This leaflet answers the following questions

(1) What is the difference in pitch between MALE and FEMALE adolescents? Are the values adult-like? And are they independent of SPEAKING STYLE?

(2) How does DIALECT affect intonation patterns?

(3) Are intonation patterns affected by SPEAKING STYLE?

(4) What is the most striking difference between the intonation of QUESTIONS and STATEMENTS?

The answers are based on acoustic and linguistic analyses of recordings from the IViE corpus (IViE = Intonational Variation in English). The corpus contains 36 hours of speech from 84 speakers and is available on-line, free of charge, at http://www.phon.ox.ac.uk/IViE/.

At the time of the recordings, the speakers were 16 years old and lived in Belfast, Cambridge, Dublin, Leeds, Newcastle, Bradford (English-Punjabi bilinguals) and London (second generation immigrants from the West Indies). Half were female. They were recorded reading aloud and talking informally.

(1) What is the difference in pitch between MALE and FEMALE adolescents? Are the values adult-like? And are they independent of SPEAKING STYLE?

Table 1. Gender, style and average f_0 (Hz)

Style	Males	Females
Read sentences	125	221
Conversation	120	209

Table 1 shows that average pitch values from 16-year-olds are adult-like. In adults, average f_0 is around 220 Hz for females and 120 Hz for males. (NB f_0 = fundamental frequency, a measurable acoustic correlate of pitch).

The table also shows that our speakers had lower average f_0 values in conversations than when reading aloud, but this difference was small compared to that found in previous research on adults. In adults, f_0 in conversations is around 30 Hz lower than when they read aloud.

Table 2 gives f_0 ranges. The table shows that female adolescents spoke with a wider range than males and the overlap between male and female ranges was small. Speaking style affected the range, both in males and females, but differently. Females lowered their average pitch in conversations, but spoke with the same pitch range. Males did not lower their average pitch but reduced the range. Research has shown that adult males and females lower *and* reduce their f_0 ranges.

Table 2. Gender, style and f_0 range (Hz)

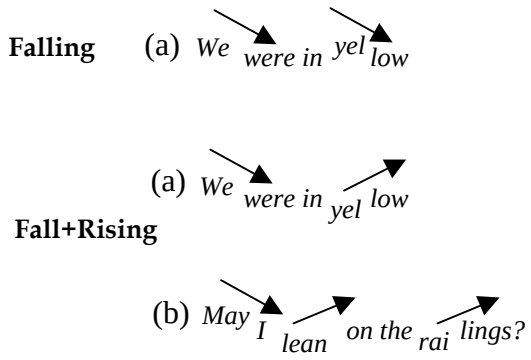
	Males			Females		
Style	Min	Max	Range	Min	Max	Range
Read sentences	99	196	97	174	339	165
Conversation	94	167	73	157	318	161

(2) How does DIALECT affect intonation patterns?

Within dialects, speakers produced around 30 different sentence tunes. Most of these were one-off instances of a pattern. Two tunes, however, were special. We refer to these as the *falling* and the *fall+rising* tunes. They were observed in all dialects, and used much more frequently than all the other tunes in the corpus (50% to 80% of the time). Examples are shown in Figure 1. The arrows and the typesetting in the figure illustrate the pitch movement on a word or word sequence.

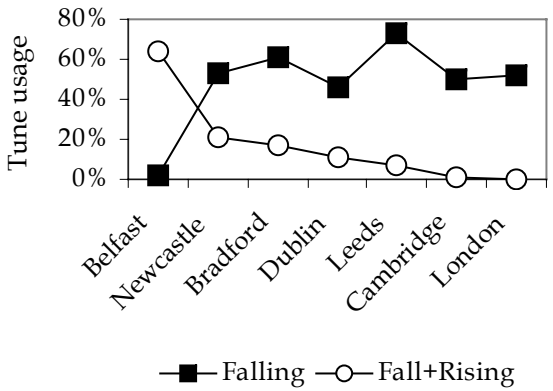
You can hear tunes like those shown in Figure 1 at http://www.phon.ox.ac.uk/IViE/tunes/.

Figure 1. Most common tunes



The two properties of the common tunes are: (1) they are typical of all dialects of English spoken in the British Isles, and (2) since they are used to different degrees in different dialects, they may contribute to perceived dialect differences. This is illustrated in Figure 2.

Figure 2. Usage of common tunes in per dialect; data from read sentences



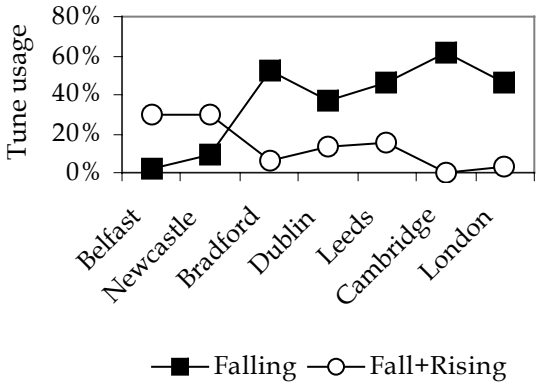
In Figure 2, Belfast English stands out: over 60% of patterns consist of the fall+rising tune. In all other dialects, the falling tune is dominant, particularly in Leeds. Figure 2 also shows that usage of the

fall+rising tune decreases roughly along a geographical North-South axis, from Belfast to London.

(3) Are intonation patterns affected by SPEAKING STYLE?

Figures 2 and 3 show that the most common tunes observed in read speech are also frequent in conversations (though there is more variation in conversation). The degree to which these tunes were used in conversations in different dialects was largely the same as in reading aloud, with one exception: Newcastle English. Here, speakers preferred the falling tune in read speech and the fall+rising tune in conversation.

Figure 3. Usage of common tunes per dialect; data from conversations



(4) What is the most striking difference between the intonation of QUESTIONS and STATEMENTS?

Questions play an important role in communication. Consequently, they are often spoken with special intonation patterns. Textbooks often state that in Southern British English, many questions end in rising pitch. This is not true of all types of questions, however, nor is it true of Northern English and Northern Irish dialects: here, statements *and* questions can end in rising pitch. Our data suggest a simple but effective approach to the teaching of question intonation. When our speakers asked a question, they raised the pitch of the entire question, regardless of the intonation pattern and regardless of the dialect they spoke. (NB pitch was raised by approximately 20% from the speakers' average statement pitch). Consequently, for communicative purposes, it may be good enough if patients or students are taught to raise the overall pitch of the utterance when they wish to ask a question.

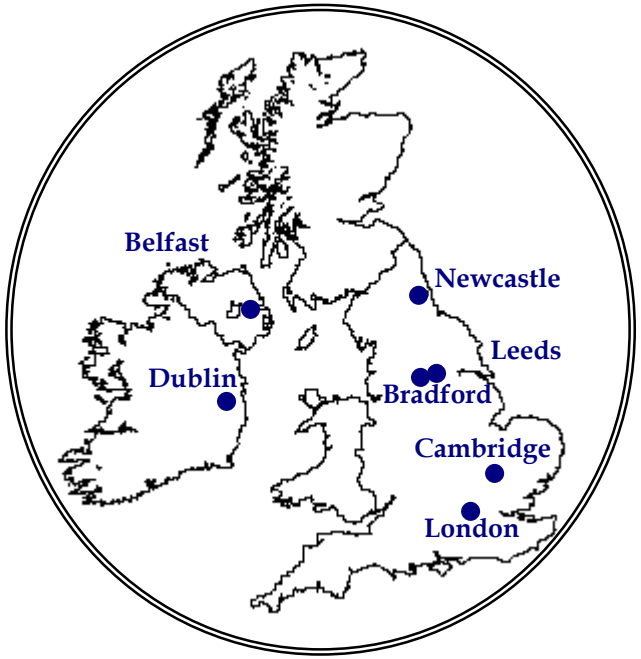
At a glance

In the intonation of English-speaking adolescents living in the British Isles:

Question	Answer
Does GENDER affect average f_0?	Yes, values are adult-like.
Does STYLE affect average f_0?	Yes.
Does STYLE affect range?	Yes.
Does DIALECT affect intonation patterns?	Yes. Common tunes are used to different degrees in different dialects.
Does STYLE affect intonation patterns?	Yes, most noticeably in Newcastle English.
What makes a QUESTION special?	A question is spoken on an *overall* higher pitch.

Intonational Variation in English

Fact sheet



This leaflet shows how factors such as gender, speaking style and dialect affect the intonation of English-speaking young people living in various parts of the British Isles.

Contact:

Dr E. Grabe or Dr J. Coleman
Phonetics Laboratory
University of Oxford
Tel. 01865 270444
enquiries@phon.ox.ac.uk
www.phon.ox.ac.uk/IViE

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