

Intonation Patterns and Nuclei in English Amphibology

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英語の多義構文における音調と核

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要旨

多義構文であっても、英語では特にイントネーションや卓立を適切に使い分けることで、その意を正確に相手に伝達することが可能である。多義構文の韻律素性を扱った先行研究より、イントネーションや核への言及が不十分な構文に的を絞って、本稿の音声資料とした。それを英語を母語とするイギリス、アメリカ、カナダ、オーストラリア出身の男女計8名が発話、録音し、音声分析ソフトを用いてその基本周波数の変移を調べた。同時に彼らの協力で各資料の核音節を同定した。その結果次のような知見を得た。女性は、「不安を伴った確認」や「非難」の意で、話し相手の名前（単音節）を呼ぶ際、その名前を2脚に分離しがちである。同一人物による隣り合う言語使用域での発話は、ストレスパタンの差として表現され、当人のイントネーションパターンに変化は生じない。正式スタイルにおいては、Yes-No questionでも文尾には下降調が好まれる。排他的“or”を用いる平叙文では、“or”自体のピッチが高まり核となる。その際、2番目の卓立が先行選択肢に置かれ、その直後にポーズが挿入されやすい。包括的“or”が文頭の主部に用いられる平叙文では、“or”は卓立を帯びず、そのピッチは直前の名詞より低くなる。“A and B...not”という構造の文は、全文否定ではもちろん、部分否定でも文末は下降調になる傾向がある。ただ全文否定では“A, B”が核となるのに対して、部分否定では“and”のみが核となる。分裂焦点を担う分裂文では、どちらが新出情報であるか既知情報であるかに関わらず、先行焦点に最大の卓立が置かれやすい。関係詞構文の発話では、一息に収まる場合、先行詞が音の物理的強度やピッチ差によって卓立を帯び、その直後にポーズが入る一方、複数の氣息群にまたがる場合は、先行詞と関係詞は連続発音され、他の個所にポーズが入ることで、真の先行詞が特定される。意味が感情の程度の差のみに依存する場合は、個人のイントネーションパターンに変化は生じず、ストレスパターンやポーズの位置に差が現れる。

1. Introduction

A native speaker of English, whatever country he/she is from, would deliver the slight difference seen in amphibology. It is done with appropriate usage of prosodic features, which he/she has acquired unconsciously. Bolinger (1958), Peterson, Wang and Sivertsen (1958) and others formerly pointed out that prominence which decided the meaning of a sentence depended most on pitch. Therefore, knowing and acquiring appropriate usage of pitch change, i. e. intonation, is the shortest way to successful communication in English. Phoneticians have described intonation, depending on their ears for a long time, with various sorts of marks, signs or symbols. Such variety seems to suggest vague features of intonation. It has been, however, fortunately illustrated by Stevens and Volkmann (1940) and others from of old that pitch changes in proportion to fundamental frequency (F_0 henceforth), in the range of approx. 50-1,000cps which is the range of human speech, that can be easily observed with sound analyzing software. The aim of this paper is give more concrete examples and further information of intonation and nucleus to the amphibological English expressions which have been little studied yet.

2. Investigation and Analysis

2.1 Corpus

A total of twenty-nine sets of sixty-seven amphibological English words and sentences, whose meanings are said to depend on intonation chiefly, were quoted from several books on phonetics: Fries 1952; Halliday 1970a, 1970b; Horn 1972; Joos 1961, 1964; Quirk *et al.* 1985, 1990; Ito *et al.* 1982; Ota 1980; Ota *et al.* 1972, and were used as phonetical corpus in this investigation. Little or no description on intonation or nucleus had been given to them. With a few exceptions, any punctuation marks of such corpora were excluded to avoid the influence of them following Fries (1952). Thus the informants were given the corpus with its connotation only.

Although there are various ways to describe intonation, it seems that British linguists prefer tonetic stress-marks and American linguists prefer pitch level marks. This paper, in chapter 3, adopted the former style, especially the marks that Quirk *et al.*(1985) used and the samples are shown in Table 1. It was because a unit of marks leads to better understanding and tonetic stress-marks could represent both features, pitch transition and stress, with one mark. The information that cannot be represented with only the marks of Quirk *et al.* was added with an asterisk. The sources of the corpus are shown in Table 2.

2.2 Informants

A total of eight native speakers of English who teach English at colleges in Japan was chosen for the informants in this paper. Their nationalities (regions), sexes and ages were: a female American (New Jersey), age 27; a female American (Vermont), age 36; a female American (Florida), age 42; a male American (New Mexico), age 57; an Englishman (East Anglia), age 45; an Englishman (Somerset), age 53; a male Canadian (Ontario), age 40; and a male Australian (Gold Coast), age 30. It was expected that the range in nationality and sex might show some common intonation beyond such features.¹⁾

2.3 Procedure

The informants were asked to pronounce the corpus mentioned above considering their connotation. The utterance was given with natural speed used in their daily life and was proceeded with even when they found no difference in intonation among some corpora. Every informant had read through all the corpus at least once before he/she uttered them and confirmed if there were some corpora whose meaning he/she didn't understand. There was a set of sentences that one of the informants said that he never used, so his utterance of that set was excluded.²⁾ Their utterance was given only once as long as they didn't stop uttering with a cough, mispronunciation or the like. A microphone and a mini-disc recorder were used for recording. The recorded materials were analyzed with sound analyzing software 'Onnseirokubunnkenn' (Imagawa and Kiritani 1989) and F_0 of each material was printed out. F_0 's were compared with all those indicated in the sources, which were few in number.

3. Results and Remarks

As was indicated in Maekawa (1996), it is difficult to extract F_0 completely, especially at the end of an utterance, where the vocal cords are apt to vibrate aperiodically. There were not a few utterances whose F_0 's were not identified although a total of eight F_0 's should have been obtained for each corpus since there were eight informants. Such utterances were eliminated from effectual objects to analyze, the number of which was shown as P(arameter) at the left end of each corpus. The corpora were classified into several groups according to their contents or structures. The identified intonation and nucleus in this investigation were compared with the limited number shown in the sources and the results were written under the head of I(ntonation) and the head of N(ucleus) given to each set of corpus. They were as follows: tt meaning all of the identified data were the same in the source, t meaning 75% or more were the same, # meaning 74~26% were the same, ? meaning 25% or less were the same, and ?? meaning all the data was different from those in the original source.³⁾ The head of I or N was

left blank when nothing was mentioned about I or N in the source. Since the only indication for corpus 3.3 was on the degree of emphasis in its source, the head of S(tress) was added instead of the heads of I and N for the corpus but a report on intonation was given as a supplement. The report concerned prominence, pause, stress or sound quality as occasion demanded. Both an Englishman and an American male helped with identification of such features.

3.1 Responses

P I N

- (A: 'I said do you know when a girl's really a terrific dancer?')
- 6 (1) B: 'Uh-uh' (Salinger, *The Catcher in the Rye*)
(A: 'Why?' I said, 'Twenty-two.')
- 8 (2) B: 'Uh-huh. Well how 'bout it?' (Salinger)
(A: 'Hey, Sally! You want me trimma tree for ya?')
- 8 (3) B: 'You want me to? Huh?' (Salinger)

The utterance to analyze is limited to the simple responses given above. Their source, Ota *et al.*(1972), says that uh-uh is negative and uh-huh is affirmative, and nothing was mentioned about their intonation. In the investigation of negative *Uh-uh*, the F_0 contours of four informants out of six were rising, one was level and the other was falling. Four informants put stress on the anterior syllable *Uh*, while three put it on the posterior syllable *uh*.⁴⁾ According to Trager (1958), the usual uh-uh of negation has higher vowel-like resonance, with internal (and often initial) glottal closure. The initial glottal closure was noticed among three informants out of eight. Although both affirmative *Uh-huh* and interrogative *Huh* designated rising contours in all utterances, the latter tended to rise with a higher angle and shift to level at the end of the utterance in all cases.

3.2 Calls

P I N

- 8 ?? (4a) Jō ĥn (Are you there?) *high to mid (2 feet)
- 8 ? (4b) Jōhn (We are ready.)
- 6 ? (4c) Jōhn (I want you.)
- 5 # (4d) Jōhn (How could you?) *mid to high to low
- 8 tt (4e) Jōhn (Is it you?) *low to high

In the source, Ito *et al.*(1982), (4a) is divided into two feet and shows the contour of high level shifting to falling. The F_0 patterns of male informants showed various tones (fall-rise, rising, rising to level), while those of females showed the same pattern: the preceding foot (which is called pretonic by Halliday) showed a rising tone and the following nucleus foot showed a level tone. That means nobody among either males or

females followed the intonation indicated in the source. In (4b) seven showed non-fall-rise tones (five level and two rising) and in (4c) four out of six showed non-falling tones (two fall-rise, one falling to level and one rising). Halliday (1970a) says that even a one-syllable name is frequently split into two feet in such types of call, which was clearly noticed in females' utterances. No male informant uttered every *John* with two feet, while three females uttered *John* in (4a) and (4d) with two feet although they uttered the others with one foot. It has been already reported that females prefer higher pitch (Lakoff 1975, Edelsky 1979) and females have a wider pitch range (Brend 1972). In the utterances of (4d), however, there was no difference in pitch range between the two sexes and the females showed rather a narrower pitch range in (4a). Some male informants said that the split of foot by the females in this investigation brought feminine characters; their utterances sounded adorable, charming, sweet or lovely to males' ears. A further survey might clarify some particular usage of each sex concerning the split foot.

3.3 Difference in Register

P S(tress)

(with formal tone)

8 # (5a) Ìs thère any chance of 'Dal looking in on us tonight⁵⁾

(with consultative tone)

8 # (5b) Ìs thère any chance of 'Dal looking in on us tonight

Joos (1961) sets five styles in one's discourse represented according to the correlation between the speaker and the hearer: frozen, formal, consultative, casual, intimate. One would use quite a distant style in different surroundings and it is natural that words he/she would use in such a case are different from the original ones. Since "normally only two neighboring styles are used alternately, and it is anti-social to shift two or more steps in a single jump, for instance from casual to formal(Joos 1961)", sentences consisting of the same words in two neighboring styles are adopted as corpora in this paper. In Joos (1968, 1st ed. 1964), the above sentences are distinguished from each other by adding four stress marks and casual style is explained just for further information by introducing the same sentence without *Is there*.

The number that followed the indication in the source was five in (5a) and three in (5b). Three informants followed indicated stress patterns in both (5a) and (5b) and there was one informant who used weak stress for each of the above styles. Every informant, however, used a different stress pattern for the other style. The stress marks Jones used just represent the degree of emphasis. In the observation of F_0 contour, five informants used rising tone and three used falling tone for (5a), while all eight informants used rising tone for (5b). It could be said that even Yes-No questions would

normally have falling intonation in a more formal style.

3.4 Sentences Having “or”

P I N

8 (6) (exclusive or) John or Mary went to the party

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

8 (8) (inclusive or; A/B/both) Beggars or dogs are not allowed on these
premises

8 (9) (inclusive or; A/B/both) If I get a raise or bonus I'll buy you a fur
coat

Sentences were applied for the corpora henceforward. The F_0 contours of (6) and (8) which were virtually observed with sound analyzing software are shown in Figure 1 and 2 for better understanding.

There is no description of intonation or of nucleus on the above corpus quoted from Ota (1980). Referring to similar sentences (Quirk *et al.* (1972, 1985))⁶⁾, the stressed syllable of right and left elements linked with “or” are nuclei in the exclusive equivalents for (6) and (7) and the stressed syllable of only the right element of “or” is a nucleus in the inclusive equivalents for (8) and (9). On the other hand, in Halliday (1970a, 1976), both right and left elements have a nucleus (which is called a tonic syllable by Halliday) on its stressed syllable in the inclusive equivalents although it is the same as the above in the exclusive equivalents. Such a difference in treatment of nucleus is seen although every linguist including those above defines nucleus as “the greatest prominent syllable.” As a matter of fact, exclusive “or” was neglected and the stressed syllables of its right and left elements were treated as nuclei at the early stage of identification by an informant in this investigation. In his explanation, it resulted from native speakers of English understanding the contents theoretically, the moment they listened to some utterance. Therefore, if they are asked to identify the syllable with a physically maximum prominence, the results would be totally different in sentences having exclusive “or.” This paper is going to report the results according to the original definition of nucleus, i. e. the most prominent syllable.

There were six informants who made *or* a nucleus in (6) and (7) respectively, both of which had exclusive *or*. The F_0 contours of *or* in (6) were: six rise-fall, one slight fall after rising, and one falling. All six informants who made *or* a nucleus put the second greatest prominence on *John*. On the other hand, in (7), all six informants who made *or* a nucleus put the second prominence on *kitchen*⁷⁾ although a consistent intonation was not seen as follows: three fall-rise, two level, one falling, one rising, and one rising to level. The second greatest prominence was put on the left element of *or* in either (6) or (7) although it doesn't matter at all whether the prominence was noticed on either side

of *or* considering the alternative notion expressed by exclusiveness. It was worthy of more attention that there were six informants who put a pause just before *or* in either (6) or (7). The duration of the pause was 50-140msec in (6) and was fixed for approx. 140msec in (7). The Australian informant, who did not insert pause in (6), lengthened *or* very much instead.

In (8) where inclusive *or* appeared in the subject, five informants put equal prominence on both *beggars* and *dogs* and two nuclei were noticed. Two informants put the greatest prominence on *dogs* and the second greatest prominence on *beggars*. On the other hand, in (9) where inclusive *or* appeared in the object at the end of a clause, there were only two informants who made both *raise* and *bonus* nuclei. Three informants put the greatest prominence on *bonus* and the second prominence on *raise*; two informants made *I* a nucleus; and the other informant had three nuclei: *I*, *raise*, and *bonus*. If it is allowed to make some remark from a limited part of a sentence, the conditional clause of (9), since the comparison in this section is based on the difference in meaning of *or*, the presence of informants who made *I* a nucleus may corroborate a view in Currie (1981) as follows: "When the information focus is a 'new' element realized as the rightmost lexical item in a sentence, more than one tonic is chosen if the sentence is presented out of context; one tonic is chosen on the given element in leftmost position, and one tonic is chosen on the new element in rightmost position." Since no informant made inclusive *or* in (8) a nucleus, many *beggars* and *dogs* designated a rise-fall curve separately, with a higher peak in the former. The F_0 contours of the *or* of six informants appeared as a falling part of a rise-fall of *beggars* at its end. In (9), however, *raise* and *bonus* linked with *or* of eight informants designated various F_0 contours and no discussion on the contour of *or* could be given here.

3.5 Cardinals with a Negative, "not"

P I N

7 # (10a) I don't have three friends
(= I have fewer than three friends.)

6 # (10b) I don't have thrée friends
(= I have more than three friends.)

In the source, Horn (1972), where cardinals are called cardinal quantifiers, Horn means that the minimum value of the cardinal is denied as in (10a) when the cardinal is denied with a non-neighboring negative but the same sentence bears the meaning of (10b) by using the intonation shown in (10b). There were five informants who used falling intonation at the end of the sentence and two (both are American females: New Jersey and Florida) used level intonation in (10a). Various nuclei were noticed in the corpus: three informants made *three*, two made *don't*, one *I*, another *friends*, and the other put an equal

prominence on *don't* and *three*. In (10b), although all informants took rising tone at the end of the sentence, there were three who followed the intonation shown above from *three* to *friends* and two informants (the American female (New Jersey) and the Australian male) made *three* level, one (the American female (Vermont)) made it falling. Various nuclei were noticed again: three *I*, two *three*, one *don't*. Only one informant used rising tone for *I* in (10a), while five out of six used steep rising for *I* in (10b) and immediately after they reached the peak of their pitch at *I* their intonation suddenly fell for *don't have*.

3.6 A and B (=Both) with a Negative, "not"

P I N

8 t (11a) John and Bill didn't gò (= Both [didn't go])

8 # (11b) John and Bill didn't gó

(= Not both of them went, i. e. one of them stayed)

* a stress mark was given on *and* in (11b)

A higher pitch was seen for *John* since pitch is apt to be higher at the beginning of a sentence as was indicated by Watanabe (1994) although both *John* and *Bill* are nuclei in (11a). Six informants used falling intonation at the end of the sentence but on the contrary two used rising. At the end of (11b) three used rising intonation while five used falling intonation. Seven made *and* a nucleus in the corpus and the exceptional one made *didn't* a nucleus and used falling tone for *go* in (11b) and made *go* a nucleus with falling intonation in (11a). There was an informant who inserted a pause (240msec after *Bill*) in (11a), while there were four informants who inserted a pause in (11b) as follows: two after *John* (70msec, 380msec), and two after *Bill* (190msec, 240msec).

3.7 A Negative, "not" + any/every (with an Auxiliary, "can/need")

P I N

8 # tt (12a) John can't marry **á**nnyone (= He must be selective.)

8 t (12b) John can't marry ànnyone (= He must remain a bachelor.)

6 (13a) John can't marry everyone (= He can't practice omnigamy.)

6 (13b) John can't marry everyone (= He can be a non-omnigamist.)

7 t (14a) John needn't marry **any**one

(= There isn't anyone John must marry.)

6 (14b) John needn't marry anyone (= He can remain a bachelor.)

Descriptions on intonation or nucleus are not always found in the above corpora quoted from Horn (1972). Five informants used rising intonation and three used falling at the end of (12a). Six informants used falling intonation and two used rising at the end of (12b). Except for the American female (Florida) who used falling in both (12a)

and (12b), the rest of the seven informants used an opposite intonation in each corpus. A nucleus was consistently noticed on anyone in (12a) but various nuclei were noticed in (12b): three anyone, two marry, one can't, one anyone and John, and one anyone and can't. In (13a) and (13b), four informants used falling intonation and two used rising at the end of the former and five used falling and one used rising at the end of the latter. With regard to individual informants, three used falling intonation in both corpora and the other three used an opposite intonation in each corpus. The nuclei were: three everyone, two can't, one John in (13a); two everyone, two can't, and the rest was unidentified in (13b). No informant made the same syllable a nucleus in each corpus; informants who made everyone a nucleus in (13a) made can't a nucleus in (13b) and vice versa. In a pair of (14), five informants used rising intonation and two used falling at the end of (14a) while all informants used falling at the end of (14b). Six informants made anyone a nucleus and one made both anyone and John nuclei in (14a) while various nuclei were noticed in (14b): two anyone, two needn't, one John and one marry. Incidentally, both F_0 contours and prominence of the two Englishmen were similar in (14a) and (14b); F_0 contour fell with needn't and gradually rose with marry in (14a) while it made a peak with John, began rising at low level with needn't and showed a straight rising until the end of marry in (14b). Although the other informants made different syllable(s) a nucleus/nuclei in each corpus, the Englishmen had the same nucleus, anyone, which may mean that intonation was the key factor for them to express the difference of meaning between (14a) and (14b).

3.8 Cleft Sentence and Relative Clause

P I N

5 (15a) It was the dog that scared me
(= The thing that scared me was the dog.)

5 (15b) It was the dog that scared me
(= The dog was the one that scared me.)

A cleft sentence was compared with a sentence having a relative pronoun here. For *dog* in a cleft sentence, (15a), four informants used rise-fall tone and one (the Australian) used level tone and at the end of the sentence five used falling and two used rising. For *dog* in a sentence having a relative, (15b), three used level and two used rise-fall and at the end of the sentence four used falling and one (the Canadian) used rising. All informants made *dog* a nucleus in both (15a) and (15b). The *dog* in (15a) was uttered with larger difference in pitch by the other informants compared with that in (15b), which made a greater prominence, except the Canadian who seems to have expressed the difference of meaning by different intonations at the end of the sentences.

3.9 Sentences Having Relative Pronouns (different antecedents)

P I N

(the courses are listed)

7 (16a) I know the requirements of the courses which are listed
(the requirements are listed)

7 (16b) I know the requirements of the courses which are listed
(the men are members)

8 (17a) The dependents of the men who are members are all from the town
(the dependents are members)

8 (17b) The dependents of the men who are members are all from the town

Since the original corpora of the above pairs quoted from Fries (1952) were not sentences but clauses, *I know* in the pair (16) and *are all from the town* in the pair (17) were respectively added for the convenience of utterance. At the end of the sentences, six used falling intonation and one (the American female (Vermont)) used rising in (16a) and similarly six used falling and one the Canadian) used rising in (16b). Different nuclei were found in each corpus: three made *know* a nucleus, two made both *know* and *courses* nuclei, one *courses* and one put equal prominence on three syllables, *requirements*, *courses* and *listed* in (17a) while five made *requirements* a nucleus and two *know* in (17b). Comparing different antecedents, *courses* in (16a) and *requirements* in (16b), for individual informants, there were four informants who gave a greater prominence on *courses* in (16a) and four informants who did the same on *requirements* in (16b). Incidentally, the Australian inserted a pause of 210msec after *courses* in (16a) and the identical pause after *requirements* in (16b). Besides, the Canadian inserted a pause of 360msec only at the same position of (16b). It is thought that the energy for utterance was once consumed at the word given prominence and a pause was introduced after the word and as the result the whole sentence was divided into two breath groups.

All informants used falling intonation at the end of both (17a) and (17b). Four informants made *members* a nucleus, one took a double nucleus on *men* and *members*, two took a triple nucleus on *dependents*, *men* and *members* and one made *dependents* a nucleus in (17a) while two made *dependents* a nucleus, two a double nucleus on *dependents* and *members*, two a double nucleus on *men* and *members*, one made *men* a nucleus and one made *members* a nucleus. Such a difference in prominence between the antecedents of (16a) and (16b) was also noticed between those of (17a) and (17b) uttered by the two Englishmen. The Englishman (East Anglia) put clearly more prominence on *men* in (17a) than that in (17b) and on *dependents* in (17b) than that in (17a). Although the other Englishman (Somerset) uttered (17a) and (17b) with a similar F_0 contour, the difference in pitch of *dependents* which designated a peak in both corpora was outstanding; the difference in pitch in (17a) was more than twice as much as that in (17b). Neither of

them, however, put a pause anywhere in each corpus while four informants out of the other six put it after *members* in (17a) and put it in two places, after *men* and after *members*, in (17b). The American female (Vermont) put a pause after *dependents* in (17a) and after *members* in (17b). And the American female (New Jersey) put two pauses after *men* and *members* in either (17a) or (17b), with the duration of 260msec after *men* in (17a) and the duration of 490msec at the same place in (17b). Informants seem to express that *men* is the antecedent in (17a) by uttering *men* and *who* continuously with least pause. Although it is not common in all informants, many of them tried putting a pause after the antecedent in the pair of (16) and avoiding a pause at the same place in the pair of (17) in order to express the antecedent. This tendency might be caused by the difference of length between the two pairs. A pause was inserted as the result of putting prominence on the antecedent although the pair (16) was short enough for native speakers of English to utter within one breath group. The pair (17) was too long for them to utter with only one breath and actually a pause/pauses was/were inserted, but it is supposed to be the place having no pause that plays the role of fixing the antecedent.

3.10 Other Declarative Sentences

P I N

(simple statement)

- 8 tt (18a) George takes his wife to the **movies**
 (A: I don't know any man who takes his wife to the movies.)
- 7 # (18b) B: **George** takes his wife to the movies
 (A: Does George approve of his wife going to the movies?)
- 5 t (18c) B: George **takes** his wife to the movies
 (A: Who does George take to the movies then?)
- 7 tt (18d) B: George takes his **wife** to the movies
 (A: Does George go all by himself to the movies?)
- 8 tt (18e) B: George takes his **wife** to the movies
 * *George* also has a prominence.
 (A: Most people go to the movies by themselves.)
- 7 tt (18f) B: George takes his **wife** to the movies
 * *George* also has a prominence.

The nuclei were indicated in the series of (18) referring to the original sentences expressing marked/unmarked items in Halliday (1970b) and the column of intonation was left blank since the source described nothing about it. If it is allowed to mention the intonation at the end of sentence, all informants used falling tone in the other corpora

except (18b) where three informants used rise-fall, two used rising, one used fall-rise and one used a slight falling. Concerning nucleus, there were five informants who made *George* a nucleus and three put the greatest prominence on *movies* with the second prominence on *George*. Only the Australian inserted a pause of 200-400msec, which made nuclei prominent, before *takes* which is his nucleus in (18c) and after *wife* which is his nucleus in both (18d) and (18e) although the rest of the informants inserted no pause in any corpus. Thus pause became a factor of prominence of nuclear syllables.

3.11 Yes-No Questions and Conditional Clauses

P I N

8 ? t (19a) Were they all ↑ **hère** we should have a quorum

*mid to high to mid

6 ? tt (19b) Were they all ↑ **hère** (question: with 3-2-4 contour)⁸⁾

5 t tt (19c) Were they all **hére** (question: with 3-2 contour)

8 ? # (20a) Should they come tomô**rr**ow it would be difficult to find them room

*mid to high to mid

5 # tt (20b) Should they come tomô**rr**ow (question: with 3-2-4 contour)

7 t tt (20c) Should they come tomô**rr**ow (question: with 3-2 contour)

Nuclei were added to the original corpora quoted from Fries (1952) to make the above corpora, referring to the description in the source. The report on (19a) is limited to its conditional clause to compare with (19b) and (19c). There were two informants who followed the original description of intonation in (19a) and the others were quite various: three informants, after level intonation, rose at *all* and fell to lower level than the beginning of the sentence at *here*; one informant, after rising at *were*, zoomed down and shifted to level tone; one rose at *were*, fell to *all* and rose again at *here*; one rose at *were*, fell to *all* and once the contour stopped and *here* began at rather high pitch and fell down. The following (19b) and (19c) are, with (20b) and (20c), and the corpora of 3. 12. 2-3 mentioned later together, exceptional corpora whose utterers were given special instructions shown after the corpora. All informants showed more or less difficulty to use the lowest pitch at sentence end in (19b) although enough explanation was given to them previously. Only the American female (Vermont) followed the intonation given to (19b) and the others showed different patterns in the corpus as it was in (19a): the American female (Florida) followed the indication except for a rising tone at the end of *here*; the American female (New Jersey) rose at *all* and fell at *here*; the Canadian made a peak at *were they all* and his *here* began with the pitch as high as the previous peak and it fell down; the Englishman (East Anglia) continued a gradual falling to *here*, which began with the highest pitch and showed a fall-rise pattern; the Englishman (Somerset) showed a gentle slope overall with a peak at *they*. Some stable intonation, on the other

hand, was noticed in (19c); four informants followed the given instruction. The only exception was the Australian who used two separate risings; one from *were* to *all* and the other at *here*. Concerning nucleus, all informants made *here* a nucleus in the series of (19) excluding the American female (Vermont) who made *were* a nucleus in (19a).

A similar tendency was found in the series of (20) in which an auxiliary *should* was added. The other informants, excluding the American female (New Jersey) who followed the source, showed various intonation patterns in (20a): two informants had a higher peak at *come* than at *tomorrow*; the Englishman (East Anglia) had the same peaks at both syllables; the American female (Vermont) rose at *come* and showed fall-rise at *tomorrow*; the Englishman (Somerset) continued a falling and shifted to rising at *-rrow*; the American female (Florida) made a peak at *they* and kept falling thereafter; and the Australian showed a simple falling from the beginning of the sentence. As in (19b) mentioned above, it seemed to be difficult for some informants to use the lowest pitch at the end of (20b). Although two informants followed the instructions, one ended the sentence with rising intonation, one uttered both *tomo-* and *-rrow* with rising tone, and one zoomed down at *-rrow* after a gradual falling from the beginning of the sentence. Six informants followed the instructions in (20c) while the Englishman (Somerset) showed a slight rising at *-rrow* whose pitch level was lower than the beginning of the sentence. All informants made *-mo-* a nucleus as was indicated above in both (20b) and (20c). Five informants also did the same in (20a); however, two showed a double nucleus on *come* and *tomorrow* and one made *they* a nucleus.

3.12 Various Sentences

3.12.1 Declarative Sentence and Imperative Sentence

P I N

6 (21a) (statement) Ship sails today

5 (21b) (request) Ship sails today

The source, Fries (1952), mentioned neither intonation nor nucleus, so both items are left blank and the results of analysis are reported in this section. Although most informants used falling tones in both (21a) and (21b), there was a difference in the position of the nuclear syllable: three *ship* and three *today* in (21a) but two *ship*, two *sails*, and one *today* in (21b). In the comparison for individual informants, both the Canadian and the Englishman (Somerset) made *today* a nucleus in either corpus while the others used a different nucleus in each corpus. Incidentally, the Australian inserted a pause of 220 msec after *ship* in (21a) and the American male inserted a pause of 250 msec at the same place in (21b). Both pauses led their nuclear syllable, *ship*, to be prominent.

3.12.2 Yes-No Questions and Imperative Sentences

P I N

- 8 (22a) (request) Have the men bet
 7 (22b) (question) Have the men bet *with falling tone⁹⁾
 7 (23a) (request) Have the boys run a race
 7 (23b) (question) Have the boys run a race *with falling tone

The above corpora were basically quoted from Fries (1952) and the original finite verb of (22a) and (22b), which was “paid” in both corpora, was shifted to *bet*.¹⁰⁾ Fries mentioned neither intonation nor nucleus. Six informants used falling tone and two (the Englishman (East Anglia) and the Australian) used rising tone at the end of (22a). All informants made *bet* a nucleus in the corpus and the second greatest prominence was noticed on most of their *have*. There were only two informants (the American female (Vermont) and the Englishman (East Anglia)) who followed the instructions in (22b). Excluding the American male whose data was not identified, the other five informants showed a peak at *Have the men* and rose again at *bet*. All informants, irrespective of rising or falling intonation, made *bet* a nucleus and there were three informants who gave the second prominence on *men*. An object was added to the pair of (22) to be the pair of (23). All showed a natural falling tone in (23a) except the American female (Florida) who used rising tone on *boys* and *race*. As in (22a), all informants made the rightmost stressed syllable, *race*, a nucleus and most of them gave the second prominence on *have* in (23a). Five informants used rising tone for *race* in (23b) while the American male used fall-rise and the Englishman (Somerset) used falling for the syllable. All informants made *race* a nucleus irrespective of its intonation as in (22b).

What is called “normal stress”, i. e. a nucleus is noticed on the stressed syllable of the rightmost content word, was confirmed in every corpus although there was some difference in meaning or structure between them. Additionally speaking, most informants were more or less embarrassed to use falling tone at the end of Yes-No question, in both (22b) and (23b), as in (19b) and (20b) in the previous section 3.11.

3.12.3 Yes-No Questions and Exclamatory Sentences

P I N

- (A: They're coming home on Saturday.)
 7 # B: (24a) **Ōh** **âre** they on **Sâturday** (I see, noted!)
 7 ?? (24b) **Ōh** **âre** they on **Sâturday** / **Ōh** **âre** they on **Sâturday**¹¹⁾
 (Is that so?)
 *high rise / fall-rise (pointed)¹²⁾
 8 ?? (24c) **Ōh** **âre** they on **Sâturday**
 (That's unexpected, are you sure?)
 *rise-fall (rounded)

The above corpora having the structure of Yes-No question could be interpreted as exclamatory sentences. The above corpora are each divided into three tone groups and each nuclear syllable (Halliday calls it tonic syllable) in every tone group is given some intonation pattern. Although more concordance is recognized in the comparison of separate nuclear syllables, concordance at all comparable places (three places in the corpora in this section) was given in the column of I(ntonation).

All informants followed the intonation at *Oh* and *are* in (24a), whereas two used falling and five used rising at *Saturday*. Nobody used either rising or fall-rise at *Oh* in (24b): four used rise-fall and three used falling. The intonation for *are* was divided into two patterns: four rising and three level. And for *Saturday* all followed the instructions: five rising and two fall-rise. For *Oh* and *are* in (24c), four used rise-fall and the other four took various tones (falling, level, and rising). For *Saturday* nobody took rise-fall as was described: six used rising and two Englishmen used fall-rise. Most informants made three syllables nuclei in all the corpora as above while the Canadian and the Englishman (Somerset) pronounced *Oh* and *are* continuously as a glide vowel, which finished the whole sentence with one breath group, in one of the three corpora. There was found a common tendency in relative prominence of nuclei: *Saturday* with the maximum prominence always, *Oh* with the second, and *are* with the third. Moreover, the Canadian and the Englishman (East Anglia) inserted a pause after *they* in (24b), 330msec and 70msec respectively, and the Australian inserted a pause of approx. 1,000msec after *Oh* in (24c). The degree of "surprise" seems to increase in the order of (24a), (24b) and (24c). The outstanding pause used by the Australian might have something to do with the difference in the degree. In the comparison of F_0 contours for individual informants, many informants showed similar contours through the three corpora, which may be a natural result if the corpora are considered to differ just in the level of "surprise." The American female (Florida) used the identical intonation pattern for every corpus and the other three male and female Americans and the Canadian used the identical pattern in two corpora out of three.

nonquestions(exclamatory sentences)

P I N

8 t (25a) Was he màd/Was ↑ he màd

7 # (26a) Will ↑ he be surprised

7 # (27a) Will ↑ we tell him

questions(with falling tone)¹³⁾

P I N

8 ?? (25b) Was he ↑ màd/Was hê mad

6 ?? (26b) Will he be surprîsed

5 ?? (27b) Will we têtll him

All the above corpora are from Fries (1952). The exclamatory sentences are firstly reported. One informant took 2-4 pattern and five informants took 3-2-4 pattern indicated by Fries and two used rising tone in (25a). There were two informants who followed the described pattern in (26a) and the others took various patterns: two began falling at *be* and fell to the normal level (Fries sets it as level 3) at the beginning of *surprised*, two shifted from gradual falling to rising at *surprised*, and one used gradual falling for the whole sentence. There were also two who followed the description in (27a), and four fell at *tell* and then used rise-fall at *him*, and the Australian fell at *we* and used rising for *tell him*.

In the Yes-No questions of (25b), (26b) and (27b), on the other hand, most informants showed more or less difficulty to use falling tone, as in similar sentences already mentioned, although falling intonation had been directed to them before. Only one informant, the American female (Vermont), ended (25b) with falling tone; her F_0 rose at *he* and fell at *mad*. The other seven informants used either a gradual falling or level tone for *Was he* and rising tone at *mad*. Two patterns were noticed in (26b): four used rising, and the American female (New Jersey) and the Englishman (Somerset) used rising for *Will he* and began falling at *surprised* with a little rising at the final syllable. In the comparison between (26b) and (25b) for individual informants, four out of five identified utterances showed the identical F_0 pattern for both corpora excluding the American female (New Jersey). Nobody showed falling intonation in (27b). Two informants rose at *we* and fell at *tell* and two others showed a peak for *tell*, rose at *him*, and one (the Canadian) used rising tone for *tell him*.

3.13 Difference of Modified Words by Prepositional Phrases

P I N

8 (28a) Money, in aid of the refugees, was collected from students and staff
(= The money collected was in aid of the refugees.)

7 (28b) Money, in aid of the refugees, was collected from students and staff
(= The act of collecting money was in aid of the refugees.)

8 (28c) In aid of the refugees, money was collected from students and staff
(= ditto)

The above corpora were quoted as they were, which meant the corpora with commas exceptionally, from Quirk *et al.*(1985) for the informants' better understanding of their meaning. In the comparison of (28a) and (28b), both of which have the identical structure, all F_0 contours of *Money* in (28a) showed a peak at -o- with a small rising at -ey, whereas those in (28b) showed a peak at -o- without any rising. Besides, all F_0 contours

of five identified *refugees* in (28a) had falling tone with a small rising at its end while three showed rise-fall and two showed a gradual rising in (28b). Seven informants made *Money* a nucleus (three of them gave the second prominence on *aid*) in (28a), while four made *collected* a nucleus, two *Money*, one *was*, and one had a double nucleus on *Money* and *collected* in (28b). Moreover, some pauses were observed as follows: five used a double pause after *Money* and after *refugees*, one inserted a pause after *Money*, and two inserted no pause in (28a); two used a double pause after *Money* and after *refugees*, and one used a double pause after *Money* and after *collected*, and one also used a double pause after *refugees* and after *collected* in (28b). In the comparison of the pause after *Money* with the one after *refugees*, both of which were often seen in (28a), three informants made the former longer and two informants made both about the same length. On the other hand, the two informants who inserted pauses at the same positions, made the pause after *refugees* twice and four times as long as the one after *Money*. Since the corpus (28c) having the same meaning as (28b) has a different structure, the results analyzed are reported as they were. Six informants designated falling tone till *refugees* with the highest peak at *aid* and fell to the end of the sentence with the second peak at *money*, and the other two designated four peaks at *aid*, *refugees*, *money*, and *collected*. There are various nuclei in (28c): two made *money*, two had a double nucleus on *money* and *collected*, two made *aid* a nucleus, one *In*, and one *was*. Incidentally, it was the American female (Florida) who made *was* a nucleus in either (28b) or (28c). Moreover, seven informants inserted a pause after *refugees*, which may have been due to the commas given before as was mentioned above.

3.14 Complex Sentences

P I N

- 7 ? (29a) How should I know what I **mean**
(when I don't even know....)
- 7 ?? (29b) How should I know what I **mean**
(when I don't know what....)
- 6 ?? (29c) How should I know **what** I mean
(---quite a lot so far!)
- 7 ? (29d) How should I **know** what I mean
(when I feel I must guess?)
- 7 tt (29e) How should I know what I mean (---ask the experts!)
- 7 ?? (29f) How **should** I know what I mean (if not this way?)
- 7 ? (29g) **How** should I know what I mean (You shall teach me.)

The original form of the above corpora shown in Joos (1961) was "How should I know

what I can mean." Some informants suggested that the sentence without "can" sounded more natural, so the sentences excluding "can" were adopted as the corpora here. The intonation of many informants tended to fall after *I* in the main clause in (29a) with correspondence of nucleus to the peak of pitch, with *How* having the second peak and *I* in the main clause having a little higher peak. The Canadian used level tone after the first *I* and the Australian uttered the second *I* with the highest pitch. In (29b) two or more peaks of pitch appeared mainly on *How* and *mean* and only the Australian had a single peak at *should* and fell smoothly thereafter. At the end of the sentence three American females took rising tone while the others took falling tone. Chiefly *How* and *mean* made peaks of pitch in (29c). Comparing two peaks, the latter made a peak with steeper grades although the former had a higher pitch. Two informants used rising and the others used falling at the end of the sentence. No consistent pattern was noticed in (29d), nor was it at the end of the sentence: three informants used falling, two rising and two level. The subject *I* made a salient peak and thereafter a smooth falling was observed in (29e). The corpus (29f), compared with the other corpora, had very little difference between the maximum pitch and the minimum pitch. A gradual falling was observed throughout (29f) with a small movement of intonation, rise-fall or fall-rise, at the end of the sentence since many informants made *mean* a nucleus. In (29g), all informants showed a gradual falling.

Very few informants followed the descriptions of nucleus except (29e) where all of them followed the description. Only one informant made *mean* a nucleus in (29a), five made the first *I* a nucleus, the other (the Australian giving the first *I* the second prominence) made the second *I* a nucleus. Four informants made *mean* a nucleus, one had a double nucleus at *How* and *mean*, one made the first *I* a nucleus, and the other made *should* in (29b). Five made *mean* a nucleus and one (the American female (Florida)) *How* in (29c). Only one (the Australian) made *know* a nucleus and three *mean*, two *How* and one the first *I* in (29d). Six made *mean* a nucleus and one (the Canadian) *How* in (29f). Only one (the American (Florida)) made *How* a nucleus, three the first *I*, one *should*, one *mean* and one had a double nucleus at *know* and the second *I* in (29g).

4. Conclusion

Some decisive tendencies on intonation and nucleus, in order of enumeration in the previous chapter, were found as follows:

- (1) Greater variety within individual utterer was noticed in the corpora of calls. It is thought that the result was due to the isolated utterance of a name, which possibly appeared at the end of a sentence. Separation of a monosyllabic name into two feet was limited to females' utterances expressing "confirmation with anxiety" and

“reproach”, with a flavor of tenderness.

- (2) The difference between registers tends to be expressed in the difference of stress patterns, if the sentences consist of identical words. In formal style, falling intonation is preferred even at the end of Yes-No questions.
- (3) In declarative sentences having exclusive “or”, “or” itself becomes a nucleus with a very high pitch. The second greatest prominence is put on the stressed syllable of the preceding choice and as a result a pause is often inserted before “or.” On the other hand, no prominence is put on inclusive “or” and “or” is uttered with a lower pitch than the pitch of the preceding noun when the “or” appears in a subject at the beginning of sentence.
- (4) “A and B...not” structured sentences meaning total negation are uttered with a gradual falling. Even the same structured sentences meaning partial negation tend to have falling tone at their end. The dual subject, “A B”, becomes a nucleus in total negation, while the conjunction, “and”, becomes a nucleus in partial negation.
- (5) A greater prominence is not always put on the focus having new information in cleft sentences which have divided focus. This can be simply interpreted: the preceding focus is apt to be given a greater prominence without being influenced by the context, new or given, so much. Besides, falling tone is preferred at the end of cleft sentences. The preceding focus in cleft sentences generally has a greater prominence than the antecedent of sentences having relatives when the focus and the antecedent appear at the same positions.
- (6) A greater prominence is naturally given to the true antecedent modified by the relative in the sentences having a relative. Either physical intensity of sound or pitch difference makes the prominence, and furthermore, the position of pause inserted can be a cue to perceive the true antecedent as well. A pause is inserted immediately after the antecedent in a sentence which can be uttered essentially within one breath as a result of giving prominence to the antecedent. In a sentence which can be uttered with two or more breaths, however, continuous utterance from the true antecedent to a relative with no pause and insertion of a pause into another place deliver the real modifier and modified to the listener.
- (7) Definite intonation patterns were hard to find in conditional clauses without “if”, which means the intonation in such clauses depend much on individual speakers.
- (8) When the meaning differs between sentences only in the degree of feeling, there rises little change in intonation pattern of individual speaker. Instead, the speaker depends much on physical intensity of sound or pause for the meaning. The difference in the degree of feeling might have the same aspects as the difference in register mentioned in (2). For little change in intonation was observed in either case.

It is not possible to identify any traits on utterance according to nationality of informant since the number of informants was too small. The Australian informant used unique intonation and nuclei in his utterance if anything. Although he did not mention his own utterances, he reported about English in Australia that it was not uncommon to listen to different varieties of English even within a family, for example, the older generation is influenced by rather British English and the younger generation is influenced by rather American English.

Many studies on intonation or prominence depend on a limited number of samples or author's introspection for their conclusions, which is an inevitable dilemma for people being engaged in such studies. The intonation and nuclei in each set of corpora in chapter 3 rarely converged even with the small number of informants in this paper. Although every informant seems to have uttered without any rules, there is some prescribed usage of intonation and prominence since native speakers of English exactly communicate the differences in amphibology to each other. To clear up such usage a further survey with far more informants is necessary. However, it would be fortunate if the present paper would be a piece of work that could enrich the data in such a field of research.

Table 1 Symbols Borrowed from Quirk *et al.*(1972)

Rising	(´)
Falling	(˘)
Fall-rise	(˘ˆ)
Rise-fall	(ˆ˘)
Level	(-)

A marked step in pitch upwards in relation to the previous syllable (↑)

* Nuclear syllable is described with boldface without changing the size of letters although it is described with small capitals in Quirk *et al.* (1972).

Table 2 Sources of the Corpus

Fries (1952) > (16a, b), (17a, b), (19a-c), (20a-c), (21a, b), (22a, b), (23a, b), (25a, b), (26a, b),
(27a, b)

Halliday (1970a) > (24a-c)

Halliday (1970b) > (18a-f)

Horn (1972) > (10a, b), (11a, b), (12a, b), (13a, b), (14a, b)

Ito, Shimaoka and Murata (1982) > (4a-e)

Joos (1961) > (29a-g)

Joos (1964) > (5a, b)

Ota (1980) > (6), (7), (8), (9)

Ota, Ikeya and Murata (1972) > (1), (2), (3)

Quirk, Greenbaum, Leech and Svartvik (1985) > (28a-c)

Quirk, Greenbaum, Leech and Svartvik (1990) > (15a, b)

Figure 1 Fundamental Frequency Contours (corpus 6)

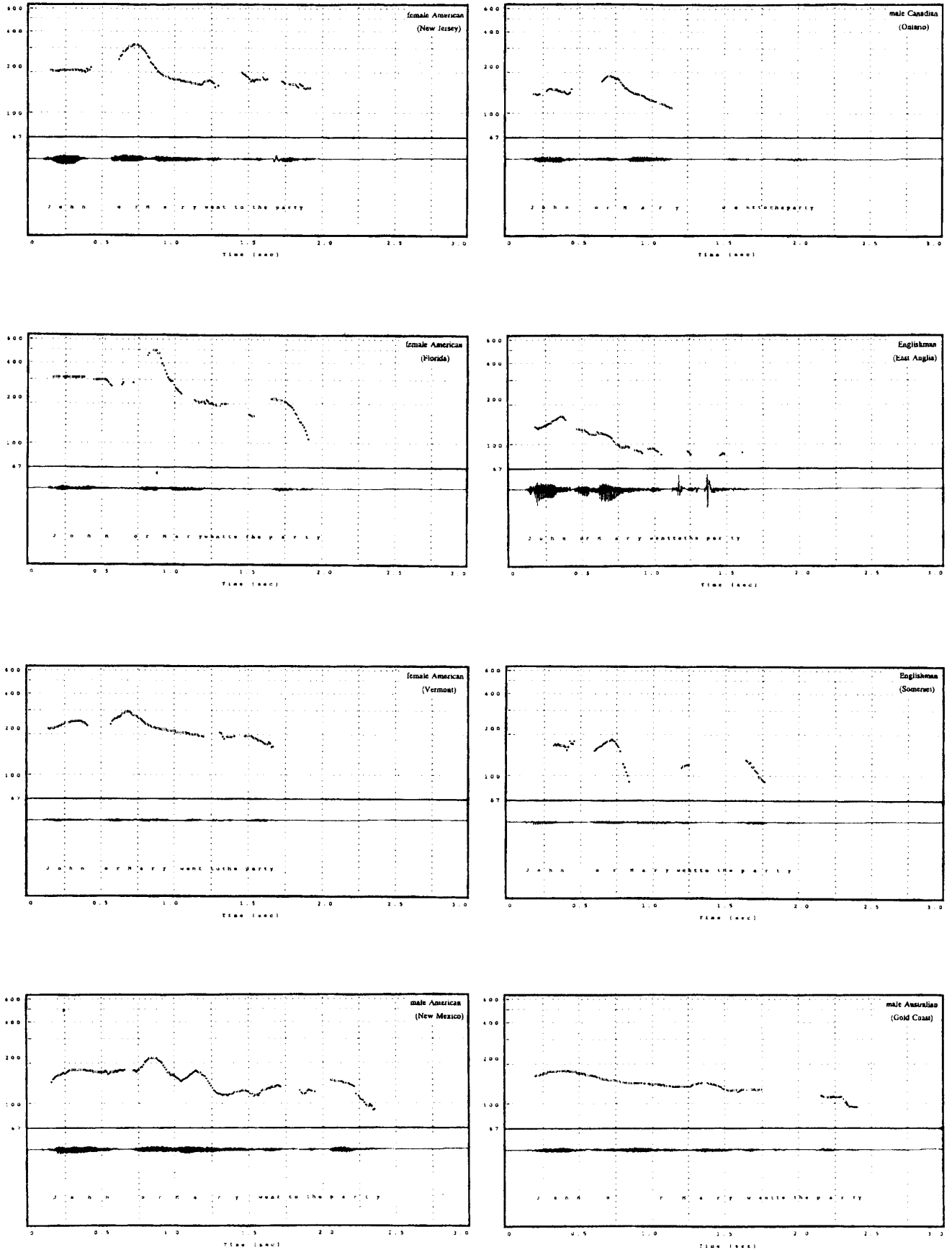
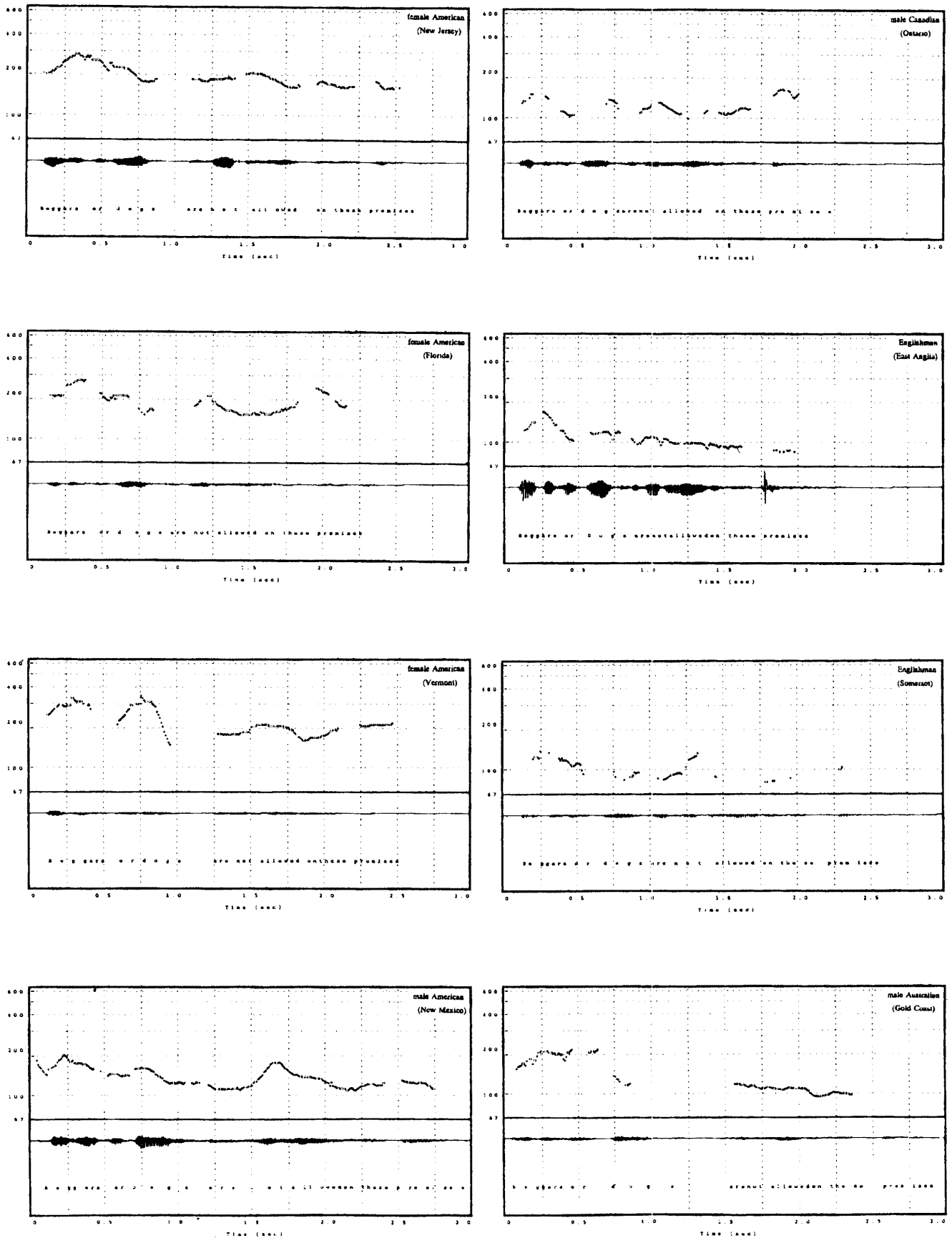


Figure 2 Fundamental Frequency Contours (corpus 8)



Notes

This is a revised version of an earlier paper presented to the 13th General Meeting of the Phonetic Society of Japan at Tohoku University on September 26, 1999.

- 1) The ranges of F_0 of each informant were: the female American (27 years) 127-582cps; ditto (36 years) 108-431cps; ditto (42 years) 97-over 600 (unmeasured); the male American 81-353cps; the Englishman (45 years) 77-312cps; ditto (53 years) 77-312cps; the male Canadian (40 years) 80-293cps; the male Australian (30 years) 87-353cps.
- 2) It is a series of *How should I know what I mean* indicated by the Englishman (Somerset).
- 3) The symbol t is the initial letter of "true" and means the same as described in the source, the symbol # means "impossible to judge" and the symbol ? means "different from the description in the source."
- 4) P in the paper means the parameter of informants whose F_0 contours were identified and it is not always the parameter which was introduced when stress patterns or sound quality was mentioned.
- 5) The symbol (`) and the symbol (~) here mean the tertiary stress and weak stress, respectively.
- 6) "Shall we go by **bus** or **train**" (By bus.) and "Shall we go by bus or **train**" (No, let's take the car.) were the sentences referred to in Quirk *et al.* as sample sentences having exclusive/inclusive "or", where different nucleus was pointed out between the two sentences, whereas "Did you play **tennis** or **golf**" (which?) and "Did you play **tennis** or **golf**" (yes or no?) were those referred to in Halliday where no different nucleus was seen.
- 7) The syllable having prominence was underlined in the text of this paper. Syllabication is not always the same as the separation in spelling.
- 8) Fries sets four pitch levels to describe intonation: extra high 1, high 2, middle 3 and low 4; whose numbers are in reverse order of those set by Trager-Smith that are widespread.
- 9) Since rising tone is generally preferred in Yes-No questions, falling tone was intentionally instructed to compare with imperative sentences where falling tone is normally used.
- 10) A sentence, "Have the men paid", was originally used in the source for both Yes-No question and causative. Although "pay" is a grammatically correct form in causative, the constituents of the two sentences will be different if "paid" is substituted with "pay" in causative. Therefore, *bet* which is the same form in bare infinitive and past participle was applied for the two sentences.
- 11) Since two patterns are described in the source, those were arranged in a line. Such

corpora were arranged the same thereafter.

12) Halliday uses "pointed" for a sharp transition and "rounded" for a gradual transition.

13) As was conducted in Note 9), falling tone was instructed in Yes-No questions (25b), (26b) and (27b) where rising tone was expected to compare with exclamatory sentences where falling tone is generally used.

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