Assessing competence in English intonation

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1 Introduction This paper describes ways in which students' perceptual and productive competence in English intonation have traditionally been assessed at UCL. It deals only with competence in the perception and production of intonational form and has nothing to say about intonational function.   Some problems with the traditional methods of assessment are detailed and alternative methods of assessment are suggested, together with alternative ways of grading students' success using the traditional methods.

2 Intonation teaching at UCL English intonation has been an important part of the teaching of phonetics at UCL for many years. It is taught at both undergraduate and post-graduate levels. At undergraduate level, it is taught (as an option) to students on the BA in Linguistics and also to BSc Speech Science students (Speech and Language Therapy students) as part of their course in practical phonetics. At post-graduate level, it is taught to MA Phonetics students, MA Modern English Language students and students on the MSc Speech and Language Pathology course. For all of these student groups, the model of intonational analysis used in their teaching is that found in O'Connor and Arnold (1973). For some student groups, a much-simplified version of the system of analysis is used, mainly because of time constraints.   In what follows, competence in the full system is assumed.

3 Traditional assessment methods Competence in English intonation has been assessed, for many years, by one or more of the following methods:

  (a) Intonation dictation
  (b) Reading from text
  (c) Oral description of intonation pattern(s)

Method (a), as might be expected, involves the mark up of a text with O'Connor & Arnold tonetic notation in response to a live dictation of the text. Typically, the text is read through once without pauses. Then it is split into sections, which may consist of one or more intonation phrases. Each section is dictated a number of times, usually six. Then, the whole text is read through once more. Students are provided with an orthographic version of the text on which to mark their decisions. An example of a recent dictation script follows.

  • ˈHave you had ˚time to ˚look at the ˚draft of the ˌtimetable I ˚sent you
  • The ↘reason I ˇask | is that I ˈhad to ˈmake a ˈcouple of ˈlast minute ˌchanges
  • After our ˈmeeting a˚bout it the other ˌday
  • I ˈgot an ˋemail | from ˋJanet | ˈone of my ˋcolleagues
  • ↗saying she ˚couldn't do ˚her session in the ˋmorning
  • ˈsomething a˚bout a ˋhospital ap˚pointment | if I reˌmember ˌright
  • but ↘why she ↘couldn't have ↘told me beˇfore | I ˋdon't know
  • ˃Anyway | I am ↘thinking of ˚switching ˇmy session | with ˋhers
  • I ˈhope that's ˚not going to cause ˆyou any ˚problems
  • If it ˌis | ˉI ↗don't quite know ˋwhat to do

Method (b), obviously, involves the candidate reading from a text with an intonation mark up. This method comes in two flavours: a prepared reading, where the candidates is given some time (typically 5 minutes) to practise their performance of the text, and an unseen reading, where the candidate is expected to give an immediate performance without preparation. A recent example follows.

Prepared

ˈIsn't there another ° train at ˌhalf past
There ↘always ˇused to be | ˋdidn't there
Perˈhaps they've ˈchanged the ˌtimetable ° recently
Although ↘why they can't ↘leave the thing aˇlone
I ˈcan't underˆstand
It would ˈmake things ´easier | for ˋeveryone

Unseen

ˇProbably
Did ˈyou buy a ˌnewspaper ° yesterday
I ˈhaven't ° made up my ˋmind yet
¯She ⌇didn't ° want to ˋtell us the ° cost of it
I ↘can't beˇlieve | he ˈreally inˈtends to ˌdo that

Method (c) involves the candidate reading a sentence in any way s/he chooses. This reading is followed by an oral description of the candidate's intonation pattern. An examiner then performs the same sentence with a different pattern and the candidate is required to describe this new version. The sentences are very often constructed in such a way that the most likely intonational treatments involve a maximal structure of prehead, head, nucleus and tail and are of a sort that allow a number of different plausible nucleus placements. A typical sentence is:

The weather will probably be awful tomorrow.

5 Grading problems All three of the above methods present the same sort of problems in grading a candidate's performance. A simple example from the dictation method will suffice to illustrate this. In the example dictation passage given above, there is a section which reads:

- but ↘why she ↘couldn't have ↘told me beˇfore | I ˋdon't know

For those unfamiliar with O'Connor & Arnold notation, here is a brief description of the intonation. The section consists of two intonational phrases (IP). The first IP begins with a low prehead (*but*). This is followed by a sliding head with accents on *why*, *could-* and *told*. Each of the syllable groups prefixed by a downward pointing arrow is gradually falling in pitch. The beginning of the second such group is slightly higher in pitch than the end of the preceding group. The IP ends with a fall-rise nuclear tone. The second IP starts with a low prehead. This is followed by a high fall nuclear tone, which in turn if followed by a low level tail.

Suppose a candidate writes the following in response to the dictation of this section:

- but ˈwhy she ˈcouldn't have ˈtold me beˌfore | I ˌdon't know

At first glance, apart from the IP division, nothing seems correct. The simplest and quickest way to grade this is to give credit for the IP division and for nothing else. One might call this the "all-or-nothing" (or even the "Attila the Hun") approach. However, a few moments thought ought to result in the conclusion that the candidate has actually got an awful lot right.

The candidate's response shows a low prehead (correct). This is followed by a stepping head where the accents are correctly located, but the pitch characteristics of the groups of syllables are incorrect. In a stepping head, each syllable group initiated by an accent is level in pitch rather than falling. Each group starts slightly lower than the end of the preceding group. The nucleus in the candidate's version is correctly located but the tone is wrong. In the second IP the prehead and tail are correct. The nucleus is correctly located, but the tone is partially wrong. The configuration is correct, but the range is not.

6 Componential competence A fairer grading system would give credit for those components of the target pattern the candidate has succeeded in recognising, or in the case of a reading test, in producing. The question then arises: what components should we expect a candidate to be aware of? Here is a list of suggestions:

- IP division (ID)
- Syllable prominence (SP)
- Tone configuration (TC)
- Tone range (TR)

SP covers the following possibilities: non-prominent, rhythmically stressed, accented, and nuclear
TC covers: fall, rise, level and for nuclear tones also fall-rise and rise fall
TR covers high and low for nuclear falls and rises and high is also for relevant for preheads

In the example target there are 13 syllables plus the IP boundary. Four of the accented syllables, those in the first IP, are worth 2 marks each, one for SP and one for TC. The nucleus in the second IP is worth 3 marks – SP+TC+TR. On this marking scheme, the target is worth a total of 20 marks. The example response would score 14/20 (70%). On the all-or-nothing marking scheme the candidate would score 1/6 (17%).

While a componential approach seems a lot fairer, there is no doubt that grading competence in this way is much more labour-intensive.

7 Componential assessment The above suggests that there must be better ways of assessing competence – ways which focus on the desired components themselves. What this means is an application to intonation of the Analytic Listening (AL) technique described in Ashby et al (1996). This technique has the advantages of being extremely quick and easy to grade, indeed it can be graded by machine. It is also simple for the candidate to understand, and is generally much less threatening than the sorts of methods outlined above.

One important consideration is, as with all objective methods of assessment, the question of success by chance. However, there are well-established ways of correcting raw scores to take account of guessing on the part of the candidate. A further possibility is to build into the testing method some measure of the candidate's confidence in their judgments of intonational phenomena. Details of such confidence-based (or certainty-based) assessment can be found at http://www.ucl.ac.uk/%7Eucgbarg/pubteach.htm

The rest of this paper outlines some ideas for incorporating AL methods into the assessment of intonational competence.

7.1 Syllable prominence: Simple assessments, involving a binary forced choice, may be used to gauge a student's perceptual competence. For example:

> Listen to the sentence: *Mary had an enormous aardvaark.*
> Is the syllable *had* stressed?
> Yes   No

Of course, one could ask whether a particular syllable were accented or not, or nuclear or not.

A development of the binary choice technique can be found in the web-based JavaScript program called *Plato* (http://www.btinternet.com/~eptotd/vm/plato/platmen.htm) This concentrates on nucleus placement, asking the user to highlight the nuclear syllable in a sentence that he or she hears. Rhythmic stress or non-nuclear accent could be targetted in the same way.

The same sort of technique could be used to assess a student's productive skills.
> Say the sentence *Mary had an enormous aardvaark.*
> Make *aard-* the nucleus.
> Now make *–norm-* the nucleus
> etc.

7.2 Tone configuration and range: Binary forced choice assessment seems particularly suited to those tonal differences that students perennially find troublesome. Here is an example:
> Listen to the sentence: *Please give me twenty pounds.*
> Choose the correct description.
> (a) Fall-rise nucleus on *twen-*
> (b) High head on *Please...twenty* + low rise nucleus on *pounds*

Tone range can also be approached in the same way. For instance:

> In the sentence *I haven't got a pet wombat* the syllable *got* is a falling nucleus. Is it a high fall or a low fall?

A development of this procedure, involves identifying more complex combinations of tone. An example of this can be found in the web-based program *Online Intonation* (http://www.phon.ucl.ac.uk/home/johnm/oi/oiin.htm)

Examples such as these could of course be multiplied. Demonstration implementations of some of these ideas will be shown in the conference presentation, and, hopefully included on the CD of the conference proceedings.

8 References
Ashby M.G., Maidment J.A. & Abberton E.R.M. (1996) Analytic Listening: a new approach to ear-training. http://www.phon.ucl.ac.uk/home/shl9/ashby/ma.htm
O'Connor J.D. & Arnold G.F. (1973) *The Intonation of Colloquial English.* London: Longman