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Talk of the tone

In this issue's pull-out, **Dominic Watt** discusses the notion of tone of voice, and the phonetic features that contribute to this rather hard-to-pin-down aspect of our speech.

“Don't talk to me in that tone of voice!”

Some variant of this phrase will be all too familiar to most readers: it's a time-honoured rebuke that every parent can deploy when dealing with an obstinate youngster. It is equally useful to schoolteachers wishing to warn a defiant pupil that some disciplinary line has just been crossed. But what do they mean by *that* tone of voice? What is 'tone of voice' anyway?

When we talk of tone in linguistics, we could be referring to several things. We might mean the general tenor or mood of a conversation; we could say, for instance, 'Veronica's always lowering the tone with those smutty jokes', or 'The tone of the meeting became more conciliatory after the sandwiches were passed round'. We might suggest that a colleague 'tone down' an email intended for her boss, so that it 'strikes the right tone'. As these last examples show, we use 'tone' to refer to written as well as spoken communications.

Tone also refers to modulations to the pitch of a speaker's voice that denote distinctions in word meaning: this is lexical tone, of the sort used in Chinese, Thai, Panjabi, Yoruba, and thousands of other languages of Asia, Africa, and the Americas. For instance, in Hong Kong Cantonese, with its six

contrastive tones, the syllable [si] can mean *silk*, *try*, *matter*, *time*, *history*, or *city*. Challenging as these contrasts are to learn, we should remember that lexical tone is the norm for human languages: the majority of them – perhaps seven in ten – make use of it.

Although as English speakers we can't make radical changes to the *literal* meanings of words via pitch modifications, as per Cantonese, we do use pitch to signal 'affect' (attitude, stance, etc.). Suppose that while you're away on holiday your flatmate calls to say that in your absence he has called in the decorators to give the apartment a makeover. In response, you say, 'Oh'. The intonation pattern you impose on this syllable could indicate an attitude ranging from annoyance or dismay to scepticism, weary resignation, inquisitiveness, surprise, or delight.

A good deal of information can be communicated just by modifying the pitch pattern on a syllable lasting mere milliseconds, but things become more complicated over longer stretches of speech. Our utterances can be broken into *tone groups* or *tone units*, each with its own *tonicity* expressed using different 'tunes'. Each tone unit contains a *tonic syllable* or 'nuclear tone', which is prominent relative to the rest of the tone unit. A sentence's implicature can change markedly just by shifting the tonic syllable around: consider the different nuances of meaning created by

repositioning the tonic syllable within the phrase *Jeremy always bakes us macaroons*. As listeners we are exquisitely attuned to what can be inferred on the basis of these subtle changes in the speed of vibration of the talker's vocal folds.

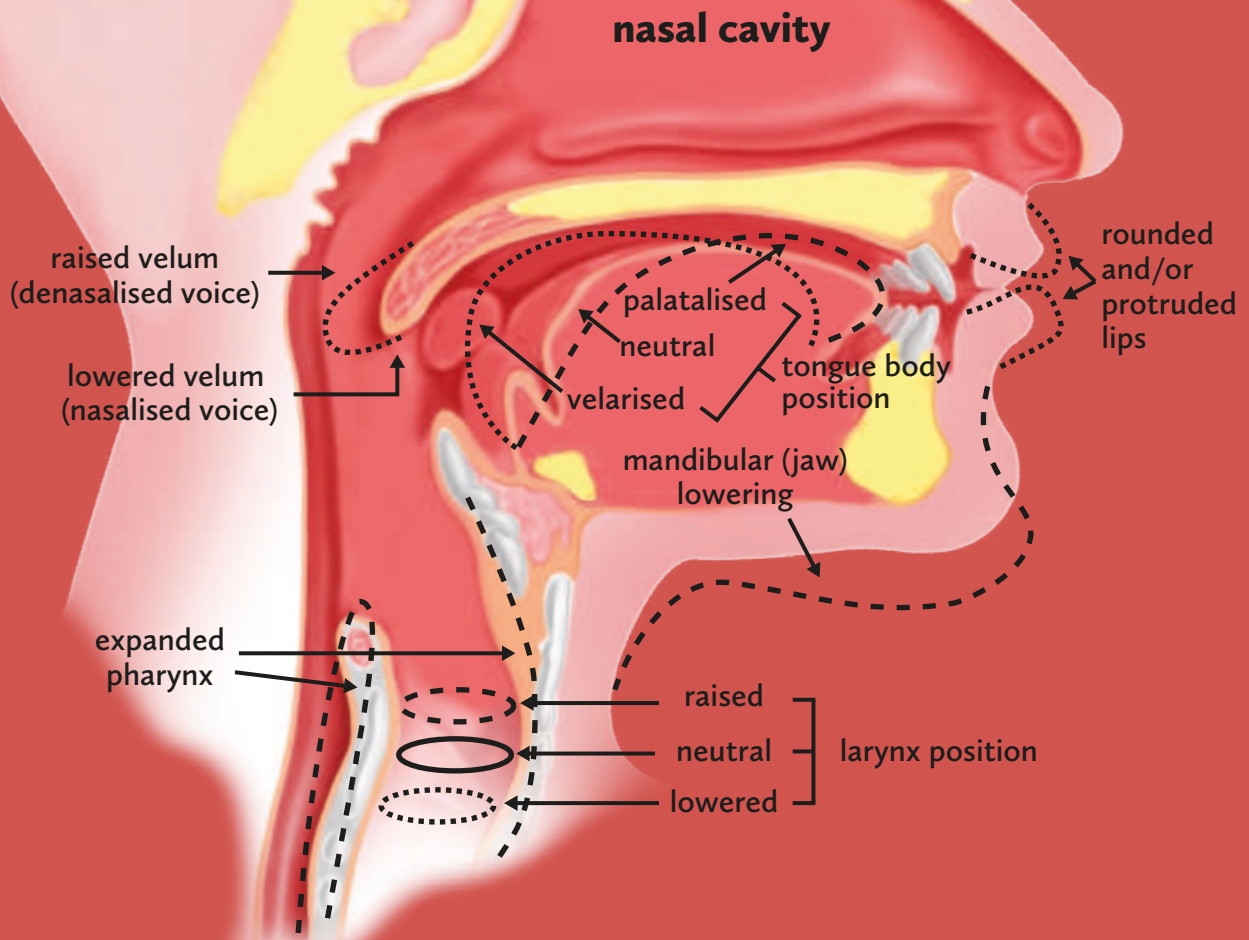
There is more to 'tone of voice' than just pitch, however. We also need to take account of *voice quality*. There are two key elements here: *phonation type* and *articulatory setting*. The first of these refers to the type of voicing being used, but it is not only the speed of the phonatory cycle – the alternating opening and closing of the vocal folds – that is of interest, but also *how* the folds are vibrating. The speaker may be using 'creaky' voice, in which the vocal folds are held stiffly such that the breath can only pass between them in a slow, irregular way, creating a sound like a creaking door. The listener may form the impression that the talker is tired, bored, very relaxed, or suffering from a sore throat, but this does not stop creak (a.k.a. vocal fry) being used by speakers who are none of these things. It's a stereotyped speech habit of Californian 'Valley Girls', but is also common among British people, particularly young middle-class women.

The use of breathy voice is also characteristic of many speakers, again especially female ones, in whose speech it is often said to evoke 'sexiness'.

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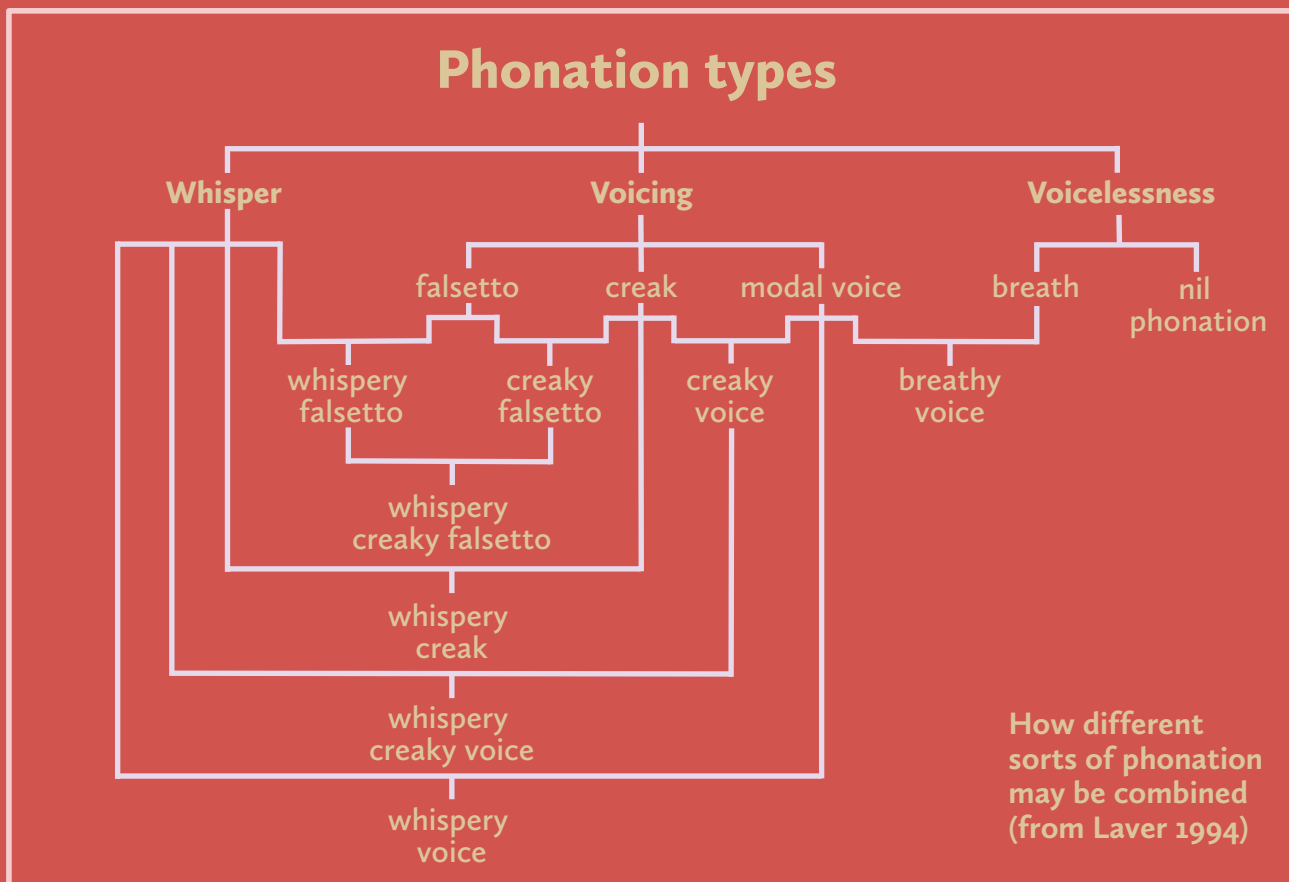
Voice quality and tone of voice

One of the many ingredients of 'tone of voice' is voice quality. As listeners we infer a great deal about the speaker's mood, attitude, and physical state (e.g. fatigue, stress, general health) from his/her voice quality, and also use it when making judgments about the speaker's age, social class, or sexual orientation. It's also implicated when we judge a speaker's sincerity, though so far we haven't been able to identify whether there is a consistent set of voice features associated with deceit.



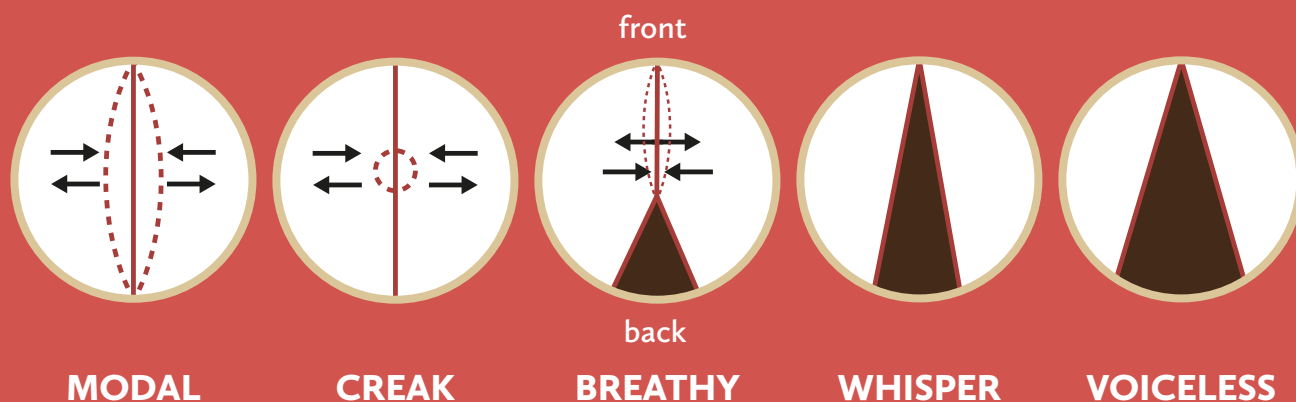
Articulatory setting

The way in which we habitually position our speech organs while we talk is known as **articulatory setting**. The configurations of our active articulators, i.e. the ones we can move during speech articulation (the lips, tongue, velum/soft palate, lower jaw, pharynx walls, and larynx), give our voices a characteristic timbre. The speech of two people with similar accent backgrounds – even identical twins – can sound different by virtue of the ways in which they use articulatory settings. One might tend to raise her larynx, protrude her jaw slightly, and talk with a fronted tongue body, while the other might produce a more velarised and nasalised voice quality owing to tongue body retraction and habitual lowering of the soft palate.



Phonation

Phonation refers to the way in which the vocal folds in the larynx generate sound as input to the speech production mechanism. Most of the time we use **modal voice** (ordinary, everyday voicing), which is made by the vocal folds vibrating in a regular wave-like way along their entire length. **Creak**, as the name suggests, is less regular than modal voice: the vibrations of the folds are slower and bursts of air are emitted through a small opening between them. In **breathy** voice, the edges of the folds vibrate but there is constant *turbulent* leakage of air, creating a 'hissing' quality. In **whisper** the folds are held apart in such a way that still more turbulence is produced. **Voicelessness** is an absence of phonation: air passes from the lungs into the throat cavity in a smooth and unimpeded way. Possible combinations are shown in the above diagram.



Simplified diagrams of the vocal folds and glottis (the gap between the folds), as though seen from above, during the production of different types of phonation. The dashed lines indicate the extent of vocal fold movement, while the arrows show the directions in which they are stretched or compressed. Modified from Daniloff (1985).

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Here, the vocal folds never close together completely during the phonatory cycle, such that air is always flowing between them. We also encounter *falsetto* phonation – a high-pitched, Mickey Mouse-like quality that helps to communicate humour or indignation – and *harsh* voice, which, as the name suggests, may give the impression of vocal strain on the speaker's part, and of emotions such as anger or aggression. Certain combinations of phonation types, such as harsh creak, are also possible.

Articulatory setting, by contrast, is to do with how the supralaryngeal ('above the larynx') speech organs are configured over longer stretches of speech. Habitual lip rounding, for example, makes a talker sound noticeably different from one who favours a spread-lip setting. A denasalised voice (think of Ed Miliband, the former British Labour Party leader) is one where the velum (soft palate) isn't lowered enough to allow nasal airflow, meaning that /n/ and /m/ sound like /d/ and /b/, respectively. The opposite of this is nasalised voice, whereby the velum is kept abnormally lowered. American English is often said to be more nasalised than British English. Speakers might favour a palatalised tongue body, giving a 'brighter' overall timbre to the voice, or a velarised tongue position, which sounds 'darker' (think of the difference between 'clear' and 'dark' /l/, as in 'lap' vs. 'pal', and then try to extend the 'darkness' of dark /l/ across all the other vowels and consonants in a longer phrase).

In a study I published with Juliet Burns, we asked phonetically untrained listeners to describe a series of voice samples. They heard recordings

of the same talker (John Laver) uttering the same sentence in the same accent – Received Pronunciation – but using a range of voice qualities. Their descriptions of the samples varied hugely with changes in Laver's voice quality. On hearing his modal voice, the listeners chose adjectives such as 'authoritative', 'clever', 'soothing', 'pleasant' and 'sincere', but after Laver switched into whispery creak, they opted for labels like 'menacing', 'scary', 'conspiratorial', 'ominous', 'pervert', 'threatening', and 'horror movie'.

Variations in tone of voice can, then, drastically alter listeners' perceptions of the talker. The current US presidential hopefuls, and their image experts, should keep this in mind. Much of the media commentary on Hillary Clinton's public appearances has focussed upon her 'shrill', 'shouty' tone of voice, a trait seen as potentially damaging to her White House prospects. Trump and his Republican rivals fare no better: David Givens, of the Center for Nonverbal Studies, describes the candidates' vocal tones as 'uniformly angry, aggressive and dyspeptic'. When presentation and image are so vital to winning votes, sounding persuasive and states(wo)manlike becomes tricky if the tone of voice is wrong. Having learned from our experiment with the Laver samples, let's conclude with some advice to anyone seeking to attain the highest offices of power. Unless you have laryngitis, avoid whispery creak! ¶

Dominic Watt is Senior Lecturer in Forensic Speech Science at the University of York. His research interests are in forensic phonetics, sociophonetics, and language and identity studies.

Find out more

Books

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