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OVERGENERALIZATION OF CLITIC AND NON-CLITIC NEGATION: A STUDY OF JAPANESE EFL STUDENTS' UNDERSTANDING OF NEGATIVE QUESTIONS

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Students of English as a foreign language (EFL) often have difficulty managing the complex nature of the formation of questions and negative sentences. The present study used a timed sentence correctness task to investigate the effects of word order and the presence or absence of clitic negation (i.e., don't, isn't, won't) on the processing of English negative questions by native speakers of Japanese. Two experiments were conducted, for both Yes/No questions and wh-questions. Each experiment included two correct conditions for the placement of negation, (a) (Why) Doesn't Mary drive? and (b) (Why) Does Mary not drive?, as well as two incorrect conditions, (c) (Why) Does not Mary drive? and (d) (Why) Does Mary drive not?. There were no significant differences attributable to student level, or between the correct and incorrect conditions. However, within the correct and incorrect groups there was a significant difference in the accuracy of responses. Students found it easier to decide the correctness of questions in the form (Why) Doesn't Mary drive? and (Why) Does Mary drive not? quickly and accurately. However, they had significantly more difficulty with questions of the form (Why) Does Mary not drive? and (Why) Does not Mary drive? Results suggest that there is little influence from L1 Japanese syntax because students judged questions using the structure (Why) Does Mary drive not? which places not after the verb and is similar to the pattern for Japanese negation, to be incorrect relatively easily. The fact that the forms (Why) Does not Mary drive ? and (Why) Does Mary not drive? were not accurately judged as correct/incorrect indicates an overgeneralization of the equivalency of clitic negation, and non-clitic negation.

Key words: overgeneralization, clitic and non-clitic negation, Japanese EFL students

For learners of English as a foreign language, especially Japanese learners, two of the most challenging facets of learning English grammar are the formation of interrogative and negative forms. The process of forming a question, from the learner's point of view, is quite complex—it can be indicated by merely using rising intonation, or may involve restructuring the sentence by the insertion of the auxiliary verb *do* and inversion of the subject and verb, also known as Subject Auxiliary Inversion, SAI (Yamaguchi, 2006). Negation involves the addition of the negative element *not* as well as the insertion of the auxiliary verb *do*. When the two processes are combined, it becomes even more complicated. Studies of native, English-speaking children indicate that even if a child has mastered the separate processes of creating negative sentences and questions, he or she may still have difficulty combining them to form accurate negative questions (e.g., Guasti

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& Rizzi, 1996; Guasti, Thornton, & Wexler, 1995). This study examined the degree to which these syntactic elements and operations are problematic for Japanese EFL students by using a timed sentence correctness task to measure the accuracy and speed with which student test subjects could determine whether the example negative questions were grammatically correct or not.

Formation of Negative Questions in English

There are three patterns for negation depending on the type of verb. The simplest is the verb *be.* Beginning with a base sentence, *This is a pipe.,* the negative element *not* is added after the verb: *This is not a pipe*. In the case of modal and auxiliary verbs (*can, must have*, *will, be*), the process of negation is also straightforward. The negative element *not* is inserted following the conjugated form of the auxiliary verb: *She is not talking.* or *We must not smoke here*. The auxiliary verb precedes both the negative element *not* and the main verb to be negated. Negation involving thematic or action verbs (e.g. *eat*), requires the addition of an additional element, the placeholder auxiliary verb *do/does*, in addition to the negative element, *not*, resulting in *Jane does not eat apples.* If the negative element *not* is unstressed, then it often is shortened to *n't* and combined with the auxiliary, this is called clitic negation (e.g., *Jane doesn't eat apples. This isn't a pipe. We mustn't smoke here.*). Both forms—the contraction or the standard use of an auxiliary verb—are equally correct, semantically and grammatically.

Similar to negation, the way SAI is used to form questions depends on the type of verb. The most straightforward pattern is the verb *be,* the statement *This is expensive* becomes a question by moving the verb to sentence-initial position before the subject, *Is this expensive*?. In the case of complex verb forms in which there are two or more verbs combined (e.g., perfect and progressive tenses or modal verbs), only the auxiliary verb or modal verb moves to the sentence-initial position, the main verb does not move (*I can help you.* becomes *Can I help you*?). In the case of a simplex verb, instead of moving the main verb, the auxiliary placeholder verb *do/does* is added before the subject to form a question (*They eat fish*. becomes *Do they eat fish*?). While these ideas seem fairly simple, the use of both SAI and negation to form negative questions is a much more complicated process than either one separately.

Influence from Syntactic Operation of Japanese to English

By comparison, in the Japanese language the processes of negation and question formation are relatively straightforward. Negation is accomplished by changing the suffix of the verb and adding the negative particle *-nai*. For example, a Japanese sentence, *Watashi-no haha-wa kaimono-ni iku* meaning '*My mother goes shopping*' can turn to a negative by *Watashi-no haha-wa kaimono-ni ika-nai* '*My mother does not go shopping*' by simply adding *-nai* at the end of the sentence. Although the previous example semantically requires the future tense, a question form is even more straightforward as in *Watashi-no haha-wa kaimono-ni iku-daro-ka* '*Will my mother go shopping?*' which is accomplished by simply adding the question particle *-ka* at the end of sentence. Negative questions involve merely adding the question particle to the negative form of the verb, it is

also easy to produce by adding both *-nai* and *-ka* as in *Watashi-no haha-wa kaimono-ni ika-nai-daro-ka* '*Will my mother not go shopping?*' As such, Japanese sentences do not require any movements for questions, but simply adding these elements after the verb.

It is expected that the acquisition of SAI in English poses a great difficulty for Japanese EFL students because this type of syntactic operation does not exist in Japanese, their first language (L1) (Yamaguchi, 2006). If syntactic operations in Japanese directly influence English, Japanese EFL students will view a sentence with the negation *not* following the verb, as in *He eats not meat*, as acceptable. To measure the effect of L1 on Japanese EFL students' understanding of English, the condition 'SAI with negation placed after the main verb' was included. However, the amount of influence is assumed to vary with overall English reading ability. In other words, the direct transfer of syntactic operations from Japanese to English will be weakened as Japanese EFL students increase their English ability. Therefore, using an English reading comprehension test, the present study compared groups of Japanese EFL students with higher and lower levels of English reading ability.

Acquisition of SAI and Negation

Language learners, regardless of native language, quickly pick up a notion of negation that is meaningful, if not grammatically correct. Stauble (1984) presents several stages of the use of negation as a student becomes more proficient in English. In early stages, the word *no* is often attached to the element to be negated: *He is no tall* and *I no have a car.* Similarly, beginning learners often create questions by taking a declarative statement and adding rising intonation: *You like pizza*?. Although technically correct, it actually has a meaning that expresses surprise rather than neutral inquiry. In both cases, the acquisition of the auxiliary verb, *do*, comes later. Moving the verb to the sentence-initial position and/or adding *do* is learned quite early, and used accurately by native English-speaking children (e.g., Guasti, 2002; Guasti & Rizzi, 1996; Radford, 1996). In an intermediate stage, *don't* and *isn't* are learned as single units and often over-applied, without respect to third-person subject agreement: *She don't like sushi.* In negative questions *do* and SAI movement can be problematic. Children often choose to combine the rules, producing sentences such as *Why don't he don't eat meat* or *What kind of bread do you don't like*? The learning trajectories of Japanese EFL students follow a similar path. The basics of negation, particularly clitic negation, and using SAI and *do* to form questions, are taught early in the curriculum of compulsory English education in Japan. But it is not necessarily mastered quickly; the ease with which learners manipulate *do* in negation and questions while applying SAI is an important indicator of overall proficiency (Stauble, 1984).

The present study began with Stauble (1984), Guasti (2002), and Radford (1996) who described the difficulty that native-speaking English children experienced in acquiring the forms of negative questions. They noted that while SAI for positive Yes/No and *wh*-questions (i.e. Who? What? Where?, etc.) is acquired at a relatively early stage, it is often incorrectly applied in negative questions. A typical mistake is that the rules learned for forming questions and negatives are applied simultaneously, resulting in a

question such as *What kind of bread do you don't like*? which uses the auxiliary verb *do* twice in the same sentence. However, formation of a negative question should begin by creating a negative sentence and then applying SAI to it (e.g., the negative statements *Joe does not cook* and *Joe doesn't cook* become the questions *Does Joe not cook*? and *Doesn't Joe cook?*).

Those examples suggest another possible source of confusion for learners (both native children and EFL students) may be in the use of clitic negation. In general the negative element *not* is affiliated with the main verb (i.e. *cook*) rather than the auxiliary verb *do*. On the other hand, SAI, by definition, affects only the auxiliary verb. So in the case of regular negation, SAI shifts *do/does* to the beginning of the sentence, while *not* remains in the predicate (*Does Joe not cook*?). In the case of clitic negation, the entire clitic phrase is subject to SAI (*Doesn't Joe cook*?). The pattern for negative questions seems consistent until we look at the case of SAI that includes the movement of the negation-*not* to the head of the sentence (i.e., *Does not Joe cook*?) which is incorrect, even though the actual negative statements (*does not* and *doesn't*) are equivalent, semantically and grammatically.

Other research in second language acquisition further indicates how problematic negation can be for learners. In timed sentence correctness tasks, although overall accuracy was high, students had more difficulty rejecting grammatically incorrect negation, than recognizing grammatically correct sentences. Incorrect forms that resembled those of the students' native language (L1) were particularly difficult (Hawkins, 2001). These results indicate that there is some influence of L1 on the assessment of the correctness of negative sentences in L2. Japanese EFL students might have the same difficulty indentifying incorrect forms of negative interrogatory sentences in English.

The present study investigated the heretofore largely unexplored topic of the extent of Japanese students' knowledge of word order in negative questions, including the correct usage of clitic negation. The strengths and weaknesses of Japanese students in this respect were determined by conducting a timed sentence correctness task to measure the effects of the placement of the elements signifying question (e.g., *do* at the beginning of the sentence) and negation (e.g., *not*) in negative questions. The current study is focused on the ability of students to determine only the correctness or incorrectness of word order. Participants were not asked to evaluate the appropriateness of nuanced differences in meanings as this was beyond the scope of the experiment[1].

Factors Influencing Control of SAI and Negation

All the above factors serve to indicate that the formation of negative questions would be problematic for learners of English, both native-speaking children and EFL students. Student learning may be hampered due to overgeneralization about the differences between the forms of negative declarative sentences and negative interrogatory sentences

[1] Swan (1995), Romero and Han (2001, 2002, and 2004), and Reese (2005) address these issues of the implied meanings of negative questions.

and the syntax of their own language. The form of the test items were chosen in order to investigate these factors. Because the syntax of regular (*do not*, *cannot*) and clitic negation (*don't, can't*) in negative declarative sentences and negative interrogative sentences are different, it may be difficult for learners to acquire this distinction. Accordingly, this study included test items with two correct forms: 'SAI including clitic negation-*n't*.' (*Don't you like sushi*?) and 'SAI with negation-*not* in the predicate' (*Do you not like sushi*?) and an incorrect form 'SAI including negation-*not*' (*Do not you like sushi*?). The fourth test item was chosen because it is assumed that the syntax of Japanese L1, which uses the word order of 'verb plus-*nai*' for negation, might influence what was seen as correct negation in English. As a result, test items of the form 'SAI with negation-not after the verb' (*Do you like not sushi*?) were created. In all cases, the influence of English reading ability is also presumed to affect error rates, with higher levels making fewer mistakes. To assess the effect, if any, of increased length and complexity on assessment of correctness, two experiments were conducted using different types of questions. The first used simple Yes/No negative questions (*Will Jane not be available*?) and the second used negative *wh*-questions (*When will Jane not be available*?).

EXPERIMENT 1

The first experiment hypothesized that the placement of the negative element would affect the speed and accuracy of students' responses. In the pair of conditions with correct 'Yes' responses, it was assumed that questions of the form, *SAI including clitic negation-n't* would exhibit relatively lower error rates and faster reaction times than those of the form *SAI with negation not in the predicate*. In the case of the pair of conditions with correct 'No' responses, the form *SAI including negation-not* was expected to have short response times but high error rates due to the perceived equivalence of clitic and non-clitic negation in questions. Due to its similarity to syntactic operations in Japanese, it was expected that the second correct 'No' condition, negative questions of the type *SAI with negation-not after the verb*, would also exhibit short response times, but high error rates. Finally, it was assumed that students with higher levels of reading ability would exhibit both higher accuracy and faster reaction times than students of lower reading ability for all conditions and types of questions.

METHOD

Participants

Forty-five undergraduate students (33 females and 12 males) at Hiroshima Shudo University in Japan, all native speakers of Japanese, participated in the experiments. Ages ranged from 23 years and 2 months to 18 years and 9 months. The average age was 20 years and 3 months with a standard deviation of 1 year and 0 months on the respective day of testing. Participants were volunteers and each received a small fee as compensation for their participation. The type of data to be collected and its use for this study were explained to the students before the tests. Following the tests, students were offered the option of withdrawing their responses from the data. Names and other identifying information were kept anonymous.

To assess the influence of students' English abilities, 45 students were given a multiple-choice cloze reading exercise based on a placement test developed by Poel and Weatherly (1997) prior to the experiments. The placement test had been previously tested for reliability in assigning college students to the appropriate level of English courses. Although the test was administered without a time limit, all the students completed the test within 10 minutes. Out of the maximum of 15 points, the test scores for all participants had a mean of 10.43 with a standard deviation of 2.56. The students were divided into two groups, those with a score of eleven or higher, and those with a score of 10 and lower; the higher reading level (22 students) had a mean of 12.45 with standard deviation of 1.14, while the lower reading level (23 students) had a mean of 8.48 with the standard deviation of 2.02. A t-test showed that mean scores of the two groups were statistically different [$t(43) = 8.077, p < .001$].

Stimulus Items

Question sentences for correct 'Yes' responses were created on the basis of 40 baseline sentences like *Stig speaks Norwegian*. Each sentence was altered to make two types of correct negative questions, a question including clitic negation *n't*, such as *Doesn't Stig speak Norwegian*? and a question in which the negation *not* remains in the predicate such as *Does Stig not speak Norwegian*? A total of 80 such questions were prepared for the experiment.

A similar procedure was used to create syntactically incorrect sentences for correct 'No' responses for the timed sentence correctness task. The correct 'No' responses were based on a set of 40 baseline sentences, like *She drinks ginger ale.* The baseline was transformed into two types of incorrect negative questions, a question in which the negation *not* is moved to the head of the sentence, such as *Does not she drink ginger ale*? and a question in which the negation *not* is placed after the main verb, such as *Does she drink not ginger ale*? A total of 80 incorrect negative questions were prepared.

Since in the creation of both sets of stimulus questions, a pair of questions was created from identical baseline sentences and are therefore equal in terms of words used, the differences in syntactic structure between the two types of correct questions can be compared in terms of reaction times and error rates. The pairs of negative questions can also be compared in the same way.

It was expected that reading times would become shorter when participants saw sentences containing the same words. In order to prevent this problem of repeatedly encountering the same words in very similar sentences, a counterbalanced design was used to assign participants to different words. Two lists of sentences were given to two groups of participants. Each list consisted of 40 correct negative questions for correct 'Yes' responses and 40 incorrect negative questions for correct 'No' responses. In addition, 20 control sentences (not in the form of questions) were added to each of the two stimulus lists. The same control sentences were used for both stimulus lists. Consequently, a total of 100 sentences in each list consisted of 40 correct (20 *SAI + n't movement* type and 20 *SAI + not in IP* type), 40 incorrect (20 *SAI + not movement* type questions and 20 *SAI + not after verb* type questions), and 20 control sentences.

Procedure

The computer program that controlled the presentation was Microsoft Visual Basic 6.0 + Microsoft DirectX8. Stimuli with both 'Yes' and 'No' correct responses were presented to participants in random order in the center of a computer screen 600 milliseconds after the appearance of a series of crosses '+++++' indicating an eye fixation point. Participants were given the following instructions: "A sentence in English will appear briefly on the screen. Please decide whether or not the question is grammatically correct. If it is correct, press the key marked 'Yes'; if it is not correct, press the key marked 'No'. Please respond as quickly and accurately as possible. The participants' responses were registered by the computer. Twenty practice trials were given to the participants prior to the commencement of actual testing.

ANALYSIS AND RESULTS

To limit the effect of anticipation and late responses, extremes among correctness decision times (less than 400 milliseconds and longer than 12,000 milliseconds) were recorded as missing values. There were 46 such cases, comprising 1.28 percent out of a

Table 1. Reaction Times and Accuracy Rates for Question Sentences with Negation in Experiment 1

Response Type	Sentence Type	Higher in Reading Comprehension				Lower in Reading Comprehension			
		Reaction Time (ms)		Accuracy Rate (%)		Reaction Time (ms)		Accuracy Rate (%)	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Correct 'Yes'	SAI+*n't* movement	4,705	1,210	82.27%	20.22%	4,687	1,342	81.96%	14.98%
Responses	SAI+*not* in predicate	5,832	1,964	35.00%	32.07%	5,499	1,638	51.74%	31.28%
Correct 'No'	SAI+*not* movement	6,023	1,670	23.64%	22.63%	6,038	1,635	28.26%	22.03%
Responses	SAI+*not* after verb	4,855	1,281	87.05%	13.33%	5,628	1,104	72.61%	21.31%

total of 3,600 responses. The means and standard deviations of correct 'Yes' reaction times and error rates for sentence correctness decisions are presented in Table 1. Before analysis, reaction times outside of 2.5 standard deviations at both the high and low ranges were replaced by boundaries of 2.5 standard deviations from the individual means of participants in each category. This data editing process of reaction times has been used commonly in experimental psychology (e.g., Coltheart & Rastle, 1994; Peereman & Content, 1995; Xu, Pollatsek, & Potter, 1999). There were 14 responses modified in this way. The statistical tests which follow analyze both subject (F_1) and item (F_2) variability. Only stimulus items of correct responses were used in the analyses of reaction times. As for correct 'Yes' responses, a series of 2 (students with higher and lower English reading comprehension) × 2 (*SAI + n't movement* and *SAI + not in predicate*) two-way analyses of variance (ANOVAs) with the last variable repeated were conducted on reaction times (milliseconds) and accuracy rates (percents), using participant (F_1) and item (F_2) variabilities. Due to having no correct responses for correct 'Yes' items, six participants were excluded (i.e., recorded as a missing value) from the analysis of reaction times, but included in accuracy data. In addition, since one sentence received no correct response, this sentence was removed (i.e., recorded as a missing value) in item analysis for reaction times. The ANOVA indicated that for correct 'Yes' responses, *SAI + n't movement* (M = 4,696 ms) resulted in shorter reaction times than *SAI + not in predicate* (M = 5,653 ms) [$F_1(1, 37) = 9.272$, $p < .01$; $F_2(1, 77) = 15.037$, $p < .001$]. The difference of 957 milliseconds in reaction times between question sentences of *SAI + n't movement* and *SAI + not in predicate* was significantly large. However, the main effect of student's level of reading comprehension was not significant [$F_1(1, 37) = 0.206$, $p =. 653$, *n.s.*; $F_2(1, 77) = 2.350$, $p = .129$, *n.s.*]. The interaction of these two variables was not significant [$F_1(1, 37) = 0.245$, $p = .624$, *n.s.*; $F_2(1, 77) = 3.082$, $p = .083$, *n.s.*].

The same analysis was also conducted on accuracy data of correct 'Yes' responses. As seen in Table 1, overall there was a great difference of 38.55 percent between *SAI + n't movement* (M = 82.11%) and *SAI + not* in IP (M = 43.56%). This difference was significant [$F_1(1, 43) = 36.631$, $p < .001$; $F_2(1, 78) = 270.395$, $p < .001$]. The main effect of student's level of reading comprehension was not significant in subject analysis [$F_1(1,$

43) = 3.830, p = .057, *n.s.*], but there was a significant difference in item analysis [F_2(1, 78) = 17.943, p < .001]. The interaction of these two variables was not significant in subject analysis [F_1(1, 43) = 1.774, p = .190, *n.s.*], but significant in item analysis [F_2(1, 78) = 16.840, p < .001]. Thus, taking the consistent results in both participant and item analyses, the results indicated in general that *SAI + n't movement* and *SAI + not in predicate* showed a great difference, regardless of student level of reading comprehension.

Regarding the data for correct 'No' responses, a series of 2 (students with higher and lower reading comprehension) × 2 (*SAI + not movement* and *SAI + not after verb*) two-way ANOVAs with the last variable repeated were conducted on reaction times and accuracy rates, using participant (F_1) and item (F_2) variabilities. Due to having no correct responses for correct 'No' items, three participants were excluded from the analysis of reaction times, but included in accuracy data. Since one sentence received no correct response, this sentence was removed from item analysis for times. The ANOVA indicated that for correct 'No' responses, *SAI+not movement* resulted in longer reaction times (M = 6,031 ms) than *SAI + not after verb* (M = 5,260 ms) [F_1(1, 40) = 10.643, p < .01; F_2(1, 77) = 7.711, p < .01]. However, the main effect of student's level of reading comprehension was not significant [F_1(1, 40) = 1.112, p = .298, *n.s.*; F_2(1, 77) = 1.043, p = .310, *n.s.*]. The interaction of these two variables was not significant [F_1(1, 40) = 2.457, p = .125, *n.s.*; F_2(1, 77) = 3.247, p = .075, *n.s.*].

The same analysis was also conducted on accuracy data of correct 'No' responses. As seen in Table 1, overall there was a great difference of 53.67 percent between a *SAI + not movement* order (M = 26.00%) and a *SAI + not after verb* order (M = 79.67%). This difference was significant [F_1(1, 43) = 134.848, p < .001; F_2(1, 78) = 614.381, p < .001]. The main effect of student's level of reading comprehension was not significant in both participant [F_1(1, 43) = 1.622, p = .210, *n.s.*] and item [F_2(1, 78) = 3.896, p = .052, *n.s.*] analyses. The interaction of these two variables was significant in both participant [F_1(1, 43) = 4.219, p < .05] and item [F_2(1, 78) = 13.118, p < .001] analyses.

Since the interaction was significant, post-hoc sample-matched t-tests for accuracy rates in the two conditions of correct 'No' responses were conducted separately for students of higher and lower levels of English reading comprehension. Regarding accuracy rates among students with higher English reading comprehension (two participants were treated as missing values for subject analysis while there were no missing values for item analysis), there was a significant difference between the *SAI + not movement* order and the *SAI + not after verb* order in accuracy rates of both participant [t_1(21) = –10.253, p < .001] and item [t_2(39) = –19.929, p < .001] analyses. Similarly, among students of lower English reading comprehension (one participant was treated as a missing value) there was a significant difference between the *SAI + not movement* order and the *SAI + not after verb* order in accuracy rates in both participant [t_1(22) = –6.444, p < .001] and item [t_2(39) = –15.087, p < .001] analyses. Since all the t-tests in both participant and item analyses showed significant differences, these post-hoc investigations did not reveal a clear tendency for the significant interaction. However, judging from the means of accuracy rates in Table 1, students in the high reading comprehension group seem to have higher accuracy rates in accurately rejecting incorrect sentences of the *SAI + not after verb* order.

DISCUSSION

One of the interesting results of Experiment 1 was the disparity in accuracy rates and reaction times within the two conditions of correct 'Yes' responses, as well as within the two conditions of correct 'No' responses. This symmetrical result indicates that the structure of the question—rather than its innate correctness or incorrectness—caused delays and errors in the timed sentence correctness task. In both groups one question form was markedly easier to assess correctly than the other. In the case of correct 'Yes' responses, it was relatively easy for students to identify the correctness of questions of the form *SAI + n't* quickly (i.e. shorter reaction times) and accurately (higher percent correct). In contrast, it was difficult for students to accurately classify questions of the form *SAI + not in the predicate* as correct. Surprisingly, in the correct 'Yes' responses, higher or lower reading levels did not seem to affect the accuracy rates.

Among the correct 'No' responses, despite the expectation of an effect from its similarity to Japanese syntactic structure questions of the form *SAI + not after verb* were quickly and accurately assessed as incorrect consistently by both groups, with the students with the higher reading level showing a slightly higher accuracy rate. On the other hand, assessment of questions with the form *SAI + not movement* required more time and were less accurate, indicating that these types of questions are extremely difficult to accurately reject as incorrect sentences. This trend was found in both groups of students.

EXPERIMENT 2

The results of the first experiment suggested that Japanese EFL students find the form of negative Yes/No questions very difficult. In particular, it was difficult to determine the correct movement of negation *not* in negative questions. The following experiment sought to extend the findings to *wh*-questions. The addition of w*h*-interogatory words clearly signals that the sentence is a question, which may aid processing. However it also adds another syntactical element to be managed in the process of SAI and negation, and may make correctness assessments more difficult. A common error among Japanese EFL learners in relation to *wh*-questions is incorrect word order in questions where *what* refers to the direct object (for example *What do you like sports?* instead of the correct form *What sports do you* like*?*). It is possible that such difficulties extend to negative questions as well.

Experiment 2 assumed that the placement of the negative element would affect the speed and accuracy of students' responses. Following the results of Experiment 1, it was expected that in the group of correct 'Yes' responses accuracy rates would be relatively high and response times relatively short for negative questions of the type *Wh- + SAI including clitic negation-n't*. Conversely, questions of the form *Wh- + SAI including negation-not in the predicate* were expected to have high error rates and long response times. In the case of correct 'No' responses, error rates for the condition, *Wh- + SAI with negation-not* after the verb in spite of its similarity to Japanese was assumed to exhibit

relatively lower error rates and faster reaction times than questions of the form *SAI including negation-not* which are also expected to have high error rates and long response times. Finally, it was assumed that students with higher levels of reading ability would be able to respond more quickly and accurately than those of lower reading ability.

METHOD

Participants

The participants were the same as in Experiment 1.

Stimulus items

Question sentences for correct 'Yes' responses were created in a similar way to those in Experiment 1. However, Experiment 2 used 40 baseline *wh*-questions such as, *Where can we use the phone*?. Each question was altered to make two types of negative *wh*-questions, a question including clitic negation *n't* such as, *Where can't we use the phone*? and a question with the negation *not* in the predicate such as, *Where can we not use the phone*?. A total of 80 such questions were prepared for the experiment.

A similar procedure was used to create syntactically incorrect sentences for correct 'No' responses for the timed sentence correctness task. The correct 'No' responses were based on a set of 40 baseline sentences, like *When does she study*?. The baseline was transformed into two types of incorrect negative questions, a question in which the negation *not* is moved to the head of the sentence such as, *When does not she study*? and a question in which the negation *not* is placed after the main verb such as, *When does she study not*?. A total of 80 incorrect negative questions were prepared.

Since in the creation of both sets of stimulus questions, a pair of questions was created from identical baseline sentences and are therefore equal in terms of words used, the differences in syntactic structure between the two types of correct questions can be compared in terms of reaction times and error rates. The pairs of negative questions can also be compared in the same way.

As in Experiment 1, a counterbalanced design was used to assign participants to different words and thus prevent the problem of repeatedly encountering the same words in similar sentences. Two lists of sentences were given to two groups of participants. Each list consisted of 40 correct negative questions for correct 'Yes' responses and 40 incorrect negative questions for correct 'No' responses. In addition, 20 control sentences (not in the form of questions) were added to each of the two stimulus lists. The same control sentences were used for the two stimulus lists. Consequently, a total of 100 sentences in each list consisted of 40 correct *wh*-questions (20 *Wh- + SAI + n't movement* and 20 *Wh-SAI + not in predicate* type), 40 incorrect *wh*-questions (20 *Wh + SAI + not movement* questions and 20 *Wh + SAI + not after verb* type), and 20 control sentences.

Procedure

The same as Experiment 1.

ANALYSIS AND RESULTS

To limit the effect of anticipation and late responses, extremes among correctness decision times (less than 400 milliseconds and longer than 12,000 milliseconds) were recorded as missing values. There were 39 such cases, making up 1.08 percent out of a total 3,600 responses. The means and standard deviations of correct 'Yes' reaction times and error rates for sentence correctness decisions are presented in Table 2. Before performing the analysis, reaction times outside of 2.5 standard deviations at both the high and low ranges were replaced by boundaries indicated by 2.5 standard deviations from the

Table 2. Reaction Times and Accuracy Rates for Wh-question Sentences with Negation in Experiment 2

Response Type	Sentence Type	Higher in Reading Comprehension				Lower in Reading Comprehension			
		Reaction Time (ms)		Accuracy Rate (%)		Reaction Time (ms)		Accuracy Rate (%)	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Correct 'Yes'	Wh+SAI+*n't* movement	4,427	1,087	76.36%	18.33%	4,820	1,121	71.30%	17.53%
Responses	Wh+SAI+*not* in predicate	4,794	1,042	48.41%	24.76%	4,867	1,156	53.70%	24.08%
Correct 'No'	Wh+SAI+*not* movement	5,791	1,795	32.05%	19.80%	5,572	1,318	33.91%	19.83%
Responses	Wh+SAI+*not* after verb	4,351	1,053	83.18%	17.96%	4,946	1,074	73.91%	21.95%

individual means of participants in each category. There were 14 responses modified in this way. The statistical tests which follow analyze both subject (F_1) and item (F_2) variability. Only stimulus items of correct responses were used in the analyses of reaction times.

In the case of correct 'Yes' responses, a series of 2 (students with higher and lower English reading comprehension) × 2 (*Wh + SAI + n't movement* and *Wh + SAI + not in predicate*) two-way ANOVAs with the last variable repeated were conducted on reaction times and accuracy rates, using participant (F_1) and item (F_2) variabilities. The ANOVA indicated that for correct 'Yes' responses, there was no significant main effect in the two types of negative *wh*-questions in the subject analysis [$F_1(1, 43) = 3.095$, $p = .086$, *n.s.*], but results were significant in the item analysis [$F_2(1, 78) = 4.133$, $p < .05$]. There was no significant main effect of student English comprehension ability [$F_1(1, 43) = 0.573$, $p = .453$, *n.s.*; $F_2(1, 78) = 1.347$, $p = .249$, *n.s.*]. The interaction of these two variables was not significant [$F_1(1, 43) = 1.864$, $p = .179$, *n.s.*; $F_2(1, 78) = 3.752$, $p = .056$, *n.s.*].

The same analysis was also conducted on accuracy data of correct 'Yes' responses. There was a significant main effect on the two types of *wh*-questions [$F_1(1, 43) = 22.443$, $p < .001$; $F_2(1, 78) = 66.355$, $p < .001$]. The main effect of student's level of reading comprehension was not significant in subject analysis [$F_1(1, 43) = 0.001$, $p = .979$, *n.s.*] and in item analysis [$F_2(1, 78) = 0.29$, $p = .866$, *n.s.*]. The interaction of these two variables was not significant in subject analysis [$F_1(1, 43) = 1.157$, $p = .288$, *n.s.*], but was in item analysis [$F_2(1, 78) = 4.267$, $p < .05$]. Thus, taking the consistent results in both participant and item analyses, the results indicated in general that SAI with clitic negation *n't* and SAI with negation *not* remaining in the predicate showed a large difference, regardless of student level of reading comprehension.

For the case of correct 'No' responses, a series of 2 (students with higher and lower reading comprehension) × 2 (*Wh + SAI + not movement* and *Wh + SAI + not after verb*) two-way ANOVAs with the last variable repeated were conducted on reaction times and accuracy rates, using participant (F_1) and item (F_2) variabilities. Due to having no correct responses for correct 'No' items, one participant was excluded from the analysis of reaction times, but included in accuracy data. In addition, three sentences received no

correct rejections. These three sentences were excluded from item analysis. The ANOVA indicated that for correct 'No' responses, a *Wh + SAI + not movement* order resulted in longer reaction times (M = 5,677 ms) than *Wh + SAI + not after verb* order (M = 4,662 ms) [$F_1(1, 42) = 19.528$, $p < .001$; $F_2(1, 75) = 34.258$, $p < .001$]. However, the main effect of student's level of reading comprehension was not significant [$F_1(1, 42) = 0.328$, $p = .570$, *n.s.*; $F_2(1, 75) = 1.705$, $p = .196$, *n.s.*]. The interaction of these two variables was not significant [$F_1(1, 42) = 3.027$, $p = .089$, *n.s.*; $F_2(1, 75) = 3.309$, $p = .073$, *n.s.*].

The same analysis was also conducted on the accuracy data of correct 'No' responses. As seen in Table 2, overall there was a great difference of 45.44 percent between a *Wh + SAI + not movement* order (M = 33.00%) and a *Wh + SAI + not after verb* order (M = 78.44%). This difference was significant [$F_1(1, 43) = 107.676$, $p < .001$; $F_2(1, 78) = 422.284$, $p < .001$]. The main effect of student's level of reading comprehension was not significant in both participant [$F_1(1, 43) = 0.848$, $p = .362$, *n.s.*] and item [$F_2(1, 78) = 1.475$, $p = .228$, *n.s.*] analyses. The interaction of these two variables was significant in both participant [$F_1(1, 43) = 1.608$, $p = .212$, *n.s.*] and item [$F_2(1, 78) = 7.037$, $p < .01$] analyses. Again, as with the results of Experiment 1, *wh*-question sentences with the *Wh + SAI + not movement* order are extremely difficult to accurately reject as incorrect sentences in both groups of students, those with higher and lower English reading comprehension.

DISCUSSION

The pattern of errors and longer reaction times in Experiment 2 was similar to that found in Experiment 1. With the correctness of *wh*-questions of the form *Wh + SAI + not movement* and the incorrectness of *Wh + SAI + not in predicate* the most difficult to assess accurately. By contrast, the incorrectness of questions of the form *Wh + SAI + not after verb* and the correctness of the form *Wh + SAI + n't movement* were relatively easier to assess accurately. As in Experiment 1, the level of English ability was not a significant factor either in determining the accuracy. Also there was little evidence of the influence of L1 Japanese because questions of the form *Wh + SAI + not after verb* (similar to Japanese syntax) were correctly assessed as incorrect relatively easily. Judging from the similarity of results between the two experiments, there is no evidence of either a positive or negative effect of the addition of the *wh*- element on students' ability to discern the (in)correctness of negative questions.

GENERAL DISCUSSION

The results of the present study indicate a tendency for Japanese EFL students to make similar errors regarding the correctness of negative questions in spite of differing levels of ability. Part of this can be explained by primacy and frequency of learning effects. The negative declarative sentence, and its clitic form in particular, is taught from

the first year of compulsory English education in Japan, so it is one of the first things they learn. Also, since negative questions are relatively infrequent, it is logical to assume that students have had much more experience with the more common and frequent negative declarative sentences. Students simply may not have had frequent exposure to both forms of the correct negative interrogative sentences making it difficult to internalize the differences between declarative and interrogative negation.

When negative questions are taught in typical Japanese high-school-level textbooks, they are usually presented in a conversational context, either as tag questions or confirmation (usually indicating surprise or contradiction of an assumption previously held by the speaker), such as *You are Mr. Jones, aren't you*? and *Don't you have an umbrella*? In these cases the clitic form is much more commonly used. So, while the non-clitic form *Do you not have an umbrella*? is equally correct, it is rarely, if ever, encountered in EFL textbooks. It also has a limited use in natural English conversation. We could focus on the fact that they learned clitic negation relatively well, rather than their difficulites in recognizing an uncommon and unfamiliar form. Because students have had limited exposure to both the incorrect form *Do not you have an umbrella*? and the correct (but less common) form *Do you not have an umbrella?,* the students simply chose the form that 'sounds' right according to the frequency with which learners have previously seen the words together in other contexts, such as negative declarative sentences.

Another possible factor is the basic form of negation, (for example, *do not*, *is not*, or *cannot*), where the negation *not* joins with the auxiliary verb to make the clitic negation *n't* (i.e. *don't, isn't,* or *can't*), may lead students to think that the negative element is more closely affiliated with the auxiliary rather than the main verb. So, where there is movement of the auxiliary but the negation *not* remains with the main verb it is seen as unfamiliar and therefore incorrect. This misinterpretation of the relationship of the negative element and the auxiliary leads to an overgeneralization in judging the correctness of negative questions causing students to correctly identify the familiar case, where there is SAI with clitic negation. This overgeneralization also manifests itself in the students' preference for the incorrect but 'familiar' form in which there is SAI with the negation *not*. Conversely, it also leads students to reject the correct form in which there is SAI for the auxiliary, but the negation *not* remains in position in front of the main verb.

Native English-speaking children were found to make errors in negation (e.g., Guasti, et al, 1995), but the types of errors are different than those examined in this paper. Native-speaking children avoided SAI in negative questions, while Japanese students overgeneralized the verb movement parameter. Indeed, the fact that many Japanese students mistakenly judged that sentences of the form *SAI + not movement* were correct (76% in Exp. 1 and 66% in Exp. 2), and a correspondingly high number of students judged, accurately, that sentences of the form *SAI + n't movement* were correct (82% in Exp. 1 and 75% in Exp. 2) could also indicate the degree of familiarity with the collocation of 'do' and 'not' and 'auxiliary/modal verb' and 'not'. Given the time constraints of the exercise, the learners probably did not perform a complex grammatical analysis. The fact that both groups (higher and lower) showed similar tendencies in

choosing 'auxiliary + not' pairings, also argues in favor of the role of the familiarity and frequency of the form.

Because the structure of the incorrect sentences in the form *SAI + not after verb* is similar to L1 (Japanese), it was assumed to cause some interference. In fact, the results showed that overall accuracy was high on this type of item. It is unlikely that students had ever encountered sentences in this form in their previous classes, so perhaps this type of question was easy to accurately reject as incorrect due to its unfamiliarity, and the innate "non-Englishness" of the form. There was, however, a marked difference between the accuracy rates of the higher and lower groups (15% difference in Exp. 1 and 10% difference in Exp. 2). The corresponding reaction times were also different with the higher group reacting significantly faster (1,773 ms difference in Exp 1 and 595 ms difference in Exp. 2). This may indicate that classifying this form as incorrect required more sophisticated grammatical analysis than selecting the more familiar forms of *do not/ don't*. The lower students had more trouble judging the form as incorrect, due to less experience and familiarity with the form. This affirms previous studies which indicate that L1 Japanese EFL students do not exhibit significant interference from L1 in the case of negation. In fact, Japanese EFL students tend to follow a path of acquisition of negation similar to other EFL students, such as L1 Spanish students (Stauble, 1984). It is assumed that students of English—even beginning level—would correctly identify a negative English sentence or question with the negation *not* after the main verb, as in *Does Joe cook not?,* as incorrect. This might be a contrastive influence of L1, rather than erroneously applying L1 syntax to L2, students automatically reject as incorrect forms that are similar to L1 when they come across them in L2.

From a practical pedagogic standpoint, the results indicate two main points, first the need to clearly explain that while the auxiliary verb *do* in conjunction with the negation *not* is essential for negation, the negative element *not* is more closely affiliated with the main verb, both grammatically and semantically. In addition, when teaching and explaining the use of clitic negation, it must be explained that the contraction *don't* merely reflects a spoken convention. While the declarative clitic negation is taught rather early, and heard more frequently, it is more likely to be retained due to primacy and frequency effects. However negative questions, especially the non-clitic form, are much less commonly used, so the forms are encountered and used with much less frequency. Deeper understanding of students' ability to use negative questions could be gained from testing their production of the form in guided conversations, to test active rather than passive understanding. Further study could analyze the frequency of these negative forms and review this exception in an appropriate situational context to facilitate the retention of the form and its use by EFL students.

On the other hand, L1 Japanese does not seem to have any influence over the judgment of the correctness of negative sentences. While negation naturally follows the verb in Japanese, the items with such a construction were overwhelming properly identified as incorrect. So, this element of negation seems to be clearly differentiated but improves with students of higher reading level. As a result of both primacy and frequency effects, the basic conventions of negation in declarative sentences are well internalized in

most college-level students, including the subjects of this study, and probably require little attention after initial presentation.

CONCLUSION

This study examined the ability of Japanese EFL students to assess the correctness of negative questions using a timed sentence correctness task. The first experiment showed that Japanese EFL students could quickly and accurately assess the correctness of negative Yes/No questions of the form *SAI + n't movement* (e.g. *Don't you play the piano*?) and the incorrectness of questions of the form *SAI + not after the verb* (e.g. *Do you play not the piano*?). It also showed that the same subjects had more difficulty assessing the correctness of questions in the form *SAI + not in the predicate* (e.g. *Do you not play the piano*?*)* and the incorrectness of questions of the form *SAI + not movement* (e.g. *Do not you play the piano*?). The second experiment used *wh*-questions and found similar results. The difference of errors and reaction times between students with high and low levels of reading ability were not significantly different, except in the case of questions of the form *SAI + not after the verb*, where students with higher levels of reading ability performed the timed sentence correctness task more quickly and accurately.

The results of the experiments in this study revealed that the influence of L1 Japanese word order for negation, where the negative particle *–nai* follows the verb, is relatively weak in Japanese EFL students. Instead, there seems to be an overgeneralization of the concept of clitic negation (*don't, won't, can't*) which influences students assessment of the correct placement of the negative element *not* in negative questions. This may result from primacy and frequency effects which allow students to be more familiar with the declarative form of negation than negative questions due to the fact that negation in declarative sentences is taught quite early in the typical curriculum of Japanese secondary-school English education, however negation in questions is much less common. Because the contracted (clitic) forms such as *don't* or *can't* are taught as being equivalent to their non-clitic forms in declarative sentences, students overgeneralize and incorrectly assume that this also applies to interrogative questions.

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