

SOCIOPHONETICS

Paul Foulkes, University of York

Sociophonetics, as is evident from its morphology, describes work at the intersection of sociolinguistics and phonetics.

The term has had its widest currency among phoneticians, referring especially to descriptive accounts of phonetic and phonological variation in particular dialects, speech styles or speaker groups. The results of such investigations are often used to address issues in phonetic and/or phonological theory. One such issue is the relationship between phonetics and phonology (e.g. Ohala 1990), although many sociophoneticians appear to make no distinction between them, using ‘phonetics’ and ‘phonology’ interchangeably. Sociophonetics is also used to refer to phonetically-oriented research in variationist sociolinguistics. Such work again focuses on the interrelationships between phonetic/phonological form and social factors such as speaking style and the background of the speaker, but with a particular interest in explaining the origins and transmission of linguistic change.

Among the first to define her work as ‘sociophonetic’ is Deshaies-Lafontaine (1974), in a study of Canadian French. Dressler and Wodak (1982) used the near-synonymous label ‘sociophonological’ for their study of Vienna German. Although the term therefore has a reasonable time depth the field has expanded rapidly since the mid 1990s. Sociophonetics is now an eclectic field with an expanding agenda. It is furthermore emerging as a research area in its own right instead of being viewed as a component of other more established traditions. Today’s sociophoneticians are concerned not only with aspects of speech production but also the effects of variation on speech perception; the implications of variation for theories of language change, the lexicon, phonology, speech production and perception; how variation impacts on the process of language acquisition; and the value of understanding variation for a range of applied areas.

This review illustrates these areas with reference to key works. It should be borne in mind, however, that the authors cited may not themselves use the term ‘sociophonetic’ to describe their research.

Speech production

The majority of sociophonetic work has been concerned with social, regional and stylistic variation in speech production. Variationist sociolinguistics in particular has yielded a wealth of information to show that variation in speech production is systematically influenced by a range of factors. These include aspects of speakers’ social background such as their age, gender, ethnicity and socio-economic status (e.g. Labov 1966, 1994-2001). Further influence may come from the groups and social networks to which speakers are affiliated (e.g. Milroy 1987, Eckert 2000).

Interest in regional variation predates modern linguistics. Systematic large-scale surveys have been carried out of many languages since Georg Wenker used a postal questionnaire

to investigate the German dialect forms used by schoolchildren in 1876. Recent surveys have used innovative methods such as telephone interviewing to gain rapid access to large samples of informants (e.g. Labov's TELSUR project, www.ling.upenn.edu/phono_atlas/home.html). More work has been carried out on English than any other language (but see e.g. Verstraeten and Van de Velde 2001, Kissine, Van de Velde and van Hout 2003 on Dutch; Sankoff, Blondeau and Charity 2001 on Canadian French). Wells (1982) provides a comprehensive account of regional variation in English accents, while Foulkes and Docherty (1999) contains several detailed studies on varieties in the British Isles.

It has also been demonstrated that phonetic and phonological form may be influenced by many dimensions of the context of interaction. These include the style or register of speech, the topic of discussion, and the addressee. Style-shifting (sometimes called phonostylistics) is summarised by Schilling-Estes (2002). A common finding is that more formal registers tend to elicit more standard spoken forms. In a slightly different vein, Lindblom (1990) hypothesises that speakers adjust their speech along a 'hyper-hypo' continuum in accordance with the perceived interactional needs of the interlocutor. More elaborated (hyper) articulations are used if the context demands listener-oriented speech, such as giving clear instructions. On the other hand, articulatory control in interactions such as narratives may be more speaker-oriented, permitting a greater degree of underarticulation (hypo-speech).

Variation in speech may contribute to expressing solidarity with, or distance from, an interlocutor. An example is provided by Trudgill (1986: 8), who monitored his own speech during fieldwork in Norwich, England. He found his use of glottal stops for /t/ correlated with that of his interviewees. Recent phonetic studies further reveal that interlocutors exert very fine control over phonetic parameters in order to structure discourse, for example to control turn-taking (e.g. Local 2003). It has also been shown that adults modify their speech when addressing children, including the use of higher fundamental frequency (F0) and a wider F0 range. Sociolinguistic variables may appear with different distributions relative to patterns in inter-adult speech, and may be affected by the age and gender of the child (Foulkes, Docherty and Watt 2005). Bilingual interaction displays a unique range of addressee effects, in that patterns of interference between languages depend upon the **language mode** being used (Grosjean 1998). In some circumstances a bilingual is likely to use just one language, such as speaking to a monolingual. In a monolingual mode, any interference between the speaker's two languages is minimal. However, in conversation with other bilinguals code-switching often emerges. That is, speakers engage in a bilingual mode where both languages are used and structures from one language may well be transposed onto the other. The phonetics and phonology of bilingualism remain, however, under-researched relative to other linguistic features (but see e.g. Khatib 2002). Another area which has only just begun to attract attention is how variation comes to be learned in the course of language acquisition. The available evidence (summarised by Roberts 2002) suggests that children acquire knowledge of sociolinguistic variation from the earliest stages.

Speech production research has been based mainly on auditory and acoustic (spectrographic) analysis of segmental properties. Sociolinguists in particular have relied on acoustic analysis to study vowels, especially formant analysis of stressed monophthongs (e.g. Labov 1994-2001, Milroy and Gordon 2003). Acoustic analysis has been extended to other aspects of vocalic quality such as duration (e.g. Scobbie, Hewlett and Turk 1999) and formant transition rate (e.g. Thomas 2000), and to consonantal variables (e.g. Docherty and Foulkes 1999, Kissine, Van de Velde and van Hout 2003). Work on suprasegmental features is increasing as well. The latter include regional and social variability in intonation (e.g. Britain 1992), voice quality/vocal setting (e.g. Henton and Bladon 1988, Stuart-Smith 1999), and rhythm (e.g. Low, Grabe and Nolan 2000). Further advances have been made as a consequence of technical developments in recording and analysis methods. Nolan and Kerswill (1990), for example, were innovative in employing electropalatography to analyse variation in connected speech processes. Other techniques such as ultrasound, laryngography, electromyography (EMG) and electromagnetic articulography (EMA) promise much for the future of sociophonetics, although not all are yet amenable to use on large speaker samples because of cost and/or invasiveness.

Speech perception

Compared with work on production, less is known about the relationship between phonetic/phonological variation and speech perception. Thomas (2002a) provides a thorough review of perceptual work in sociophonetics, identifying five main types of work. First, a number of studies have tested whether listeners can identify the social or regional background of speakers, based on exposure to the phonetic and phonological properties of their voices (e.g. van Bezooijen and Gooskens 1999).

Secondly, a group of studies have shown that phonological categorisation may be influenced by the (assumed) social characteristics of the talker. For example, Strand (1999) presented listeners with a continuum of synthetic stimuli ranging from a good [s] at one pole to a good [ʃ] at the other. The listeners' task was to label the stimuli as either /s/ or /ʃ/. As the stimuli were presented some listeners saw a female face while others saw a male face. The category boundary differed for the two listener groups, in line with typical differences in speech production: listeners who saw a female face placed the boundary at a higher frequency, since female voices typically produce fricatives with higher frequencies than male voices. Similar results were found by Elman, Diehl and Buchwald (1977). The third type of study assesses how native dialect impacts on perceptual categorisation. Janson (1983), for instance, found that younger and older listeners in Stockholm had a different perceptual boundary to divide a continuum of synthesised Swedish vowels. The boundary was in line with differences in the production of the two groups.

Thomas' fourth group includes investigations of whether listeners are able to perceive sound changes in progress, such as subtle splits in vowel quality (e.g. Di Paolo and Faber 1990). The final group are experiments investigate how variation contributes to listeners' judgements about the personality of the speaker (e.g. Giles and Powesland 1975).

Theoretical implications

The wide variety of work that can be called sociophonetic has contributed in diverse ways to the development of linguistic theory. In sociolinguistics the discovery of socially-constrained variation has made a particular impact on understanding how linguistic change originates, and how it spreads through communities and grammars (e.g. Milroy 1992, Labov 1994-2001, Kerswill and Williams 2000, Trudgill, Gordon, Lewis and Maclagan 2000). Labov's work on vowel formant analysis has yielded influential models which aim to explain and predict directions of long-term phonological change via universal principles, including chain shifting (for a critical review see Gordon 2001). In particular it has been shown that certain individuals are more likely to adopt new variants than others because of their social position (e.g. the structure of their networks of interaction), physical and social mobility, and attitude. In the latter case, for example, an individual may be willing to adopt new pronunciations if such forms have a high 'market value' in the workplace (Coupland 1980).

Until recently, sociophonetic studies have made less of an impact on grammatical theory, which is unsurprising in view of the fact that modern linguistic theory has been preoccupied with the 'ideal speaker-hearer in a homogeneous speech community'. Variation has therefore not been a prime concern in the development of most phonological models. However, adjustments to the machinery of several phonological models have been made in response to the findings of sociophonetic work. These include Optimality Theory (e.g. Nagy and Reynolds 1997), Government Phonology (Harris 1994), and Lexical Phonology (McMahon 1991). The recent emergence of exemplar theories of lexical representation, based primarily on psycholinguistic research, has also seen variation in both perception and production play a more central role (Pisoni 1997, Pierrehumbert 2002).

Applications of sociophonetics

Sociophonetic work has an important contribution to a range of interests beyond linguistic theory. Speech technology, for instance, must cater for social, regional and contextual variation to generate natural-sounding synthesised speech and to ensure speech recognition systems can tolerate natural variation (Hoequist and Nolan 1991). Descriptive accounts of systematic variation in speech are therefore of vital importance, as is testing of the perceptual evaluation of synthetic speech.

Speech and language therapists benefit from informed views of linguistic variation, enabling them to distinguish genuine pathology from natural non-standard variation. Pedagogical issues are similarly informed by debate on phonological variation, most famously perhaps in the case of the 'Ebonics' debate in the USA (Wolfram and Schilling-Estes 1998: 169ff.). Models of English for teaching as a foreign language are also constantly revised in line with changes in British and American standard varieties, as well as in response to the development of influential new standards such as Australian in east Asia.

Information on variation is critical for casework in forensic phonetics, in which the commonest task is the comparison of a criminal recording (such as a threatening phone

call) with a suspect's speech, to assess the likelihood that the suspect was indeed the speaker in the crime (Nolan 1997). The strength of conclusion that can be reached is largely dependent on the state of descriptive reference material, including the likely geographical origins of particular features and the distribution of variable features across the relevant population.

Summary

Sociophonetics is very much a developing field with a wide remit. As it begins to take on its own shape and gain independence from its parent disciplines it is apparent that its defining characteristic is a cross-fertilisation of methods and theories which have their origins in distinct fields. As Thomas (2002b) points out, this enables sociophonetics to address the weaknesses in its components. It takes its material not only from standard dialects and careful speech, but also from spontaneous interaction. It combines highly controlled experimental designs with observation of speaking and listening in different everyday situations, often using large and heterogeneous samples of subjects. It employs detailed analysis using a variety of techniques. Its methods are informed by a variety of different theoretical models, and its results are in turn used to address a wide range of theoretical issues. This approach is allowing us to gain an ever more focused picture of what is probably the single most defining characteristic of human speech – its variability.

References

- van Bezooijen, R. and Gooskens, C. (1999) 'Identification of language varieties: the contribution of different linguistic levels' *Journal of Language and Social Psychology* 18, 31-48.
- Britain, D. (1992) 'Linguistic change in intonation: the use of high rising terminals in New Zealand English' *Language Variation and Change* 4, 77-103.
- Chambers, J.K., Trudgill, P. and Schilling-Estes, N. (eds.) (2002) *The Handbook of Language Variation and Change*. Oxford: Blackwell.
- Coupland, N. (1980) 'Style-shifting in a Cardiff work-setting' *Language in Society* 9, 1-12.
- Deshaies-Lafontaine, D. (1974) *A Socio-Phonetic Study of a Québec French Community: Trois-Rivières*. PhD Dissertation, University College London.
- Di Paolo, M. and Faber, A. (1990) 'Phonation differences and the phonetic content of the tense-lax contrast in Utah English' *Language Variation and Change* 2, 155-204.
- Docherty, G.J. and Foulkes, P. (1999) 'Newcastle upon Tyne and Derby: instrumental phonetics and variationist studies' In Foulkes and Docherty (eds.), 47-71.
- Dressler, W.U. and Wodak, R. (1982) 'Sociophonological methods in the study of sociolinguistic variation in Viennese German' *Language in Society* 11, 339-370.
- Eckert, P. (2000) *Linguistic Variation as Social Practice*. Oxford: Blackwell.
- Elman, J.L., Diehl, R.L. and Buchwald, S.E. (1977) 'Perceptual switching in bilinguals' *Journal of the Acoustical Society of America* 62, 971-974.
- Foulkes, P. and Docherty, G.J. (eds.) (1999) *Urban Voices*. London: Arnold.
- Foulkes, P., Docherty, G.J. and Watt, D.J.L. (2005) 'Phonological variation in child directed speech' *Language*, 81.
- Giles, H. and Powesland, P.F. (1975) *Speech Style and Social Evaluation*. New York: Academic Press.

- Gordon, M.J. (2001) 'Investigating mergers and chain shifts' In Chambers, Trudgill and Schilling-Estes (eds.), 244-266.
- Grosjean, F. (1998) 'Studying bilinguals: methodological and conceptual issues' *Bilingualism: Language and Cognition* 1, 131-149.
- Harris, J. (1994) *English Sound Structure*. Oxford: Blackwell.
- Henton, C. and Bladon, A. (1988) 'Creak as a sociophonetic marker' In Hyman, L. and Li, C.N. (eds.) *Language, Speech and Mind: Studies in Honor of Victoria A. Fromkin*. London: Routledge. 3-29.
- Hoequist, C. and Nolan, F.J. (1991). 'On an application of phonological knowledge in automatic speech recognition' *Computer Speech and Language* 5, 133-153.
- Janson, T. (1983) 'Sound change in perception and production' *Language* 59, 18-34.
- Kerswill, P.E. and Williams, A. (2000) 'Creating a new town koine: children and language change in Milton Keynes' *Language in Society* 29, 65-115.
- Khattab, G. (2002) /l/ production in English-Arabic bilingual speakers. *International Journal of Bilingualism* 6, 335-353.
- Kissine, M, Van de Velde, H. and van Hout, R. (2003) 'The devoicing of fricatives in standard Dutch' In Fikkert, P. and Cornips, L. (eds.) *Linguistics in the Netherlands 2003*. Amsterdam: John Benjamins. 93-104.
- Labov, W. (1966) *The Social Stratification of English in New York City*. Washington DC: Center for Applied Linguistics.
- Labov, W. (1994-2001) *Principles of Linguistic Change* (2 vols.). Oxford: Blackwell.
- Lindblom, B. (1990) 'Explaining phonetic variation: a sketch of the H and H theory' In Hardcastle, W.J. and Marchal, A. (eds.) *Speech Production and Speech Modelling*. Amsterdam: Kluwer. 403-439.
- Local, J. (2003) 'Variable domains and variable relevance: interpreting phonetic exponents' *Journal of Phonetics* 31, 321-339.
- Low, E.L., Grabe, E. and Nolan, F.J. (2000) 'Quantitative characterizations of speech rhythm: syllable-timing in Singapore English' *Language and Speech* 43, 377-402.
- McMahon, A.M.S. (1991) 'Lexical Phonology and sound change: the case of the Scottish Vowel Length Rule' *Journal of Linguistics* 27, 29-53.
- Milroy, J. (1992) *Linguistic Variation and Change*. Oxford: Blackwell.
- Milroy, L. (1987) *Language and Social Networks* (2nd ed.). Oxford: Blackwell.
- Nagy, N. and Reynolds, B. (1997) 'Optimality Theory and variable word-final deletion in Faetar' *Language Variation and Change* 9, 37-55.
- Nolan, F.J. (1997) 'Speaker recognition and forensic phonetics' In Hardcastle, W.J. and Laver, J. (eds.) *The Handbook of Phonetic Sciences*. Oxford: Blackwell. 744-767.
- Nolan, F.J. and Kerswill, P.E. (1990) 'The description of connected speech processes' In S. Ramsaran (ed.) *Studies in the Pronunciation of English. A Commemorative Volume in Honour of A.C. Gimson*. London: Routledge. 295-316.
- Ohala, J.J. (1990) 'There is no interface between phonetics and phonology: a personal view' *Journal of Phonetics* 18, 153-171.
- Pierrehumbert, J.B. (2002) 'Word-specific phonetics' In Gussenhoven, C. and Warner, N. (eds.) *Laboratory Phonology* 7. Berlin: Mouton de Gruyter. 101-139.
- Pisoni, D.B. (1997) 'Some thoughts on 'normalization' in speech perception' In Johnson, K. and Mullennix, J.W. (eds.) *Talker Variability in Speech Processing*. San Diego: Academic Press. 9-32.

To appear in K. Brown (ed.) *Encyclopedia of Language and Linguistics* (2nd ed.). Amsterdam: Elsevier Press.

- Roberts, J. (2002) 'Child language variation' In Chambers, Trudgill and Schilling-Estes (eds.), 333-348.
- Sankoff, G., Blondeau, H. and Charity, A. (2001) 'Individual roles in a real-time change: Montreal (r->R) 1947-1995' In Van de Velde and van Hout (eds.), 141-157.
- Schilling-Estes, N. (2002) 'Investigating stylistic variation' In Chambers, Trudgill and Schilling-Estes (eds.), 375-401.
- Scobbie, J.M., Hewlett, N. and Turk, A.E. (1999) 'Standard English in Edinburgh and Glasgow: the Scottish Vowel Length Rule revealed' In Foulkes and Docherty (eds.), 230-245.
- Strand, E. (1999) 'Uncovering the role of gender stereotypes in speech perception' *Journal of Language and Social Psychology* 18, 86-99.
- Stuart-Smith, J. (1999) 'Glasgow: accent and voice quality' In Foulkes and Docherty (eds.), 203-222.
- Thomas, E.R. (2000) 'Spectral differences in /ai/ offsets conditioned by voicing of the following consonant' *Journal of Phonetics* 28, 1-26.
- Thomas, E.R. (2002a) 'Sociophonetic approaches of speech perception experiments' *American Speech* 77, 115-147.
- Thomas, E.R. (2002b) 'Instrumental phonetics' In Chambers, Trudgill and Schilling-Estes (eds.), 168-200.
- Trudgill, P. (1986). *Dialects in Contact*. Oxford: Blackwell.
- Trudgill, P., Gordon, E., Lewis, G. and Maclagan, M. (2000) 'Determinism in new-dialect formation and the genesis of New Zealand English' *Journal of Linguistics* 36, 299-318.
- Van de Velde, H. and van Hout, R. (eds.)(2001) *'r-atics: Sociolinguistic, Phonetic and Phonological Characteristics of /r/ (Etudes et Travaux 4)*. Brussels: IVLP.
- Verstraeten, B. and Van de Velde, H. (2001) 'Socio-geographical variation of /r/ in standard Dutch' In Van de Velde and van Hout (eds.), 45-61.
- Wells, J.C. (1982) *Accents of English* (3 vols.). Cambridge: Cambridge University Press.
- Wolfram, W. and Schilling-Estes, N. (1998) *American English*. Oxford: Blackwell.