

NOTICING WORD-BOUNDARIES: A BRIEF INVESTIGATION

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The investigation was conducted in two stages. In the first stage ten speakers each recorded phrases such as *mice kill* and *my skill*. In the second stage ten listeners tried to identify what had been said. Both speakers and listeners spoke English as their first language.

The list of phrases was as follows: *Joy sprints*/*Joyce prints*, *pea-stalks*/*peace-talks*, *Park Road*/*Pa crowed*, *once tried*/*one stride*, *so dry*/*sowed rye*, *mice kill*/*my skill*, *Pa cried*/*Park Ride*, *Nye speaks*/*nice peaks*, *Lu slips*/*loose lips*, *house trained*/*how strained*, *race miles*/*Ray smiles*, *false printing*/*fall sprinting*, *fear strumpets*/*fierce trumpets*, *Joyce trips*/*Joy strips*.

The phrases were of more than one type. First, there were those in which the word-boundary occurs either between a vowel and two consonants (as in *my skill*) or between a consonant and a consonant (as in *mice kill*): there were sixteen of these V-CC and VC-C phrases. Secondly, there were those in which the boundary occurs either between a vowel and three consonants (as in *how strained*) or between a consonant and two or three consonants (as in *house trained*): there were eight such V-CCC or VC-CC phrases. Thirdly, there were four phrases belonging to the somewhat similar types VC-CC(C) or VCC-CC.¹ All the phrases chosen can stand on their own, with the possible exception of *race miles*. All but the pair *pea-stalks* and *peace-talks* appear to invite the use of two strong stresses. In choosing the phrases, no attempt was made systematically to include various types of sound; but eleven different vowels and a number of consonant combinations are represented.

The phrases were not presented (to either the speakers or the listeners) in sentences, but as isolates, the reason being that it was easier, so to speak, to equate them in this way, whereas to devise sentences in which each member of the pair occurred in identical contexts of stress and intonation would be extremely difficult and also perhaps unnecessary, since for the second stage of the investigation the context had to be eliminated, the aim of the investigation being to find whether the word boundaries were rightly perceived in the absence of contextual guidance.

The ten speakers, who were not of course told what was involved, were all women of 18 to 20 years old (except for one aged 45). They were speech-therapy students who

¹ Occurrences of phrases belonging to the second and third types seem to be fairly rare.

had not received instruction in juncture or word-division, though they had some knowledge of phonetics. They came from various parts of England and some spoke with traces of regional dialect.

Two lists were prepared, each containing 40 phrases. In each list, 14 of these phrases belonged to the selected pairs, no phrase occurring twice. The types were mixed; thus there were five V-CC phrases on Sheet 1 and three on Sheet 2, and so on. Besides these 28 phrases belonging to the material under observation, there were 52 other phrases (26 in each list) intended to distract the speakers from realising what the investigation was about. On the whole this 'blind' material consisted of phrases, such as *black smoke*, *mutton chop*, and *no time*, having roughly the same rhythmic character as the rest. Many of them contained also such features as incomplete and nasal plosion. The distractive material was successful in its purpose, and none of the speakers guessed the nature of the investigation.

Each speaker read from the lists individually, out of sight and hearing of the others, and was tape-recorded at 3.5 ins. (9.5 cms.) per second. Each speaker was separately asked beforehand not to make any effort to read distinctly, and for each a sample speed was given by reading two or three phrases not on the list. No opportunity was allowed of looking through the phrases in advance of recording. On the second occasion the speakers followed one another in a somewhat different order from the first.

Check sheets were then prepared for the ten listeners: men and women teachers in training (average age, 24) at another institution.² Each sheet bore the 28 phrases, arranged in numbered pairs, and no other material. The listeners were asked to listen to the tapes and to place a tick on their sheets against the phrase they thought they heard as each relevant item came along (the numbers had also been recorded). The relevant phrases had not been cut out and made into a new tape; instead they were brought into prominence by means of the volume control, which was turned down for the other items. This proved to be a speedy method of presenting the phrases to the listeners, though it had the disadvantage that some irrelevant material could be faintly heard, owing to the practical difficulty of turning down the volume quickly enough.

Since 28 phrases spoken by ten different speakers were listened to by ten listeners, 2800 judgements were involved. Of these, 79.7% were correct, the four men's and the six women's performances being on average about equally good. The least successful performer scored 67.1%,³ the most successful 90%.⁴ The least accurately

² I am grateful to the Phonetics Department of University College, London (and particularly to Professor A. C. Gimson and Mr J. D. O'Connor) and also to the Division of Language Teaching at the Institute of Education, London (and especially to Professor B. Pattison and Mr G. Broughton) for their provision of the facilities which enabled this investigation to take place.

³ Although this listener's first language was English, she was of mixed parentage.

⁴ In a similar investigation, concerned with other types of word-boundary and involving 2400 judgements, J. D. O'Connor and O. Tooley observed a lower degree of success in identification — 66.8%. See 'In Honour of Daniel Jones', 1964, p. 171.

identified phrase was *race miles* (51 errors), followed by *sowed rye* (41), *Pa crowed* (36), *nice peaks* (35), and *Lu slips* (35). The phrases most consistently identified with success were *one stride* and *Nye speaks* (2 errors each), followed by *peace-talks* and *house trained* (5 each) and *Park Road* (7). One is tempted to think that frequency of everyday occurrence may have had something to do with the ease with which a phrase was identified, but there is nothing in the evidence which clearly bears this out: one can hardly believe that *Nye speaks*, which was only misheard twice, is any commoner than *nice peaks*, which was misheard 35 times, though it is probably true that *Park Road* (7 errors) is more often to be met with than *Pa crowed* (36 errors).

Every listener except one listened more successfully to the second tape than to the first, the average improvement being slight (roughly 1.3 extra identifications out of 10; range, 0.5 to 2.6). Most improvement was shown by the listener with the lowest score. The improvement suggests that increasing practice in attempting to distinguish such word-boundaries may lead to increased skill; but the evidence is not of course enough to be conclusive.

Discrimination between phrases of the V-CCC and VC-CC(C) types, and also between those of the VC-CC(C) and VCC-CC types, was more accurate than discrimination between the V-CC and VC-C types. There were, however, only eight phrases belonging to the former pair of types, and four to the latter; whereas there were sixteen phrases belonging to the V-CC or VC-C types. The average number of mishearings of the phrases in this category was 45.

Initial aspiration of stops might perhaps be expected to give listeners a reliable clue. *Nice peaks*, however, was among the phrases most often misheard, though there was little mishearing of *peace-talks*.

Further analysis of the data obtained would be possible. It seems at the moment illegitimate to draw any conclusion except the broad one that *without guidance from context* it is hard even for native British listeners to recognize certain word boundaries in British English. (This conclusion does not necessarily apply to American English or to other types of word boundary.) One wonders whether it is worth while, in teaching the pronunciation of English, to spend a lot of time on drilling this type of feature.

DISCUSSION

Hill:

Professor Lee would find it profitable, I believe, to consult the elegant experiment by Prof. Lehiste (*Phonetica* vol. 5) if he has not done so. In my own teaching, I find it now clearer to stick to "juncture" as a syllable divides, as in *at all: a tall: atoll*. When there is no separator the division is in the (+), otherwise before or after it.

Krech:

Wurde bei Ihrer Untersuchungen eine physikalisch-akustische Analyse der Wortpaare durchgeführt, und wenn ja, welche Allophone der Vokale oder Konsonanten konnten in der Randstellung beobachtet werden? Es wäre wesentlich zu erfahren, welche Merkmale für die Perzeption relevant sind.

Lee:

ad *Krech*: No analysis of this kind was carried out, but it would of course be a useful extension of the research.