Ambiguity Resolution in English Tough-Constructions by L1 Japanese Speakers: A Preliminary Study

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Abstract

This paper reports on an empirical study that investigated the interpretation of English tough-constructions by native Japanese speakers. English tough-constructions obligatorily give rise to object interpretation, whereas their Japanese equivalents allow either subject or object interpretation. In order to examine whether native Japanese speakers successfully unlearn subject interpretation and acquire object interpretation of English tough-constructions, native Japanese university students were compared to native English adults in interpreting English tough-constructions in a truth-value judgement task adapted from Kim (2014). The results show that nearly 80% of the Japanese students mistakenly interpreted English tough-constructions as having subject interpretations. These results suggest that, without negative evidence, unlearning the object interpretation is difficult for native Japanese speakers studying English as a foreign language in Japan.

1. Introduction

It has been pointed out that in English tough-constructions (henceforth TCs), the matrix subject is obligatorily interpreted as the missing object of the embedded infinitival clause. By contrast, in Japanese translation equivalents of English TCs, the matrix subject is interpreted as either the object or the subject of the embedded clause. This paper reports on an empirical study that investigated whether first language (L1) Japanese speakers of second language (L2) English can acquire the correct interpretation of English TCs like native English speakers.

This paper is structured as follows: Section 2 explains the interpretation of English TCs and Japanese equivalents of them; Section 3 introduces a previous study on L2 acquisition of English TCs; Section 4 presents a research question; Section 5 explains the experiment; and Section 6 presents the results and their implications. The paper ends with a conclusion.

2. Linguistic property

2.1 English TCs

English TCs are structures in which a tough adjective (e.g., tough, easy, hard, difficult, comfortable) is followed by an embedded infinitival clause that lacks an object, as shown in (1a). The missing object is interpreted as coreferential with the matrix subject. For example, in (1a), the matrix subject Mary is the one being pleased, not the one trying to please. As a result, the TC in (1a) has the same meaning as the expletive-headed tough sentence in (1b). Thus, in the TCs, the matrix subject is interpreted as the missing object of the embedded infinitival clause. Following Kim (2014), I will call this interpretation ‘object interpretation.’ English TCs do not allow the ‘subject interpretation’ in which the matrix subject is the subject of the embedded infinitival clause.
(1) a. Mary is tough to please.
   (matrix subject = object of the infinitival clause: object interpretation)
   (*matrix subject = subject of the infinitival clause: subject interpretation)
   
   b. It is tough [PRO to please Mary].

Note that TCs are distinct from control sentences, which also consist of adjectives followed by infinitival clauses as in (2).

(2) Mary is eager to please.

The control sentence in (2) and the TC sentence in (1a) have similar surface structures, but differ, nevertheless, in terms of interpretation. The control adjectives (e.g., *eager, afraid*) select an external argument, and accordingly, the matrix subject is interpreted as being the subject of the infinitival clause (i.e., subject interpretation). For example, in (2), the matrix subject *Mary* is the one trying to please, not the one being pleased. As such, TCs obligatorily give rise to object interpretation, while control sentences have subject interpretation, despite the surface-level structural similarity.

It should also be noted that object interpretation is not unique to TCs in English. The examples in (3) show similar constructions that contain an object gap and have subject interpretations (Anderson 2005, Kim 2015).

(3) a. The boys are [DegP too young [to teach e]].
   b. Butterflies are [AP pretty [to look at e]].

In (3a) and (3b), the matrix subject is linked to the object gap in the embedded infinitival clause, just like TCs. However, Kim (2015: 88) suggests that (3a) and (3b) differ from TCs in that the matrix subjects in (3a) and (3b) also serve as the thematic subjects of the matrix predicates whereas the matrix subjects in TCs do not. For example, in the TC in (1a), *Mary is tough to please*, the matrix predicate *tough* does not assign a thematic role to the matrix subject *Mary*. *Mary is just one component of the proposition, please Mary.*

Regarding why TCs obligatorily have object interpretation, several syntactic accounts for this interpretation have been proposed. For example, Rosenbaum (1967) suggests that the missing object A-moves to the matrix subject position. However, this A-movement analysis can be problematic, because he leaves the motivation for this A-movement unexplained. A-movement is motivated by Case assignment, but the missing object in the TCs can receive the accusative case from the transitive verb in its original position (Kim 2014). Later, Chomsky (1977) proposed that TCs involve a phonologically null operator movement, a type of A’-movement, analogous to wh-movement. This analysis postulates that the TC subject is base-generated in situ, and that the null operator (Op) moves from the embedded infinitival object position to the SpecCP, as in (4).

(4) Mary is tough $[\text{LCP Op} \ [\text{TP PRO_{ab} to please e}]]$

This account is likewise not unproblematic, because it objects theta theory, which postulates a single theta-role assigned by a verb. In TCs, two arguments, the TC subject and the null operator, share the same theta-role.
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given by the embedded verb (Hicks, 2009). Thus, no syntactic accounts for TCs have been very successful so far. As a result, Holmberg (2000) suggests that tough-movement is an unexplained phenomenon, and it remains basically unexplainable in principles-and-parameters models.

More recently, Hicks (2009) proposes a combined A- and A'-movement analysis for TCs in the framework of Minimalist Program. First, the operator moves from the object position to the SpecCP in the embedded infinitival clause (A'-movement), smuggling in the DP that subsequently becomes the TC subject. Next, the smuggled DP A-moves from the SpecCP in the embedded infinitival clause to the matrix subject position.

Thus, different syntactic operations have been proposed to account for the interpretation of TCs. However, whatever operation TCs involve, it is the linking between the matrix subject and the missing object in the embedded infinitival clause that L2ers need to acquire, in other words, TCs obligatorily have the object interpretation (Kim 2014).

2.2 Japanese translation equivalents to English TCs

So far, we have observed that English TCs only allow object interpretation. The sentence in (5) presents another example of English TCs, while (6) presents Japanese translation equivalents of (5). Then (6a) and (6b) show that, unlike English, either subject or object interpretation is possible in Japanese, because Japanese allows argument ellipses (Saito 2007).

(5) The child, is easy to find $e_i$.

(6) a. $e_i$ sono kodomo-ga mituke yasui.
that child-Nom find easy

‘It is easy (for somebodyi) to find that childj.’

b. Sono kodomo-ga [ $e_i$ mituke yasui ].
that child-Nom find easy

‘The childi easily finds somethingj.’

(7) John-ga Mary (-no-koto)-ga suki-da.
John-Nom Mary-Gen-fact-Nom fond-Pres

‘John is fond of Mary.’ (Koizumi 2008)

In (6a), the sentential subject is elided and the sentential object sono kodomo-ga (‘that child-Nom’) remains. Note that Japanese allows a nominative object construction like (7), in which the sentential object is marked nominatively (Koizumi 2008), although Japanese is a nominative-accusative language, in which the objects of transitive verbs are typically marked with the accusative. As a result, the object interpretation is obtained in (6a). In contrast, in (6b), the sentential object is elided and the nominative case marked subject sono kodomo-ga (‘that child-Nom’) remains, accordingly, the subject interpretation is obtained. Thus, Japanese translation equivalents of English TCs are ambiguous. The overt argument is interpreted as either the subject or object of the sentence. Consequently, it is not easy for L1 Japanese speakers of L2 English to figure out which interpretation is necessary for English TCs if they transfer the interpretations of Japanese equivalents of English TCs.

It should be noted that the interpretive difference between English and Japanese TCs seen so far is not taught
in English language classrooms. Therefore, in order to acquire the correct interpretation of English TCs, L1 Japanese speakers need to understand: (i) argument ellipses are not allowed in English, and (ii) the missing object in English TCs is linked to the matrix subject.

3. Previous study

Kim (2014) investigated the acquisition of English TCs by L1 Korean speakers. Kim’s research suggests that both subject and object interpretations are possible in Korean equivalents of English TCs, just as in Japanese. For example, the matrix subject Inhyeng-i ‘doll-Nom’ in (8) can be either the object of the embedded clause, as in (8a) (i.e., object interpretation), or the subject of the embedded clause, as in (8b) (i.e. the subject interpretation), although the latter is dominant.

(8) Inhyeng-i po-ki-ka swip-ta.
     doll-Nom see-Nml-Nom esay-Decl
     a ‘The doll is easy to see.’          (object interpretation)
     b. ‘The doll sees something easily.’  (subject interpretation)

According to Kim, no English-like tough movement exists in Korean. In addition, L1 Korean speakers of L2 English usually have neither classroom instruction nor input to explain that the subject interpretation is impossible for English TCs. Therefore, the learnability problem / logical problem of L2 acquisition occurs (White 1989; 2003) when L1 Korean speakers unlearn the subject interpretation of English TCs. In other words, if native Korean speakers of L2 English successfully acquire the obligatory object interpretation of English TCs, an argument for innate knowledge of human languages is motivated.

Kim investigated whether adult L1 Korean speakers (aged 19-26) with three proficiency groups (low, mid, and high) successfully reject the subject interpretation and accept the obligatory object interpretation of English TCs in a truth-value judgement task (TVJT). The TVJT was a 2x2 design, manipulating transitivity of the verb in the embedded infinitive clause (obligatorily transitive vs. intransitively-biased optionally transitive) and the context type (neutral vs. agent-biased). Regarding the verb transitivity, beat, catch find and touch were used as the obligatorily-transitive verbs. The intransitively-biased optionally-transitive verbs were those with a transitivity bias of less than 50% in Gahl, Jurafsky, and Roland (2004) (i.e., fight 23.5%, hunt 45.2%, move 34.0%, and race 36.3%). Regarding the context type, the agent biased context created a strong bias toward the subject interpretation, which does not match the correct interpretation of the TC sentence. (More detailed explanation of this context is given in Section 5.2 since the present study also used the agent biased context adapted from Kim’s experiment.)

It was found that the native English control group (n=10) had 100% object interpretation, irrespective of verb transitivity and context bias. It follows that the controls interpreted test sentences solely depending on their knowledge of TCs without being misled by verb transitivity or context bias. In contrast, the high L2 group correctly had object interpretation only when the verbs were obligatorily-transitive. They did not fully choose the object interpretation when intransitively-biased optionally-transitive verbs were used (40.3% and 37.5% object interpretation in the neutral and agent-biased context, respectively.) This suggests that the high L2 group was more affected by verb transitivity than context bias. Regarding the low and mid L2 groups, they mostly showed
subject interpretation bias. Only when obligatorily-transitive verbs were used in the neutral context did the mid L2 group have object interpretation over 50% of the time (54.2%), and in the other conditions, they had object interpretation less than 30% of the time. A repeated measures ANOVA found that the mid L2 group was affected by both context type and verb type. The low L2 group demonstrated stronger subject interpretation bias, showing less than 30% object interpretation in all conditions. A repeated measures ANOVA found a robust main effect of context type and a less robust effect of verb type. Kim also administered a Korean TVJT in which native Korean speakers interpreted Korean translation equivalents of English TCs and found a strong subject interpretation bias in Korean. From these results, Kim suggest that most L2ers were mislead by context type, verb type, and L1 in interpreting TCs in L2. On the other hand, when individual performance was analyzed, 7 out of the 18 high L2 group members showed significantly-above-chance performance on the task. Consequently, Kim concluded that L1 Korean speakers of L2 English finally come to have the correct knowledge of the English TCs by un-learning the subject interpretation transferred from L1 Korean.

4. Research questions

To the best of the author’s knowledge, there have been few attempts at investigating the acquisition of English TCs by L1 Japanese speakers. The present study focuses on adult L1 Japanese speakers of L2 English and investigates their interpretation of English TCs. More specifically, the following research question is formulated.

(9) Can L1 Japanese speakers of L2 English correctly unlearn subject interpretation of English TCs?

To address this question, the experiment was conducted as shown in Section 5.

5. Experiments

5.1 Participants

33 adult L1 Japanese speakers of L2 English (JSEs) participated in the experiment. All JSEs were university students (aged 18-20) studying English as a foreign language in Japan. They were divided into two proficiency groups, intermediate (JI) and elementary (JE), according to scores on the TOEIC (Test of English for International Communication) which they had taken three months before they participated in the experiment. 13 adult native English speakers also participated as the control group. Table 1 summarizes the profiles of the L2 groups and the control group.

<table>
<thead>
<tr>
<th>group</th>
<th>L1</th>
<th>n</th>
<th>English Proficiency</th>
<th>TOEIC score Mean (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>JI</td>
<td>Japanese</td>
<td>14</td>
<td>intermediate</td>
<td>560 (515-595)</td>
</tr>
<tr>
<td>JE</td>
<td>Japanese</td>
<td>19</td>
<td>elementary</td>
<td>404 (275- 480)</td>
</tr>
<tr>
<td>control</td>
<td>English</td>
<td>13</td>
<td>native</td>
<td>n.a.</td>
</tr>
</tbody>
</table>
5. 2 Stimuli

The task was a modified TVJT adapted from Kim (2014). In the task, participants read written pairs made up of a context and a TC sentence, and judged whether the context matched the TC sentence by choosing True or False. They were instructed to choose I don’t know when they did not understand the meaning of the contexts or any part of the TC sentences. For JSEs, the instructions and the contexts were given in Japanese so that even low-proficient learners were able to fully understand the contexts. For native English speakers, all materials were presented in English.

The stimuli were divided into 4 conditions, depending on the combination of the verb transitivity of the TC sentence (obligatorily transitive vs. intransitively-biased optionally transitive) and the context type (match vs. mismatch the TC sentence). All contexts were created based on the “agent-biased” contexts in Kim’s (2014) experiment. In the first condition, the verb was obligatorily transitive (O) and the context did not match the TC sentence (False), as shown in (10).

(10) Condition 1 (O-False)
The context:
Lisa and Sam love to box. Lisa has special gloves that detect the other boxer’s movements and make her give punches, so she always wins. However, today Lisa lent the special gloves to Sam and is wearing normal gloves, so she cannot punch him as she used to. In contrast, Sam can give punches much more quickly and accurately than Lisa.

Sam is easy to beat today. True False I don’t know

In (10), the TC sentence, Sam is easy to beat today, only allows for object interpretation, and accordingly, it does not match the given context explaining that Sam is superior to Lisa today because of the special gloves. As a result, native English speakers were expected to choose False.

The example of the second condition is given in (11). In (11), the context is exactly same as (10) but the subject of the following TC sentence changes from Sam to Lisa. In this case, the object interpretation of the TC sentence matches the context, and as a result, the expected response by native English speakers was True for this stimulus.

(11) Condition 2 (O-True)
The context: same as (10)

Lisa is easy to beat today. True False I don’t know

In Conditions 1 and 2, the verbs used in the TC sentences were beat, catch, find, and touch, which are consistently used as transitive (Gahl et al. 2004). In the remaining two conditions, Conditions 3 and 4, the verbs used in the TC sentences were fight, hurt, move, and race, which are intransitively-biased (I), although they are optionally transitive. These verbs were adapted from Kim (2014) to see the effect of transitivity of verbs on interpretation of TCs. In Condition 3, the context mismatched the TC sentence (I-False), and in Condition 4, the context
matched the TC sentence (I-True). As a result, native English speakers were expected to choose False in Condition 3, and True in Condition 4. Each condition consisted of four stimuli, and accordingly, the total number of the stimuli was 16. Ten pairs of a context and a non-TC sentence were also created as distractors. The total 26 pairs of a context and a sentence were presented to the JSEs. Among the 26 pairs, the number of expected choices of True and False by native English speakers were even.

6. Results and discussion
6.1 Group results
Figure 1 presents the group means of choosing True and False in each condition. The horizontal axis shows 4 conditions (Condition 1: O-False, Condition 2: O-True, Condition 3: I-False, and Condition 4: I-True) and the vertical axis shows the ratio of choosing True from 0 to 1 and choosing False from 0 to -1. Table 2 presents the results of statistical analyses (t-tests).

<table>
<thead>
<tr>
<th>groups</th>
<th>Condition1</th>
<th>Condition2</th>
<th>Condition3</th>
<th>Condition4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t</td>
<td>p</td>
<td>t</td>
<td>p</td>
</tr>
<tr>
<td>N vs. JI</td>
<td>-4.92</td>
<td>&lt;0.01</td>
<td>6.99</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>N vs. JE</td>
<td>-8.03</td>
<td>&lt;0.01</td>
<td>9.64</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>JI vs. JE</td>
<td>-0.89</td>
<td>0.38</td>
<td>0.70</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Three findings were obtained in Figure 1. First, native English speakers rejected the mismatched pairs of a context and a TC sentence 88% of the time in Condition 1 (O-False), as we expected. They also accepted the matched pairs of a context and a TC sentence 88% of the time in Condition 2 (O-True), also as we predicted. Regarding the TCs containing intransitively-biased optionally transitive verbs, namely Condition 3 (I-False) and Condition 4 (I-True), native English speakers also rejected the mismatched pairs and accepted the matched pairs more than 70% of the time, as we expected. Thus, their judgement was consistent, irrespective of contexts and verb types. The results suggest that native English speakers have comprehensive knowledge that TCs allow only object interpretation. In contrast, both L2 groups judged in the opposite way. They accepted the mismatched
pairs (O-False and I-False) and rejected the matched pairs (O-True and I-True) 32-66% of the time. These results suggest that in their grammar, TCs do not have the object interpretation but have the subject interpretation. Although the JI group performed better than the JE group, both groups judged the pairs significantly differently to the native English group across the conditions (p<0.01, as shown in Table 2).

6.2 Individual results

In Section 6.1, we have seen that the JSEs had different interpretations of the English TCs than the native English speakers, comparing their group means. To further analyze the JSEs' interpretations, this section looks at the performance of individual JSEs. Figure 2 presents the total number of the correct responses, namely, the sum of the acceptance of object interpretation and the rejection of subject interpretation of TCs by each JSE. In Figure 2, the 33 JSEs are presented in order of proficiency of English on the horizontal axis. J1 on the left edge is the most proficient and J33 on the right edge is the least proficient. Figure 2 shows that only 4 JSE (J1, J4, J13, and J25) out of the 33 (i.e., 12%) were accurate more than half of the time. Regarding the 26 JSEs (i.e., 78% of the all JSEs), the accuracy rates were not over 25%. Only a weak correlation between their accuracy and English proficiency was found (r=0.242). These results suggest that acquisition of the object interpretation of English TCs is very difficult for most JSEs, although it may not be impossible.

6.3 Discussion and limitation

In section 4, I put forward the following research question.

(10) Can L1 Japanese speakers of L2 English correctly unlearn subject interpretation of English TCs?

The group results show that both L2 groups misinterpreted English TCs as having subject interpretation, not object interpretation. The individual results show that only 4 out of the 33 JSEs (i.e., 12%) had correct interpretation and the remaining 29 (i.e., 78%) JSEs misinterpreted, irrespective of their English proficiency. From these results, it seems that it is difficult for JSEs to unlearn the subject interpretation of English TCs. Native Japanese university students studying English as a foreign language probably need some negative evidence, such as an explicit classroom instruction, to unlearn the subject interpretation and acquire the object interpretation of TCs.

The present study has at least two limitations. First, more advanced JSEs should be tested to investigate
whether JSEs truly cannot acquire the correct interpretation of TCs. In the present study, only JSEs with intermediate and elementary levels of proficiency were tested and found their deviant knowledge. However, development of their knowledge at later stages is unclarified. Second, interpretation of Japanese equivalents to English TCs, like (6), by native Japanese speakers should be investigated to determine whether the JSEs’ misinterpretation transferred from their L1, Japanese. The present study shows that JSEs have difficulty in correctly interpreting English TCs, but the source of this problem remains unclear. Moreover, looking at syntactic analyses of Japanese TCs, including Inoue (1978) and Takezawa (1987), may also help find the source of the problem, because previous L2 studies show that syntactic aspects of L2 learners’ interlanguage develop on L1 syntactic structures (Schwartz & Sprouse 1996). These points should be explored in future research.

7. Conclusion
This study investigated whether JSEs have the same interpretation of English TCs as native English speakers. English TCs only allow object interpretation while Japanese equivalents of English TCs have either subject or object interpretation. The TVJT was administered to JSEs with elementary and intermediate proficiency levels of English and native English speakers to compare their interpretations of TCs. The results show that 78% of the JSEs misinterpreted the TCs, irrespective of their English proficiency levels. These results suggest that unlearning object interpretation is difficult for adult L2ers studying English as a foreign language without negative evidence. To confirm this result, more advanced JSEs should be tested in future research. The interpretation of Japanese equivalents to English TCs by native Japanese speakers also need to be analyzed to find the source of the JSEs’ misinterpretation.

Acknowledgments
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Notes
1 This test has been conducted by the Institute for International Business Communication (IIBC) and accepted as the world’s universal measure of skills in English as a second language by nearly 160 countries since 1979 (http://www.iibc-global.org/english/about.html).

References
日本人英語学習者による tough 構文の曖昧性の解消に関する予備調査

大 熊 富季子

要 旨

本稿では、日本人学習者による英語の tough 構文の解釈について調査した。英語の tough 構文では、文の主語が否定詞節の目的語となる目的語解釈のみが可能である。これに対し、tough 構文を和訳すると、目的語解釈だけでなく、（文の主語が否定詞節の主語となる）主語解釈も可能となり、文の解釈が曖昧になる。そこで、学習レベルが初・中級の日本人大学生が、tough 構文を、英語母語話者と同じように正しく解釈するのかを、真偽値判断法により調査した。その結果、78%の大学生が、tough 構文を誤って主語解釈することがわかった。このことから、英語を外国語として学ぶ日本人大学生にとっては、否定証拠なしに、tough 構文の目的語解釈を習得することは、困難であると考えられる。