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# Indirect Comparison as a Last Resort by Interpretive Economy\*

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## 1 Introduction

This study is concerned with the following contrast. (1) is a phrasal *yorimo*-comparative in Japanese. The subject involves a relative clause, and the standard of the comparison is the noun *John*. The sentence ends up denoting a strange comparison of the taste of the cake that Mary made and the taste of John himself. On the other hand, in (2), which has practically the same structure as (1), a sensible comparison of Mary's test score and that of John is available.

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\* I thank the anonymous reviewers and the audience of Japanese and Korean Linguistics 28. This work was inspired by An (2019), which deals with similar data in Korean. Both papers were scheduled to be presented at a workshop on comparative constructions at Konkuk University, Seoul, in March 2020. Even though the workshop was canceled due to the COVID-19 pandemic, I am grateful to those who planned the conference. All errors present in this manuscript are my own. This work was supported by the Japan Society for the Promotion on Science KAKENHI Grant Number 20K00582.

- (1) #[[<sub>RC</sub> Mary-ga tsukutta] keeki]-wa [John]-yorimo oishii.<sup>1</sup>  
 Mary-NOM made cake-TOP John-YORIMO delicious  
 Available meaning: #‘The cake that Mary made is more delicious  
 than John (himself).’  
Unavailable meaning: ‘The cake that Mary made is more delicious  
 than the one John made.’  
 (Matsui and Kubota 2012: 5, slightly modified)
- (2) [[<sub>RC</sub> Mary-ga totta] tennsuu]-wa [John]-yorimo takakatta.  
 Mary-NOM obtained test.score-TOP John-YORIMO high.past  
 Available meaning: ‘The test score that Mary obtained was higher  
 than the test score that John obtained.’  
Unavailable reading: \*‘The test score that Mary obtained was higher  
 than John (himself).’

Nothing is mysterious about the oddness of (1). The English equivalent, #*The cake that Mary made is more delicious than John*, is equally odd. Thus, the question is rather why (2) turns out to be a sensible comparison. An equivalent in English, \**The test score that Mary obtained was higher than John*, never denotes what (2) means.

A key to solving the mysterious reading of (2) is obtained from cross-linguistic data in Hohaus (2015). A Samoan example given in (3) is in the form of phrasal comparison. The subject involves a relative clause, and the standard of comparison is the noun *Temukisa*. The sentence intuitively compares the length of the book that Malia read and the length of another book that *Temukisa* read. This reading is not obtained by an English equivalent \**The book that Malia read is longer than Temukisa*. For that reason, Hohaus provides the translation of the sentence with *compared to* in English.

- (3) E umi atu le [tusi [<sub>RC</sub> na faitau e Malia]]  
 TAM long DIR DET book TAM(PAST) read ERG Malia  
 i lo Temukisa.<sup>2</sup>  
 PREP COMP Temukisa  
 ‘Compared to Temukisa, the book which Malia read is longer.’  
 (Hohaus 2015: 136)

<sup>1</sup> The following abbreviations are adopted for Japanese data. NOM: nominative case marker, TOP: topic marker, YORIMO: *yorimo*, a standard marker, which is often treated as an equivalent to *than*, GEN: genitive marker.

<sup>2</sup> The following abbreviations are cited from Hohaus (2015: xi) for Samoan data. TAM: tense-aspect marker, DIR: directional particle, DET: specific singular determiner, ERG: ergative preposition, PREP: default preposition, COMP: comparison marker.

The purpose of this paper is to argue that phrasal *yorimo*-comparatives are ambiguous: some of them correspond to standard phrasal comparatives such as *more than*-comparatives in English, whereas others correspond to *compared to*-comparatives in English or *i lo*-comparatives in Samoan. In other words, (1) corresponds to the former, and (2) the latter despite their surface similarities. I will further argue that an economy principle governs the distribution of the two types of comparisons among phrasal *yorimo*-comparatives.

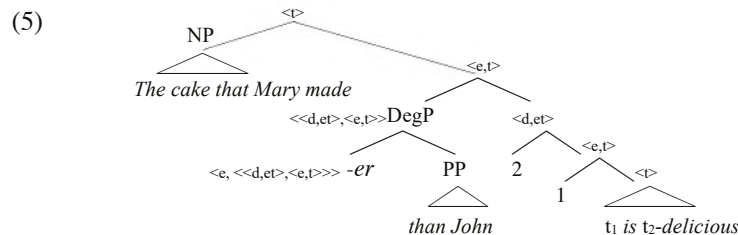
The organization of this paper is as follows. Section 2 reviews the standard analysis of phrasal comparatives, which we call “direct comparison.” The odd interpretation of (1) is correctly captured by direct comparison. Section 3 reviews Hohaus’s (2015) framework of *indirect compositional strategy*, which we call “indirect comparison” in this paper. It will be shown that the Samoan data is captured as an instance of indirect comparison, and it will further extend to cover (2) in Japanese. Section 4 discusses instances in which indirect comparison arises in *yorimo*-comparatives. I propose that Kennedy’s (2007) *Interpretive Economy* plays a crucial role, under which indirect comparison arises as a last resort only when direct comparison fails to produce well-formed assertions. Section 5 discusses additional data with left-branch islands as evidence for indirect comparison as a last resort by *Interpretive Economy*. Section 6 presents concluding remarks.

## 2 Direct comparison and island structures

Let us first review a standard analysis of phrasal *more than*-comparatives. For the purpose of our paper, we call such mechanisms “direct comparison.” Consider (4), the English equivalent of (1).

(4) #The cake that Mary made is more delicious than John.

The odd reading is obtained from the LF structure in (5), in which the whole subject NP undergoes movement. As a result, the sentence ends up as a comparison between the taste of the cake that Mary made and the taste of John himself.



I adopt Heim's (1985) comparative operator for the purpose of our discussion. I also assume that gradable adjectives are type  $\langle d, \langle e, t \rangle \rangle$  (Cresswell 1976; von Stechow 1984, among others). The truth conditions of the sentence are a comparison of two maximum degrees.

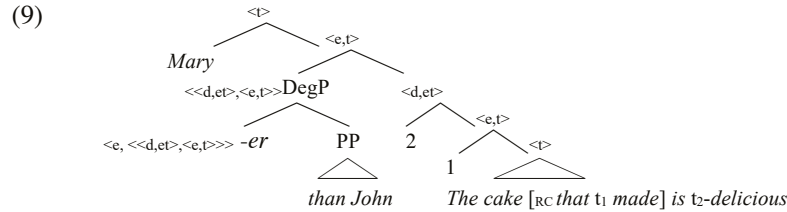
$$(6) \llbracket -er \rrbracket = \lambda y_{\langle e \rangle} \lambda p_{\langle d, \langle e, t \rangle \rangle} \lambda x_{\langle e \rangle} \cdot \text{MAX}(\lambda d. p(d)(x)) > \text{MAX}(\lambda d. p(d)(y))$$

$$(7) \llbracket delicious \rrbracket = \lambda d_{\langle d \rangle} \lambda x_{\langle e \rangle} \cdot x \text{ is } d\text{-delicious}$$

$$(8) \text{MAX}(\lambda d. \text{the cake that Mary made is } d\text{-delicious}) >$$

$$\text{MAX}(\lambda d. \text{John is } d\text{-delicious})$$

A sensible comparison of two cakes is syntactically ruled out by the island constraints (Ross 1967). Such a reading would require the LF structure given in (9), in which *Mary* undergoes movement out of the relative clause.



Returning to the Japanese data, the oddness of (1) is captured if the same direct comparison applies. Then, the question remains why (2) can produce a comparison of the two test scores of Mary and John. Under a direct comparison, such a comparison would have an LF structure that is parallel to (9); thus, it would be predicted to be ruled out, contrary to the fact. The next section turns to the framework of indirect comparison proposed by Hohaus (2015).

### 3 Indirect comparison by Hohaus (2015)

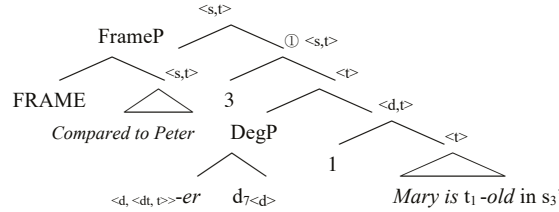
*More than*-comparatives are not the only option for making comparisons. Comparisons can also be made using *compared to*. (10) intuitively makes a comparison of Mary's age and that of Peter.

$$(10) \text{ Compared to Peter, Mary is older.} \quad (\text{Hohaus 2015: 61})$$

This section reviews Hohaus's framework that captures the semantics of (10) as well as the Samoan data that we saw in (3). I call the framework "indirect comparison" for the purpose of our discussion. I will further argue that the framework explains the mysterious reading of (2) in Japanese.

Hohaus (2015) provides the LF structure (11) for (10), where *compared to Peter* adjoins to the main clause. Importantly, *-er* takes a free degree variable, say  $d_7$ , whose value is determined by the given context. This is a crucial difference from direct comparison, in which a standard degree is provided via compositional calculation.

(11)



(slightly modified from Hohaus 2015: 63)

What is the role of *Compared to Peter*? Hohaus argues that it brings a presupposition that a relevant degree comparison must involve *Peter*. The semantics of FrameP is given in (12). *Compared to Peter* means a degree comparison with Peter. The FRAME operator adds a presupposition that  $p$  takes place in a minimal situation. Thus, FrameP simply adds a presupposition that a degree comparison with *Peter* takes place in a minimal situation such that no other comparison takes place.

- (12) a.  $\llbracket \textit{compared to Peter} \rrbracket = \lambda s_{\langle s, t \rangle} . \exists x_{\langle e \rangle} . \exists \mu_{\langle s, \langle e, d \rangle \rangle} [\mu(s)(x) \geq \mu(s)(\textit{Peter})]$   
 b.  $\llbracket \textit{FRAME} \rrbracket = \lambda p_{\langle s, t \rangle} . \lambda q_{\langle s, t \rangle} . \lambda s : \text{MIN}(p)(s) . q(s)$   
 c.  $\llbracket \textit{MIN} \rrbracket = \lambda p_{\langle s, t \rangle} . \lambda s . p(s) \ \& \ \neg \exists s' [s' \prec s \ \& \ p(s')]$   
 d.  $\llbracket \textit{FrameP} \rrbracket = \lambda q_{\langle s, t \rangle} . \lambda s : s \in \text{MIN}(\lambda s^* . \exists x_{\langle e \rangle} . \exists \mu_{\langle s, \langle e, d \rangle \rangle} [\mu(s^*)(x) \geq \mu(s^*)(\textit{Peter})]) .$  (Hohaus 2015: 68)

The semantics of the main clause *Mary is older* is calculated in the normal manner. The truth conditions given in (14) are informally paraphrased as follows. They are defined if a relevant degree comparison involves Peter in a minimal situation. When defined, the sentence is true if and only if Mary's age exceeds a contextually given degree. The value of the contextually given degree, namely  $g(7)$  is naturally restricted to the age of Peter due to the presupposition. Thus, *Compared to Peter* indirectly contributes the value of the standard degree. This is why Hohaus calls the framework an *indirect strategy*.



The truth conditions are given in (21). Note that the tense is ignored. The value of the standard degree  $g(7)$  is contextually restricted to the test score of John due to the presupposition. This is how the sentence intuitively compares two test scores.

- (21)  $\lambda s:s \in \text{MIN}(\lambda s^*:\exists x\langle e \rangle.\exists \mu\langle s, \langle e, d \rangle \rangle[\mu(s^*)(x) \leq \mu(s^*)(\text{John})]). \text{MAX}(\lambda d.\text{the test score that Mary obtained is } d\text{-point in } s) > g(7, \langle d \rangle)$
- (22)  $\llbracket d_7 \rrbracket \stackrel{e}{=} g(7) \approx \text{the test score that John obtained in } s$

We have seen that the phrasal *yorimo*-comparatives in (1) and (2) have different semantics, namely direct comparison and indirect comparison, respectively. The next question is how the distribution of the two types of comparison is determined.

#### 4 Economy principle that governs indirect comparison

This section discusses a rule that governs the availability of indirect comparison. The first subsection proposes that Kennedy's (2007) *Interpretive Economy* plays a crucial role. I will show how *Interpretive Economy* allows indirect comparison to arise for (2). The second subsection discusses the case of (1), in which indirect comparison is blocked by *Interpretive Economy*.

##### 4.1 When indirect comparison arises

We have seen that the somewhat mysterious meaning of (2) is captured by indirect comparison, a framework that does not involve the movement of antecedents. The question arises why similar indirect comparison is not available for (1) as well. What prevents (1) from being an instance of indirect comparison? I assume that a notion of economy is relevant. My proposal is given in (23), based on *Interpretive Economy* as cited in (24).

- (23) Proposal
- a. Phrasal *yorimo*-comparatives are, in principle, ambiguous between direct comparison and indirect comparison.
  - b. *Interpretive Economy* allows phrasal *yorimo*-comparatives to adopt indirect comparison only as a last resort when direct comparison fails to provide a well-formed assertion.
- (24) Interpretive Economy
- Maximize the contribution of conventional meanings of the elements of a sentence to the computation of its truth conditions.

(Kennedy 2007: 36)

Let us consider the proposal in detail. The ambiguity of *yorimo*-comparatives stems from the ambiguous role of *yorimo*. When *yorimo* is a preposition and serves as a standard marker, *yorimo*-phrases are an argument of a comparative morpheme just like *than*-phrases in English. When *yorimo* serves as a frame setter, *yorimo*-phrases become part of the FrameP of indirect comparison like *compared to*-phrases in English.

Put differently, the two roles are realized as *yorimo* in Japanese, whereas they are realized either as *than* or *compared to* in English. Such a phenomenon is not unprecedented. For instance, Beck (2000) proposes that *different* in English carries both the semantics of *anders* ‘different’ and that of *verschieden* ‘different’ in German.

The second part of the proposal defines situations in which indirect comparison arises. I propose that indirect comparison is a marked case, and arises only as a last resort. Kennedy’s *Interpretive Economy* provides a theoretical justification for this assumption. Under *Interpretive Economy*, the contribution of conventional meaning must be maximized. This means that direct comparison must operate first. Only when it produces insufficient results is indirect comparison activated.

The underlying ambiguous status of *yorimo*-comparatives is very similar to the case of absolute gradable adjectives discussed in Kennedy (2007). The truth value of a sentence with a relative gradable adjective in its positive form depends on the utterance context. In (25), for instance, whether or not *Mary is tall* is true depends on the utterance context. The truth conditions of the sentence are informally paraphrased as ‘Mary is taller than a contextually salient standard’ (von Stechow 1984). However, such context-relative interpretations are absent for absolute gradable adjectives. In (26), *bent* comes with a lower closed scale (Kennedy and McNally 2005), and *this wire* is considered *bent* with any non-zero degree of being *bent*.

- (25) Mary is tall.            (relative gradable adjective)  
 (26) This wire is bent.    (absolute gradable adjective)

Kennedy raises the question of why context-relative interpretation is not available for *bent*. Kennedy proposes *Interpretive Economy*, which prefers less context-dependent truth conditions. Kennedy argues that *bent* is, in principle, ambiguous between relative and absolute gradable adjectives. However, the relative meaning of *bent* is suppressed due to *Interpretive Economy*.

Similarly, indirect comparison is not an economical option due to the involvement of rich presupposition, which is a type of contextual information. With this in mind, let us return to the case of (2). Under direct comparison, (2) has at least two manners of interpretation. However, both are ruled out either syntactically or semantically. Thus, uneconomical indirect



comparison is allowed as a last resort. One interpretation is a comparison of two test scores. However, the relevant LF structure in (27) is syntactically ruled out due to the movement of *Mary-ga* out of the relative clause.

- (27) [*Mary-ga* [[<sub>DegP</sub>  $\emptyset$ -er [*John yorimo*]] [2[1[[<sub>NP</sub> [<sub>RC</sub>  $t_1$  *totta*]*tensuu*]-wa  $t_2$ -*takakatta*]]]]] (syntactically ruled out)

Another manner of interpretation is a comparison of Mary's test score and John himself. The LF structure in (28) is syntactically well-formed. However, the comparison of Mary's test score and John himself given in (29) is semantically ill-formed. Note that the tense is ignored.

- (28) [[<sub>NP</sub>[<sub>RC</sub> *Mary-ga totta*]*tensuu*] [[<sub>DegP</sub>  $\emptyset$ -er[*John yorimo*]] [2[1[ $t_1$   $t_2$ -*takakatta*]]]]]

- (29) MAX( $\lambda d$ . the test score that Mary obtained is d-high)>  
MAX( $\lambda d$ . John is d-high) (semantically ruled out)

The problem is that the two compared degrees belong to different scales. Thus, the presupposition of comparative morphemes is not satisfied. When *takai* 'tall' applies to a test score, it is associated with a scale of the test score, from zero to a hundred, for instance. When it applies to an individual person such as *John*, it is most likely associated with a scale of height.

- (30) Presupposition of comparative morphemes  
The comparative morphemes 'more', 'less', and 'as' presuppose that their degree arguments are elements of the same ordered set.  
(Kennedy 2001: 58)

The two interpretations by direct comparison are both ruled out. Thus, *Interpretive Economy* allows indirect comparison to arise.

#### 4.2 When indirect comparison is blocked

The question remains why indirect comparison is not available for (1). I assume that *Interpretive Economy* is relevant. Direct comparison produces pragmatically odd but well-formed semantics for (1). Thus, *Interpretive Economy* does not allow indirect comparison to arise. The odd interpretation of (1) in Japanese is treated as on par with the English example in (4). Thus, its truth conditions are those given in (31).

- (31) MAX( $\lambda d$ . the cake that Mary made is d-delicious)>  
MAX( $\lambda d$ . John is d-delicious)

This comparison is pragmatically odd simply because no one eats each other in our modern society. However, it is still semantically well-formed. In other words, the oddness of (1) comes from our knowledge of the world, which is independent of formal semantics. This implies that *Interpretive Economy* does not see informal pragmatic information, and it only sees the formal truth conditions.

Before I conclude this section, I would like to discuss data provided by Frank Sode (p.c.). Our analysis predicts that a phrasal *yorimo*-comparative is either a direct or indirect comparison, but cannot be both at the same time. This prediction is borne out. Intuitively, (32) has at least two readings given in (33); thus, it appears to be ambiguous.

- (32) [Mary-ga tsukutta keeki]-wa [John-no tomodati]-yorimo ooi.  
 Mary-NOM made cake-TOP John-GEN friend-YORIMO many.  
 Lit. ‘The cakes that Mary made is more than John’s friend(s).’
- (33) a. The number of cakes that Mary made is greater than the number of John’s friends. (direct comparison)  
 b. The number of cakes that Mary made is greater than the number of cakes that a particular friend of John made. (indirect comparison)

However, a careful observation reveals that the sentence is not truly ambiguous. When the sentence is understood as (33a), *John no tomodati* must be understood as the plural ‘John’s friends’. Thus, there should be an invisible plural morpheme. On the other hand, if the sentence is understood as (33b), *John no tomodati* must be understood as the singular ‘a friend of John’. Therefore, there are two different underlying sentences for (32). (33a) is an instance of direct comparison, whereas (33b) is an instance of indirect comparison. Thus, there is no sentence that is both a direct and indirect comparison at the same time, as predicted by our analysis.

## 5 More on indirect comparison

If our line of analysis is on the right track, it should capture data with other types of islands. This section will examine data with left-branch islands. It will be shown that *Interpretive Economy* correctly captures the availability of indirect comparison. Furthermore, *Interpretive Economy* will explain why one reading is preferred over another among two possible readings by indirect comparison.

### 5.1 Data with left-branch islands

In (34), the complement of *yorimo* is *John*. Nevertheless, the sentence intuitively compares Mary's salary and that of John. This makes a sharp contrast against an equivalent in English #*Mary's salary is higher than John*.

- (34) [NP<sub>[PossP] Mary-no] kyuuryoo]-wa [NP John]-yorimo takai.  
 Mary-GEN salary-GEN John-YORIMO high  
 Lit. 'Mary's salary is higher than John.'  
 Available (sensible) reading: 'Mary's salary is higher than John's salary.'</sub>

Note that *no* 'GEN' can follow *John*, as shown in (35), which is an equivalent of *Mary's salary is higher than John's* in English. In this case, it is reasonable to assume a deletion of NP *kyuuryoo* 'salary'. Thus, it is an instance of direct comparison.

- (35) [Mary-no kyuuryoo]-wa [ John-no ~~kyuuryoo~~]-yorimo takai.  
 Mary-GEN salary-GEN John-GEN ~~salary~~-YORIMO high  
 'Mary's salary is higher than John's salary.'

The point is that, even without *no* 'GEN', (34) still carries the interpretation of a comparison of two salaries. (34) is analyzed as an instance of indirect comparison. The LF structure of (34) is given in (36), where *Mary* stays in situ. Thus, no island violation occurs. In the truth conditions, a comparison is made with  $g(7)$ , the value of which is restricted to the amount of John's salary because of the presupposition.

- (36) [[<sub>FrameP</sub> FRAME *John-yorimo*] [[<sub>DegP</sub>  $\emptyset$ -er  $d_7$ ][[1<sub>TP</sub> [NP [PossP *Mary-no*] *kyuuryoo*]-wa  $t_1$ -*takai*]]]]  
 (37)  $\lambda s:s \in \text{MIN}(\lambda s^*.\exists x_{\langle e \rangle}.\exists \mu_{\langle s, \langle e, d \rangle} [\mu(s^*)(x) \leq \mu(s^*)(\text{John})])$ .  
 $\text{MAX}(\lambda d. \text{Mary's salary is } d\text{-much in } s) > g(7)$   
 (38)  $[[d_7]] \stackrel{g}{=} g(7) \approx$  the amount of John's salary in  $s$

In conclusion, the framework of indirect comparison captures data with left-branch islands.

### 5.2 Cases in which less comparison is preferable

This subsection discusses cases in which one meaning out of two interpretations under indirect comparison is chosen by *Interpretive Economy*. Consider (39) – although it is similar to (34), it has a bigger subject. Interestingly, (39) is only a comparison of Mary's brother's salary vs. John's salary,

and never makes a comparison of Mary's brother's salary vs. John's brother's salary. Such unambiguous reading is puzzling given the analysis of indirect comparison, in which a standard degree is flexibly given by context. Why does (39) not denote a comparison with John's brother's salary?

- (39) [<sub>NP</sub> Mary-no ototoo-no kyuuryoo]-wa [<sub>NP</sub> John]-yorimo takai.  
 Mary-GEN brother- GEN salary-TOP John-YORIMO high  
 Lit. 'Mary's brother's salary is higher than John.'
- (40) a. Available reading  
 'Mary's brother's salary is higher than John's salary.'  
 b. Unavailable reading  
 'Mary's brother's salary is higher than John's brother's salary.'

I argue that *Interpretive Economy* plays a role again in choosing one of the two readings. Given in (41) are the truth conditions of the available reading. This reading is made possible by the  $\mu$ -function in the presupposition that derives the salary of an individual. As for the unavailable semantics given in (42), we need another function, namely  $\beta$ , in order to derive the amount of John's brother's salary. This means that the truth conditions in (41) have less presupposition than those in (42). Therefore, the interpretation of (39) is captured by (43), which is safely inferred from *Interpretive Economy*.

- (41) Indirect comparison of the available reading  
 a.  $\lambda s: s \in \text{MIN}(\lambda s^*. \exists x_{\langle e \rangle}, \exists \mu_{\langle s, \langle e, d \rangle} [\mu(s^*)(x) \geq \mu(s^*)(\text{John})])$ .  
 $\text{MAX}(\lambda d. \text{Mary's brother's salary is } d\text{-much in } s) > g(7)$   
 b.  $\mu = \lambda x_{\langle e \rangle}. \lambda s. \text{ the salary of } x \text{ in } s$   
 c.  $\llbracket d_7 \rrbracket \stackrel{g}{=} g(7) \approx \text{the amount of John's salary in } s$
- (42) Indirect comparison of the unavailable reading  
 a.  $\lambda s: s \in \text{MIN}(\lambda s^*. \exists x_{\langle e \rangle}, \exists \beta_{\langle e, e \rangle}, \exists \mu_{\langle s, \langle e, d \rangle} [\mu(s^*)(x) \geq \mu(s^*)(\beta(\text{John}))])$ .  
 $\text{MAX}(\lambda d. \text{Mary's brother's salary is } d\text{-much in } s) > g(7)$   
 b.  $\mu = \lambda x_{\langle e \rangle}. \lambda s. \text{ the salary of } x \text{ in } s$   
 c.  $\beta = \lambda x_{\langle e \rangle}. \exists y_{\langle e \rangle}. y \text{ is a brother of } x$   
 d.  $\llbracket d_7 \rrbracket \stackrel{g}{=} g(7) \approx \text{the amount of John's brother's salary in } s$
- (43) When truth conditions need to include presupposition, ones with less contextual information are preferable.

This line of analysis implies that the amount of contextual information is comparable. This would require further theoretical and empirical support.

## 6 Conclusion

This study proposed a novel analysis that phrasal *yorimo*-comparatives in Japanese are ambiguous between direct comparison and indirect compari-

son. In other words, some are equivalent to *more than*-comparisons while others are more like *compared to*-comparisons in English. The evidence is obtained from some phrasal *yorimo*-comparatives that do not exhibit the expected island effect.

The contribution of this study is to provide additional empirical support for *Interpretive Economy*, which to my knowledge has very little supportive data so far. This paper also demonstrated that *Interpretive Economy* is relevant in comparing the amount of contextual information.

Many issues have been left undiscussed due to space limitations. In further research, the findings of this study should be compared with those of Hohaus (2015), which did not resolve whether Japanese is a language that adopts direct comparison or indirect comparison. Based on the findings of this study, my answer would be “both.” Further, this study implies that at least some Japanese *yorimo*-comparatives are made possible in a context-dependent manner. Such context-dependent semantics has been suggested for clausal *yorimo*-comparatives by Beck et al. (2004), but argued against by Shimoyama (2012) and Sudo (2015), among others. Another issue is cross-linguistic research. The Japanese data discussed in this paper behave basically in the same manner as the Mandarin data discussed in Oda (2020). Thus the analysis is supported cross-linguistically. Korean *pota*-comparatives also show similar behaviors to phrasal *yorimo*-comparatives. An (2020) provides syntactic analysis for the Korean data. His syntax analysis and the semantics analysis discussed in this paper should be compared in future work.

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