

## **Realities and Challenges in the Acquisition of English Suprasegmentals Amongst Japanese High School Learners<sup>1</sup>**

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### **Abstract**

This study assesses high school students' comprehension of suprasegmental elements and their ability to infer meaning from intonation. Our objectives are twofold: firstly, to assess the current state of suprasegmental phoneme acquisition amongst Japanese high school students, and secondly, to understand whether they could understand the implied meaning of intonation. Our findings reveal that high school English learners struggle to place stress on function words, particularly pronouns. Regardless of English proficiency, students face challenges in correctly placing stress on a word from the contrastive perspective. Additionally, whilst students relatively can grasp intonation attitudes, misconceptions persist regarding wh-questions and tag questions. Furthermore, an intriguing phenomenon of 'initial high pitch' emerged in speech data analysis, though generalisation remains difficult due to limited data. Overall, this study sheds light on the suprasegmental challenges faced by high school students, emphasising the critical role of stress placement in achieving effective communication.

*Keywords:* stress, intonation, pitch, high school students

No one would dispute that a minimum knowledge of sounds is essential for communication to properly take place. Many junior high and high schools are expected to provide instruction on the segmental level, and instruction on segmental phonemes seems to be carefully taught in class. However, instruction on the suprasegmental level is rarely provided in classrooms. Some questions on nuclear stress had been included in the National Center Test for University Admissions (hereafter NCTUA) before the Common Test for University Admissions was implemented in January 2021; thus students consciously deepened their knowledge of sounds. And instruction was, the writer believes, provided in classrooms at many schools. In recent decades, with the importance of communication having been emphasised, it seems that phonetic instruction has been, though it may be contradictory, rarely offered. The emphasis is rather more on the intelligibility of English than accurate pronunciation (Jenkins,

2000; Kachru & Smith, 2008; Smith & Nelson, 1985).

In this study, high school students were asked to work on questions dealing with stress by the former NCTUA to determine their degree of comprehension on the suprasegmental level. In addition, it was also investigated whether they could understand the implied meaning of intonation. In the following, the author's research questions are presented after mentioning previous studies. The methodology of the author's experiments will then be described, and discussions will be attempted based on the data obtained. Finally, the answers to the research questions will be presented, and suggestions for phonetic instruction in high schools will be made.

### **Background**

In a study conducted by Saito (2020), a total of 44 university students were analysed. The study aimed to examine the acquisition of different tones that were considered challenging for Japanese learners. The data collected were in the form of recordings obtained both before and after lectures. The results revealed a significant discrepancy in the acquisition ratio of the various types of intonation. It is noteworthy that the tone with the highest acquisition rate before and after the lecture was the fall-rise tone rarely found in the Japanese language. The findings suggest that the acquisition of tones amongst Japanese learners is not uniform, and some tones may require greater attention and practice to achieve mastery.

After presenting an overview of English intonation, Nakago's study (2017) clarified the major phonetic mistakes made by Japanese learners of English and their backgrounds. Despite the recent emphasis on communication in English education, university students have reportedly not been able to use English with natural rhythm and intonation. With regard to intonation amongst Japanese learners of English, he states, the general tendency is to begin sentences with a high pitch, even when there is no particular prerequisite or context. The following paper by Nakago (2018) described the major cause of why Japanese English learners were likely to use initial high pitch. He found that the speech in junior high school textbooks used by learners did actually use initial high pitch as a model speech, and he speculated that this may have had an effect on the learners.

Based on the aforementioned previous studies, this study will investigate the level of comprehension of high school students, especially those who have not been taught suprasegmental phonemes, using as material the former NCTUA in which those types of questions were asked. The research questions for the two surveys are fourfold:

1. To what extent do high school English learners understand nuclear stress?
2. Does the understanding of nuclear stress vary according to the English proficiency level of

*Eiken*?

3. When they are asked to read aloud, is the phenomenon known as initial high pitch, which has been pointed out in previous studies, observed?
4. Can they understand the meaning implied by intonation?

### Method

The research endeavour comprised two questionnaire-based surveys, which were administered in June and November in 2022 respectively. The primary objective of the initial survey (Appendix A) was to ascertain the extent to which participants were knowledgeable regarding fundamental stress-related principles (Questions 1–17), as well as their level of comprehension of the implications of four intonations (Questions 18 and 19). The secondary survey (Appendix B) placed more emphasis on intonation, with participants being tasked with listening to various sentences read in different intonations, subsequently making informed conjectures regarding their meanings.

To answer the first and second research questions, the first survey was conducted, where a questionnaire was employed as the primary instrument for data collection. The participants in this research were comprised exclusively of second-year students enrolled in a private high school. The materials utilized in the questionnaire included a set of stress-related questions that had been previously employed in the NCTUA. Participants were presented with a total of nineteen questions, of which seventeen were solely text-based, whilst the remaining two were audio-based. The participants were prompted to select from a set of four options pertaining to the placement of stress within a dialogue. The number of participants was 171. Out of a total of 171 participants, the predominance of individuals possessed *Eiken* pre-2 grade (74), followed by *Eiken* 3 grade (62), *Eiken* 2 grade (24), *Eiken* 4 grade (8), and lastly, a small number of *Eiken* pre-1 holders (3). Furthermore, to answer the third research question, we asked one representative each of the holders of *Eiken* level 2, pre-2 and 3 to read the self-introduction, through which we investigated whether or not characteristic intonation pattern was observed amongst Japanese learners of English.

The second survey was carried out to answer the fourth research question, in which the participants were presented with recordings of native English speakers' voices, each of which featured one of four intonation patterns, namely rising, falling, fall-rise or rise-fall tone. The study comprised a total of 157 individuals, classified according to their *Eiken* proficiency level: three were pre-1 grade holders, 42 were 2 grade holders, 68 were pre-2 grade holders, and 44 were 3 grade holders.

### Results and Discussion

The results of the first survey are shown in Table 1. The questions can be divided into two main categories: those relating to the placement of the stress (Question 1 to 17) and those asking about the meaning implied by the intonation (Questions 18 and 19). The former group is divided into two groups when answering the questions, one from the perspective of ‘contrast’ (Questions 1, 2, 3, 5, 6, 10, 12, and 16) and the other from the perspective of ‘last content word’ (Questions 4, 7, 9, 11, 13, 14, 15, and 17). The numbers of the cells indicate the number of respondents and the percentages in round brackets. Questions 18 and 19 show the percentage of correct answers as they are two-choice questions.

**Table 1**

*Number and percentage of respondents to each question in the first survey*

|             | ①                        | ②        | ③         | ④         |
|-------------|--------------------------|----------|-----------|-----------|
| Question 1  | 8 (5%)                   | 99 (58%) | 50 (29%)  | 14 (8%)   |
| Question 2  | 53 (31%)                 | 27 (16%) | 68 (40%)  | 23 (13%)  |
| Question 3  | 8 (5%)                   | 59 (34%) | 34 (20%)  | 70 (41%)  |
| Question 4  | 18 (11%)                 | 14 (8%)  | 64 (37%)  | 75 (44%)  |
| Question 5  | 20 (12%)                 | 66 (39%) | 76 (44%)  | 9 (5%)    |
| Question 6  | 99 (58%)                 | 7 (4%)   | 5 (3%)    | 60 (35%)  |
| Question 7  | 66 (39%)                 | 20 (12%) | 81 (47%)  | 4 (2%)    |
| Question 8  | 94 (55%)                 | 23 (13%) | 22 (13%)  | 32 (19%)  |
| Question 9  | 3 (2%)                   | 45 (26%) | 5 (3%)    | 118 (69%) |
| Question 10 | 6 (4%)                   | 74 (43%) | 22 (13%)  | 69 (40%)  |
| Question 11 | 28 (16%)                 | 6 (4%)   | 40 (23%)  | 97 (57%)  |
| Question 12 | 9 (5%)                   | 48 (28%) | 81 (48%)  | 33 (19%)  |
| Question 13 | 30 (17%)                 | 13 (8%)  | 103 (60%) | 25 (15%)  |
| Question 14 | 107 (63%)                | 32 (19%) | 23 (13%)  | 9 (5%)    |
| Question 15 | 11 (7%)                  | 67 (39%) | 12 (7%)   | 81 (47%)  |
| Question 16 | 20 (12%)                 | 25 (15%) | 50 (29%)  | 76 (44%)  |
| Question 17 | 12 (7%)                  | 28 (16%) | 12 (7%)   | 119 (70%) |
| Question 18 | correct answer rate: 93% |          |           |           |
| Question 19 | correct answer rate: 94% |          |           |           |

*Note.* Shaded cells indicate correct answers.

Overall, questions on ‘contrast’ were less frequently answered correctly than those on ‘last content word’. As the details will be discussed in the next section for each question, it is thought that this may be due to the unusual placement of the stress on the function word and the stress on the pronoun at the beginning of the sentence. On the other hand, the questions on the meaning of intonation received a high percentage of correct answers, probably due in large part to the fact that it was a two-choice question.

The results of the second survey are presented in Table 2. The aim was to determine whether subjects could understand the implied meaning of intonation when listening to speech.

**Table 2**

*Number and percentage of respondents to each question in the second survey*

|      | A         | B         | C        | D        |
|------|-----------|-----------|----------|----------|
| (10) | 119 (76%) | 38 (24%)  |          |          |
| (11) | 53 (34%)  | 104 (66%) |          |          |
| (12) | 40 (26%)  | 18 (11%)  | 83 (53%) | 16 (10%) |
| (13) | 44 (28%)  | 33 (21%)  | 70 (45%) | 10 (6%)  |
| (14) | 50 (32%)  | 107 (68%) |          |          |
| (15) | 121 (77%) | 36 (23%)  |          |          |

*Note.* Shaded cells indicate correct answers.

Fall-rise tone was used in (11) to (14), where more than half of the subjects were able to understand the meaning of the fall-rise tone with the exception of (13). In (13), the largest number of participants were able to choose the correct answer amongst the four options, although the percentage of correct responses did not exceed half. In (10) and (15), the difference from the default nuclear tone may have led to the low percentage of correct responses.

### First survey

The year in which the question appeared on the NCTUA is indicated in round brackets. Presented below are the questions and accompanying results, evaluated by the author. The numbers in round brackets in the text indicate the number of selectors.

(1) A: Helen, I heard you are writing a new book.

B: Well, actually, ①I’m only ②thinking of ③writing ④one. (1990)

Fifty-eight per cent of the respondents (99) chose the correct answer, ‘thinking’, whilst 29 per cent of them (50) chose ‘writing’. This may be the result of them being unable to

distinguish between A's assumption and B's actual behaviour.

(2) A: My sister told me John's going to visit either the States or Canada?

B: As a matter of fact, he's ①going to the ②States ③and ④Canada. (1990)

This question is slightly different from the question numbered 1 in that a function word has a stress. This is a good example of how stress is changeable depending upon the context. The participants who chose the correct answer, 'and' was only 40 per cent (68) although this group was the largest one. Those who chose 'going' was 31 per cent (53) and this figure is similar to the group who chose 'writing' in the first question. They have in common that both words are repeated ones. A certain group might wrongly believe stress should be put on the repeated word in the dialogue.

(3) A: My sister came back from abroad last week.

B: Where was she?

A: She was in New York in July and Los Angeles in August.

B: Oh, really? ①My ②sister also ③went to the ④States this summer. (1992)

Only five per cent of the respondents (8) chose the correct answer, 'My'. The percentage is the second lowest of all the questions. As in (2), a function word has a stress, which might be why they were not able to put a correct stress on 'My'. It is understandable that 41 per cent of the students selected 'States'. If we take this sentence out of context, 'States' would be the last content word, and a stress would therefore be placed there. It is crucial for learners to have the perspective that any word can have a stress depending upon the context.

(4) A: Tom's going to be late.

B: Why? Did he miss his flight?

A: No, it seems that ①they ②had ③engine ④trouble. (1992)

What makes this question difficult lies in the fact that 'engine trouble' is a compound noun. Thirty-seven per cent of the respondents (64), who were the second largest group, chose 'engine'. It is desirable that learners should keep in mind that the stress, in the case of compound nouns, is usually put on the first noun. In classrooms they also need to learn that a difference in position of the stress within the same phrase can cause a difference in meaning, such as 'a dancing girl and a dancing girl'. (The underlined vowels have a stress.)

(5) A: Shoko always has her coffee with her meal, I think.

B: Really? I prefer to ①have my ②coffee ③after the ④meal. (1991)

Forty-four per cent of respondents (76) chose 'after'. This might be a result of a distinct contrast between 'with' in A's remark and 'after' in B's remark. In (3) there were only a few students who chose the correct answer. It is true that the learners had difficulties putting a stress on function words, but it seems that they were able to put a stress on prepositions more easily than on pronouns. Amongst the three functional words, of which the parts of speech are conjunction, pronoun, and preposition, contrast seems to be the most likely to lead to a correct choice of preposition.

(6) A: What a charming dress! It makes her look really young.

B: ①But ②she ③is ④young. She's still in her twenties. (1991)

This question had the lowest percentage of correct answers. Only three per cent of the respondents (5) chose 'is' and 58 per cent of them (99) 'But'. A's impression of appearance is starkly contrasted, so that 'is' is a favourable choice. Nonetheless, the overwhelming majority's choice was 'But' owing in part to the direct influence of the Japanese language, in which the be-verb does not usually have a stress.

(7) (In Japanese: (situation) Friends are talking about Jeff's hair.)

A: Have you seen Jeff recently?

B: No. Has he changed his hair again?

A: He sure has. This time, (1)the trendy guy dyed it.

B: Wow! It must look really great. What color is it?

A: You won't believe it! I (2)can hardly believe it myself.

B: Why? Is it that different?

A: I'll say! It's black and white. (3)He looks like a panda.

7 (In Japanese: Which of the following is most emphatically pronounced in the underlined sentence (1)? Choose one from the following ① to ④.)

① trendy ② guy ③ dyed ④ it

8 (In Japanese: Which sentence contains 'can' pronounced the same way as the underlined sentence (2)? Choose one from the following ① to ④.)

① He says he can help me with my homework.

- ② I put the money in the can over there two days ago.  
 ③ Is there a possibility that he can?  
 ④ Please let me know when you can, if you don't mind.

9 (In Japanese: Which of the following is most emphatically pronounced in the underlined sentence (3)? Choose one from the following ① to ④.)

- ① He ② looks ③ like ④ panda (2000)

In Question 7, 47 per cent of the respondents (81) chose the correct answer 'dyed'. On the other hand, 51 per cent of them (86), who chose either 'trendy' or 'guy', seemed not to think of 'the trendy guy' as old information. The style of elegant variation peculiar to English is not familiar to Japanese learners, with the result that they use the same words or phrases repeatedly in their composition. In this question 'Jeff' is replaced with 'he' and then 'the trendy guy', so this noun phrase has little information value with no stress put on it.<sup>2</sup> Concerning Question 8, the underlined word is pronounced using schwa. Despite the fact that high school students have few opportunities to learn the distinction between the strong form and the weak form and the fact that the subjects for this research had not learnt it either, 55 per cent (94) distinguished between the two forms. The possible reason might be related to their daily habits of reading aloud the textbooks at home, which might lead to unconscious acquisition of it. As for Question 9, they must have understood that the final content word 'panda' is new information, so 69 per cent (118) chose the correct answer.

(8) (In Japanese: (situation) Marion, Terri, and Harry met for the first time at a party and were talking. )

Marion: Oh, are you American?

Terri: No, I'm Canadian, but I live in Sydney.

Marion: How funny! <sup>(1)</sup>My sister lives in Sydney.

Harry: Small world! I have a cousin in Sydney, too.

Terri: Marion, <sup>(2)</sup>what does your sister do?

Marion: She's a professional athlete.

Harry: Really? What sport?

Marion: Soccer. Harry, are you interested in women's soccer?

Harry: Not really. I'm not a big fan of soccer.

Marion: Too bad. I have a spare ticket to a soccer match next week.

Terri: Well, <sup>(3)</sup>I like watching soccer.

Marion: Do you want to come?



Terri: Sure. I'd love to.

Marion: Hey, why don't we go out to dinner before the match? What do you like to eat?

Terri: Hmm. <sup>(4)</sup>How about Chinese food?

10 ① My            ② sister            ③ lives            ④ Sydney

11 ① does            ② your            ③ sister            ④ do

12 ① I            ② like            ③ watching            ④ soccer

13 ① How            ② about            ③ Chinese            ④ food

Although the final content word in Question 10 is 'Sydney', it is old information. The respondents needed to choose 'sister'. The number of them who chose either 'sister' or 'Sydney' was almost the same, 74 and 69 respectively. If the students who chose 'Sydney' had paid attention to 'Sydney' being old information, they would have been able to choose 'sister' instead. Regarding Question 11, 57 per cent of them (97) chose the correct answer, 'do', largely because it was clear that 'do' was the final content word.

In Question 12, only five per cent of the respondents (9) answered correctly. Marion invites Harry to see a soccer match, but he refused her invitation, saying 'I'm not a big fan of soccer.' Then Terri shows interest telling Marion that 'I like watching soccer.' Considering the situation, 'I' needs to be emphasised in order to convey the message that Terri himself wants to join her. Taking into consideration that they did not choose 'I', the phenomenon known as initial high pitch does not seem to occur unconditionally.

In Question 13, 60 per cent of respondents (103) chose the correct answer, 'Chinese'. It is noticeable that 15 per cent of them (25) chose 'food' but this word has little information value in that it is a response to the 'eat' of Marion's utterance, which leads to old information with no stress necessary.

(9) (In Japanese: (situation) Jim and Rie are discussing the career they would like to pursue in the future.)

Jim: What job do you eventually want to have?

Rie: <sup>(1)</sup>I haven't thought about it. Have you?

Jim: Yeah, I want a job <sup>(2)</sup>that allows me to travel.

Rie: Hmm, that would be nice, wouldn't it? What kind of job?

Jim: I'd like to be a tour guide. <sup>(3)</sup>What would you like to do?

Rie: Now that you mention it, I guess I'd also like a job allowing me to travel.

Jim: Doing what?

Rie: <sup>(4)</sup>I'd like to be a pilot.

|    |   |         |   |         |   |       |   |        |
|----|---|---------|---|---------|---|-------|---|--------|
| 14 | ① | haven't | ② | thought | ③ | about | ④ | it     |
| 15 | ① | that    | ② | allows  | ③ | me    | ④ | travel |
| 16 | ① | would   | ② | you     | ③ | like  | ④ | do     |
| 17 | ① | I'd     | ② | like    | ③ | be    | ④ | pilot  |

Question 14 had been controversial in that after the examination finished its appropriateness was discussed amongst high school English teachers and university lecturers in the English Teaching magazine (Ikegami, 2003; Saito, 2003). What makes this question difficult was that high school students, generally speaking, did not have a knowledge of the rule of the stress being put on a final content word in a sentence. On top of that, the influence of the Japanese language intervenes, which led to the respondents choosing 'haven't' instead of 'thought'. As Wells describes 'negative transfer', 'a Japanese speaker of English would tend to place the English nucleus on the word that incorporates the translation of *nai*, namely *haven't*' (Wells, 2006, p. 13). In our experiment too, 63 per cent of them (107) chose 'haven't'.

In Question 15, the percentage of students who chose either 'allows' or 'travel' is 86 per cent (148). The word having high information value is 'travel'. If they had understood the rule of the stress being put on the final content word, the number of those who chose 'allows' would have been low.

Question 16 is a question in which the stress is put on a pronoun. Jim told Rie what occupation he would like to be engaged in. Then he asks Rie's desire, so that 'you' is emphasised. Nevertheless, only 15 per cent of the respondents (25) chose 'you'.

Contrary to the previous three questions, in Question 17 the overwhelming majority (70 per cent, 119 people) chose the correct answer.

Questions 18 and 19 in the first survey involved whether the participants could distinguish rising, falling, fall-rise, or rise-fall intonation. The response (Yes. / No.) was read with two different intonations, the first for (10) in a fall-rise intonation and the second in a rise-fall intonation. The subjects were asked to choose the attitude implied by the response text. The correct answer was 2 in the first and 1 in the second intonation. The sentence in (11) was read in a falling intonation the first time and in a rising intonation the second time. The correct answer was 1 in the first and 2 in the second intonation.

(10) Question 18

How was the movie? Did you like it? — Yes.

1. I liked it very much.
2. It was good, but ...

## (11) Question 19

Are you free tonight? — No.

1. unfriendly attitude
2. Why are you asking?

The percentage of correct answers was 93% in (10) and 94% in (11). In both questions over 90 per cent of respondents could tell the difference. The high percentage of correct answers can be attributed to the fact that there were only two answer choices and that the words used for intonation were very short words, 'yes' and 'no'. Since it is not possible to generalise the subjects' tendencies regarding intonation from these two questions, another experiment conducted several months later is described below as the second survey.

### Differences by *Eiken* English proficiency

The writer investigated whether the score of the stress-related test was relevant to the test-taker's *Eiken* English proficiency. The questions were divided into two groups: one group was 'content' and the other one was 'contrast', which means that these were the viewpoints for judging a stress-placed word. Questions 4, 7, 9, 11, 13, 14, 15, and 17 are the 'content' group and Questions 1, 2, 3, 5, 6, 10, 12, and 16 are the 'contrast' group. The 'content' group did not show significant differences in means amongst the *Eiken* grades as Table 3 shows.

**Table 3**

*Relationship Between Scores on 'Content Word' Questions and Grade Held on the English Proficiency Test.*

| Grade | Number | Average | SD    |
|-------|--------|---------|-------|
| Pre-1 | 3      | 6.000   | 1.732 |
| 2     | 24     | 4.625   | 1.861 |
| Pre-2 | 74     | 4.068   | 1.666 |
| 3     | 62     | 3.790   | 1.839 |
| 4     | 8      | 4.125   | 2.295 |

As the results revealed, there were no statistically significant differences across all *Eiken* proficiency groups in the questions in which a stress is placed on the last content word. On the other hand, statistically significant differences were observed in the academic achievement gap for the questions related to 'contrast' as Table 4 and Table 5 show. More specifically, the difference lies between *Eiken* pre-1 grade holders and pre-2 grade holders ( $p < .05$ ), and between *Eiken* pre-1 grade holders and 3 grade holders ( $p < .05$ ). This can mean that the most

academically highest group, *Eiken* pre-1 grade holders are different from other groups in that they were able to place a stress from a contrasting perspective.

**Table 4**

*Relationship Between Scores on ‘Contrast Word’ Questions and Grade Held on the English Proficiency Test.*

| Grade | Number | Average | SD    |
|-------|--------|---------|-------|
| Pre-1 | 3      | 4.333   | 1.528 |
| 2     | 24     | 2.792   | 1.668 |
| Pre-2 | 74     | 2.027   | 1.414 |
| 3     | 62     | 1.887   | 1.332 |
| 4     | 8      | 1.875   | 1.959 |

**Table 5**

*Multiple Comparison Test*

| Method | Eiken 1 | Eiken 2 | Average 1 | Average 2 | Difference | Statistic | P value |
|--------|---------|---------|-----------|-----------|------------|-----------|---------|
| Tukey  | Pre-1   | 2       | 4.3333    | 2.7917    | 1.5417     | 1.7346    | 0.3067  |
|        | Pre-1   | Pre-2   | 4.3333    | 2.0270    | 2.3063     | 2.6982    | 0.0384* |
|        | Pre-1   | 3       | 4.3333    | 1.8871    | 2.4462     | 2.8512    | 0.0254* |
|        | Pre-1   | 4       | 4.3333    | 1.8750    | 2.4583     | 2.5020    | 0.0632  |
|        | 2       | Pre-2   | 2.7917    | 2.0270    | 0.7646     | 2.2428    | 0.1153  |
|        | 2       | 3       | 2.7917    | 1.8871    | 0.9046     | 2.5926    | 0.0505  |
|        | 2       | 4       | 2.7917    | 1.8750    | 0.9167     | 1.5471    | 0.4098  |
|        | Pre-2   | 3       | 2.0270    | 1.8871    | 0.1399     | 0.5600    | 0.9549  |
|        | Pre-2   | 4       | 2.0270    | 1.8750    | 0.1520     | 0.2815    | 0.9962  |
|        | 3       | 4       | 1.8871    | 1.8750    | 0.0121     | 0.0222    | 1.0000  |

\* : P<0.05

What this comparison revealed was as follows: the subjects can relatively with ease place the stress in terms of ‘last content word’, but have difficulty placing the stress in terms of ‘contrast’. Students need to be taught that stress can be placed on any word in terms of ‘contrast’ and that the stress is placed on the last content word and in addition that the new information is responsible for the placement.

Comparing the ‘content’ and ‘contrast’ questions, subjects performed better on the ‘content’ questions. Interestingly, there had been no opportunity to learn the rule of placing a stress on the last content word by default. If they unconsciously acquired this rule, it may have

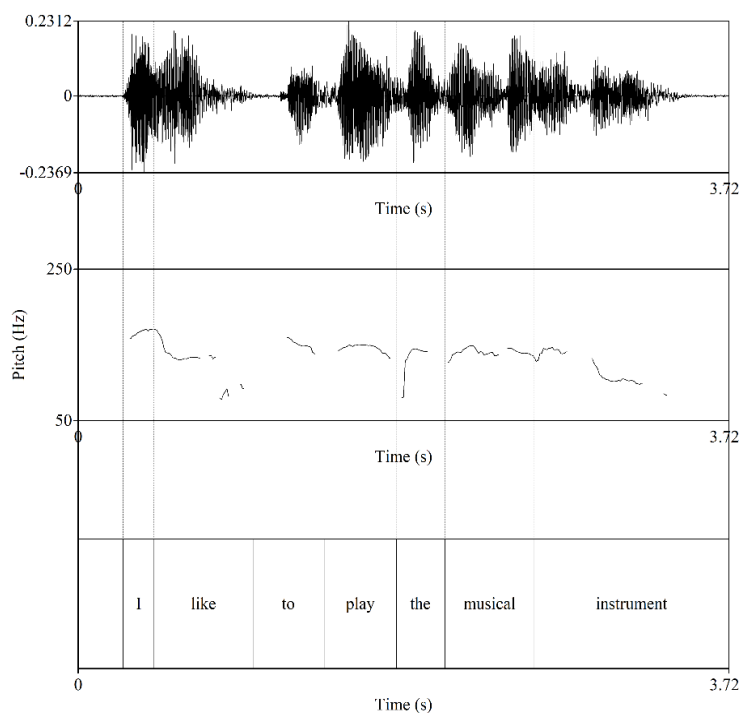
been learnt naturally by ear through daily reading aloud task. On the other hand, what makes the issue of ‘contrast’ more difficult is the fact that the stress is placed in a different place than the default depending on context. The fact that they are accustomed to being exposed to written English, such as in textbooks, but are less familiar with spoken English, may be the reason for their inability to do so.

### Differences in the stress of ‘I’ between spoken and written language

Only five per cent of subjects were able to choose the correct answer in Question 12. Japanese English learners are known to tend to put a stress on the initial pronoun ‘I’. Despite this, the failure to choose ‘I’ in this question may be due to the difference between written and spoken language. To test this, the author voluntarily asked the holders of *Eiken* grade 3, grade pre-2, and grade 2 to introduce themselves in order to find out whether the phenomenon called initial high pitch described in previous research on pitch would actually be observed or not. A template (Appendix C) was provided in advance so that an environment was set up where initial high pitch would not be the default. The voiceprint of an *Eiken* 3 grade holder of the ‘I like ...’ sentence through Praat software is shown as a representative in Figure 1. The grade pre-2 and 2 holders showed a similar trend, so we omitted their pitch contour diagrams.

**Figure 1**

*Pitch Contour of Eiken 3 Grade Holder*



As this is essentially a self-introductory sentence, the 'I' should start with a low pitch and the nuclear stress should be placed on the object of the verb, 'like', but the three subjects started with a high pitch for the 'I', dropped with 'like', and gradually dropped intonation towards the end of the utterance. This was an unnatural intonation with the nuclear stress placed on 'I', even though they were not making comparison with others.

The fact that subjects utter 'I' at a high pitch in the default state and end the utterance in a faded manner is, according to Mori (2012), due to mother tongue interference in Japanese. In Japanese grammar, she states, pronouns and conjunctions belong to independent words and have their own accent, and furthermore, the typical intonation of Japanese declarative sentence is *he* in *hiragana* shaped, which causes initial high pitch. However, the present study revealed that initial high pitch is not unconditionally observed in written language.

### Second survey

The second study examined whether English learners could understand the meaning implied by intonation when they heard English sentences. As in Survey 1, the results for the questions and responses are presented below. The total number of participants was 157.

(12) What's the time?

Q: Which is more polite? A or B

In (12) Speaker A used falling tone and Speaker B rising tone. Only 24 per cent of students (38) chose B. This may be because they mistakenly believe that wh-questions always employ falling tone. The rising tone avoids assertions, which implies gentleness as Wells states 'this (=a rise-fall) has the effect of making it *more gentle*, kindly, encouraging, sympathetic or deferential, as opposed to the businesslike fall' (Wells, 2006, p. 43). Subjects' ignorance that this is also true for wh-questions led to a low percentage of correct responses.

(13) I know Mary.

Q: Which follows 'But ...' after the sentence, A or B?

In (13) Speaker A used falling tone and Speaker B fall-rise tone. Fall-rise tone is, generally speaking, unfamiliar to Japanese learners of English. That being said, of two choices (falling and fall-rise intonations) 66 per cent of respondents (104) understood the meaning of fall-rise intonation. It may be relatively easy for subjects to perceive that the fall-rise tone does not end the statement and that the opposite content follows later.

Next, the following two questions, (14) and (15) have four choices (A for falling, B for

rising, C for fall-rise, or D for rise-fall tone). Interestingly, the majority of the respondents understood the meaning of the fall-rise tone. In (14) 53 percent of respondents (83) and in (15) 45 percent of them (70) chose the correct answer.

(14) She could do.

Q: Which follows 'But ...' after the sentence, A, B, C, or D?

(15) That's OK.

Q: Which follows 'But ...' after the sentence, A, B, C, or D?

(16) He doesn't speak to anybody.

Q: Which means that he speaks to some people, A or B?

Similarly, their relatively understandable knowledge of the fall-rise tone was confirmed in the question (16) in which there were only two choices (A for falling and B for fall-rise tones). 68 per cent of respondents (107) answered correctly. Despite having learnt nothing about intonation as theory, we can say that the subjects have a fairly good understanding of the meaning of fall-rise tone. The fact that they were able to read the meaning implied by the use of rising intonation in the middle of a sentence, where judgment is withheld and a further sentence follows, may be because the same rule applies in Japanese.

Finally, whether the intonational implications of the tag question could be understood was also investigated.

(17) You did it, didn't you?

Q: Which asks for confirmation, A or B?

In (17) Speaker A used rising tone and Speaker B falling tone. Since confirmation is required, subjects will choose B. Falling tone in a tag question means 'appealing for agreement' (Wells, 2006). Of two choices (rising or falling tone), only 23 per cent of the students (36) chose the correct answer.

Based on these results, it seems that it is not so difficult for English learners to hear fall-rise intonation and guess its meaning. On the other hand, the inability to understand the intonational implications of rising and falling intonations can be attributed to a simple lack of knowledge of basic rules.

### Conclusion

In response to research questions 1 and 2, it has been observed that high school English learners cannot correctly place the stress on functional words as readily as they can on content words. In particular, the results indicated that pronouns were significantly more difficult to place the stress on. Observing the two major aspects of the question, ‘placing the stress on the last content word’ and ‘placing the stress on the contrasted word’, it was found that learners at all levels, regardless of English proficiency, were generally unable to correctly answer the question in which ‘placing the stress on the contrasted word’ is the key. This suggests that learners should be taught the rule that stress can be placed on any word depending upon the context. At the same time, it was confirmed that learners with high English proficiency at the level of *Eiken* pre-1 are statistically significant in being able to place stress on any word with a contrastive perspective. Holders of other levels are required to consider the stress from a contrastive perspective.

As for the response to the third research question, the phenomenon of initial high pitch was observed when analysing the speech data of those who had obtained *Eiken* grade 2, pre-2, and 3. However, it is difficult to generalise the results since the data were obtained from only a few representative students from each level. Subjects unconsciously start the ‘I’ at the beginning of the sentence with a high pitch and place the nucleus when speaking, but do not necessarily place the stress unconditionally when looking at written English.

Finally, with regard to the fourth research question, we determined that learners can understand the attitude implied by the intonation, since more than 90% of the subjects in the first survey were able to distinguish the four types of intonations after listening to the audio. However, generalising with only two questions, and with only two options, is risky; consequently, we conducted a second survey. What became clear was that the understanding of fall-rise tone was high. On the other hand, a number of subjects were found to assume that wh-questions were always read in a falling tone. It was confirmed that many students were also unable to understand the meaning of intonation for tag questions.

In a study on intelligibility by Nishio & Tsuzuki (2014), intelligibility was reportedly lower when the position of the stress was placed incorrectly than it was when the segmental phoneme was incorrectly pronounced. This result is noticeable because it is contrary to *Lingua Franca Core* by Jenkins, where word stress does not necessarily have to be placed correctly by the speaker. When it comes to nuclear stress, however, it plays a crucial role for intelligibility (Jenkins, 2000). For English learners, correct placement of stress both in segmental and in suprasegmental levels is particularly important knowledge for smooth communication. As default, the stress is placed on the last content word, which is assumed to be new information.



In a dialogue, it is also important for English learners to know that the stress can be placed on any word, whether it be a content word or a function word, taking the contrast perspective into account. When teaching suprasegmental phonemes, we believe that if the above minimum information is acquired, it will lead to relatively sufficient communication.

Although the small amount of data is not sufficient to draw generalised conclusions, the study did reveal some of the challenges high school students face at the suprasegmental level. Further research on intonation will be the subject of future studies.

### Notes

1. This paper is based on a paper presentation at The 5<sup>th</sup> Conference of the Japan Association of Language and Speech on the 18<sup>th</sup> of September 2022.
2. One of the reviewers noted that question (7) was problematic. S/he pointed out that ‘trendy’ could also be the correct answer, assuming that the ‘charismatic’ hairdresser dyed the hair.

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**Appendices****Appendix A**

A 以下の対話において、①～④のうちどの語を最も強く発音すればよいか。1つ  
選びなさい。(In the following dialogues, which of the word ① to ④ should be  
pronounced the most strongly? Choose one.)

1.

A: Helen, I heard you are writing a new book.

B: Well, actually, I'm only thinking of writing one.

①      ②      ③      ④

2.

A: My sister told me John's going to visit either the States or Canada?

B: As a matter of fact, he's going to the States and Canada.

①      ②      ③      ④

3.

A: My sister came back from abroad last week.

B: Where was she?

A: She was in New York in July and Los Angeles in August.

B: Oh, really? My sister also went to the States this summer.

①   ②      ③      ④

4.

A: Tom's going to be late.

B: Why? Did he miss his flight?

A: No, it seems that they had engine trouble.

①   ②   ③      ④

5.

A: Shoko always has her coffee with her meal, I think.

B: Really? I prefer to have my coffee after the meal.

①      ②   ③      ④

6.

A: What a charming dress! It makes her look really young.

B: But she is young. She's still in her twenties.

①   ②   ③   ④

B 次の会話について、問いに答えなさい。(Answer the questions about the following conversation.)

《状況》 Jeffの髪について友達が話し合っている。([situation] Friends are talking about Jeff's hair.)

A: Have you seen Jeff recently?

B: No. Has he changed his hair again?

A: He sure has. This time, (1)the trendy guy dyed it.

B: Wow! It must look really great. What color is it?

A: You won't believe it! I (2)can hardly believe it myself.

B: Why? Is it that different?

A: I'll say! It's black and white. (3)He looks like a panda.

7. 下線部 (1)で最も強調して発音されるものはどれか。次の①～④のうちから1つ選びなさい。(Which of the following is most emphatically pronounced in the underlined sentence (1)? Choose one from the following ① to ④.)

① trendy ② guy ③ dyed ④ it

8. 下線部 (2)と同じように発音される can を含む文はどれか。次の①～④のうちから1つ選びなさい。(Which sentence contains 'can' pronounced the same way as the underlined sentence (2)? Choose one from the following ① to ④.)

- ① He says he can help me with my homework.
- ② I put the money in the can over there two days ago.
- ③ Is there a possibility that he can?
- ④ Please let me know when you can, if you don't mind.

9. 下線部 (3)で最も強調して発音されるものはどれか。次の①～④のうちから1つ選びなさい。(Which of the following is most emphatically pronounced in the underlined sentence (3)? Choose one from the following ① to ④.)

① He ② looks ③ like ④ panda

Ⓒ 以下の会話の下線部(1)～(4)について、それぞれ下の問い(問10～13)に示された①～④の中で最も強調して発音されるものを1つ選びなさい。(For each of the underlined parts (1) to (4) of the following conversation, choose the one most strongly pronounced of the words indicated ① to ④ of the questions below (Q10 to 13).)

《状況》 Marion, Terri, Harry の三人がパーティーで初めて会い、話をしている。  
 ((situation) Marion, Terri, and Harry met for the first time at a party and were talking.)

Marion: Oh, are you American?

Terri: No, I'm Canadian, but I live in Sydney.

Marion: How funny! <sup>(1)</sup>My sister lives in Sydney.

Harry: Small world! I have a cousin in Sydney, too.

Terri: Marion, <sup>(2)</sup>what does your sister do?

Marion: She's a professional athlete.

Harry: Really? What sport?

Marion: Soccer. Harry, are you interested in women's soccer?

Harry: Not really. I'm not a big fan of soccer.

Marion: Too bad. I have a spare ticket to a soccer match next week.

Terri: Well, <sup>(3)</sup>I like watching soccer.

Marion: Do you want to come?

Terri: Sure. I'd love to.

Marion: Hey, why don't we go out to dinner before the match? What do you like to eat?

Terri: Hmm. <sup>(4)</sup>How about Chinese food?

- |    |   |      |   |        |   |          |   |        |
|----|---|------|---|--------|---|----------|---|--------|
| 10 | ① | My   | ② | sister | ③ | lives    | ④ | Sydney |
| 11 | ① | does | ② | your   | ③ | sister   | ④ | do     |
| 12 | ① | I    | ② | like   | ③ | watching | ④ | soccer |
| 13 | ① | how  | ② | about  | ③ | Chinese  | ④ | food   |

D 以下の会話の下線部(1)~(4)について、それぞれ下の問い (問 14~17) に示された①~④の中で最も強調して発音されるものを1つ選びなさい。(For each of the underlined parts (1) to (4) of the following conversation, choose the one most strongly pronounced of the words indicated ① to ④ of the questions below (Q14 to 17).)

《状況》 Jim と Rie が将来就きたい職業について話し合っている。((situation) Jim and Rie are discussing the career they would like to pursue in the future.)

Jim: What job do you eventually want to have?

Rie: <sup>(1)</sup>I haven't thought about it. Have you?

Jim: Yeah, I want a job <sup>(2)</sup>that allows me to travel.

Rie: Hmm, that would be nice, wouldn't it? What kind of job?

Jim: I'd like to be a tour guide. <sup>(3)</sup>What would you like to do?

Rie: Now that you mention it, I guess I'd also like a job allowing me to travel.

Jim: Doing what?

Rie: (4) I'd like to be a pilot.

- |    |   |         |   |         |   |       |   |        |
|----|---|---------|---|---------|---|-------|---|--------|
| 14 | ① | haven't | ② | thought | ③ | about | ④ | it     |
| 15 | ① | that    | ② | allows  | ③ | me    | ④ | travel |
| 16 | ① | would   | ② | you     | ③ | like  | ④ | do     |
| 17 | ① | I'd     | ② | like    | ③ | be    | ④ | pilot  |

E 以下の例文が読まれます。応答文（ Yes. / No. ）は2つの異なるイントネーションで読まれます。応答文のイントネーションが意味する内容を選択しなさい。

(The following statement will be read. The response sentence will be read with two different intonations. Choose what the intonation of the response sentence means.)

18. How was the movie? Did you like it?

(応答文) (the response sentence) Yes.

- (a) とても気に入った。 (I liked it very much.)  
 (b) よかったけど・・・ (It was good, but ...)

19. Are you free tonight?

(応答文) (the response sentence) No.

- (a) 無愛想 (unfriendly attitude)  
 (b) なぜ聞くの? (Why are you asking?)

**Appendix B***Intonation Test*

The following sentences are read with two (A and B) or four (A, B, C, and D) intonations.  
Answer each question.

1. What's the time?  
Which is more polite? A or B
2. I know Mary.  
Which continues 'But ...' after the sentence, A or B?
3. She could do.  
Which continues 'But ...' after the sentence, A, B, C, or D?
4. That's OK.  
Which continues 'But ...' after the sentence, A, B, C, or D?
5. He doesn't speak to anybody.  
Which means that he speaks to some people, A or B?
6. You did it, didn't you?  
Which asks for confirmation, A or B?

## Appendix C

### *Self-introduction template*

Hello.

I'm \_\_\_\_\_

I'm from \_\_\_\_\_

I live in \_\_\_\_\_

I like \_\_\_\_\_

I belong to the \_\_\_\_\_ club.

I'm a \_\_\_\_\_ person

I want to be a \_\_\_\_\_ in the future.

### 【vocabulary】

cheerful (楽しい、快活な)

honest (誠実な)

earnest (真面目な)

thoughtful (思いやりのある)

diligent (勤勉な)

optimistic (楽観的)

sociable, outgoing (社交的)

calm (穏やか)