Use of Deontic Consequent Clauses with Conditional *to* and *ba* in Written Japanese: Effects on Comprehension and Perceived Proficiency

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Abstract

This study investigates the effects of violating deontic constraints on the Japanese conditional markers *to* and *ba*. Via an online survey, native speakers reviewed sentences containing violations of these constraints, evaluating their own ability to understand the sentence and the proficiency of the sentences' authors. Additionally, they were asked to correct sentences they rated poorly, and determine whether or not erroneous sentences differed in meaning from correct versions of the same sentence. Results indicate a significant negative effect on perceived proficiency when either markers' constraints are violated, and a potential impact on comprehension.

Keywords: error analysis, deontic modality, conditional markers

Acknowledgements

Conventions

Formatting is used in the following ways:

- *italics* indicate romanized Japanese, as well as English words or short phrases that are separate from the main text.

- **bold** emphasizes words, such as those that are important to grasp, are being defined or discussed, or will be used again later.

- Braces indicate alternatives: "I like { cats / dogs }" compactly expresses the options "I like cats" and "I like dogs".

Romanized Japanese follows Modified Hepburn with some exceptions:

- Long vowels use kana spelling (*toori*, *satou*)

- Particles use kana spelling (*he ni wo ha*)

- The *sokuon*, っ, is always represented by doubling the following letter (*kocchi*)

- *d* is prepended to ぢ and づ in order to differentiate them from じ and ず (*aidzuchi*)

- The vowel lengthening bar ー is romanized as - (*bi-ru*)

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1 Introduction

Intuitively, and sometimes as a matter of definition, errors are undesirable. Indeed, being able to produce error-free speech is one criteria for acquisition (Solvang, 2008, p. 46). However, errors need not always impede communication (*I saw ~~an~~ red car*), and even native writing is not necessarily error free (*the book ~~peaked~~ my interest*). The goal of this study is to answer the following two questions:

- How does use of {*to* / *ba*} with a deontic consequent clause affect native Japanese users' perception of a writer's proficiency?

- How does use of {*to* / *ba*} with a deontic consequent clause affect native Japanese users' comprehension of a sentence?

Comprehension here refers to the reader's ability to interpret a sentence's meaning as it was intended by the writer. Since perceived proficiency relates to the reader's subjective impressions, proficiency is more vaguely defined as the ability to use the Japanese language.

1.1 Motivation

Previous research (Solvang, 2008) has shown that L2 learners of Japanese struggle to fully acquire the complex constraints on the use of the conditional markers *to* and *ba*. One of the most difficult aspects of these two markers is that the consequent clause cannot be deontic, precluding their use for statements such as *if you go to the store, please buy bread*. In the case of *ba*, this constraint also depends on the nature of the antecedent clause. With *to* and *ba* identified as a weakness for L2 learners, should Japanese learners and educators focus on the acquisition of these constraints?

Given the limited resources available to learners and teachers of Japanese, both in and out of the classroom, it is worth first weighing the potential benefits against the opportunity cost. When communicating, one fundamental

goal is to faithfully convey ideas between parties. A secondary goal for non-native users of a language could be to avoid drawing attention away from the communication at hand and towards their language abilities. Depending on the extent to which conditional marker misuse is detrimental to these goals, it may be best for learners to prioritize acquisition of other areas.

2 Background

The premise for the present study originated from studies within error analysis and related fields. Although Brown deals with L1 rather than L2 acquisition, studies as early as Brown (1973) highlight the existence of errors common among learners, and the value these errors have as a means of investigating the acquisition process (p. 98). Typically, analysis within this field has focused on the cause of various errors, using them to aid in understanding and teaching the target language (Sakoda, 2016, p. 133). While Sakoda claims that "error analysis lost its popularity as a result of its methodological weaknesses" (p. 134), L2 learner errors continue to be studied through lenses such as **acquisition**. These studies will serve as a foundation for the present study, which aims to investigate the next step in the chain of cause-and-effect.

2.1 Invalid selection of conditional marker

Core to the investigation at hand are the constraints placed on the use of the Japanese conditional markers. In order to ensure that the control sentences are grammatically correct, and that the test sentences are incorrect in a consistent manner, an understanding of the conditional markers' constraints is essential.

2.1.1 Conditional markers

Conditional markers, as the name would imply, mark a conditional construction; one where the truth or falsehood of an **antecedent clause** determines the validity of an associated **consequent clause**. The English *if* is one such marker, and is very flexible when compared to the Japanese conditional markers *to*, *tara*, *nara*, and *ba*. This section will briefly cover the restrictions that apply to each marker. All descriptions in this section are based on Makino and Tsutsui (1986), specifically the entries for *to* (pp. 480-482), *tara* (pp.

452-457), *nara* (pp. 281-284), and *ba* (pp. 81-83); any quotes are from said source.

The first marker, *to*, is appended to a clause in present-plain form and "marks a condition that brings about an[*sic*] noncontrollable event or state" (p. 480). Since the consequent clause must be noncontrollable, *to* cannot be used to provide advice or otherwise express volition. However, as seen in (1), the consequent clause may be a direct consequence of a controllable antecedent clause. *To* is the only conditional marker that cannot be used with a known false condition to form a **counterfactual** statement; there is an idiomatic exception when the consequent clause is *ii* (good) or *yokatta* (was good).

(1)   *Kono botan wo osu to pasokon ga saikidou suru.*
        If you press this button, the computer will restart.

The next marker, *tara*, is formed by conjugating the antecedent clause's main verb or copula to past tense and appending *ra*. If the condition is known to be true or inevitable, *tara* takes on the meaning of *when* rather than *if* (as seen in (2)). Regardless of meaning, the consequent clause in a *tara* construction always occurs after the antecedent clause. When used in the past tense, the consequent clause may not describe intentional behavior; thus *goukaku dekitara ke-ki wo kau* (I will buy a cake if I pass) is acceptable, but **goukaku dekitara ke-ki wo katta* (I bought a cake after I passed) is not.

(2)   *Ano hito ga kitara boku ha kaeru.*
        I'll go home {if / when} that person shows up.

Affixing *nara* directly after a clause (in modern Japanese) or after a clause and nominalizing *no* marks said clause as "the speaker's supposition" (p. 281). By nature of being a supposition, the antecedent clause must not be known to be true or inevitable; additionally, it may not be unknowable. The consequent clause may not be caused directly by the antecedent clause's

fulfillment, but may be a suggestion or contain volition. Though *nara* is the only marker whose consequent clause may occur chronologically before the antecedent clause, it is forbidden to pair a non-past tense antecedent clause with a past tense consequent clause. An example of this, taken from Makino and Tsutsui (1986, p 281), can be seen in (3).

(3)   *Shikago he iku no nara basu de ikinasai.*
       If you go to Chicago, go by bus.

Despite serving as the etymological origin for *nara*, the *ba* conditional presents different constraints. Unlike *nara*, but as with the other conditional markers, the antecedent clause must occur before the consequent in time. Furthermore, while the antecedent clause may occur in the past, this is only allowed for counterfactual or habitual events and not for "single factual [events]" (p. 83). Meanwhile, the consequent clause may not be volitional if the antecedent clause describes an action. Finally, this construction does not invite the listener to "read between the lines" and infer any information other than the stated facts.

(4)   *Yokereba kore wo yonde hoshii.*
       If it's alright, I'd like you to read this.

As is hopefully clear by now, selection of a valid conditional marker is not a simple task. Table 1 presents a simplified comparison of the conditionals discussed above (C1 is the antecedent clause, C2 the consequent clause). The three criteria included are enough to demonstrate that no two conditionals are equivalent in terms of when they are appropriate to use.

Conditional	Counterfactual CC	Volitional DC	C1 before C2
to	If DC = *ii*	No	No
tara	Yes	Yes	No
nara	Yes	Yes	Within same tense
ba	Yes	If CC ≠ action	No

Table 1: Unique constraints on each conditional

2.1.2 The Markedness Differential Hypothesis

The **Markedness Differential Hypothesis** (MDH), originally proposed in Eckman (1977), supposes that the more **marked** a language feature is, the more difficult it will be to acquire (p. 321). A feature can be considered marked only if there is an **unmarked** version that is also present in all languages where the marked version exists (p. 320). Since the unmarked feature may freely occur without the marked, but not the other way around, a marked feature is by definition more rare than an unmarked one.

2.1.3 Deontic modality in the consequent clause

Solvang (2008) applies the MDH to explain why the Japanese conditional markers are difficult to acquire, assigning greater markedness to conditional markers that restrict the **modality** of the consequent clause. The modalities of concern here can be seen as a binary: a **deontic** clause "expresses the speaker's attitude towards possible actions by himself or others", an **epistemic** clause does not (p. 35). The first proposition made by Solvang is as follows (p. 39):

(5)   In languages with overt conditional markers, if there are markers subject to modal constraints in the consequent clause, there will also be markers not subject to such constraints.

The modal constraints in question are summarized in the "Volitional DC" column in Table 1 of section 2.1.1. If Solvang's proposition is true, the markers *to* and *ba* are marked relative to *tara* and *nara* (p. 42). Additionally, they

are marked in relation to the conditional markers in English and Swedish, which have no modal constraints (Solvang, 2008, p. 40). Next, Solvang brings up the additional complexity of *ba* when compared to *to*. The antecedent clause's verb being **active** (an action) or **passive** determines which modalities are allowed in the consequent clause; Solvang proposes that a language with this sort of marker will also have markers where modal constraints are not affected by the antecedent clause's verb, and as such *ba* is marked in relation to *to*. Examples of acceptable and unacceptable use of *ba* with a deontic consequent clause can be seen in (6) and (7) respectively.

(6)   *Jikan ga areba pan wo katte kudasai.*
      If you have time, please buy bread.

(7)   **Su-pa ni ikeba pan wo katte kudasai.*
      If you go to the store, please buy bread.

This argumentation leads to the conclusion that *ba* is more marked than *to*, which is in turn more marked than *tara*, *nara*, the English *if*, and any other conditional markers without modal constraints; in turn, difficulty of acquisition should follow the same ordering (Solvang, 2008, p. 45). To test if this is the case, L1 Norwegian learners of Japanese (lower to intermediate level) were tasked with translating conditional sentences from Norwegian into Japanese (p. 46). Promisingly, none of the students' translations featured incorrect uses of the unmarked *tara* or *nara* markers (p. 49). Comparing uses of *ba* (with active verb in the antecedent clause) to those of *to*, only roughly 25% of uses of the former and 60% of uses of the latter were correct (p. 50). Considering this, and that *ba* with passive verbs (as in (6)) was never used incorrectly (p. 49, Table 5), it would seem that modal constraints on the consequent clause are a driving factor in L2 speakers' erroneous use of conditional markers.

2.2 An unnatural distractor

As stated in Schütze and Sprouse (2013, p. 39), survey respondents may begin to employ "conscious response strategies" if they discover what is being investigated. In a survey, **distractors** are elements unrelated to the topic of the study, which can help to obscure said topic. Movement verbs will serve as one type of distractor in the present study's survey, as Inagaki (2001) has shown that L1 users of Japanese are sensitive to errors in this area of grammar.

2.2.1 Movement verbs

The Japanese verbs *iku* and *kuru* can both mean "go (somewhere)"; the direction of the movement relative to the speaker's chosen frame of reference determines which verb is used, with *kuru* being used for **inwards** motion and *iku* for **outwards** (Martin, 1988, p. 536). As seen in Makino and Tsutsui (1986, p. 302), these verbs can be paired with a destination marked by the particle *ni*:

(8) *Itsuka watashi no uchi ni kimasen ka.*
     Wouldn't you like to come to my house sometime?

Stating that "The notion of movement in Japanese is represented by a pair of verbs with opposite deictic specifications", Martin (1988, p. 536) implies that *iku* and *kuru* alone stand for all expression of movement. This raises the question of how words like *aruku* (walk) or *hashiru* (run) function; they result in a movement and may in English take a destination as in "I walk to work" or "he ran inside". Martin implies in (9) that these verbs are used in combination with *iku* or *kuru* (p. 536):

(9)   The straightforward meaning is usually appropriate when no
      other verb is present in the sentence or when the motion verb is
      preceded by a gerund of manner or[*sic*] movement.

An example of this construction can be seen in the entry for *iku* in Makino and Tsutsui (1986, pp. 152-153):

(10) *Mainichi kaisha ni basu ni notte iku.*
      [I] go to work every day by bus.

2.2.2 Manner-of-motion verbs with Goal PPs

The phrase *kaisha ni* ("to work") in (10) is an example of what Inagaki calls a **goal PP**: "a prepositional or postpositional phrase (PP) expressing a goal" (Inagaki, 2001, p. 154). In the same sentence, *iku* is an example of a **directed motion verb**, a category contrasted here with **manner-of-motion verbs** such as *aruku*. While both categories of words may be used with a goal PP in English, Japanese does not allow manner-of-motion verbs to be used with a goal PP by themselves. Instead, when conveying both the manner and goal of a motion in Japanese, one must use the gerund form of a manner-of-motion verb together with a directed motion verb (Inagaki, 2001, p. 154). This means that the constructions allowable in Japanese are a subset of those allowed in English, leading Inagaki to the following hypothesis (p. 156):

(11) English speakers will have difficulty recognizing that manner-of-motion verbs with goal PPs [...] are ungrammatical in Japanese.

To test the hypothesis, Inagaki showed advanced learners (L1 English) and native speakers (L1 Japanese) images containing a **figure** ("object that moves"), **ground** ("object with respect to which the object moves"), and an arrow representing "the direction and endpoint of the motion depicted" (2001, p. 157). Presented with a list containing both erroneous and correctly-formed Japanese descriptions of these images, participants then rated "to what degree each sentence sounded natural" (p. 157). The collected data revealed that while L1 Japanese speakers rejected manner-of-motion verbs with goal PPs, L1 English speakers not only accepted them, but found them more natural than some correct constructions (p. 161).

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3 Methodology

To investigate the effects of incorrect use of *to* and *ba*, representative sentences containing these errors were presented to native users of Japanese. The respondents evaluated perceived proficiency and their comprehension of the sentences on Likert scales. Additional qualitative evaluations were collected with a focus on sentence comprehension, in order to better understand any difference that may have arisen between the sentence's intended meaning and the respondent's interpretation.

An anonymous online survey, where each respondent was assigned a unique random ID, was used to collect this data. The survey questions were presented in four strictly sequential stages, i.e. respondents could not return to an earlier stage after seeing the next stage's questions. These survey's structure can be seen in Japanese in Appendix B, or translated to English in Appendix C. Sixteen sentences were to be evaluated; each respondent's ID was associated with an ordering such that no two respondents were shown these sentences in the same order. The survey was disseminated entirely online, without any compensation offered for completion.

3.1 Survey Structure

Before taking the survey, respondents were shown an introductory text (reproduced in appendix A) providing them with practical information about the survey (such as structure and approximate completion time). This text, written in both English and Japanese, also served to distract from the topic of the study by falsely implying that non-native speakers would also be responding to the survey. Respondents were told that the aim of the survey was to "investigate differences in perception of written Japanese between native and non-native readers", and informed that both native and non-native users of Japanese would be responding to the same questions (albeit translated). Additionally, the English text stated that "[some questions] may be

difficult to answer as a non-native speaker", whereas the Japanese stated that "some questions may not seem to be aimed at native speakers"; both texts encouraged respondents to answer to the best of their ability in spite of this.

The first stage of the survey mainly collected demographic information. This included age, gender, home prefecture, and current residence (prefecture if within Japan, country otherwise). Additionally, respondents were asked to rate their Japanese proficiency compared to the average native speaker, on a scale ranging from "1 - definitely lower" to "5 - definitely higher".

The next stage was the only stage to present all sixteen example sentences, and investigated both perceived proficiency and comprehension. Perceived proficiency can arguably be evaluated directly, so respondents were asked to "compare the Japanese abilities of the person who wrote this sentence with your own" and rate them between "1 - definitely lower" and "5 - definitely higher". Due to the fact that all respondents are native speakers, scores in the interval $[1, 2]$ can be interpreted as less than native proficiency, and $[3, 5]$ as native-like proficiency. A direct evaluation for ease-of-comprehension was also taken during this stage, with respondents selecting whether they "{1 - can't / 2 - barely / 3 - mostly / 4 - completely} understand" or "5 - easily and completely understand" the meaning of the sentence. Those giving a rating in $[1, 3]$ were encouraged, but not required, to elaborate on what they found unclear as a free text response.

The tasks in stage three and four of the survey were created to attempt to capture the respondent's interpretation of the sentence's meaning, in order to more objectively determine how well they had comprehended it. Sentences that the respondent had rated poorly in stage two, meaning those rated in $[1, 2]$ for proficiency or $[1, 3]$ for comprehension, were presented to them again for review in stage three. Here, respondents were asked to rewrite the sentences to correct the flaws they perceived in them. In cases where the sentence's meaning was ambiguous, providing several potential corrections was allowed

but not required. In order to reduce the time required for completion, control sentences and distractors were excluded from this stage, leaving at most four sentences to correct.

In stage four, respondents were presented with erroneous uses of *to* and *ba* alongside correct versions of the same sentence. They were instructed to mark the sentence pairs where they believed the meaning differed, and could optionally write a text response to explain the difference in meaning.

3.2 Example Sentence Selection

The example sentences used in the survey (collected in Appendix D) were selected to fit one of eight categories; two sentences were picked for each category in order to reduce the impact of factors unrelated to the attribute the category is intended to represent. Half of the categories relate directly to the study's aims, while the other half serve as various distractors.

The first two categories are correct uses of *to* and correct uses of *ba*, serving as controls. These sentences are all sourced from examples in Ueyama (2021) (a linguistics textbook aimed at native Japanese speakers), with only minor modifications to one sentence. The second two categories are the test sentences, containing erroneous use of *to* and *ba*. In order to isolate the effects of conditional marker misuse, these sentences are based on correct sentences from Ueyama (2021) and Oka et al. (2009) (a Japanese textbook aimed at non-native learners), then modified to violate modal constraints. Misuse of *to* was achieved by sourcing *tara* sentences expressing desire, then replacing *tara* with *to*. One misuse of *ba* was created by altering a sentence using *shitara* followed by a command to instead use *sureba*; another by changing a verbal noun with *da to* (followed by a suppositon about someone else's actions) into *wo sureba*.

To ensure that conditionals using *tara* and *nara* are not conspicuously absent, one sentence with each of these is present among the distractors. As a red herring, there are also two distractor sentences featuring correct

use of motion verbs and two distractor sentences featuring directed motion verbs directly attached to a target location with *ni*. The incorrect sentences are modified from examples given in Inagaki (2001). As described in 2.2.2, these errors should be readily apparent to native speakers, hopefully diverting suspicion from the real test and control sentences. Finally, two sentences are included that make use of neither conditionals nor motion verbs.

4   Results

4.1   Respondent demographics

A total of 45 responses to the survey were received. As can be seen in Table 2, the results skew heavily towards female respondents, and no participants opted to select *other* or decline to answer.

Gender	Count (proportion)
Total	45 (100.0%)
Male	6 (13.3%)
Female	39 (86.7%)
Other	0 (00.0%)

Table 2: Respondents by gender

The respondent demographics also skew young, with two thirds of the respondents falling in the 20-29 year old range. Figure 1 makes it clear that even for the remaining respondents, most fall in younger age brackets. In combination with the fact that two respondents elected not to specify their age, this leads to very uneven population sizes should a comparison between age groups be attempted.
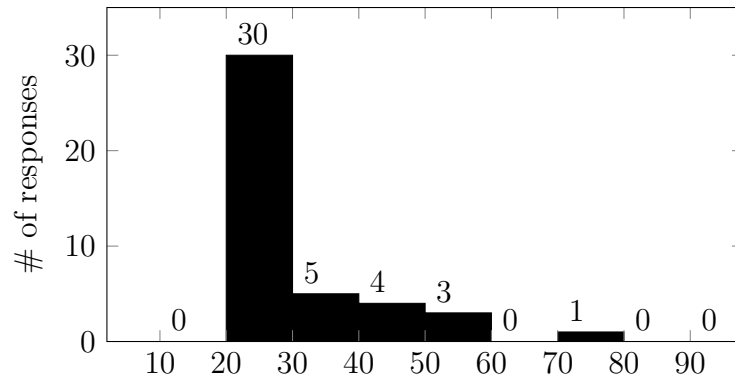
Figure 1: Respondent ages

Table 3 groups respondents' reported home prefectures into eight regions,

listed in order of north/east-most to south/west-most; this implies that a group of regions continuous in the table would also be continuous geographically. The cumulative column in this table gives the sample size that would be obtained if one takes the first n regions in the list as one group, illustrating that the response distribution allows for a (potentially arbitrary) comparison between at least two regions with sample sizes of 23 and 22.

Region	Count (proportion)	Cumulative
Hokkaidou	2 (04.4%)	2
Touhoku	1 (02.2%)	3
Kantou	16 (35.6%)	19
Chuubu	4 (08.9%)	23
Kansai	12 (26.7%)	35
Chuugoku	1 (02.2%)	36
Shikoku	4 (08.9%)	40
Kyuushuu	5 (11.1%)	45

Table 3: Respondents by region of home prefecture

Looking instead at the respondents' current residences (Table 4), it can be seen that a majority are in Sweden. This is likely because the online groups in which the survey was shared include a group primarily consisting of Japanese exchange students at Lund University, and two groups aimed more generally at Japanese people interested in or living in Sweden. Although the amount of responses from people currently residing in Japan is low, and residing in Japan does not preclude having been abroad, it would be interesting to see if responses from those currently residing outside of Japan are more accepting of erroneous formulations.

Residence	Count (proportion)
Japan	16 (35.6%)
Sweden	27 (60.0%)
Other	2 (04.4%)

Table 4: Respondents by current residence
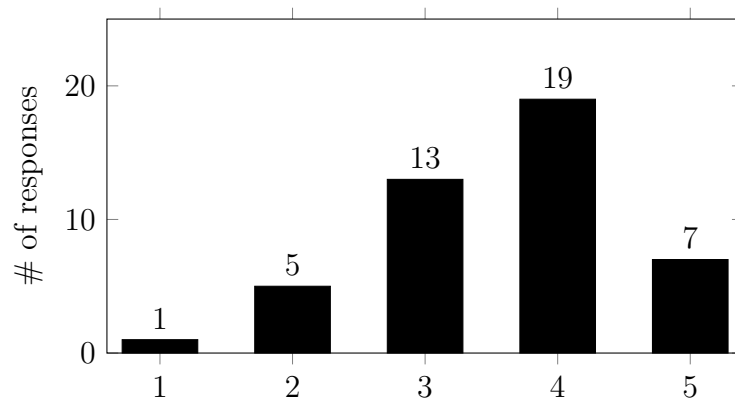
Figure 2: Respondent self evaluations

Finally, Figure 2 reveals that a small majority of respondents felt their own Japanese skills were above average. However, only around a third of these respondents were confident in that assessment, with most evaluating their Japanese abilities as "probably higher than average" (a score of 4 on the response scale). Here it seems apt to compare the scores of respondents who regarded themselves as average (or below) with those who considered themselves above average.

4.2   Sentence parity

Before proceeding with analysis, it is worth checking how the scores of the sentences in each category compare to each other. While the sentences are intended to be representative of the absence or presence of some trait, a large difference in score could indicate that an external factor is influencing the respondents' judgements.

Specifically, the *control* and *error* category pairs represent the presence of a grammatical concept used correctly and incorrectly, respectively. The remaining categories are intended to be error free, and in addition to distracting from the survey's aims will provide additional reference data for how a correctly written sentence is evaluated by respondents.

Table 5 shows mean scores for the first and second sentences in each category, as well as the difference between them; due to rounding the difference between two items' scores may appear to differ from the reported delta. Looking at the scoring differences, the proficiency score of 1.7 for the second correct use of *ba* stands out as particularly low, especially when compared to the 3.1 received by the first sentence in this pair. A native speaker revealed that this sentence used the particle *ha* where *ga* would have been more appropriate, and checking the source text (Ueyama, 2021) again revealed that the sentence was incorrectly transcribed in the survey. Since this unrelated error would unduly lower the rating of the *ba* control category, the sentence was excluded from further analysis.

The second biggest score difference is found between the two sentences representing *ba* errors, where comprehension for item two is rated one whole point lower than for item one. In this sentence, the use of the *suru*-verb *seikatsu* (life, lifestyle) with *da to* was changed to *seikatsu sureba* in order to manifest an erroneous use of *ba*. Although it is possible that using *seikatsu* as a verb rather than a noun affected the sentence's comprehensibility, this sentence was included in analysis.

Category	Mean Proficiency				Mean Comprehension		
	Item 1	Item 2	Δ		Item 1	Item 2	Δ
to control	3.0	2.6	0.5		4.8	4.3	0.5
ba control	3.1	1.7	1.4		4.8	4.1	0.8
to error	2.0	1.6	0.5		4.5	4.1	0.4
ba error	2.1	2.2	-0.1		4.4	3.5	1.0
Motion control	3.1	2.4	0.8		4.9	4.3	0.6
Motion error	1.6	2.0	-0.4		3.5	3.8	-0.3
tara or *nara*	2.9	2.8	0.1		4.9	4.6	0.2
Other	2.9	3.2	-0.3		4.7	4.8	-0.1

Table 5: Average sentence scores, notable differences highlighted

From Table 5 we can also see that while comprehension scores are above 4 for all correct sentences, some of these sentences still received low proficiency

ratings. In the case of *to* control item two, use of the colloquial term *yatsu* (chap, fellow) may have contributed to the score of 2.6. The score of 2.4 for the second directed motion item could be explained by the fact that this sentence is written entirely without kanji.

4.3 Statistical evaluation

The three rightmost columns in Tables 6 through 9 report the results of a Welch's t-test (performed using the R language's `t.test` function via R-studio), comparing ratings of sentences in the reference category and ratings of sentences in the error category. Here the p-value gives the probability, where 1 represents full certainty, that the real mean score for both categories is the same (implying that any difference is due to random variation). Conversely, a low p-value indicates a high probability that the scores differ meaningfully (in this study, 0.05 is used as the threshold for significance). The 95% Interval Low and High columns indicate an interval that the difference in mean score is 95% likely to fall within; particularly of interest is the High column, since for negative values one can be at least 95% confident that the score has decreased by at least this amount.

To allow for further analysis, a complete list of ratings from each respondent for each sentence is available in Tables 16 and 17 of Appendix E.

4.4 Evaluations of *to*

The average proficiency score for correct use of *to* was 2.81 (as seen in Table 6), indicating proficiency nearly on par with the respondents' own abilities. This is slightly lower than the average proficiency score obtained when including all error-free sentences (*to*, *ba*, and motion controls; uses of *tara* or *nara*; and sentences containing no conditionals nor motion). The average comprehension score (seen in Table 7) for these sentences was 4.56, meaning it was completely understood. Both of these scores are slightly below the

average for error-free sentences as a whole.

Reference	Mean Score				95% Interval	
Category	Reference	Error	Δ	p-value	Low	High
All correct	2.90	1.81	-1.09	< 2.2e-16	-1.25	-0.93
to control	2.81	1.81	-1.00	< 2.2e-16	-1.20	-0.80

Table 6: Mean proficiency scores, *to* error vs controls

Reference	Mean Score				95% Interval	
Category	Reference	Error	Δ	p-value	Low	High
All correct	4.67	4.29	-0.39	2.8e-05	-0.56	-0.21
to control	4.56	4.29	-0.27	0.02	-0.49	-0.04

Table 7: Mean comprehension scores, *to* error vs controls

Compared to correct usage of *to*, introducing an error reduced the proficiency score by one whole point (± 0.2) to 1.81, indicating that respondents felt the writer's proficiency was likely below their own. Comprehension remained high at 4.29 points, indicating full comprehension was retained for most respondents. Additionally, the 95% confidence interval for this comparison includes the possibility that the real score difference is near zero.
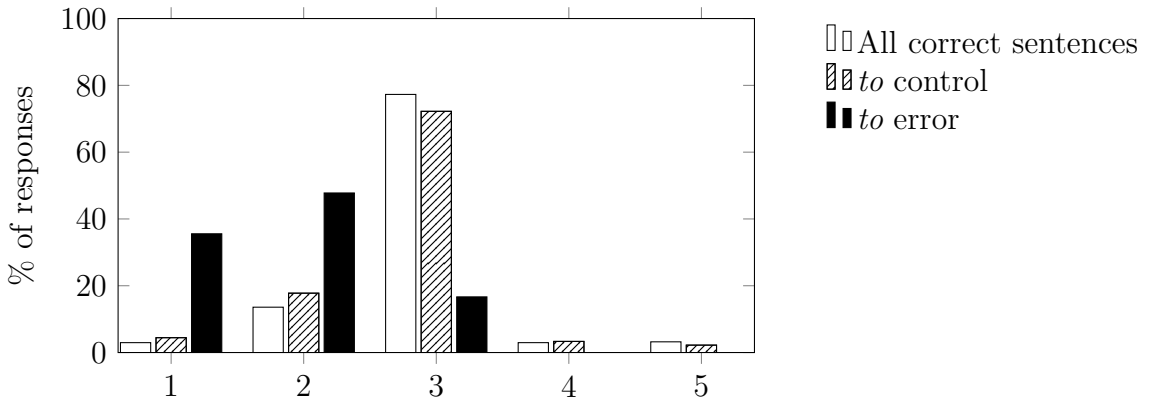
Figure 3: Proficiency score distribution, *to* error vs controls
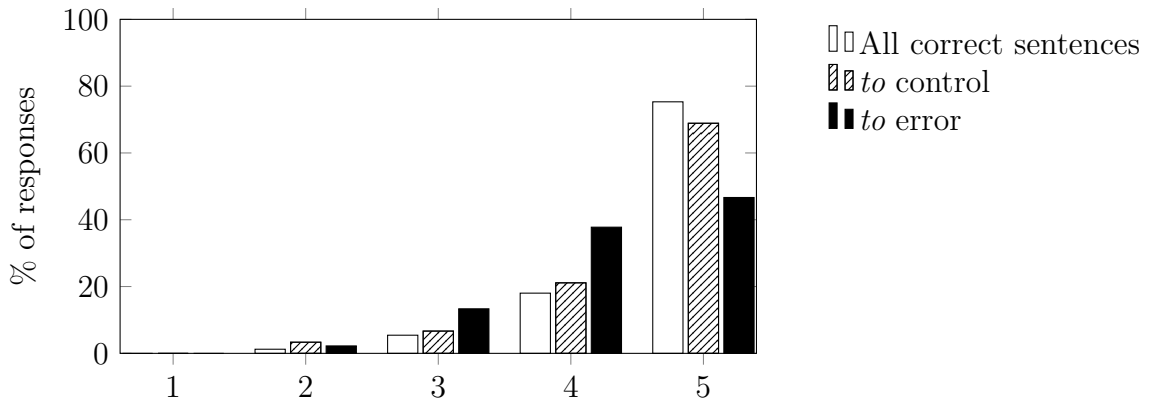
Figure 4: Comprehension score distribution, *to* error vs controls

Continuing analysis with the help of Figure 3 and Figure 4, it can be seen that erroneous sentences were never rated as more proficiently written than the respondent, nor as completely incomprehensible. Despite the lower range of observed responses, these sentences' scores are more spread out than those of the control sentences, with no score accounting for more than roughly half of the responses.

4.5 Evaluations of *ba*

For correct use of *ba*, the average proficiency rating is 3.09, slightly above the average for control sentences as a group (see Table 8). The same above-average rating is seen for comprehension in Table 9, where correct use of *ba* receives a score of 4.82.

| Reference | Mean Score | | | | 95% Interval | |
Category	Reference	Error	Δ	p-value	Low	High
All correct	2.90	2.19	-0.71	6.5e-13	-0.88	-0.54
ba control	3.09	2.19	-0.90	3.2e-10	-1.156	-0.64

Table 8: Mean proficiency scores, *ba* error vs controls

The proficiency score for incorrect use of *ba* is 0.9 points less than for

Reference	Mean Score				95% Interval	
Category	Reference	Error	Δ	p-value	Low	High
All correct	4.67	3.94	-0.73	1.5e-08	-0.96	-0.49
ba control	4.82	3.94	-0.88	7.4e-10	-1.14	-0.62

Table 9: Mean comprehension scores, *ba* error vs controls

correct use, but the 95% confidence interval for this difference is rather wide. The comprehension score difference of 0.88 points is also accompanied by a large confidence interval.
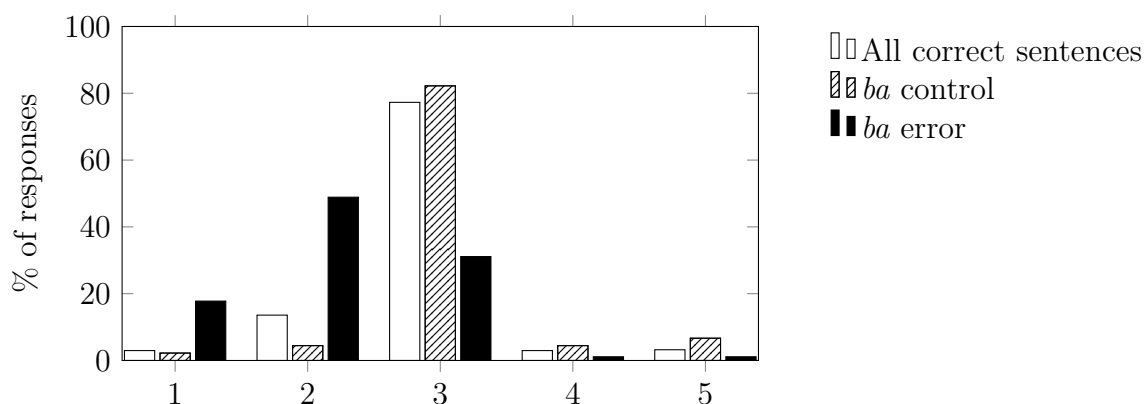
Figure 5: Proficiency score distribution, *ba* error vs controls

The distribution of proficiency scores depicted in Figure 5 largely resembles Figure 3, but some respondents considered even a writer who violates *ba*'s constraints to be more proficient than themselves. Specifically, these scores are from two separate respondents' evaluations of the second erroneous *ba* sentence; one rating of 5 from a respondent from Tokyo (who considered their own abilities to be definitely above average), and one rating of 4 by a respondent from Tokushima (who rated their own ability as definitely below average). No explanation for this result has been found.

Despite faring better than erroneous use of *to* in proficiency scores, Figure 6 indicates that comprehension is severely impacted by erroneous use of *ba*, with at least one respondent reporting that they are unable to understand
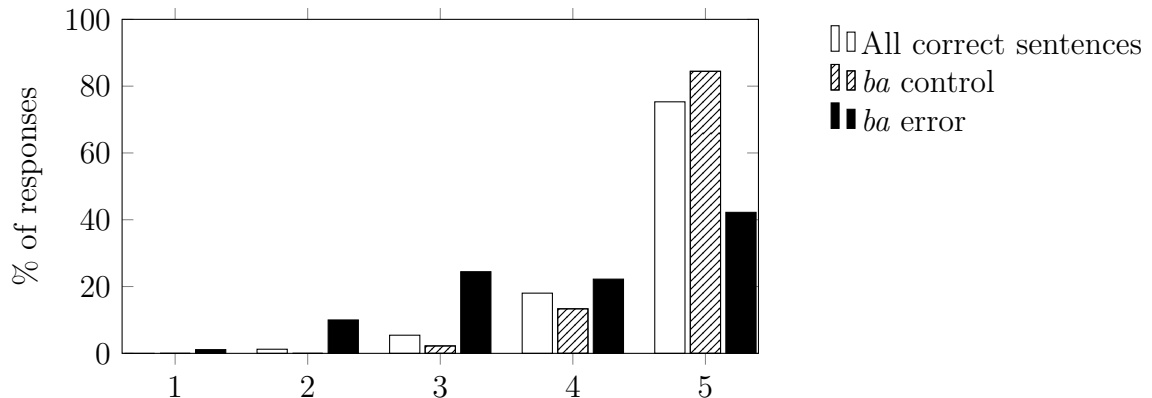
Figure 6: Comprehension score distribution, *ba* error vs controls

these sentences. Also of note is the dip in responses with a score of four, potentially indicating that there are two groups of respondents with different rating tendencies for this category. The two respondents who gave high proficiency scores for the second example sentence both gave it a comprehension score of 5.

4.6   Group comparisons

Comparing respondents whose home prefecture is in the North (defined here as Hokkaidou, Touhoku, Kantou, or Chuubu) to those in the West (Kansai, Chuugoku, Shikoku, Kyuushuu), some significant differences in scoring can be detected (see Table 10). Most notably, respondents from the North rated sentences containing erroneous use of *ba* nearly half a point lower in proficiency than respondents from the West. Respondents from the North also rated both proficiency and comprehension of correct sentences slightly lower.

Referring back to the number of responses per region seen in Table 3, the North category in this comparison is mostly comprised of respondents from the Kantou region, while most respondents in the West category are from Kansai. More specifically, 9 of the 16 Touhoku respondents are from Tokyo (see Table 15 in Appendix E), accounting for 39% of the North category.

Thus, it is worth noting that *hyoujungo*, standard Japanese, is much more similar to the dialect spoken in Tokyo than it is to dialects spoken in the West. Speaking a less standard dialect may explain why respondents from the West were less critical of non-standard grammar.

Category	Proficiency Score				Comprehension Score			
	North	West	Δ	p-value	North	West	Δ	p-value
No error	2.83	2.97	-0.15	0.02	4.59	4.76	-0.16	0.01
to error	1.70	1.93	-0.24	0.11	4.17	4.41	-0.24	0.15
ba error	1.98	2.41	-0.43	0.01	4.00	3.89	0.11	0.62

Table 10: Score comparison, home prefecture in North vs West

Table 11 shows the values obtained when attempting to compare scoring between respondents residing in Japan and those residing elsewhere. Counter to the prediction made in section 4.1, the results most likely to be significant indicate that respondents outside of Japan gave lower scores. Of the 12 respondents who gave at least one proficiency score of 4 or above, 6 were currently residing in Japan, with the remaining 6 in Sweden (cf. Table 4). However, a larger sample would be required to draw any real conclusions.

Category	Proficiency Score				Comprehension Score			
	Abroad	Japan	Δ	p-value	Abroad	Japan	Δ	p-value
No error	2.85	2.98	-0.12	0.08	4.70	4.62	0.09	0.21
to error	1.83	1.78	0.05	0.77	4.29	4.28	0.01	0.95
ba error	2.09	2.38	-0.29	0.11	3.91	4.00	-0.09	0.72

Table 11: Score comparison, residing abroad vs in Japan

Comparing scores by respondents who rated themselves as more proficient than average with those who rated themselves average or below yields unsurprising results for mean scores; as Table 12 shows, the more confident respondents tended to give lower proficiency scores for sentences containing errors, and reported better comprehension for correctly written sentences.

The presence of two peaks in the comprehension score distribution shown

Category	Proficiency Score				Comprehension Score			
	Lower	Higher	Δ	p-value	Lower	Higher	Δ	p-value
No error	2.95	2.86	0.09	0.15	4.56	4.76	-0.20	0.004
to error	2.05	1.63	0.42	0.004	4.26	4.31	-0.04	0.79
ba error	2.37	2.06	0.31	0.06	3.97	3.92	0.05	0.83

Table 12: Score comparison, average vs above-average self-assessment

in Figure 6 does not appear to be explained by any of the comparisons made here.

4.7 Non-scored tasks

A total of 40 respondents completed the third stage of the survey, in which they were asked to rewrite sentences they rated poorly in stage two. For both *to* error sentences and the first *ba* error, Table 13 counts occurrences of conditional markers used in these corrected sentences. Since not all participants rewrote all sentences, and some participants provided several alternative corrections, these counts do not necessarily total 40.

Sentence	*tara*	*toshitara*	*nara*	*ba*	*toki*	*ta toki*	Other
to error 1	20	4	2	0	1	2	*tte* (1)
to error 2	17	0	11	18	0	0	0
ba error 1	25	0	0	N/A	0	1	0

Table 13: Rewrites provided for each sentence, excluding *ba* error 2

The sentences in Table 13 all contained *tara* before they were modified to introduce errors; most respondents select *tara* to correct them and as such restore the sentences to their original state. For the first erroneous *to* sentence, some respondents opted to use the more hypothetical *toshitara* or *nara*. A smaller number of respondents chose *toki* (one with non-past and two with past tense), implying that they read the sentence as *when* rather than *if*.

For *to* error 2, where the antecedent clause (*if you have time*) was not an action, *ba* was the most commonly occurring marker among corrections, but it was closely followed by *tara*.

The second item representing *ba* errors deserves special attention, due to the large number of alternative corrections provided. The original sentence from Oka et al. (2009, p. 327) is reproduced in (13) and roughly means "living on less than a dollar per day, it'd be hard for kids to go to school every day". The sentence as shown to participants is reproduced in (12); in order to avoid assumptions about how the sentence will be interpreted, no translation is given here.

(12)

Ichinichi	*ichidoru*	*ika*	*no*	*seikatsu*	*wo*	*sure-ba,*
1.day	1.dollar	at.most	GEN	life(style)	ACC	do-COND

kodomotachi	*ga*	*mainichi*	*gakkou*	*ni*	*kayou*	*no*	*ha*
children	NOM	every.day	school	to	go	NMLZ	TOP

muzukashii	*darou*	*ne.*
difficult	MOD	SFP

(13)

Ichinichi	*ichidoru*	*ika*	*no*	*seikatsu*	*da*	*to*
1.day	1.dollar	at.most	GEN	life(style)	COP	COND

kodomotachi	*ga*	*mainichi*	*gakkou*	*ni*	*kayou*	*no*	*ha*
children	NOM	every.day	school	to	go	NMLZ	TOP

muzukashii	*darou*	*ne.*
difficult	MOD	SFP

The following is an incomplete list of proposed corrections, truncated to the antecedent clause and translated to English:

- *If one aims for a lifestyle of less than a dollar per day [...]*

- *If one is made to live on less than a dollar per day [...]*

- *If one is unable to live on less than a dollar per day [...]*

- *If one is able to live on less than a dollar per day [...]*

- *If one lives on less than a dollar per day [...]*

- *If one does not live on less than a dollar per day [...]*

Notably, most of the respondents who provided several corrections gave opposing alternatives: choice or obligation, ability or inability, truth or falsehood. Two respondents gave tentative corrections, noting that they had to make assumptions they weren't confident about in order to interpret the sentence. One respondent wrote that they were unable to correct the sentence.

It is clear that this particular use of *ba* has impeded comprehension, but less clear whether this is due to the violation of conditional constraints.

Continuing to the fourth and last stage of the survey, Table 14 compares the number of respondents who rated a sentence low in proficiency (two or below) with the number who indicated that the meaning of the sentence changed when they were shown the original correct sentence. The final column specifically counts respondents who gave a low proficiency rating, but still indicated that the sentence conveyed the intended meaning. Ratings from respondents who did not complete the entire survey are excluded from this table, giving a response count of 37 (a list of all responses to this question is available in Table 18, found in Appendix E). Similar to what was seen before, misuse of *ba* appears to alter a sentence's meaning to many respondents, but most did not report that violating *to*'s constraints altered its meaning.

Sentence	Low rating	Meaning differs	Low rating + same meaning
to error 1	28 (76%)	9 (24%)	23 (62%)
to error 2	37 (100%)	8 (22%)	29 (78%)
ba error 1	26 (70%)	8 (22%)	22 (59%)
ba error 2	26 (70%)	15 (41%)	14 (38%)

Table 14: Proficiency rating and success at conveying meaning

Regarding *to* item one, two respondents remarked that *to* gave the impression that the condition was going to be met, whereas the corrected sentence with *tara* was more hypothetical. Responses to *to* item two include claims that it is unnatural, wouldn't be said, and that "rather than a difference in meaning, the original isn't a sentence". For *ba* item one, use of *ba* instead of the correct *tara* was interpreted by some respondents as *if* rather than *when*, but this sentence was also reported as ungrammatical by one respondent. Once again, for the second *ba* item several interpretations were given, each attested by multiple respondents:

- The condition could be an intentional choice when marked with *sureba*,

but not with *da to*

- Using *sureba* implies a hypothetical, whereas *da to* relates to a specific example

- Rather than imparting a different meaning, changing *sureba* to *da to* makes the sentence easier to understand

It seems likely that the difference in response between the two *ba* items is responsible for the uneven score distribution seen in Figure 6; while the first item receives an average comprehension score of 4.42, the second item's average comprehension score is 3.47.

5 Conclusion

As stated before, the aim of this study was to answer the following questions:

- How does use of {*to* / *ba*} with a deontic consequent clause affect native Japanese users' perception of a writer's proficiency?

- How does use of {*to* / *ba*} with a deontic consequent clause affect native Japanese users' comprehension of a sentence?

Analyzing native speakers' own assessments of the two factors, significant scoring differences were detected between sentences that used *to* and *ba* without error and sentences that violated the constraints on these markers. For both markers, proficiency ratings fell from those indicating near-native levels of proficiency to indicating that the sentence's author was perceived as less proficient than the respondent. These results were especially pronounced for *to*.

Comprehension scores present a less clear-cut result. For *to*, introducing errors is likely to have reduced scoring by up to half a point, but the mean score remains in the range representing full comprehension of the sentence's meaning. Misuse of *ba* produces a more significant reduction in score, with the mean score falling between full comprehension and some lack of understanding. The distribution of scores for *ba* was also less regular than for *to*, with some indications that a single central score is not present.

Analysis of the written responses in sections three and four of the survey provides a potential explanation for this phenomenon, indicating that the second item representing misuse of *ba* was more difficult to comprehend than the first item. Most respondents who completed the survey felt that this sentence did not convey the same meaning as the original sentence it was based on. However, it is difficult to determine the degree to which this effect is caused by violation of deontic constraints. Misuse of *to* does not appear to have caused as much divergence in meaning as misuse of *ba* did.

Comparisons were also performed between demographic groups, two of which revealed significant results. Respondents who rated their own Japanese abilities as above average gave higher scores for their own comprehension of sentences, and lower scores for the proficiency of the example sentences' authors. Respondents from the North gave lower proficiency and comprehension scores for correct sentences than those from the West, and much lower proficiency ratings when *ba*'s constraints were violated.

In summary, there is a clear negative effect on perceived proficiency when *to* or *ba*'s deontic constraints are violated. Comprehension was generally self-reported as high regardless of errors, but further analysis reveals that it is affected to a non-negligible degree. As such, results regarding effects on comprehension are unconclusive, especially for *ba*.

5.1   Limitations

The example sentences selected for evaluation have several limitations. For one thing, only two representative sentences being selected per grammatical category makes undue influence from other factors more likely. This is particularly evident when looking at the correct uses of *ba*, where an unrelated error in the second example sentence drastically affected the score. If this sentence is included as a control, the impact of a misuse of *ba* appears less significant than it truly is. Even for other grammatical categories, the correlation in scoring between sentences is not always strong. Secondly, the errors made in the test sentences are contrived, rather than naturally occurring. It's possible that the specific mistakes made by L2 users of Japanese with *to* and *ba* do not resemble those investigated here, and that the nature of the mistake would alter its impact. This is a tricky limitation to resolve, however, as L2 writing may differ from L1 in ways other than the error under investigation, and avoidance (as described in Sakoda (2016, p. 136)) may make it difficult to source incorrect uses of *to* and *ba* from L2 production.

Another set of limitations have to do with the number and demographics

of the survey respondents. The respondent demographic is quite different from the overall demographics of L1 Japanese users, as respondents skew heavily female and young. In combination with these skewed demographics, the low number of respondents makes it difficult to compare tendencies between sub-groups (e.g. age brackets, gender), and to confidently draw generalizable conclusions. Many respondents currently reside outside of Japan; this could lead to increased exposure to L2 Japanese, which may in turn affect perceptions of proficiency and the ability to comprehend Japanese produced by non-native users.

5.2 Further work

In addition to addressing the present study's limitations, there are several avenues to expand on this topic. One would be to continue to investigate the conditional markers, in order to measure the impact of violating other constraints. Here it would be interesting to see if native users of Japanese recognize which aspects of the language are difficult to acquire and account for this in their proficiency rating; meanwhile, comprehension evaluations could provide insight into which constraints are most important for the sake of accurately conveying meaning.

Another avenue would be to expand the survey's target demographic, and determine the extent to which L2 respondents' evaluations line up with L1 responses. Given the difficulty of acquisition, it would likely be best to focus on advanced learners in this case.

It would also be interesting to see whether the errors studied here have the same effects in the context of speech rather than writing. This would introduce additional factors to control for, such as the speaker's pronunciation and cadence, and would therefore require a carefully considered methodology. However, it would provide a valuable point of comparison as well as useful information for L2 speakers aiming for fluency.

Finally, even if acquisition of these constraints is deemed important, it is

not obvious how this acquisition can be assisted. It would be worth investigating, for example, whether or not students who receive classroom instruction on these constraints demonstrate a greater ability to follow them.

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Appendix A   Survey Prelude

Perception of Written Japanese

（日本語訳が続きます）

For my bachelor's thesis, I'm conducting a survey to investigate differences in perception of written Japanese between native and non-native readers. The survey consists of four parts, and takes 5 to 10 minutes in total. Your answers are saved after each part, so you can complete the survey in several sessions if needed.

- Part 1: Demographic information

- Part 2 - 4: Evaluating Japanese sentences

The survey is presented in English for non-native speakers, but the questions in the part 2 to 4 are the same as those for native speakers. Some may be difficult to answer as a non-native speaker, but please answer as best as you can. Thank you! - William Karlsson (Lund University, Sweden)

To start the survey for the first time, press the button below. Or, to continue the survey where you left off, paste your ID in the field below and then press the button.

Continue

Contact: [redacted]

日本語訳

スウェーデンのルンド大学で勉強し、日本語専攻の学士論文を書いているウィリアム・カールソン（William Karlsson）と申します。日本語で書かれた文章について、母語話者とそれ以外の日本語話者の感覚を比べるためにアンケート調査を行っています。アンケートは四つのパートに成り立って、全てが５〜１０分ほどかかります。次のパートに進むごとにデータが更新されるので、一気に完成できなくても大丈夫です。

- パート１：個人情報

- パート２〜４：文章の評価

母語によって質問が英語か日本語に表示されますが、基本的に同じ内容です。母語話者向けでないような質問があっても、一番適当な答えを選んでください。ご協力、よろしくお願いします！ウィリアム・カールソン 下のボタンを押すと、アンケートを開始できます。それとも、欄に ID

を入力してボタンを押すと、途中に休止したアンケートを継続できます。

進む

お問い合わせ：[redacted]

Appendix B　Survey (Japanese)

パート１／４

個人情報

個人情報は個々に分析されずに、年齢層や性別などによる傾向を探すために集められます。

国語力

日本人の平均と比べたら、自分の国語力は...

- ○ 1 - きっとより低い
- ○ 2 - たぶんより低い
- ○ 3 - だいたい同じ
- ○ 4 - たぶんより高い
- ○ 5 - きっとより高い

年齢

回答しない場合は０を入力してください。

[　　　　　　　　　　]

性別

- ○ 男性
- ○ 女性
- ○ その他
- ○ 回答しない

出身地（都道府県）

[都道府県　　　　]

現在の居住地

日本国内なら都道府県、外国なら国で答えてください。

[都道府県か国　　]

許可など

どうやってこのアンケートを見つけましたか。（任意）

[　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　]

論文に回答を引用する許可

（引用は無記名で行います）

- ○ すべて許可する
- ○ 部分的に許可する（※メールで確認するつもりです）
- ○ 許可しない

次に進むとこれまでの回答を変更することはできないのでご注意ください。

[進む]

パート２／４

以下の文を、それぞれ検討してこの二つの側面で評価してください。

- この文を作った人の日本語能力
- 文の分かりやすさ

分かりにくい文があったら、不明な点を指摘してください。

『あの屋上に登ればこの町が一望できますよ。』

この文を作った人の日本語能力は自分と比べたら_____。

- ○ 1 - きっとより低い
- ○ 2 - たぶんより低い
- ○ 3 - だいたい同じ
- ○ 4 - たぶんより高い
- ○ 5 - きっとより高い

この文の意味が_____。

- ○ 1 - 全然分かりません
- ○ 2 - ほとんど分かりません
- ○ 3 - ほとんど分かります
- ○ 4 - 完全に分かります
- ○ 5 - 容易で完全に分かります

不明な点があれば、ここに書き留めてください。（任意）

[Identical tasks for 15 additional sentences omitted]

パート３／４

パート２で低い評価を付けた文を書き直してください。
全文を入力しても、直したい部分だけを省略しても、どちらでもかまいません。
不明な意味の場合は、複数の訂正案を挙げても、一つだけでも、どちらでもかまいません。

『**１日１ドル以下の生活をすれば、子供達が毎日学校に通うのは難しいだろうね。**』

> １日１ドル以下の生活をすれば、子供達が毎日学校に通うのは難しいだろうね。

[Identical task for up to 3 additional sentences omitted]

パート４／４

以下の文は、前のパートで評価した文の正しいバージョンです。
正しい文を読んで理解が変わったら、チェックボックスをマークしてください。
意味が変わらないと思ったら、入力しなくてもかまいません。

『**１日１ドル以下の生活だと、子供達が毎日学校に通うのは難しいだろうね。**』

元：『１日１ドル以下の生活をすれば、子供達が毎日学校に通うのは難しいだろうね。』

☐ この２文の文の意味が違います。

意味の差があれば、ここに書き留めてください。（任意）

[Identical tasks for 3 additional sentences omitted]

Appendix C Survey (Translated)

Part 1/4

Personal Information

Demographic information is collected in order to search for trends by e.g. age group or gender.
It will not be analyzed on an individual basis.

Japanese abilities

Compared to the average Japanese person, my Japanese abilities are…

- ○ 1 - Definitely lower
- ○ 2 - Probably lower
- ○ 3 - Around the same
- ○ 4 - Probably higher
- ○ 5 - Definitely higher

Age

Enter 0 if you do not wish to give your age.

[   ]

Gender

- ○ Male
- ○ Female
- ○ Other
- ○ Do not wish to respond

Home prefecture

[prefecture   ]

Current residence

Prefecture if in Japan, country otherwise.

[prefecture or country]

Consent

How did you find this survey? (Optional)

[   ]

Permission to quote responses in essay.

(Quotations will be anonymous)

- ○ Blanket permission
- ○ Permission with approval (via email)
- ○ No permission

Please note that you will not be able to change your answers in this part once you have continued to the next part.
[Continue]

Part 2/4

Please consider each of the following sentences and rate them based on these two criteria:

- The Japanese abilities of the person who wrote this sentence
- How easy the sentence is to understand

If any sentence is difficult to understand, please point out which part is unclear.

『**大学に入って家を出ることになった時も、ポチと一緒なら寂しくないだろうと思ったので、連れて行きました。**』

Compared to mine, the Japanese abilities of the person who wrote this sentence are _____.

- ○ 1 - definitely lower
- ○ 2 - probably lower
- ○ 3 - around the same
- ○ 4 - probably higher
- ○ 5 - definitely higher

I _____ the meaning of this sentence.

- ○ 1 - do not understand
- ○ 2 - mostly do not understand
- ○ 3 - mostly understand
- ○ 4 - completely understand
- ○ 5 - completely and easily understand

If any part of the sentence is unclear, please note it here. (Optional)

[Identical tasks for 15 additional sentences omitted]

Part 3/4

Please rewrite the sentences you rated poorly in part 2.
You may enter the complete sentence, or only the part you wish to change.
If the meaning of the sentence is unclear, you may (but are not required to) provide multiple alternative corrections.

『**僕が合図すれば、出てきてくれ。**』

僕が合図すれば、出てきてくれ。

[Identical task for up to 3 additional sentences omitted]

Part 4/4

The sentences below are correct versions of sentences you have previously rated.
If your understanding of the sentence changes after reading the correct version, please mark the checkbox.
If you think the meaning is unchanged, you do not need to input anything.

『１日１ドル以下の生活だと、子供達が毎日学校に通うのは難しいだろうね。』

Original：『１日１ドル以下の生活をすれば、子供達が毎日学校に通うのは難しいだろうね。』

☐ The meaning of these two sentences differs.

If there is a difference in meaning, please note it here (optional).

[Identical tasks for 3 additional sentences omitted]

Appendix D   Example sentences

This example sentences shown to survey respondents are collected in this section, with each sentence presented in a table. The first row indicates the sentence's internal *ID* in the survey software, which follows some rules:

- The first letter is `I` for sentences that are under investigation and `D` for distractors

- Sentences that are part of a control/error pair use `C` as the second letter for the control sentences and `E` for the sentences containing errors

- The ID ends with a number, to distinguish multiple sentences within the same category

- The remaining letters further specify the category, e.g. `TNA` for *tara* or *nara*

The next two rows give the *source* of the sentence, followed by the *original* sentence as it is written in the source. Some sentences were modified before being presented to respondents, so the *correct* row shows the canonical correct version of the sentence as used in the survey; differences between these two will be underlined in the original row. Finally, for sentences in the error categories, the *erroneous* version of the sentence is given. In stage 2 of the survey, control sentences show the correct version and error sentences show the erroneous version. Stage 3 and 4 do not show any control sentences; stage 3 only shows erroneous versions of error sentences, and stage 4 shows erroneous versions alongside their correct versions.

D.1 Correct use of *to*

ID	ICTO1
Source	Ueyama, 2021, p. 75.
Original	きれいな人に見つめられるとドキドキしてしまいます。
Correct	きれいな人に見つめられるとドキドキしてしまいます。
	Kirei na hito ni mitsumerareru to dokidoki shiteshimaimasu.
	My heart beats fast when someone pretty looks at me.

ID	ICTO2
Source	Ueyama, 2021, p. 74.
Original	慣れたヤツだとこんなドアはヘアピンで開けてしまいますからね。
Correct	慣れたヤツだとこんなドアはヘアピンで開けてしまいます。
	Nareta yatsu da to konna doa ha heapin de aketeshimaimasu.
	For someone experienced,
	this door can be opened with a hairpin.

D.2 Correct use of *ba*

Sentence ICBA2 was incorrectly transcribed (in this case, this is the reason for the difference between the *original* and *correct* versions), and was therefore excluded from analysis.

ID	ICBA1
Source	Ueyama, 2021, p. 70.
Original	あの屋上にのぼればこの町が一望できますよ。
Correct	あの屋上に登ればこの町が一望できますよ。
	Ano okujou ni noboreba kono machi ga ichibou dekimasu yo.
	If you climb up to that rooftop,
	you can get an unbroken view of the whole city.

ID	ICBA2
Source	Ueyama, 2021, p. 92.
Original	君が手紙を書けばおばあちゃんも喜ぶだろう。
Correct	? 君は手紙を書けばおばあちゃんも喜ぶだろう。
	Kimi ha tegami wo kakeba obaachan mo yorokobu darou.
	I'm sure your grandma would be happy
	if you wrote her a letter.

D.3   Incorrect use of *to*

ID	IETO1
Source	Oka et al., 2009, p. 5.
Original	皆さんは、日本に行ったらどんなことをしてみたいですか。
Correct	皆さんは、日本に行ったらどんなことをしてみたいですか。
	Minasan ha, nihon ni ittara donna koto wo shitemitai desu ka.
	What would you like to do {if / when} you go to Japan,
	everyone?
Erroneous	* 皆さんは、日本に行くとどんなことをしてみたいですか。
	Minasan ha, nihon ni iku to donna koto wo shitemitai desu ka.
	What would you like to do if you go to Japan, everyone?

ID	IETO2
Source	Ueyama, 2021, p. 72.
Original	もし時間があったら、明日空港に迎えに来てもらえない？
Correct	もし時間があったら、明日空港に迎えに来てもらえない？
	Moshi jikan ga attara,
	ashita kuukou ni mukae ni kite moraenai?
	If you have time,
	would you come pick me up at the airport tomorrow?
Erroneous	* もし時間があると、明日空港に迎えに来てもらえない？
	Moshi jikan ga aru to,
	ashita kuukou ni mukae ni kite moraenai?
	If you have time,
	would you come pick me up at the airport tomorrow?

D.4 Incorrect use of *ba*

No translation is given for the erroneous version of IEBA2, on account of the differing interpretations reported by survey respondents.

ID	IEBA1
Source	Ueyama, 2021, p. 100.
Original	僕が合図したら、出てきてくれ。
Correct	僕が合図したら、出てきてくれ。
	Boku ga aizu shitara, detekite kure.
	{If / When} I signal, please come out.
Erroneous	* 僕が合図すれば、出てきてくれ。
	Boku ga aizu sureba, detekite kure.
	If I signal, please come out.

ID	IEBA2
Source	Oka et al., 2009, p. 327.
Original	１日１ドル以下の生活だと、 子供達が毎日学校に通うのは難しいだろうね。
Correct	１日１ドル以下の生活だと、 子供達が毎日学校に通うのは難しいだろうね。
	Ichinichi ichidoru ika no seikatsu da to, kodomotachi ga *mainichi gakkou ni kayou no ha muzukashii darou ne.* Living on less than a dollar per day, it'd be hard for kids to go to school every day.
Erroneous	* １日１ドル以下の生活をすれば、 子供達が毎日学校に通うのは難しいだろうね。
	Ichinichi ichidoru ika no seikatsu wo sureba, kodomotachi ga *mainichi gakkou ni kayou no ha muzukashii darou ne.* ??

D.5 Correct use of directed motion

ID	DCDM1
Source	Ueyama, 2021, p. 74.
Original	高山君は、法事で田舎に帰っています。
Correct	高山君は、法事で田舎に帰っています。
	Takayama kun ha, houji de inaka ni kaetteimasu. Takayama has returned to the countryside for a memorial service.

ID	DCDM2
Source	Ueyama, 2021, p. 89.
Original	みんながおふろにはいりたいのです。
Correct	みんながおふろにはいりたいのです。
	Minna ga ofuro ni hairitai no desu. Everyone wants to get in the bath.

D.6 Incorrect use of directed motion

For sentence DEDM1, Inagaki (2001) provides both correct (*original*) and incorrect (*original 2*) sentences. DEDM1 and DEDM2 were modified to be less similar to each other.

ID	DEDM1
Source	Inagaki, 2001, p. 170.
Original	<u>サム</u>は家の中に歩いて入った。
Correct	花子は店の中に歩いて入った。
	Hanako ha mise no naka ni aruite haitta.
	Hanako walked into the store.
Original 2	<u>サム</u>は<u>家</u>の中に歩いた。
Erroneous	* 花子は店の中に歩いた。
	Hanako ha mise no naka ni aruita.
	Hanako walked ?? the store.

ID	DEDM2
Source	Inagaki, 2001, pp. 154-155.
Original	＿＿＿＿＿＿ジョンが<u>家の中</u>に走って行った。
Correct	放課後、ジョンがジムに走って行った。
	Houkago, jon ga jimu ni hashitte itta.
	After school, John ran to the gym.
Erroneous	* 放課後、ジョンがジムに走った。
	Houkago, jon ga jimu ni hashitta.
	After school, John ran ?? the gym.

D.7 Correct use of *tara* or *nara*

ID	DTNA1
Source	Ueyama, 2021, p. 74.
Original	ピアノがひけたらいいのになあ。
Correct	ピアノがひけたらいいのになあ。
	Piano ga hiketara ii no ni naa.
	It'd be nice to be able to play the piano.

ID	DTNA2
Source	Oka et al., 2009, p. 56.
Original	大学に入って家を出ることになった時も、
	ポチと一緒なら寂しくないだろうと思ったので、
	連れて行きました。
Correct	大学に入って家を出ることになった時も、
	ポチと一緒なら寂しくないだろうと思ったので、
	連れて行きました。
	Daigaku ni haitte ie wo deru koto ni natta toki mo,
	pochi to issho nara sabishikunai darou to omotta no de,
	tsurete ikimashita.
	Even when I left home to go to university, I brought Pochi
	along, thinking that if they were with me I wouldn't be lonely.

D.8 Correct sentences with no condition nor motion

ID	DNOR1
Source	Ueyama, 2021, p. 64.
Original	正夫は自転車をペンチで直した。
Correct	正夫は自転車をペンチで直した。
	Masao ha jitensha wo penchi de naoshita.
	Masao fixed his bike with pliers.

ID	DNOR2
Source	Ueyama, 2021, p. 71.
Original	医師は退院後の処置について患者の家族と相談した。
Correct	医師は退院後の処置について患者の家族と相談した。
	Ishi ha taiingo no shochi ni tsuite
	kanja no kazoku to soudan shita.
	The doctor consulted with the patient's family about
	their post-discharge treatment.

Appendix E   Data

Table 15 lists the demographic data of each respondent, and assigns them a short numeric ID. The scores in the *Japanese proficiency* column are participants' self evaluations, as described in more detail in Section 3.1. Respondents had the option to respond with *0* for their age if they did not wish to answer; in the table these respondents' ages will be blank.

Tables 16 and 17 list proficiency and comprehension score ratings by each respondent for each sentence; the respondent IDs in these tables correspond to those in Table 15. The sentence IDs in the heading (*ICTO*, *ICBA*, and so on) are explained in Appendix D. The left column under a sentence ID corresponds to the first item in that sentence category, and the right column corresponds to the second item.

Finally, Table 18 shows whether or not respondents felt that the meaning of a sentence differed when presented with both the erroneous and correct version (see Section 3.1 or refer to Part 4/4 in Appendix C). Here as well, respondent IDs match those in Table 15. Not all respondents completed the entire survey, thus there are blank rows for participants who did not complete stage 4 of the survey.

Table 15: Respondent demographics

ID	Gender	Age	Home Prefecture	Current Residence	Japanese Proficiency (Self-Evaluated)
1	Female	20	東京都	東京都	5
2	Female	20	東京都	Sweden	4
3	Male	22	兵庫県	東京都	5
4	Female	22	東京都	東京都	2
5	Female	22	北海道	Sweden	3
6	Female	21	千葉県	Sweden	5
7	Female	21	神奈川県	Sweden	3
8	Female	21	東京都	Sweden	3
9	Female	22	長野県	東京都	4
10	Female	21	熊本県	France	5
11	Female	26	宮崎県	神奈川県	3
12	Male	21	宮城県	東京都	3
13	Male	21	岐阜県	Netherlands	3
14	Female	20	徳島県	Sweden	2
15	Female	23	福岡県	東京都	4
16	Female	31	神奈川県	Sweden	4
17	Male		神奈川県	Sweden	3
18	Male	21	奈良県	Sweden	5
19	Female	21	奈良県	Sweden	4
20	Female	27	埼玉県	Sweden	2
21	Female	21	大阪府	Sweden	3

Table 15: Respondent demographics (Continued)

ID	Gender	Age	Home Prefecture	Current Residence	Japanese Proficiency (Self-Evaluated)
22	Female	21	兵庫県	Sweden	4
23	Female	22	大阪府	Sweden	4
24	Female	21	東京都	Sweden	4
25	Female	37	京都府	Sweden	3
26	Female	21	東京都	大阪府	4
27	Female	21	徳島県	徳島県	1
28	Female	20	兵庫県	大阪府	4
29	Female		東京都	Sweden	5
30	Female	20	岡山県	大阪府	4
31	Female	20	兵庫県	兵庫県	2
32	Female	20	福井県	大阪府	4
33	Female	52	愛媛県	東京都	4
34	Male	22	鹿児島県	鹿児島県	4
35	Female	52	愛媛県	東京都	4
36	Female	51	京都府	Sweden	4
37	Female	33	東京都	Sweden	4
38	Female	40	静岡県	Sweden	3
39	Female	40	京都府	Sweden	3
40	Female	78	千葉県	Sweden	4
41	Female	45	福岡県	Sweden	3
42	Female	38	兵庫県	Sweden	3

Table 15: Respondent demographics (Continued)

ID	Gender	Age	Home Prefecture	Current Residence	Japanese Proficiency (Self-Evaluated)
43	Female	22	北海道	Sweden	4
44	Female	31	神奈川県	Sweden	5
45	Female	48	東京都	Sweden	2
				End of Table	

Table 16: Proficiency evaluations

ID	Sentence ID															
	ICTO		ICBA		IETO		IEBA		DCDM		DEDM		DTNA		DNOR	
1	3	2	1	1	2	1	1	4	3	2	1	3	2	3	3	5
2	3	2	3	2	3	2	2	2	3	2	1	2	3	2	3	3
3	3	4	3	2	3	2	2	3	3	2	2	3	3	3	3	4
4	3	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3
5	3	2	3	2	2	1	2	3	3	3	1	2	3	3	3	3
6	3	2	5	2	2	2	2	2	5	1	1	2	3	4	3	5
7	3	2	3	1	2	2	2	3	3	2	2	1	3	2	3	3
8	3	3	3	2	2	2	2	3	3	2	1	2	3	3	3	3
9	3	2	4	2	1	2	2	2	3	2	2	2	3	3	2	3
10	3	3	3	2	2	2	3	2	3	3	1	3	3	3	3	3
11	3	2	3	2	2	1	2	2	3	3	2	1	3	3	3	3
12	3	2	2	2	2	2	2	2	3	2	2	2	3	3	3	3
13	3	3	3	2	2	2	2	3	3	2	2	3	3	3	3	3

Table 16: Proficiency evaluations (Continued)

ID	ICTO		ICBA		IETO		IEBA		DCDM		DEDM		DTNA		DNOR	
							Sentence ID									
14	3	2	3	2	3	2	2	2	3	2	2	1	3	3	3	5
15	3	2	3	2	1	1	2	2	3	2	1	2	3	3	3	3
16	3	4	3	1	1	1	1	1	3	3	1	1	3	3	3	3
17	3	1	3	2	2	2	3	2	3	3	1	2	3	3	3	3
18	3	4	3	2	3	2	3	2	3	3	1	2	3	3	3	3
19	3	3	3	1	1	1	3	3	3	1	1	2	2	2	3	3
20	3	3	3	2	2	2	2	2	3	3	2	2	3	3	3	3
21	3	3	3	2	2	2	2	2	3	2	2	2	3	2	2	3
22	3	3	3	2	2	2	3	2	3	3	2	2	3	2	3	3
23	3	3	3	2	2	1	3	3	3	1	2	2	3	3	2	3
24	3	1	3	1	1	1	1	1	3	3	1	2	3	2	3	3
25	3	3	3	2	3	2	3	2	3	3	2	2	3	3	3	3
26	3	1	3	1	1	1	1	2	3	3	1	2	3	1	3	3
27	5	3	5	1	3	1	3	5	4	2	2	2	3	3	3	5
28	3	2	3	1	2	1	3	2	3	2	3	2	3	2	3	3
29	3	3	3	1	1	1	1	1	3	2	1	1	3	3	3	3
30	3	3	3	2	3	2	3	3	4	3	2	2	3	4	3	3
31	5	2	5	2	1	2	2	2	5	3	1	2	3	5	3	5
32	3	3	3	1	2	1	2	3	3	2	1	1	3	3	3	3
33	3	3	3	2	3	2	3	3	3	3	2	2	3	3	3	3
34	3	3	3	1	1	1	1	2	3	3	1	2	3	3	3	3

Table 16: Proficiency evaluations (Continued)

ID	ICTO		ICBA		IETO		IEBA		DCDM		DEDM		DTNA		DNOR	
									Sentence ID							
35	3	2	3	2	2	2	2	2	3	3	2	3	3	3	3	3
36	3	2	3	1	2	1	2	1	3	2	1	1	2	3	3	2
37	3	2	2	1	1	1	1	1	3	2	1	1	3	3	3	4
38	1	3	3	1	1	1	1	1	3	1	1	1	1	2	3	3
39	3	3	3	2	3	2	3	3	3	3	2	3	3	3	3	3
40	3	3	3	2	3	2	2	2	3	3	2	3	3	3	3	3
41	3	3	3	1	3	1	2	1	3	1	2	1	3	3	3	3
42	3	3	3	2	3	2	3	2	3	3	2	2	3	3	3	3
43	3	2	3	2	2	1	2	2	3	2	2	2	3	2	3	3
44	3	3	3	2	1	1	1	2	3	2	1	2	3	2	3	3
45	3	3	4	3	3	2	3	3	3	3	3	3	3	3	4	3
End of Table																

Table 17: Comprehension evaluations

ID	ICTO		ICBA		IETO		IEBA		DCDM		DEDM		DTNA		DNOR	
									Sentence ID							
1	5	5	5	5	5	5	5	5	5	5	2	4	5	5	4	5
2	5	4	5	5	4	5	4	5	5	5	4	5	5	4	5	5
3	5	5	5	4	5	4	5	5	5	5	3	3	5	5	5	4
4	3	2	3	3	2	4	4	2	3	3	3	4	4	3	2	3

Table 17: Comprehension evaluations (Continued)

ID	ICTO		ICBA		IETO		IEBA		DCDM		DEDM		DTNA		DNOR	
5	4	3	4	3	3	3	3	4	4	4	3	3	4	4	4	4
6	5	5	5	3	5	4	5	3	5	3	5	5	5	5	5	5
7	5	4	5	4	4	4	4	5	5	3	4	4	5	4	5	5
8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
9	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5
10	5	5	5	5	4	4	4	3	5	5	3	5	5	5	5	5
11	5	3	5	4	4	3	3	2	5	4	2	3	5	4	5	5
12	5	3	5	5	5	4	5	3	5	4	3	3	5	5	4	5
13	5	5	5	3	3	3	5	5	5	3	3	4	5	5	5	5
14	5	2	5	4	5	4	4	2	5	4	3	3	5	5	5	5
15	5	5	5	5	5	5	5	2	5	5	3	5	5	5	5	5
16	5	5	5	3	4	2	3	2	5	3	3	4	5	5	4	4
17	5	3	5	4	5	4	5	3	5	5	4	4	5	5	5	5
18	5	5	5	3	5	3	4	2	5	4	3	4	5	4	4	4
19	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5
20	5	4	5	5	5	4	4	4	5	5	5	4	5	5	5	5
21	5	5	5	5	5	5	5	3	5	3	3	3	5	5	5	5
22	5	4	5	5	5	4	5	4	5	5	4	4	5	3	5	5
23	5	4	5	4	5	5	5	4	5	5	5	3	5	5	5	5
24	5	5	5	5	5	5	5	3	5	5	4	3	5	4	5	5
25	5	5	5	3	5	5	5	2	5	5	2	3	5	5	5	5

Table 17: Comprehension evaluations (Continued)

ID	ICTO		ICBA		IETO		IEBA		DCDM		DEDM		DTNA		DNOR	
															Sentence ID	
26	5	4	5	4	4	4	4	3	5	5	3	3	5	4	5	5
27	5	5	5	3	5	3	5	5	5	4	3	4	5	5	5	5
28	5	4	5	4	4	4	5	3	5	4	4	4	5	5	5	5
29	5	5	5	3	4	4	3	3	5	3	3	4	5	5	5	5
30	4	4	4	4	4	3	4	3	5	3	3	3	4	4	4	4
31	5	2	5	5	5	5	5	3	5	5	5	5	5	5	5	5
32	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5
33	5	4	5	3	5	5	5	3	5	3	3	4	5	5	5	5
34	4	5	5	4	4	4	4	4	5	4	4	4	5	4	5	5
35	4	4	5	3	4	3	3	4	5	4	3	5	5	5	5	5
36	5	5	5	4	5	4	5	3	5	5	3	3	5	5	5	5
37	5	5	5	5	4	5	5	2	5	5	4	3	5	5	5	5
38	5	5	5	5	5	5	5	5	5	5	3	3	5	5	5	5
39	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
40	4	4	4	3	4	3	3	2	4	4	3	3	4	4	4	3
41	5	3	5	3	5	4	5	1	5	3	3	3	4	5	5	5
42	5	5	5	4	4	4	4	3	5	5	3	3	5	5	5	5
43	5	4	4	4	5	4	5	5	5	5	4	4	5	5	5	5
44	5	5	5	3	3	3	3	3	5	4	2	3	5	4	5	5
45	5	5	4	5	5	5	5	5	5	4	5	5	5	5	2	5
End of Table																

Table 18: Difference after correction?

ID	IETO1	IETO2	IEBA1	IEBA2
		Sentence ID		
1	No	No	No	Yes
2	No	No	Yes	Yes
3	-	-	-	-
4	-	-	-	-
5	Yes	Yes	Yes	No
6	No	No	No	No
7	Yes	Yes	No	No
8	No	No	No	No
9	No	No	No	No
10	No	No	No	Yes
11	No	No	No	No
12	No	No	No	No
13	No	No	No	No
14	No	No	No	No
15	No	No	No	No
16	No	No	No	Yes
17	Yes	Yes	Yes	Yes
18	No	Yes	Yes	Yes
19	No	No	No	Yes
20	No	No	No	Yes
21	No	No	No	Yes

Table 18: Difference after correction? (Continued)

ID	IETO1	IETO2	IEBA1	IEBA2
		Sentence ID		
22	No	No	Yes	No
23	No	No	No	No
24	-	-	-	-
25	-	-	-	-
26	-	-	-	-
27	No	No	No	No
28	No	No	No	No
29	No	No	No	No
30	Yes	No	No	No
31	No	No	No	No
32	Yes	Yes	Yes	Yes
33	-	-	-	-
34	No	No	No	Yes
35	Yes	No	No	No
36	-	-	-	-
37	No	No	No	No
38	No	No	No	No
39	-	-	-	-
40	Yes	Yes	Yes	Yes
41	No	No	No	Yes
42	Yes	Yes	Yes	Yes

Table 18: Difference after correction? (Continued)

| ID | Sentence ID | | | |
	IETO1	IETO2	IEBA1	IEBA2
43	No	No	No	No
44	No	No	No	Yes
45	Yes	Yes	No	No
End of Table				