

INTONATION AND AMBIGUITY

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Intonation is a field full of unresolved problems, and one of the most interesting concerns the perception of pitch and other prominence features by listeners. One aspect of this interest stems from Lieberman's assertion that "it is only when ambiguity arises that intonation becomes important."¹ What he seems to imply is that listeners can tolerate a fair amount of variation in the pitch patterns of utterances, without serious loss or distortion in the message, so long as the possibility of ambiguity does not obtrude. My own studies in this area² have suggested that listeners tolerate variations from one what might justifiably call the expected intonation patterns even when the particular variation occurring is normally associated with a different meaning; in other words, the listeners can tolerate an actual conflict between form and meaning, relying no doubt on the redundancy of the language to get the message through.

With this in mind, I devised a set of dialogues which were intended to test the ability of features of intonation to perform a few central functions:

1) to indicate grammatical juncture and disjuncture:

A. Oh dear I'm thirsty.

B. Will you have tea, or coffee.

Dialogue One

A. Tea thanks, I'm not allowed coffee.

A. Oh dear I'm thirsty.

B. Would you like tea or coffee.

Dialogue Two

A. Yes thank you. I should like that.

A. Why did you have to get rid of him?

B. Well we can't afford to have gamblers here.

Dialogue Three

and it's a pity but...

B. ...he speculated, unfortunately.

- A. Why did you have to get rid of him?
 B. Well we can't afford to have men with bad judgment here, and I'm afraid...

Dialogue Four

- B. ...he speculated unfortunately

- A. Did he ask what you were concealing?

- B. Yes; I said, "Nothing".

Dialogue Five

- A. Did he believe you?

- A. Did he ask what you were concealing?

- B. Yes; I said nothing.

Dialogue Six

- A. You were brave not to answer.

- 2) to indicate where the information points in the sentence are³; that is, to distinguish between what has been mentioned before and what is completely new, or to mark a contrastive reference:

- A. They only got here a few minutes ago.

- B. But you must know what kept them late.

Dialogue Seven

- A. I'm hanged if I know.

- A. They only got here a few minutes ago.

- B. I wonder what kept them late?

Dialogue Eight

- A. I'm hanged if I know.

- A. They only got here a few minutes ago.

- B. But at least they know what they're here for.

Dialogue Nine

- A. I'm hanged if I know.

- A. Joe will do it.

- B. Have you changed your mind about who will do it?

Dialogue Ten

- A. No, I said Joe would do it.

- A. Joe will do it.
 B. Did you say Flo will do it? Dialogue Eleven
 A. No, I said Joe will do it.

3) To express a particular degree of emphasis, related to an attitude or mood:

- A. He set out to ride to Dural.
 A. The horse refused to go on after half a mile. Dialogue Twelve
 B. Did he ride it home?

- A. He bought a horse in Dural.
 A. He's been stiff for a week since he got it home. Dialogue Thirteen
 B. Did he ride it home?

4) To distinguish between ambiguities:

- A. There have been lots of enquiries from people who
 want to join. Dialogue Fourteen
 B. Oh well, we'll just have to turn some away.
 A. Yes, we can't have too many.

- A. There have been lots of enquiries from people who
 want to join. Dialogue Fifteen
 B. Well, we need all the help we can get, don't we?
 A. Yes, we can't have too many.

The notation given for intonation in these dialogues represents the "expected" versions, based on my own judgment, confirmed by other scholars, of the forms most likely to be adopted by educated Australian speakers in order to distinguish the meanings of the sentence sequences which occurred with different meanings in different contexts.

The method was to record a large number of subjects reading these dialogues, as solo performance after a very careful study of the text. The subjects asked to record were those whom it was reasonable to expect to be proficient readers without being either elocutionary or over-dramatic. Speakers were mostly undergraduates, university staff and school-teachers, and all were male. Once recorded, the performance

was played back to the speaker for his critical listening. If he felt that his performance wasn't right, either because it gave the wrong sense or was in any way unusual, he was asked to make a fresh reading of the dialogue in question. No subject was allowed to go away till he was satisfied that he'd got it the way it ought to be. Even so, some of the efforts were obviously laboured and unnatural, and these were rejected.

All of these readings will eventually be analysed by a computer programme that is presently being devised. My hope is that a computer-controlled Fourier analysis will enable me to extract fundamental frequency from continuous speech with an adequate sampling rate of two centiseconds. In the meanwhile I have made a rough analysis in terms of the percentage of readings that conformed with a standard way of reading the passage. Thus I found that 93% of speakers read tea or coffee (Dialogue One) with a disjuncture in intonation to match the disjuncture in sense. One could confidently say that this is the standard form, and that other forms would be non-standard. But my expectations were occasionally rudely shattered in the event. Only 4% of subjects, for instance, produced the standard I'm hanged if I know (Dialogue Eight) whereas 96% gave non-standard readings. It should be noted that the key sentence in Dialogue Eight is an expansion of the form I don't know. Similarly, in the other form of tea or coffee (Dialogue Two), only 39% of the speakers spoke tea or coffee in the same tone unit; even though that seems to be grammatically required.

A wide range in scores was shown in other dialogues, too. Although Dialogues Five and Six are clearly differentiated in writing, speakers failed consistently to distinguish them formally in reading aloud. The same was true for Dialogues Ten and Eleven. Both senses tended to get the standard pattern appropriate for Dialogue Eleven, No, I said Joe will do it. In fact, 79% of all speakers used the same intonation pattern for both senses, without distinction. Similarly, in I'm hanged if I know, Dialogues Seven and Eight typically got the pronunciation appropriate to Dialogue Nine. 41% of speakers said I'm hanged if I know, for all three dialogues, and 52% used it for two of them. For Dialogues One and Two, 59% of speakers gave Dialogue Two the pronunciation properly used for Dialogue One - tea or coffee. The standard form for Dialogue One was used by 93% of speakers, while that for Dialogue Two - tea or coffee - was produced by less than 40%. Of Dialogues Fourteen and Fifteen, the form appropriate for Dialogue Fourteen, we can't have too many, was used more often than not for Dialogue Fifteen.

On the other hand, there were occasionally variations on the expected form which pointed to the existence of alternative, "allophonic" patterns. For example, in Dialogue Thirteen, Did he ride it home? and Did he ride it home? were given by 36% and 28% of speakers, respectively, and it is apparent that the community of "standard" speakers (for this dialogue) is divided in terms of the direction of the contour which makes the word "ride" prominent.

The conclusion one might draw is that the distinctiveness of the available patterns is not deployed either thoroughly or consistently; readers tended to use the same familiar pattern for two senses which are opposed, without being aware that they had produced an anomaly, or done anything unusual. It would be easy to say that the experimental task was not easy; but then, few speakers expressed dissatisfaction with the way they had done it. Perhaps their standards are just not very high.

This raised the question of how subjects recognized appropriate patterns when they heard other people using them. The next stage of the investigation tested the ability of listeners to identify the dialogues by hearing only that bit of each where the formal ambiguity was located. To this end, I made a selection from the recorded readings, choosing some that were pretty definitely of one standard pattern or another, and some that fell uncertainly between two distinct patterns, perhaps with some features of both. My subjects were given copies of the dialogues set out in the following manner:

READING EXPERIMENT 2B

NAME: _____

If you have already taken part in an experiment using these same dialogues, please indicate with a cross.....

On the accompanying tape, you will hear three versions of a key sentence from each dialogue. Place a tick in the space indicated to show whether the spoken version properly belongs to dialogue A or to dialogue B.

NUMBER ONE.

Version 1

Why did you have to get rid of him?

_____ A. Well we can't afford to have gamblers here and it's a pity, but...

_____ B. Well we can't afford to have men with bad judgment here, and I'm afraid...
...he speculated unfortunately.

Version 2

Why did you have to get rid of him?

_____ A. Well we can't afford to have gamblers here and it's a pity, but....

_____ B. Well we can't afford to have men with bad judgment here, and I'm afraid...
...he speculated unfortunately.

Version 3

Why did you have to get rid of him?

_____ A. Well we can't afford to have gamblers here and it's a pity, but....

_____ B. Well we can't afford to have men with bad judgment here, and I'm afraid...
...he speculated unfortunately.

NUMBER TWO

Version 1

Joe will do it.

_____ A. Have you changed your mind about who will do it?

_____ B. Did you say Flo would do it?

No, I said Joe would do it.

Version 2

Joe will do it.

_____ A. Have you changed your mind about who will do it?

_____ B. Did you say Floe would do it?

No, I said Joe would do it.

When a recorded version of just the last line of the dialogue was played to them, they were asked to state whether this version would have been the response appropriate to either A. or B. The listeners were being asked to decide that the sentence they were hearing had a form appropriate to, say, Dialogue Ten and not to the corresponding Dialogue Eleven. Their success rate for this particular pair of dialogues was quite high. 93% of subjects hearing the version No, I said Joe would do it decided it was in response to the phrase Did you say Floe would do it? and not to Have you changed your mind about who will do it? When they heard the form No, I said Joe will do it, 93% again related this to the preceding Have you changed your mind about who will do it? These figures suggest that the two forms are recognised as distinctive. Yet in the reading experiment,

the distinction was very poorly observed, for whereas 100% of readers used the standard form for Dialogue Eleven, only 21% used the distinctive form for Dialogue Ten. Most of the remaining 79% spoke the same form for both dialogues. This sort of distribution occurred very often. When reading aloud, subjects showed a tendency to adopt a familiar pattern whether it suited the context or not. Another example, I'm hanged if I know, was spoken most frequently for all three dialogues (Dialogues Seven, Eight and Nine), even though it seemed truly appropriate only to one (in order to contrast between their knowing and my knowing). Yet in perception, in the listening experiment, it was correctly related to its context by a smaller percentage of listeners than either of the other forms.

Perhaps the most revealing cases were those where there was no one form that seemed to be the most familiar one and therefore the one most readily chosen, independently of sense. In such cases, the success rate in recognition was always higher than the success rate in speaking. I believe this represents a general state of affairs, and the belief gets support from another observation. A number of those who took part in the reading experiment also took part in the listening experiment. It was not uncommon for the listening judgment to conflict with the reading practice. But the strong tendency was to repudiate the choice of a non-standard form in speaking by responding "correctly" to the standard form in listening.

This result seems to support the notion that perceiving is an aspect of performance which reflects one's competence better than reading or perhaps speaking. It throws some doubt on the motor theory of speech perception which holds that between the acoustic signal and its interpretation is an act of reference back to articulation. If there had been such a reference back in the present investigation, one would have expected perception to have been misled by articulation. But what in fact happened was that the subject's perception tended to follow valid generalizations of experience about language (competence) whereas articulation tended to fall in indiscriminatingly with well-established motor patterns whether they were distinctively appropriate or not.

FOOTNOTES

1. P. Lieberman, Intonation, Perception and Language
Cambridge, Mass. M.I.T. Press, 1967. p.125
2. "A preliminary experiment on the perception of intonation among some Australian speakers". Proceedings XI AULLA Congress Sydney, 16-23 August, 1967
3. Lee Hultzen, "Information points in intonation." Phonetica 4, 1959, 107 - 120