

Intonational Barrier in English Ambiguity for Japanese Students

Kazuaki ICHIZAKI

曖昧な英語文のイントネーションの同定について 日本人学生に見られる問題

市 崎 一 章

要旨

その曖昧性の差がイントネーションにあるとされる英語文の聴き取り同定テストを通して、基本周波数曲線への言及の下、日本人学生が、いかなる曖昧性の同定を困難としているかを明らかにした。聴き取りテストと音声資料の基本周波数分析の結果、より少ない音節でのピッチ変化の対立や脈絡がない聴き取り対象、また、当然ながらより馴染みのないと思われるイントネーションパターンに対する同定の困難さが観察された。また同じ曖昧性を含む文でも、そのピッチ変化の対立が文頭に位置するより、後方に現れた方が同定は困難であった。なお、本テストは六カ月の時間を隔てて同一被験者を対象に同一問題で行ったが、テスト問題間の相対的難易度は二度共に同じ傾向を呈し、二度のテストの得点間に統計的有意差は認められなかった。

1. Introduction

Ambiguity causes misunderstanding in communication and we usually try to get rid of it when we talk or write. Although there seems to be some direct relation between prosodemes in spoken language and punctuation marks in written language, the former has to be more respected since the latter themselves cannot represent precise information unless further detailed designations are given to them. When the same sentences are uttered in different ways, it is important to know where the speaker put prominence in each sentence. Prominence here means being auditory prominent — in other words, stress, generally. It has been said that stress consists of three basic factors: pitch change, duration, intensity; with decreasing participation in this order.

This paper is going to deal with intonation, which seems to play the greatest role in speech and whose misuse can produce more ambiguity. Intonation divides connected

speech sounds into some meaningful fragments, for intonational units correspond to syntactic units. Native speakers of English properly use intonation unconsciously or at their will and hearers, if their mother tongue is English, seldom make an effort to comprehend the meaning that each intonation carries. Then how do they identify the meaning if hearers are non-native speakers of English? The aims of this research, which was done using Japanese students as testees, are to clarify 1) how precisely they identify the meaning that each English intonation carries and 2) what sorts of intonation, or ambiguity, if any, are greater barriers for them to understand spoken English.

2. Investigation Procedure

2.1 Corpus

Sixteen sets of English sentences/names, whose structures are the same but with different intonation in each set, were chosen as the corpus from nine linguistics books published in recent years: Fries(1952), Halliday(1970, 1976), Horn(1972), Jackendoff(1972), Quirk et al.(1972, 1985), Ota(1980), Ito et al.(1982). When citing such materials, all punctuation marks were deleted in principle — following Fries(1952) — in order to avoid their influence, and very little intonation and only meaning/connotation were appended to each corpus as a guide for the informants to utter. They are titled Table 1 and listed at the end of this paper.

2.2 Informants and Testees

Eight native speakers of English, aged 27-57, who were teaching English at a Japanese college or a university were chosen as the informants to take educated/standard usage of English. They were from the U.S. (a male and three females), the U.K. (two males), Canada (a male), and Australia (a male). The divergence in their sex and nationality was a result of deliberate selection as it was expected that there might be some common intonation patterns in their English regardless of such factors. For the testees there were two groups of Japanese college students on two occasions: nineteen second year female students in April 1999 and a half year later; and fifty-nine female freshmen on the same occasions. All of them had been learning English for 6-7 years and majoring English at a college.

2.3 Testing Procedure

The informants were asked to pronounce the corpus with natural speed and manner, as in their daily conversation, referring to the given meaning/connotation. They were also asked to be indifferent even when they felt there would be no difference in intonation between some pairs in a set. Their utterance was recorded with a mini disc recorder. The

recorded corpus was analyzed using sound analyzing software "Onnseirokubunnkenn" made by Imagawa and Kiritani (1989) and the contours of fundamental frequency (F_0) were observed. Pitch, which is sensitive scalar, is different from fundamental frequency, which is physical scalar. According to Stevens and Volkman (1940), however, it does not matter much to regard F_0 contour as intonation contour since the former is roughly in proportion to the latter in the range of 50-1,000 cycles/second in which human speech is conducted. More detailed remarks with reference to intonation can be found in the following section, 3.2 Observation of Intonation Contour. In order to make a cassette tape for playing back for a listening test any informant whose intonation contour was rather dissimilar to that of the others was excluded. After such exclusion two female Americans and a male American were finally adopted as the informants for the cassette tape used.

Listening tests were carried out in L.L. on every occasion. The testees were given an answer sheet and question sheets on which meanings to match were rearranged at random from the recorded order. Along with the play back of the mini disc, each of the testees recorded the materials on her cassette tape for herself and played back as many times as she wanted. The time spent for each test was approximately 45 minutes. A half year later tests were conducted in exactly the same manner using the same recorded corpus and test papers.

3. Results

3.1 Test Results

The original test used this time consists of sixteen questions: twelve alternatives, No. (1)-(12), and four multiple choices, No.(13)-(16), which have twenty-four blanks. The test was marked with thirty-six points maximum, which means twelve points for the alternatives plus twenty-four points for the multiple choices. The total scores were also converted with one hundred maximum for better comprehension and shown in Table 2. T-test, McNemar test and Cochran's Q test were carried out and their results were given in brackets as occasion demanded.

There was no significant difference between the two groups on either occasion ($[t=1.16, df=76, p>.10]$ in April and $[t=1.31, df=76, p>.10]$ in October). While the average score of freshmen in April (henceforth F 1) and that of freshmen in October (henceforth F 2) were 40.9 and 42.5 with 100 maximum respectively, that of the second year students in April (henceforth S 1) and that of the second year students in October (henceforth S 2) were 37.6 and 39.0 out of 100. Both groups showed very little development after six months ($[t=.95, df=58, p>.10]$ between F 1 and F 2 ; $[t=.75, df=18, p>.10]$ between S 1 and S 2), which means there was no statistical significance between the two occasions

for either group.

Since no significant difference was noticed between either groups or occasions, the combined scores of the two groups were employed for the criterion of difficulty. For alternative questions, No.(1)-(12), they can be divided into three difficulty levels taking the averaged scores of the two occasions. Questions No.(4), (10), (1), (9), (2) and (6), with increasing difficulty in this order, made a less difficult group, in which the scores were 74 or more; questions No.(3), (5), (12), (8) and (7) made a difficult group, in which the scores were in the 50s; and question No.(11) was the most difficult one, with a score of 32. The combined scores of six questions out of twelve improved, those of two questions were the same, and those of four questions got worse in October. The only statistical difference after a half year was in the progress noticed on question No.(8) in the result of McNemar test [$z=2.16$, $p<.05$]. As the next comparison, the difference of difficulty was tested on both occasions between question No.(2) in which *all* precedes the sentence as a part of the subject and question No.(3) in which *all* appears in a posterior position as a part of the object. A significant difference was found with $p<.01$ on both occasions: [$Q=8.26$, $df=1$, $p<.01$] in April and [$Q=7.05$, $df=1$, $p<.01$] in October.

The score range for multiple choices, question No.(13)-(16), were from 8 to 63 points in the scale of one hundred. As was done in the alternative questions above, it would be simpler to distinguish three levels of difficulty in order to have consistency. Therefore, the range was divided into three groups: a less difficult group scoring 40 or more points, a difficult group scoring from 20 to 39 points, and the most difficult group with less than 20 points. The less difficult group included questions No.(14)-(5), (15)-(4) and (15)-(6) with increasing difficulty in this order, the difficult group included fourteen questions out of twenty-four and the most difficult group included seven questions, No.(16)-(1), (15)-(5), (14)-(6), (14)-(7), (13)-(4), (13)-(2) and (14)-(4). The numbers of the questions whose combined scores got better in October were three in the series of No.(13), three in No.(14), five in No.(15) and five in No.(16). Among twenty-four questions, two showed significant difference after a half year. They were No.(13)-(1) with a regression [$z=2.09$, $p<.05$] and No.(15)-(4) with a progression [$z=2.79$, $p<.01$]. Also, according to Cochran's Q test, all questions on both occasions, except question No.(16) in April [$Q=3.37$, $df=5$, $p>.10$], showed significant differences in difficulty between choices within each question.

3.2 Observation of Intonation Contours

Observing intonation contours of alternative questions, many of them differentiated on the contour of a single word. In the easiest question No.(4), however, two words, *and* and *go*, had opposite contours; both *and* and *go* in total negation had a falling contour whereas those in partial negation had a rising contour. In the second easiest question No.(10), the contrast was seen on the overall contour; wh-question had a falling contour

whereas echo question had a rising one. In question No.(9), which also belonged to the less difficult group, there was a contrast on two words, *don't* and *friends*. While the sentence meaning "I have more than three friends" showed a steep rise-fall on *don't* and a rise on *friends*, the sentence meaning "I have fewer than three friends" showed an overall down drift. Comparing different questions, between question No.(2) and (3), there was a significant difference in difficulty as mentioned above. Both questions were the same in one respect; that they had a contrast of total-partial negation, *all* in partial negation in both pairs showing a steep rise in intonation whereas *all* in total negation in them was considered to be a part of the overall down drift; however, they were different in the place where *all* appeared, *all* at the beginning in question No.(2) and *all* in a posterior position in No.(3).

In the case of multiple choices, calls using one's name were relatively difficult to identify. There were as many as five calls out of seven questions which belonged to the most difficult group. The names used in the test consisted of one or two syllables and the testees had to distinguish them within a moment. Moreover, apart from question No.(15) and (16), no context was given to the "calls." The most difficult items, *John* meaning "We are ready" and *Eileen* meaning "You shouldn't have done that", both ended with a rather level contour. Furthermore *Eileen* meaning "Listen! I've got something to say to you", which belonged to the most difficult group, also ended with a level contour after a rise-fall. Among the calls there was an exception whose scores belonged to the less difficult group. It was question No.(14)-⑤, *Eileen* meaning "Is that you? Where are you?" It had a rising contour and was pronounced with a medium intensity. Question No.(13)-④, *John* meaning "I want you", could be a counterpart of question No.(14)-⑤ since No.(13)-④ also showed a rising contour but belonged to the most difficult group. The only difference in their manner of pronunciation was that question No.(13)-④ was pronounced with a large intensity with a decisive attitude. Question No.(16)-①, *Fred ate the beans* corresponded to "I know what Fred COOKED. But then, what did he EAT?", is another example whose scores belonged to the most difficult group whereas the other items in question No.(16) belonged to the (medium) difficult group. The F_0 contour of No.(16)-① was just like that of a simple sentence and showed a natural down drift with the largest prominence on *beans* and the second largest prominence on *Fred*.

4. Conclusion

Except for a few changes proved by McNemar test, there was no significant increase in testees' scores throughout the questions even after a half year. It can regrettably be said that a half year is too short for Japanese students to identify English intonation correctly grasping the differences in meaning. Since McNemar test just showed the overall

tendency of the testees, even under the result of regression there were some students who answered wrongly in April and answered correctly in October, and under the result of progression, vice versa; that is, to know educational effect on individual students is a different matter.

A greater contrast in intonation contour seems to give listeners more hints to identify the meanings in the same structured sentence. It was illustrated in the higher scores of question No.(4) where two words had contrast and those of question No.(10) where the contrast over whole sentences was seen.

When distinguishing intonation in a certain position, as seen in total-partial negation in this test, intonation appears to be more easily distinguished at the beginning of a sentence by Japanese students. The higher scores of question No.(2) over No.(3) might suggest that.

Since most English names consist of only a few syllables listeners have to identify their connotation within a moment. Without any context identification would be all the harder. This seems to be why many in the most difficult group were calls.

Although it cannot be decisively concluded, there seemed to be a tendency for spoken materials ending with level contour to be difficult to identify. Utterances ending with level contour appear less frequent compared to those ending with falling or rising contour, so Japanese students had not been accustomed to listening to such utterances. In the same sense it seems to be the first time for them to listen to *Was he mad* with the meaning of exclamation in question No.(11) whose score was the worst of all alternatives. The counterpart of it, that is, *Was he mad* with the meaning of a Yes-No question was pronounced not with a rising contour but with a rather level contour according to the writer's request (the only item in the corpus for which the informants were asked to give a specified intonation), which seems to have made the listeners all the more confused.

It is true that there was a series of sentences, question No.(15)-(4), ⑤, ⑥ — two of them (④ and ⑥) belonged to the less difficult group whereas one of them (⑤) belonged to the most difficult group — whose difference of scores cannot be explained by only observing their intonation contours. Intonation varies depending upon the speaker's feeling on every occasion. Its flexibility might be beyond conception. Although there are a great number of problems, to clarify this mysterious feature is the next step for the writer to take.

Table 1 :**Listening Test**

(The questions, notes and the meaning/connotation on original question sheets were given in Japanese.)

The following sentences are pronounced with different intonations: No.(1)-(5) and (9)-(12) with two, No.(6)-(8) with one, No.(13)-(16) with five through seven. Which meaning/connotation does each utterance correspond to? Fill in the blanks in the answer sheet with appropriate numbers. The numbers put over the blanks means the order of utterance you hear.

(1) I like it

- ① I in this sentence suggests 'too.'
- ② Even if you don't, I don't know about anyone else.

(2) All the men didn't go

- ① partial negation (=Some of them went.)
- ② total negation (=Nobody went.)

(3) I wasn't listening all the time

- ① partial negation
- ② total negation

(4) John and Bill didn't go

- ① Neither John nor Bill went.
- ② Not both of them went, i.e. one of them stayed.

(5) Shall we go by bus or train

- ① Which shall we use, bus or train?
- ② Shall we use bus, train, or... some other means of traffic?

(6) John or Mary went to the party

- ① Either John or Mary went to the party.
- ② John, Mary, or... someone else went to the party.

(7) My mother is in the kitchen or in the bedroom

- ① My mother is either in the kitchen or in the bedroom.
- ② My mother is in the kitchen, in the bedroom, or... somewhere around.

(8) If I get a raise or bonus, I'll buy you a fur coat

- ① If I get either a raise or a bonus, I'll buy you a fur coat
- ② If I get a raise, bonus, or... some other income, I'll buy you a fur coat.

- (9) I don't have three friends
- ① I have fewer than three friends.
 - ② I have more than three friends.
- (10) Who is the man over there
- ① Did you say "Who is the man over there?"
 - ② Who is the man over there?
- (11) Was he mad
- ① Was he mad?
 - ② I can't believe he was mad!
- (12) Were they all here
- ① Were they all here?
 - ② If they were all here...
- (13) John
- ① Are you there?
 - ② We are ready.
 - ③ How could you?
 - ④ I want you.
 - ⑤ Is it you?
- (14) Eileen
- ① I'm warning you!
 - ② Come here! Stop that!
 - ③ Listen carefully! Don't tell anyone. Be honest.
 - ④ You shouldn't have done that.
 - ⑤ Is that you? Where are you?
 - ⑥ Listen! I've got something to say to you.
 - ⑦ Now I've told you before! Take a look at that!
- (15) Except①, two people, A and B, are talking each other. Did B say the following sentence by himself or which question of A did B reply to?
- B: I am painting my living room blue
- ① (simple statement of B)
 - ② (A: Weren't you intending to paint your living room blue?)
 - ③ (A: So John is painting your living room blue.)
 - ④ (A: Are you painting your kitchen blue?)

⑤ (A: John is painting his living room blue.)

⑥ (A: I've changed my mind about papering.)

- (16) Let us suppose there are some people and some dishes and they had some dishes. Speaker A uttered the following questions with some stress on the capital words. Which question of A did B reply to?

B: Fred ate the beans

① (A: I know what Fred COOKED. But then, what did he EAT?)

② (A: Well, what about FRED? What did HE do to the beans?)

③ (A: Well, what about the BEANS? Who ate THEM?)

④ (A: Well, what about FRED? What did HE eat?)

⑤ (A: I know who COOKED the beans. But then, who ATE them?)

⑥ (A: Well, what about the BEANS? What did Fred do with THEM?)

Table 2:

The Ratios of Correctness for the Group of Freshmen, the Group of the Second Year Students and the Combined of the Two.

(For each question the figures in the first line are the ratio of freshmen; the second line, the second year students; the third line, the combined.)

1)		April	October	2)		April	October	3)		April	October
	F	86	88		F	81	75		F	61	47
	S	89	79		S	79	68		S	53	63
	C	87	86		C	81	73		C	59	51
4)		April	October	5)		April	October	6)		April	October
	F	97	97		F	47	58		F	78	73
	S	89	95		S	58	58		S	63	79
	C	95	96		C	50	58		C	74	74
7)		April	October	8)		April	October	9)		April	October
	F	51	53		F	46	58		F	81	85
	S	53	47		S	42	68		S	79	89
	C	51	51		C	45	60		C	81	86
10)		April	October	11)		April	October	12)		April	October
	F	88	95		F	36	31		F	51	58
	S	84	89		S	32	21		S	53	53
	C	87	94		C	35	28		C	51	56
13)-①		April	October	13)-②		April	October	13)-③		April	October
	F	53	36		F	10	17		F	20	24
	S	32	16		S	11	5		S	16	16
	C	47	31		C	10	14		C	19	22

		April	October			April	October				
13)-④	F	8	20	13)-⑤	F	49	34				
	S	5	5		S	21	16				
	C	8	17		C	42	29				
		April	October			April	October			April	October
14)-①	F	24	27	14)-②	F	41	37	14)-③	F	20	24
	S	26	0		S	21	16		S	32	11
	C	24	21		C	36	32		C	23	21
		April	October			April	October			April	October
14)-④	F	8	19	14)-⑤	F	59	61	14)-⑥	F	17	12
	S	11	5		S	53	68		S	32	26
	C	9	15		C	58	63		C	21	15
		April	October								
14)-⑦	F	10	19								
	S	21	11								
	C	13	17								
		April	October			April	October			April	October
15)-①	F	36	44	15)-②	F	24	17	15)-③	F	24	27
	S	26	37		S	16	21		S	21	26
	C	33	42		C	22	18		C	23	27
		April	October			April	October			April	October
15)-④	F	34	56	15)-⑤	F	14	20	15)-⑥	F	41	42
	S	37	58		S	32	16		S	37	42
	C	35	56		C	18	19		C	40	42
		April	October			April	October			April	October
16)-①	F	27	15	16)-②	F	34	32	16)-③	F	31	39
	S	16	11		S	21	37		S	32	37
	C	24	14		C	31	33		C	31	38
		April	October			April	October			April	October
16)-④	F	32	34	16)-⑤	F	25	31	16)-⑥	F	24	27
	S	26	53		S	16	32		S	21	32
	C	31	38		C	23	31		C	23	28

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