the absolute *de re/de dicto*), nor that he is the best actual/non-actual mountain climber in his desire worlds (i.e., the comparative *de re/de dicto*). What the sentence (24b) conveys is only exactly the fifth reading: John's desire for the minimum height of mountains is higher than others.

- (24) a. John<sub>i</sub>-ga [PRO<sub>i</sub> *ichiban* takai yama-ni nobor]-itaga-tteiru.  
 John-NOM most high mountain-to climb-want-be
- b. *Ichiban*<sub>k</sub> John<sub>i</sub>-ga [PRO<sub>i</sub> t<sub>k</sub> takai yama-ni nobor]-itaga-tteiru.  
 most John-NOM high mountain-to climb-want-be  
 'John wants to climb the highest mountain.'

The fifth reading detected in (24b) receives a natural explanation when we adopt the movement theory. First, the *C-ichiban* complex undergoes movement to the sentence initial position as in (25b), leaving its copy behind. Second, to yield the correct word order, the highest copy in (25c) is chosen for pronunciation in PF. Third, the highest interpretable copy in (25d) is chosen for semantic interpretation in LF. Here, the superlative morpheme is interpreted outside of the scope of the intensional verb *want*, but its description stays under the scope of *want*. The LF of this sentence mimics the one of the English (23) for the fifth reading. Thanks to the assumption of the chain interpretation (see the discussion of the sentence (14)), the other possible LFs, where the copy right

<sup>6</sup> The judgments of the sentence (24a) are gathered based on the sentence with explicit pause between the subject *John-ga* and the superlative morpheme *ichiban*, which guarantees that *ichiban* stays in its base-generated position (see the discussion of the sentences in (16) for details).

<sup>7</sup> In the discussion of Japanese superlatives under intensional contexts, I take the verb *-itaga-tteiru* (*-want-stative be*) as an example. This is because I want to keep a parallelism between the structure of English and Japanese intensional superlatives; when we form a sentence with the expression *hitsuyoo-ga aru* 'need-NOM exists', which corresponds to the English verb *need*, the complement of this expression has to be the finite clause while English *need* takes an infinitive clause. Note that the use of *-itaga-tteiru* 'want' does not bring about the problem of neg-raising (see the footnote 4 above) because it has generally been argued that there is no neg-raising in Japanese.

below PRO or in the base-generated position is interpreted, never go with the PF (25c) as expected.

- (25) a.  $[_{IP} \text{John-ga } [_{VP} \lambda W [_{IP} \text{PRO } [_{DP/NP} \text{C-ichiban } \text{takai yama-w}]\text{-ni } \text{John-NOM} \text{ most high mountain-to} \text{ nobor-w }_{(IP)}\text{-itaga-tteiru-@ }_{(VP)}]_{(IP)}]$   
 climb-want-be
- b. Pre-Spell-Out:  
**C-ichiban**  $[_{IP} \text{John-ga } \text{C-ichiban } [_{VP} \lambda W [_{IP} \text{PRO } \text{C-ichiban } [_{VP} [_{DP/NP} \text{C-ichiban } \text{takai yama-w}]\text{-ni } \text{nobor-w }_{(VP)}]_{(IP)}\text{-itaga-tteiru-@ }_{(VP)}]_{(IP)}]$
- c. PF: **C-ichiban**  $[_{IP} \text{John-ga } \cancel{\text{C-ichiban}} [_{VP} \lambda W [_{IP} \text{PRO } \cancel{\text{C-ichiban}} [_{VP} [_{DP/NP} \cancel{\text{C-ichiban}} \text{takai yama-w}]\text{-ni } \text{nobor-w }_{(VP)}]_{(IP)}\text{-itaga-tteiru-@ }_{(VP)}]_{(IP)}]$   
 $\rightarrow$  *Ichiban John-ga takai yama-ni nobor-itaga-tteiru.*
- d. LF (the fifth reading):  
 $\cancel{\text{C-ichiban}} [_{IP} \text{John-ga } \text{C-ichiban } \lambda d [_{VP} \lambda W [_{IP} \text{PRO } \cancel{\text{C-ichiban}} [_{VP} [_{DP/NP} \text{d-takai yama-w}]\text{-ni } \text{nobor-w }_{(VP)}]_{(IP)}\text{-itaga-tteiru-@ }_{(VP)}]_{(IP)}]$

## 5. Negative Superlatives in Extensional Contexts

As is extensively discussed in Sharvit and Stateva (2002), the movement theory makes wrong predictions for the interpretation of negative superlatives, namely *least*-superlatives, in extensional environments. Before discussing the problematic case, let us first look at how the interpretation of the negative superlative works in (26). The semantics of *least* in (27) is taken from Stateva (2000), who modeled it after Heim's (1999) semantics of *-est*.

(26) Mary climbed the least high mountain.

(27)  $[[\textit{least}]] = [\lambda C . [\lambda R . [\lambda x: x \in C \ \& \ \forall z [z \in C \ \rightarrow \ \exists d [R(d)(z)=1]]] . \exists d [R(d)(x)=0 \ \& \ \forall y [y \neq x \ \& \ y \in C \ \rightarrow \ R(d)(y)=1]]]]]$

In the same way as *-est*, a sentence with *least* gives rise to the A- and the C-reading. On the one hand, *least* stays in-situ in the LF (28a), and this LF yields the truth conditions for the A-reading in (28b). Suppose that Mt. Sinai is 5800m high, and the other mountains, Mt. Everest and Mt. Kilimanjaro, are higher than that. In this case, 6000m, for example, is the degree to which Mt. Sinai is not high, but all the other mountains are (due to monotonicity).

- (28) a. LF: Mary climbed [ the [ C-least ] [ high mountain ] ]  
 b. Whenever defined,  $[[\textit{(28a)}]] = 1$  iff Mary climbed the unique  $x$  such that  $\exists d [x \text{ is not a } d\text{-high mountain} \ \& \ \forall y [y \neq x \ \& \ y \in C \ \rightarrow \ y \text{ is a } d\text{-high mountain}]]$   
 $C = \{\text{Mt. Everest, Mt. Kilimanjaro, Mt. Sinai}\}$  (the A-reading)

On the other, *least* undergoes movement out of the DP in the LF (29a), and this LF yields the truth conditions for the C-reading in (29b). In this case, the comparison is among the contextually relevant climbers.

- (29) a. LF: Mary [*C-least*]  $\lambda d$  [ climbed [ ~~the~~ [ *d*-high mountain ] ] ]  
 b. Whenever defined,  $\llbracket (29a) \rrbracket = 1$  iff  $\exists d$  [ Mary didn't climb a *d*-high mountain  
 &  $\forall y$  [  $y \neq \text{Mary} \ \& \ y \in C \rightarrow y$  climbed a *d*-high mountain ] ]  
 $C = \{ \text{John, Mary, Bill} \}$  (the C-reading)

Now let us look at the case where the movement theory makes wrong predictions. Consider the following scenario called “the sandwich scenario” by Sharvit and Stateva.

- (30) Scenario 4: Mary climbed one mountain - a 3000m mountain.  
 Bill climbed two mountains - a 2500m and a 3500m mountains.  
 John climbed one mountain - a 4000m mountain.

In this scenario, the sentence (26) is predicted to be true under the movement theory, which goes counter to our intuition. Specifically, under the movement LF (29a), we can find a degree between 3001m and 3500m such that Mary did not climb a mountain that is high to that degree but other relevant climbers did. To solve this problem, Stateva (2000) argues that *least* is decomposed into the superlative morpheme *-est* and negation (originally, Rullmann 1995). The sentence (26) under the sandwich scenario (30) comes out false if *-est* undergoes movement, leaving negation within the DP in (31a). According to the truth conditions in (31b), Mary climbed a non-3001m mountain, i.e., 3000m, but other relevant climbers did not climb a non-3001m mountain, i.e., they have to have climbed higher than that. Since Bill climbed a non-3001m mountain, namely a 2500m mountain, this 2500m mountain violates the truth conditions as expected.

- (31) a. LF: Mary [*C-est*]  $\lambda d$  [ climbed [ ~~the~~ [ not-*d*-high mountain ] ] ]  
 b. Whenever defined,  $\llbracket (31a) \rrbracket = 1$  iff  $\exists d$  [ Mary climbed a not-*d*-high mountain  
 &  $\forall y$  [  $y \neq \text{Mary} \ \& \ y \in C \rightarrow y$  didn't climb a not-*d*-high mountain ] ]

However, the decompositional view of negative superlatives has its own drawback. As reasonably pointed out by Sharvit and Stateva, once *least* is allowed to be decomposed into *-est* and negation, nothing prevents negation from moving together with *-est*. The movement of *-est*+negation amounts to the movement of *least*; the movement of *least* yields the LF (29a) for the C-reading, which is problematic under the sandwich scenario in (30): the same problem.

Now, I am showing that the problem we saw above does not arise under the movement theory in Japanese. Japanese is known to lack negative quantifiers, such as *no one* and *nobody*; the same is the case for the negative comparatives and superlatives like *less* and *least*. When we want to express the negative superlatives such as (26), we would do it by combining *ichiban* and negation of the *high*-class degree adjective in (32a), or by combining *ichiban* and the corresponding *low*-class degree adjectives in (32b).

*Japanese Superlative Constructions*

- (32) a. Mary-ga ichiban takaku-nai yama-ni nobot-ta.  
 Mary-NOM most high-NEG mountain-to climb-PAST  
 b. Mary-ga ichiban hikui yama-ni nobot-ta.  
 Mary-NOM most low mountain-to climb-PAST

Our concern here is the interpretation of the sentence (33), which is derived from (32a) by the overt movement of *ichiban*. Crucially, this sentence only allows the C-reading, where relevant climbers' attempts of climbing a not-high mountain are compared, and Mary climbed lower than anyone else. Moreover, the sentence is correctly judged false under the sandwich scenario in (30).

- (33) Ichiban<sub>i</sub> Mary-ga t<sub>i</sub> takaku-nai yama-ni nobot-ta.  
 most Mary-NOM high-NEG mountain-to climb-PAST

The C-reading of (33) is derived straightforwardly. While the highest copy of *C-ichiban* is chosen in PF to yield the correct word order, the highest interpretable copy below the subject *Mary* is chosen in LF in (34) to yield exactly the same truth conditions as English (31b). Since the truth conditions requires Bill and John not to climb a mountain that is not high to the degree to which Mary climbed, Bill and John has to climb higher than Mary did. Bill's 2500m mountain violates this.

- (34) LF: ~~*C-ichiban*~~ [Mary-ga **C-ichiban** λ<sub>d</sub> [<sub>VP</sub> [<sub>DP</sub> *d-takaku-nai* yama-ni ] nobot-ta]]

Recall that the decompositional analysis of negative superlatives in English did not block the movement of *-est* and negation together, which was equivalent to the movement of *least*. Significantly, in the case of Japanese (33), negation *nai* never moves out of the DP together with *ichiban* because negation in this language is a bound morpheme and can only attach to predicative elements such as adjectives and verbs. Since *ichiban* is not predicative, the following sentence with overt superlative movement is impossible.

- (35) \*Ichiban-**nai**<sub>i</sub> Mary-ga t<sub>i</sub> takai yama-ni nobot-ta.  
 most-NEG (=least) Mary-NOM high mountain-to climb-PAST

Thus, the interpretation of negative superlative under intensional contexts does not pose a problem for the movement theory in Japanese. Rather, the lack of negative quantifiers and the morphological property of negation provide a principled account for the availability of the superlative movement in this language.

## 6. Conclusion

I have argued that the C-reading of Japanese superlative constructions, where superlative morphemes undergo overt movement, receives a natural explanation under the movement theory; hence, Heim's (1999) movement theory has its own right in the theory of superlatives. The conclusion reached in this article, however, does not necessarily show that the movement theory is on the right track when dealing with English superlatives

since the movement theory still poses a serious problem for the interpretation of negative superlatives pointed by Stateva (2000) and Sharvit and Stateva (2002). What is striking in Japanese is that the morphological property of negation, i.e., that it is a bound morpheme, interplays with a decompositional approach to *least* to provide a principled explanation for the availability of superlative movement. Furthermore, Japanese superlatives provide us with a good testing ground to investigate into the syntactic constraint on superlative movement, which is pointed out in Heim (1999) but not investigated due to the lack of overt *-est* movement in English. Most importantly, the current proposal makes cross-linguistic predictions about the interpretation of superlatives. If one language has an analytic form of superlatives (i.e., a superlative morpheme + a degree adjective) and allows overt movement of the superlative morpheme, a similar kind of disambiguation of superlative sentences, i.e., the lack of the A-reading, is expected. I leave these issues for the future research.

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