The Effect of Linking on Japanese EFL University Students' Listening Comprehension

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Abstract

The presence of phonologically connected speech negatively affects input-intake for Japanese students (Ito, 2014). The purpose of this study is to assess whether or not students make more errors in listening comprehension when writing down six dictated sentences with consonant vowel links, where a word ends in a consonant and is connected to another word beginning with a vowel, compared with six sentences that do not have consonant vowel links. Students attending a private women's university in Fukuoka City, Kyushu, Japan, studying English as a Foreign Language (EFL), were invited to participate in the study. Materials, sent through 'Google classroom,' consisted of a consent form, three questions, a pre-recorded dictation of 12 sentences, and a document for responses and comments. Included in this study are 39 students. English language proficiency ranges from Test of English for International Communication (TOEIC) scores between 295-690, the average score being 574. The longest stay in an English-speaking country reported was three months. In all ability groups, the connected consonant vowel sentence condition resulted in a larger number of errors ($p < 0.001$). Japanese university students found it more difficult to correctly interpret sentences with consonant vowel links versus those which do not have consonant vowel links. The findings carry wider significance for lecturers and examiners teaching Japanese university students. This study builds on current evidence regarding phonologically connected speech and adds to the literature that such sentences are difficult to process. Future research should focus on the kind of errors made when comprehending connective sentences from dictation.

Keywords: consonant vowel linking, linking, connected words, dictation, listening comprehension, Japanese university, EFL teaching

Background

The COVID-19 pandemic has introduced several challenges for university education globally, one of which is the education of students through a virtual platform. Through firsthand experience this academic year (2021-2022), it was noticeable that most of the Japanese university students had a high command of the English language in writing and reading skills for the level that they were assigned in first-year English communication classes. This became even more apparent during online classes which involved a lot of activities utilising these two skills. For some groups it felt as though the textbook material was too easy. However, after the introduction of more listening and speaking activities, it became clear that generally, the students' level of aural and oral skills did not always match the sophistication of their silent reading and writing skills. There is therefore a likely gap between the proficiency in writing and reading skills, and listening and speaking skills and there may be a difference between the ability to understand connected speech which may reflect on the EFL students' listening comprehension.

According to Catford (1977), English is categorized as a stress-timed language and Japanese is a syllable-timed language. This difference in styles means Japanese speakers' pronunciation of English words and sentences may sound staccato-like (Ohata, 2004). Language techniques, such as suprasegmental phonemes[1] that occur simultaneously with vowels and consonants in an utterance, especially juncture[2], are of particular interest because they occur in English, but are uncommon in the Japanese language and therefore generally unfamiliar to Japanese students. In fluent English, when one word ends in a consonant sound and the next word begins with a vowel sound, the two sounds are linked together without a pause in between them. So, 'an egg' becomes 'anegg'. This is called catenation[3] (BBC English Learning, 2022). According to Corder, "Incorrect utterances are evidence of someone being in the process of acquiring

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[1] Suprasegmental phonemes are of, or relating to, significant features such as stress, pitch, or juncture (joint, connection) that occur simultaneously with vowels and consonants in an utterance (Merriam-Webster).

[2] Juncture (joint, connection) is the manner of transition or mode of relationship between two consecutive sounds in speech (Merriam-Webster).

[3] Catenation is when a consonant sound at the end of one word joins with a vowel sound at the beginning of the next word (British Council).

language" (Corder, 1967, p.165). Input is defined as what is provided or available to be understood by a person. Intake is defined as what is actually internalised and is supposed to be controlled by the learner (Corder, 1967). An interest in how much input becomes intake was explored by Henrichsen (1984) who hypothesised that connected speech would affect the input-intake[4] process, especially when English proficiency was low. Henrichsen suggested that 'attacking misperceptions' in input by focussing on the 'various manifestations' of sandhi-variation[5] in 'normal spoken English' may help EFL learners interpret input correctly (Henrichsen, 1984, p. 121). All influences which determine how much of the input becomes intake should be explored so as to give a thorough and useful understanding of this process (Henrichsen, 1984, p. 121).

Inspired by Henrichsen's (1984) research, Ito (2006, 2014) proceeded to build on Henrichsen's work and concentrated in 2014 on only Japanese EFL first-year university students. Ito's work compared a dictation test with and without connected speech. Two types of connected speech were tested, 'salient-lexical forms', for example, 'don't', and 'less salient-phonological forms', for example, 'they're'. Ito (2014) concluded that categorisation of connected speech may need further investigation in future research. Following on from the work of Ito (2014), the research question of interest in this study is to determine whether Japanese first-year language students' input-intake is negatively affected by the presence of phonological connected speech, specifically when a word ends in a consonant and connects to the following word which begins with a vowel. The aim of the study is to assess the effect of consonant vowel linking through the dictation of 12 sentences, six sentences with consonant vowel links and six sentences without consonant vowel links, by comparing the number of errors in both sentence conditions on participants' typed responses on a 'Google document'.

The dependent variable is the correct number of sentences, specifically, the total number of linked sentences with errors, and the total number of unconnected sentences with errors. The independent variables are the absence or presence of consonant vowel connections in the dictated

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[4] The input-intake process differentiates between what is available for the learner as input and what is intake actually internalised by the learner as intake (Corder, 1967).
[5] Sandhi-variation is modification of the form or sound of a word under the influence of an adjacent word from Sanskrit samdhi a placing together, from sam together + dadhāti he puts (Collins English Dictionary).

sentences. Based on previous research by Ito (2014), it is predicted that when words are linked together naturally in English, first-year Japanese university students will have more difficulty catching the words. This is not about speed, but about fluency. Therefore, the hypothesis being tested in this study is whether the sentences with consonant vowel links will have more mistakes or not. This is used as an indicator of the effect linking has on Japanese EFL university students' listening comprehension. The null hypothesis, Ho is : there will be no difference in the amount of errors incurred in consonant vowel connected or unconnected sentences. The alternative hypothesis, Ha is: the sentences with consonant vowel linking will force more errors.

Method

A prospective cohort study was conducted. The data was collected in January, 2022 from EFL students of a private women's university situated in Fukuoka City, Japan. The materials were distributed to eight online classes through 'Google classroom' and data was also collected through the same medium. Instructions in English and Japanese stated that participants would listen to the dictation audio only once and write down the sentences during a 30-second gap between them. Participants were informed that they needed to write their name on the electronic consent form. Each consent form was checked for validity. One student included in the study wrote, 'agree'. Another student typed her name in a different place. Any responses without a name or the word 'agree' on the consent form were not included in the study. Students were told that they could withdraw from the study at any time, and that it would have no bearing on their final course grades. Every effort was made to anonymise the data. Due to the nature of data collection the researcher was not blinded. As stipulated, no reference to individuals by name is included in the report. There were three questions asking for information; one question about English language proficiency, one question about the length of time spent in an English-speaking country, and one asking for the age of the student. Below the questions the numbers 1-12 were written for students to type the 12 sentences that they heard. A space was provided on the response form for any comments to be written freely after the dictation was over (Appendix A).

Along with the instructions, consent and response form, an audio file

of 12 pre-recorded sentences were sent to students electronically through the 'Google classroom'. All the sentences were the same length, consisting of six words. The six connected speech sentences and six unconnected speech sentences were comparable on topics. The order the topics appeared, either in a connected speech or unconnected speech sentence was varied. Odd number sentences had consonant vowel links, whereas even numbered sentences did not have consonant vowel links. All the students had been taught for at least a semester by the lecturer dictating. The whole recording was seven minutes 27 seconds long. See Appendix B for the list of sentences that were dictated on the recording. It should be noted that the students did not have the chance to read lips or interpret any body language due to the dictation being sent in the form of an audio file. This is similar to a listening comprehension exercise from a textbook or examination without visuals, and is close to the condition of the lecturer wearing a mask. In this study, only data from Japanese female university students about to complete their first year of study was analysed. However, responses from students that were non-Japanese or above first grade may be useful in future studies.

The study participants were assigned to a class named Class A-E for the purpose of this study. They loosely reflected the students' proficiency, with Class A being the highest and Class E the lowest. In order to determine if Japanese first-year students' input-intake is negatively affected by the presence of phonological connected speech, specifically when a word ends in a consonant and connects to the following word which begins with a vowel, there were two conditions, sentences with consonant vowel linking and sentences without consonant vowel linking. All participants were tested in both conditions.

Results

In total, the responses of 39 female Japanese first-year university students met the inclusion criteria. Firstly, in answer to the questions, students' self-reported English Language proficiency ranged from TOEIC scores between 295-690 with an average score of 574. Test in Practical English Proficiency *Jitsuyo Eigo Gino Kentei* (EIKEN) level 2 was reported by four students and level 3 by one. Computer Adaptive Test Institutional Program (IP) score of 69 was reported by one student. The numbers 64, and 50 were also stated by two students. From 12 students, the answer to

the proficiency question was left blank, or included a note explaining that they had no test results to report. In answer to the second question, the longest length of stay in an English-speaking country by a participant was three months, three participants had one-month stays, others under a month, with 20 having no time in an English-speaking country at all (Table 2). The third question about age revealed that the students were all between 18 and 20 years old. The majority, 31, (79%) of the participants were 19 years old. There were six (15%) 18-year-olds, one student (3%) was 20 years old, and the age of one participant (3%) was unrecorded.

Regarding the 12 dictated sentences, all mistakes were taken into consideration as there were only six words in each sentence. A sentence

Table 1: *To Compare the Number of Sentences with Errors in the Two Conditions: Six Sentences with Consonant Vowel Links (Connected) and Six Sentences without Consonant Vowel Links (Unconnected)*

|	Class	Participants	Connected Errors	Unconnected Errors	Difference of Errors
	A	8	9	6	3
	B	14	25	15	10
	C	6	14	6	8
	D	7	21	11	10
	E	4	15	6	9
Total	5	N=39	84	44	40

Figure 1: *To Show the Errors in Both Conditions by Class*
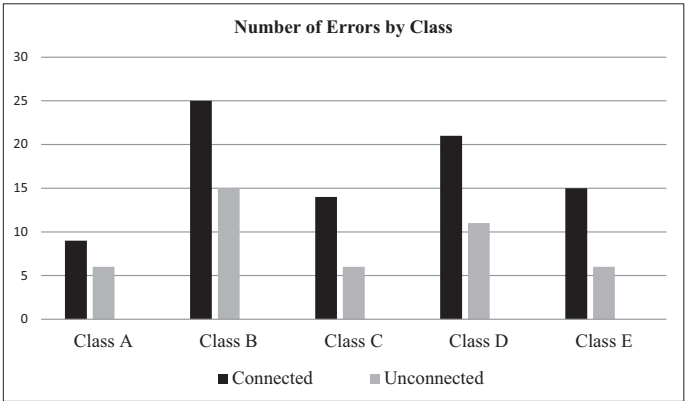
with an error, or any number of errors, was marked as 1. The points were then counted and divided into two groups, those of the sentences with consonant vowel linking and those without (Table 1).

Figure 1 demonstrates the number of sentences in each condition which had errors by class. All classes had mistakes in more consonant vowel sentences than sentences without consonant vowel connections in them. It is clear that the participants assigned to the class with the highest proficiency had the smallest margin between conditions, three. The other classes were quite similar in their results, with differences of eight, nine, or ten. Only two individuals from the 39 participants made more errors on the unconnected sentences than the connected ones. In all groups, the connected consonant vowel sentence condition had a larger number of erroneous sentences.

Figure 2: *A Pie-chart to Show the Number of Connected Sentence Errors Versus Unconnected Sentence Errors*
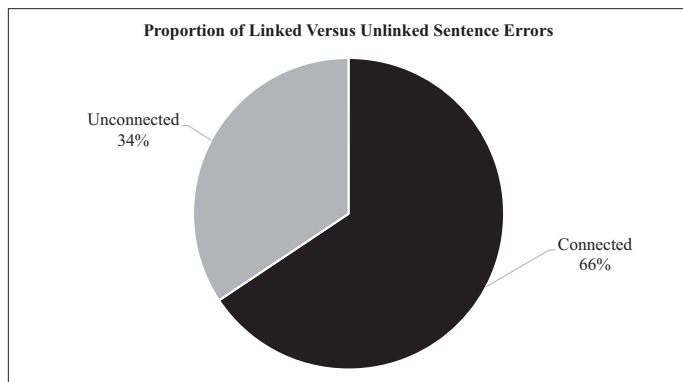
The data from Table 1 of the total number of incorrect consonant vowel linked sentences, 84, and the total number of incorrect sentences without consonant vowel linked sentences, 44, is presented in the pie-chart, Figure 2. There were almost twice as many errors in the connected sentence condition.

Analysis

Tests for normal distribution were carried out and the data was found

to be normally distributed. The mean number of mistakes from the six 'linked' sentences was 2.15. The mean number of mistakes from the six 'unlinked' sentences was 1.13. The variance (s) and standard deviation (SD) for the two conditions were as follows: Sentences with consonant vowel links s=2.55 with SD=1.60. Sentences without consonant vowel links s=2.06 and SD=1.44. Two tailed paired t-test p*<0.001 and t=5.42. The p-value is significant (<0.05 is strong evidence for the alternative hypothesis). It can be seen from this sample that consonant vowel connections resulted in more errors compared with sentences that did not include consonant vowel connections. As Ito (2001, p. 114) pointed out, longer sentences appear to test memory retention, which could potentially affect participants' performance on those long sentences. In this study the sentences were short, only consisting of six words. Any mistakes were counted as one error for that sentence. Looking closer at the common mistakes it can be said that participles with weak pronunciation were challenging for many students. Some examples of this are:
"1. The weathering Fukuoka is warm."
"3. I met home all day."
"3. I met at home all day."
"3. I met her all day."
"3. I would home all day."
"3. I am at home almost day."
"3. I am in home all day."
"5. He gots to bed in eleven."
"7. They enjoy working tasks together."
"9. Taking care of about yourself is important."
"9. Taking care about yourself is important."
"9. Taking care of is important."
"9. Taking care of myself is important."
"9. Taking care of us is important."
"9. Taking care of selfs is important."
"9. Taking care about self is important."
Not picking up or predicting pronunciation was also an issue in these two examples:
" 5. He goes to bet at eleven."
"5. He gots to bed in eleven."
Some participants attempted to fill in what they heard. For example:
"11. She is the neck of the day."

"11. She is the neg day."
"11. She is the   a day."
"11. She is an egg that day."
"11. She is a neg a day."
"I had difficulty listening to English," was a comment left by a student who scored a perfect 12 out of 12. Another student who scored no errors in any of the 12 sentences noted, "I haven't done dictation since I was in high school, so it was a good opportunity to do it for the first time in a while." These two comments show how challenging trying to catch all that is dictated is, and possibly that practice makes intake easier.

Other comments about perceived ability were:
"It is a little difficult for me to listen and write."
"Immediately after hearing it, I could understand the content. However, it was difficult for me to write it down."
"Some questions were a little difficult."
The word 'difficult,' is used in all three of these comments. This suggests that the six-word dictation was not easy. "I was able to write more sentences than I expected." The skill of typing, is another important factor to be considered in this task. The 30-second interval between sentences to type the six words was sufficient as shown by this comment:
"…I had 30 seconds before I heard the next question, so I think I was able to remember the parts I might have forgotten during that time."

Table 2: *The Results of Students in Relation to Length of Stay in an English-Speaking Country*

	Time Spent in an English-Speaking Country				
	1-3 months n=4	2-3 weeks n=5	1 week n=5	<1 week n=5	None n=20
Number of Errors					
0	2	-	1	-	3
1-5	2	5	2	5	14
6-10	-	-	2	-	3

The results in Table 2 show that two students with 1-3 months in an English-speaking country made zero errors. A student with one week and three students with no time in an English-speaking country also did not make errors on any sentence. Students with no time in an English-speaking country made the most number of errors, 14, in the 1-5 range.

Interestingly, the sum of the number of mistakes by students in all the other groups who had stayed in an English-speaking country, in the 1-5 range, was also 14. Only students with one week and no time in an English-speaking country made errors in the 6-10 category. Students were not asked for any indication of the purpose of their stay. It is possible that there was not enough interaction in language 2 (L2) even with a stay depending on its purpose. It was noted that one student disregarded a school trip to Singapore as a stay in an English-speaking country.

Discussion

This study demonstrates that there is strong evidence ($p<0.001$) that consonant vowel linked sentences result in more errors made by students. This finding is significant for teaching and examining purposes. For a more discriminative test, teachers should consider the use of consonant vowel linking sentences in their listening examination, as using unconnected sentences is unlikely to distinguish between students' listening proficiency level. From a teacher's perspective, the focus on learning should centre on connective sentences, as this is clearly a difficult skill to master. In future research, it would be interesting to study further the kind of errors made when picking up connective sentences from dictation. This could help to delineate where to focus when teaching.

Even with the authentic material available online, dictation is still a useful tool in the classroom because students need to notice what to listen for and how to predict the words coming next. The tefl.net website, mentions that dictation is not so popular because it is perceived to be a 'teacher-centred writing activity with no real input from the student,' but also stresses that with the right level of material and procedure, dictation involves: 'listening, writing (spelling, pronunciation), grammar, vocabulary, punctuation, and possibly reading and speaking,' (Tefl.net, 1998-2022). Although dictation was used as the method to find out about how students cope with connected speech, it also seems to be a tool with which to work on improving the recognition of linking in natural English speech for EFL students.

There are textbooks which have sections that emphasise learning collocations and other words that often go together, and encourage the learner to remember the words in chunks[6]. This should make it easier psychologically to remember the words as a group, (Miller, 1956, as cited in

Rathus, 1999). It would be an advantage if the rhythm and flow, light and shade, and accents and weaknesses of the words could also be learnt. This leads back to Henrichsen (1984) and his calls for all the influences which determine how much input becomes intake to be explored.

Sometimes language 1 (L1) seems to obstruct language 2 (L2). This can be heard in disjointed reading, the mispronunciation of unfamiliar words, and a lack of overall fluency. In future studies, it would be interesting to determine what effect picking out suprasegmental phonemes in the English language and drawing attention to them would have in smoothing over any fragmented English, over time. However, this may not be easy to assess. Wickins (2016) points out that the individual students' internal motivation to want to speak English could be related to their ability to produce connected speech (Wickins, 2016, p. 99). Although this study examined the effect of linked words on listening comprehension, there is a strong interest in how the ability in listening comprehension to catch fluent English affects spoken fluency.

A comparison of the first-year students with second or third-year students to assess whether their awareness of consonant vowel linking comprehension improves with the prolonged exposure to English language classes could be carried out in further studies. Another avenue to investigate which might give insight to learnt differences could be to compare the errors of Japanese students with their non-Japanese peers. A more specific analysis of the effect of linking on the same Japanese EFL university students' listening comprehension in a before and after study using input techniques such as chunking then measuring intake may be insightful. The strengths of this study were the use of short sentences to test the hypothesis, the fact that it uses prospective cohort data, and that there was a good uptake for the study. Limitations are that all the participants are from a single university and N=39 is a small sample size. Due to the online nature of the study, typing ability (predicted text function, and device size) could also be a factor affecting responses.

Conclusion

In this study linking sentences had a negative effect on Japanese EFL

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[6] A chunk in psychology is a unit of information retained in the memory and easily recalled (Merriam-Webster).

university students' listening comprehension. There may be many reasons why errors were made in transferring dictation input to the typed online document. Some students may use small devices which are easy to mistype on. Predictive text is a function which could also hinder the typing of correct sentences. However, the results of this study show a significant difference between the number of mistakes made on sentences with consonant vowel links and sentences without consonant vowel links. More mistakes when words are connected in this way indicates that Japanese students find natural English more difficult to hear, predict, or comprehend. A more specific analysis of the effect of linking on Japanese EFL university students' listening comprehension in a before and after study using input-intake techniques such as chunking by dictation is suggested for future research. This study builds on current evidence regarding phonologically connected speech and adds to the literature that such sentences are difficult to process.

Acknowledgements

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Appendices

Appendix A: Instructions, Consent Form, and Response Form

Instructions

手順

Listen to the dictation/audio only once. Write down the 12 sentences as you hear them. (There is a 30 second gap between sentences for you to write).

文章を読み出すのは一度だけです。その12の文章を聞いたとおりに書き出してください。文と文の間に30秒の空白があるので、その時に聞いた文章を書き出してください。

Consent Form

I, Claire Suenaga, would like to conduct an experiment to help with my language research. Your participation would be greatly appreciated. Please write your name in the gap below to show you agree.

I _____ consent to participating in a language experiment voluntarily. I can quit at any time. This does not affect my final grades.

Your data will be presented anonymously. Your name will not be shown.

Thank you

同意書

私、クレア・スエナガは、私の言語研究のために実験を行いたいと思っています。ご協力よろしくお願いいたします。同意することを示すために、上の空白にあなたの名前を書いてください。
その事により自主的に語学実験に参加することに同意します。あなたはいつでも途中でやめることができます。そしてこれはあなたの最終成績には影響しません。
あなたのデータは匿名で提示されます。あなたの名前は表示されません。

よろしくお願いします。

Q1. What is your English language proficiency (IELTS/TOEFL/TOEIC etc.) test score?
Q1. 英語力（IELTS / TOEFL / TOEIC など）のテストスコアは？
A1.

Q2. How long have you spent in an English speaking country?
Q2. 英語圏の国でどのくらい過ごしましたか？
A2. _____ Days　日々
_____ Weeks　週

_____ Months　月
_____ Years　年

Q3. How old are you?
Q3. 何歳ですか？
A3.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

Comments:

Appendix B: Dictation Script 30-second gap between each sentence, 7 minutes 27 seconds long

1. The weather in Fukuoka is warm.

2. He drinks more water than me.

3. I am at home all day.

4. She never sleeps for nine hours.

5. He goes to bed at eleven.

6. They protect natural places from pollution.

7. They enjoy working together on tasks.

8. We can make more progress together.

9. Taking care of ourselves is important.

10. Every Summer the sun feels hotter.

11. She eats an egg a day.

12. I enjoy studying with my friends.