

Zeki Majeed Hassan, Barry Heselwood
(eds.)

Instrumental Studies in Arabic Phonetics

Current Issues in Linguistic Theory, No. 319
John Benjamins Publishing Company
Amsterdam 2011
xii + 365 pp.
ISBN 978–90–272–4837–4

In what is still the relatively modest field of Arabic instrumental phonetics, one must applaud a new contribution such as the book under review. Rather than focusing on one aspect, it is a collection of essays of experimental phonetic investigations written by 22 scholars, from both the West and the Arab world. The volume contains a number of comparative studies (Iraqi Arabic/Swedish, Yemeni Arabic/Mehri, Lebanese Arabic/Yorkshire English) alongside investigations on individual varieties of Arabic: Moroccan (3), Jordanian (3), Palestinian (1), Syrian (1) and Egyptian (1).

The introduction includes a brief historical overview of the discussion of phonetics by leading medieval Arab scholars, such as Sībawayhi (8th century), highlighting similarities between their findings and methods with those of modern phonetic investigations. This is followed by a survey of some of the developments in modern Arabic acoustic phonetics.

The book contains a total of 14 papers, with the common thread being the emphasis on speech production and ‘the harnessing of modern instrumental and quantitative techniques to the methods of experimental phenomena that remain hidden from unaided inspection’ (p. 10). The contributions are divided along 4 themes: syntagmatic structure, gutturals, emphasis (sc. pharyngealization) and intonation.

Part 1 of the book focuses on ‘Issues in syntagmatic structure’ and contains 3 studies. The opening chapter, by A. Gafos et al., examines Moroccan Arabic word-initial consonant clusters and syllabification. Using Oujda, a Moroccan dialect famous for its consonant clusters – or vowelless syllables – the researchers conducted an articulo-graphic analysis of data collected from 2 speakers producing a total of 9

triads (word-initial C, CC and CCC). The results reveal that adding a consonant to a CV syllable yields an additional single-C syllable (rather than a complex onset).

Z. Hassan’s ‘Acoustic phonetic study of quantity and quality complementarity in Swedish and Iraqi Arabic’ provides acoustic measurements of vowel and consonant durations of short and long vowels preceding geminates in Iraqi. The experiment revealed a significant difference between the behaviour of vowels preceding geminates in Swedish and Arabic. In Swedish, there are very significant acoustic durational differences between long and short vowels preceding geminates versus singletons, whereas in Arabic only a slight significant difference was found between short vowels before geminates versus singletons, and no significant difference for long vowels in the same context.

B. Heselwood et al. provide a new approach to the analysis of the manner of assimilation of word-final /l/ to a following word-initial /r/ in Syrian Arabic. The authors discuss Sībawayhi’s treatment of assimilation in relation to sonority, and the extent to which assimilations can be gradient or categorical, the latter point being the main research question of the chapter. According to the data, assimilation of the type examined is optional – it can be complete, gradient or non-occurring (though complete is more common than gradient) – and affected by speech rate.

Part 2 contains studies dealing with a key area in Arabic phonetics, i.e. ‘guttural consonants’. The first paper, by B. Heselwood and F. Al-Tamimi, describes the production of the 2 laryngeal and 2 pharyngeal phonemes (both singletons and geminates) in Jordanian Arabic, specifically in terms of the action of the epiglottis and laryngopharynx. In the discussion of ‘emphaticness’ of pharyngeals, the authors concur with previous research regarding the action of the laryngeal articulator mechanism in the production of both laryngeals and pharyngeals. As regards terminology, it must be said that the use of ‘emphatic’ here (as in many other papers of the volume) is unfortunate; while it may be a convenient phonological catch-all, the term is impressionistic in origin and has no actual phonetic basis.

K. Shahin's study examined the guttural natural class, made up of postvelars and laryngeals, using a rhinolaryngeal stroboscope to analyse guttural laryngeals in Palestinian (Jaffa) Arabic. The laryngeals lacked the pharyngeal (aryepiglottic) articulation of the other Arabic gutturals. Thus, there is a phonetics-phonology mismatch, just as is the case in Hebrew.

The final paper in this part is M. Yeou and S. Maeda's 'Airflow and acoustic modeling of pharyngeal and uvular consonants in Moroccan Arabic'. The study proposes idealized models for Arabic uvulars and pharyngeal fricatives, compared against data from speakers of Moroccan Arabic. The principal outcome of the study is that these consonants should be considered approximants rather than fricatives, as area values of supraglottal constriction and glottal constriction are estimated to be higher than for simple fricatives, while the spectrograms show a vowel-like formant structure with non-turbulent airflow.

Part 3, 'Emphasis and coronal consonants', contains twice as many papers as the previous two parts. The opening study is also the second contribution to the volume by Al-Tamimi and Heselwood. Using the same nasoendoscopic, videofluoroscopic and acoustic techniques, the authors direct their attention to 'emphatic' coronals in Jordanian Arabic, after providing a brief overview of past studies on emphasis, in general, and in Jordanian Arabic, in particular. The data comprised minimal and near-minimal pairs of plain-emphatic contrast in initial, medial and final positions, the aim being to investigate effects on contiguous vowels. The authors also broach the controversial issue of whether emphatics are subject to pharyngealization or uvularization, with the only evidence for the latter being the raised F3 for high back /u:/. Equally of note is that the data show significant gender differences with male speakers making a larger difference between plain and emphatic consonants. This is a potentially fruitful avenue for future exploration and one that has received extremely little attention.

The study by M. Embarki et al. is the odd one out in the volume for a number of reasons. Firstly, it is the only one to offer an investigation into 4 dialect varieties (Yemeni, Kuwaiti, Jordanian and Moroccan). Secondly, it compares production between Modern Standard Arabic and dialectal Arabic (DA) speech by the same respondents. Finally, it also examines articulatory measures of a speaker of Tunisian. The comparative experiment focuses on acoustic data based on locus equation parameters extracted

from recordings of the speakers producing both Modern Standard Arabic and DA speech. One methodological problem ignored by the authors is the fact that the comparison is 'idealized' inasmuch as not all of the phonemes investigated are used in all of the DA varieties under consideration; this is particularly problematic for the pharyngealized dental fricative and stop. The principal findings are that: (1) the pharyngealized consonants are significantly lower in the Eastern group than the Western group; (2) despite different system inventories, phonetic realization is very similar across Middle Eastern countries and constitutes convergent patterns of coarticulatory effects; (3) pharyngealization may develop differently in East and West DA, with a possible weakening in DA, as a result of which pharyngealized consonants may be in the process of merging with their plain cognates to form a single consonant class, and (4) there are fine gestural adjustments and coarticulator effects that vary according to speech variety and speaker dialectal origin.

Z. Hassan and J. Esling's contribution aimed at investigating the acoustic and articulatory exponents of emphasis in Iraqi Arabic, based on a set of stimuli pronounced by 2 informants (male and female). The main findings are that the effect of the emphatic is spread over other syllables of the word both progressively and regressively. It is interesting that, contrary to the results of al-Tamimi and Heselwood in the volume, these authors found a *lower* larynx height (combined with a backing of the tongue and apparent raising of the tongue dorsum). The findings also support that 'anticipatory coarticulation is a language-specific phenomenon and that the secondary articulation is assumed prior to the primary one and dominates the word' (pp. 232–233).

The research presented by Watson and Bellem is a comparative acoustic analysis of the prepausal glottalization in Ṣanʿānī Yemeni Arabic (SA) and Mahriyōt, a dialect of the Modern South Arabian language Mehri (MM). The comparison between these two understudied language varieties is of considerable interest as it provides much needed additional insight into the language situation in Yemen, of which Watson is a leading expert. Equally noteworthy is the fact that the study relies on natural conversational speech data, rather than 'labspeech'. The rationale of the sample is, however, less methodologically sound since it involves a 14-year-old female speaker (SA) and a middle-aged male speaker (MM) on the grounds that their 'recordings were the clearest'. The authors found that SA and MM

both exhibited significant glottalization in prepausal position, but that in SA a greater range of segment types is affected (with voiced obstruents and emphatics being mainly affected in MM). Vowels are postglottalized, but never elided. This study also has a very interesting gender dimension in that the authors suggest that the nature of glottalization in SA may vary between male and female speakers, with male glottalization involving more creak, and female glottalization more sustained glottal closure. Though it is somewhat tenuous to make the claim on the basis of speech by one 14-year-old speaker, it is clear that this is a very exciting area for future research.

B. Zawaydeh and K. de Jong examine how contrasts involving uvularization are expressed in Jordanian (Amman) Arabic, with a focus on variations in the degree to which it occurs across a word containing a uvularized consonant. The authors observed 4 general effects in uvularization: (1) the most uvularized vowels (i.e. those with lowest F2) immediately follow the emphatic trigger; (2) uvularization weakens considerably as distance from the consonant increases; (3) anticipatory spreading is not sensitive to distance, and (4) the degree of uvularization is very strong 2–3 vowels before the trigger but lessens towards the trigger (F2 is higher in the vowel before the emphatic consonant than in vowels earlier in the word).

The contribution by C. Zeroul et al. relies on electromagnetic articulography, nasoendoscopy and ultrasound measures of articulatory gestures in Moroccan Arabic emphatic stops and labialized consonants. The main findings are that while the back articulation of emphatic consonants can be considered pharyngealization, Moroccan Arabic geminate labials /ff^w, mm^w/ are velarized but not emphatic or pharyngealized.

The first paper in part 4, ‘Intonation and acquisition,’ is S. Hellmuth’s ‘Acoustic cues to focus and givenness in Egyptian Arabic’, which is the only one in the volume – and of the few in general – to deal with intonation. Focus is understood to refer to the presence of alternatives for the interpretation of linguistic expressions, whereas givenness refers to the presence of the denotation of an expression in the common ground, i.e. availability or prior mention in the discourse. Both can be marked in different ways in different languages, most commonly by intonational pitch accents or the lack thereof, i.e. deaccentuation. It has been observed that in Egyptian Colloquial Arabic the latter fails to occur. The study explored whether there is any variation in intensity as a marker of givenness,

either in terms of overall intensity or selective intensity (spectral tilt). The principal finding was that no variation was observed either according to postfocal status or the givenness status of the indirect object itself. There is, however, an issue with the author’s definition of Egyptian Colloquial Arabic as the variety ‘spoken in Cairo and by educated speakers throughout Egypt’ since educated Upper-Egyptian (Ša‘īdī) speakers, for instance, will ordinarily speak their local variety.

G. Khattab presents data from auditory and acoustic analyses of /l/ in the production of 23 English and (Lebanese) Arabic monolingual and bilingual children and adults living in England. The aim of the study was to establish: (1) the distribution of /l/ variants in both languages; (2) the language-specific differences in the realization of the so-called ‘clear’ and ‘dark’ variants of /l/, and (3) whether bilingual children acquire language-specific articulatory and phonotactic patterns of /l/ in each of their languages. The analysis shows that while /l/ is clear in all positions in Arabic in non-emphatic contexts, in English there is a tendency for clear /l/ in onset positions and dark /l/ in codas. However, the author notes that dialectal factors play a role. No firm conclusions could be drawn about the dark allophones of /l/ in each language due to the scarcity of its occurrence in Arabic. However, it emerged that both pharyngealized /l/ in Arabic and dark /l/ in English involve F2 lowering and variable F1 raising, making it difficult to establish where there are language-specific differences in the realization of the secondary articulation of the dark lateral in both languages.

The papers are followed by an appendix offering a brief discussion of the ‘Phonetic instrumentation used in the studies’ and a subject and name index. Though much of the appendix is useful and relevant to a general reader, one wonders whether it is necessary for the intended readership of what is a highly specialized volume of this kind. Indeed, it is difficult to see how anyone unfamiliar with sound spectrography (p. 355) would be able to derive much benefit from many of the chapters in the book.

In terms of presentation, it is unclear what the rationale is behind the highly unusual and idiosyncratic use of ‘Before Hijra’ dates (vs. AH/CE).

All in all, this is an interesting collection of papers that constitutes a valuable contribution to the field of Arabic phonetics and will form the basis for much future research. From a general methodological point of view, it is

worth pointing out that the editors recognize the inherent constraints of many of the instrumental investigations, such as the relatively small data sets and population samples, and the fact that often speech is observed in laboratory conditions (resulting in what has been called

unnatural ‘labspeech’; p. 11). However, this does not detract from the originality of the studies in both their innovative use of modern techniques and areas of interest.

Daniel Newman, Durham