Journal of the International Phonetic Association (2023), 1–19
doi:10.1017/S0025100323000269

ILLUSTRATIONS OF THE IPA

Abha Arabic

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(Received 12 November 2021; revised 16 August 2023; accepted 5 September 2023)

Abha Arabic is a dialect of Arabic (ISO 693-3: ara), belonging to the Semitic language family group, and spoken primarily in Abha city. Abha Arabic can be broadly classified as a variety of Arabic from the Arabian Peninsula group (Versteegh, 2014), and further sub-classified as a south (-west) Arabian dialect (Ingham, 1982). Abha city is the administrative capital of the province of Asir, in south-west Saudi Arabia (Figure 1). The population of Abha is approximately 290,185 and that of the Asir province is 1,601,725, according to the most recent data on the population (General Authority for Statistics, 2010). The province is named after the Asir tribe, who first inhabited Abha and the surrounding regions. The present day Abha Arabic dialect thus represents a blending of Bedouin and urban dialects. The first settlers to Abha were the Bani-Mghed tribe (an Asir tribe) followed by three additional Asir tribes (Alkam, Rabiah w Rufeda, Bani-Malik) and other nearby tribes such as the Gahtaːn, Ballahmir, Bal-lasmir, Shahran, Rejal Alma', all of which had distinct dialects (Al-Azraqi, 1998). These dialects merged to varying degrees and were further influenced by urban education and mass media, which were and continue to be dominated by Modern Standard Arabic (henceforth MSA) (Al-Azraqi, 1998).[1]

As is the case with other Arabic dialects, Abha Arabic does not have its own writing system, and thus the alphabet of MSA is used instead in the relatively infrequent instances when Abha Arabic is written. Abha Arabic in written form is typically only used in chat applications between native speakers and sometimes in advertisements for added impact to attract people's attention. Abha Arabic is primarily a spoken dialect which coexists with MSA in a situation of diglossia (Ferguson, 1959). Abha Arabic is used in informal daily conversations, while MSA is used in formal situations such as in media, education, and formal meetings.

Like other Arabic dialects, Abha Arabic has received little attention in the literature; to our knowledge, there are only three studies devoted to this dialect. Al-Azraqi (1998) focused on selected aspects of syntax while Nakshabandi (1988) focused on the phonology and morphology of Abha Arabic. However, although Nakshabandi's phonological analysis included a description of the sounds, syllable structure, stress, and some phonological

[1] For non-phonological features of this dialect, please see Al-Azraqi (1998).

Figure 1. (Colour online) Map of Saudi Arabia showing Asir region with main cities.

processes of the dialect, the phonetic description is not as detailed as those available for other Arabic dialects. In particular, an acoustic analysis is not conducted in Nakshabandi (1988). The third study of Abha Arabic, Al Malwi (2017), provides some acoustic analyses but it focuses mainly on the effects of age and gender on the production of Voice Onset Time (VOT).

The present study thus aims to provide a comprehensive description of the main features of the phonological system of Abha Arabic. Audio data has been collected from participants who are native speakers of Abha Arabic between twenty-eight and forty-six years of age; the first author is also one of the participants. They all hold a university degree and speak Abha Arabic at home. The phonemic values of the sounds were identified by near/minimal pairs/sets. For the VOT, three males and three females uttered the words four times and only the first three repetitions were measured. For each vowel, five males and five females pronounced every word five times and only the first four tokens were measured to avoid including a final intonation contour. All samples were recorded in isolation. The data were analyzed using Praat (Boersma & Weenink, 2021). The transcribed passage in the final section is a reading of 'The North Wind and the Sun' by the first author.

Consonants

Abha Arabic has twenty-seven consonants, while MSA has twenty-eight; this is due to the fact that /dˤ/ and /ðˤ/ merge into /ðˤ/ in Abha Arabic. A notable characteristic of Arabic is the existence of pharyngealized consonants, commonly known as emphatic consonants, which are represented by the symbol /ˤ/ in the IPA.

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	Bilabial	Labio-dental	Inter-dental	Alveolar	Post-alveolar	Palatal	Velar	Labialised Velar	Uvular	Pharyngeal	Laryngeal
Plosive	b			t̪ d̪ t̪ˤ			k g		(q)		ʔ
Nasal	m			n							
Trill				r							
Fricative		f	θ ð ðˤ	s z sˤ	ʃ ʒ		x ɣ			ħ ʕ	h
Lateral fricative				l							
Approximant						j		w			

The following is a list of all the consonant phonemes in Abha Arabic. Details regarding any phonetic variation, when relevant, are included in the discussion that follows. Since Abha Arabic does not have a writing system, we use MSA orthography to write the words used in the list below.

Phoneme	**Phonemic example**	**Orthography**	**Gloss**
/b/	/baːb/	باب	‘door’
/t/	/taːb/	تاب	‘he repented’
/tˤ/	/tˤaːl/	طال	‘he became tall’
/d/	/daːm/	دام	‘since’
/k/	/kaːn/	كان	‘he was’
/g/	/gaːm/	قام	‘he stood up’
/ʔ/	/ʔaːl/	آل	‘family of’
/m/	/maːl/	مال	‘it inclined’
/n/	/naːb/	ناب	‘tusk’
/r/	/raːs/	راس	‘head’
/f/	/faːs/	فاس	‘axe’
/θ/	/θaːr/	ثار	‘he revolted’
/ð/	/ðaːb/	ذاب	‘it melted’
/ðˤ/	/ðˤaːg/	ضاق	‘it got tight’
/s/	/saːm/	سام	‘poisonous’
/sˤ/	/sˤaːm/	صام	‘he fasted’
/z/	/zaːr/	زار	‘he visited’

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Phoneme	Phonemic example	Orthography	Gloss
/ʃ/	/ʃaːl/	شال	‘carrying’
/ʒ/	/ʒaːb/	جاب	‘he brought’
/x/	/xaːl/	خال	‘uncle: a mother’s brother’
/ɣ/	/ɣaːb/	غاب	‘absent’
/ħ/	/ħaːd/	حاد	‘sharp’
/ʕ/	/ʕaːm/	عام	‘general’
/h/	/haːk/	هاك	‘take’
/l/	/laːʃ/	لاش	‘nothing’
/j/	/jaːm/	يام	‘Yam tribe’
/w/	/ˈwaːdiː/	وادي	‘valley’

Abha Arabic has seven plosives /b, t̪, d̪, t̪ˤ, k, g, ʔ/ and, except for /g/, they are all found in MSA. MSA voiceless uvular plosive /q/ corresponds to Abha Arabic voiced velar plosive /g/. For example, MSA قال /ˈqaːla/ ‘he said’ and دقيق /daˈqiːq/ ‘flour’ are /gaːl/ and /dɐˈgiːg/ in Abha Arabic, respectively. /q/, however, appears in Abha Arabic as a phoneme with a limited application by younger speakers and educated people in formal situations, for instance /qalam/ ‘a pen’. Furthermore, the voiceless glottal stop /ʔ/ can appear word-initially, word-medially and word-finally in MSA and is pronounced [ʔ] in those contexts. However, in Abha Arabic, /ʔ/ only appears word-initially; it is /ʔ/ word-initially and /j/ word-medially if it follows /aː/, as in MSA سائل /ˈsaːʔɪl/ ‘liquid’, which is /ˈsaːjɪl/ in Abha Arabic. If /ʔ/ appears after a short vowel, it is deleted and the short vowel is lengthened. For instance, MSA مؤمن /muʔmɪn/ ‘a believer’, ذئب /ðiʔb/ ‘wolf’ and فأس /faʔs/ ‘axe’ are /ˈmuːmɪn/, /ðiːb/ and /faːs/ in Abha Arabic, respectively. /ʔ/ is also deleted word-finally, as in MSA عشاء /ʕaˈʃaːʔ/ ‘dinner’, which is /ˈʕɐʃaː/ in Abha Arabic. These are common historical changes in Arabic dialects.

Voice Onset Time differentiates between three types of plosives in Abha Arabic (Table 1): (1) voiced plosives display voicing-lead, meaning that voicing starts before the burst; (2) voiceless plosives have long-lag VOT; and (3) the voiceless emphatic plosive /tˤ/ is pronounced with short-lag VOT (Figure 2) (Al Malwi, 2017). All possible vowels were used after a plosive since VOT is affected by the vowel height where VOT tends to be longer in high vowels than in low vowels (Morris, McCrea & Herring, 2008). In careful pronunciation, the stop /t/ can be affricated, as in the example provided for /t/ in Table 1 /tiːn/ ‘figs’.

The voiced plosives /b/, /d/ and /g/ undergo partial devoicing word-finally and are pronounced [b̥], [d̥] and [g̊], respectively, while /t/ and /k/ are pronounced [tʰ] and [kʰ] word-finally; an analysis of word-final voiced plosives using the fraction of locally unvoiced frames function on Praat shows devoicing of between 20% and 50% of the stop consonants from the beginning of closure up to the beginning of the burst. Therefore, the contrast between voiced and voiceless stops is mainly based on lack of aspiration or aspiration in word-final position. For example, جد /ʒɐdd/ is pronounced [ʒɐdt] ‘grandfather’ while جت /ʒɐt/ is pronounced [ʒɐtʰ] ‘she came’. Similarly, شق /ʃɐgg/ is pronounced [ʃɐgk] ‘crack’ whereas شك /ʃɐkk/ is pronounced [ʃɐkkʰ] ‘doubt’. The following four spectrograms illustrate the difference (Figures 3, 4, 5 and 6). Furthermore, the voiced plosives are devoiced if they appear in coda position before a final voiceless consonant (regressive assimilation).

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Table 1. Mean length (ms) of VOTs in Abha Arabic plosives. Each word was pronounced four times by three male and three female speakers of Abha Arabic. The first three tokens were measured (n = 770). Standard variations are reported in parentheses and number of tokens are reported in square brackets

Plosives	/iː/	/ɪ/	/eː/	/aː/	/ɐ/	/oː/	/uː/	/ʊ/	VOT
/tˤ/	/tˤiːn/ ‘clay’	/tˤɪbb/ ‘medicine’	/tˤeːf/ ‘a female proper name’	/tˤaːl/ ‘he became tall’	/tˤɐnn/ ‘tun’	/tˤoːg/ ‘collar’	/tˤuːb/ ‘bricks’	–	18 (3.3) [125]
/t/	/tiːn/ ‘figs’	–	/teːs/ ‘cheep’	/taːb/ ‘he repented’	/tɐmm/ ‘done’	–	/tuːt/ ‘berries’	/tʊb/ ‘repent. IMP.M.SG.’	65 (14.5) [107]
/k/	/kiːs/ ‘bag’	/kɪnn/ ‘it looks’	/keːf/ ‘how’	/kaːs/ ‘trophy’	/kɐmm/ ‘how many’	/koːb/ ‘a cup’	/kuːt/ ‘jacket’	/kʊbb/ ‘pour. IMP. M.SG.’	64 (13.3) [143]
/b/	/biːr/ ‘well’	/bɪrr/ ‘to honor one’s parents’	/beːt/ ‘house’	/baːb/ ‘door’	/bɐtˤtˤ/ ‘ducks’	–	/buːt/ ‘sports shoes’	/bʊnn/ ‘coffee beans’	-79 (32.1) [125]
/d/	/diːk/ ‘rooster’	/dɪff/ ‘push IMP.M, SG.’	/deːn/ ‘loan’	/daːl/ ‘letter D’	/dɐmm/ ‘blood’	/doːr/ ‘one floor’	/duːd/ ‘worms’	/dʊbb/ ‘bear’	-87 (28.7) [144]
/g/	/giːs/ ‘measure. IMP. M.SG.’	/gɪdd/ ‘already’	/geːs/ ‘a village name’	/gaːz/ ‘kerosene’	/gɐʃʃ/ ‘stuff’	/goːs/ ‘bow’	/guːl/ ‘say. IMP. M.SG.’	/gʊmm/ ‘stand up. IMP.M.SG’	-81 (27.5) [126]

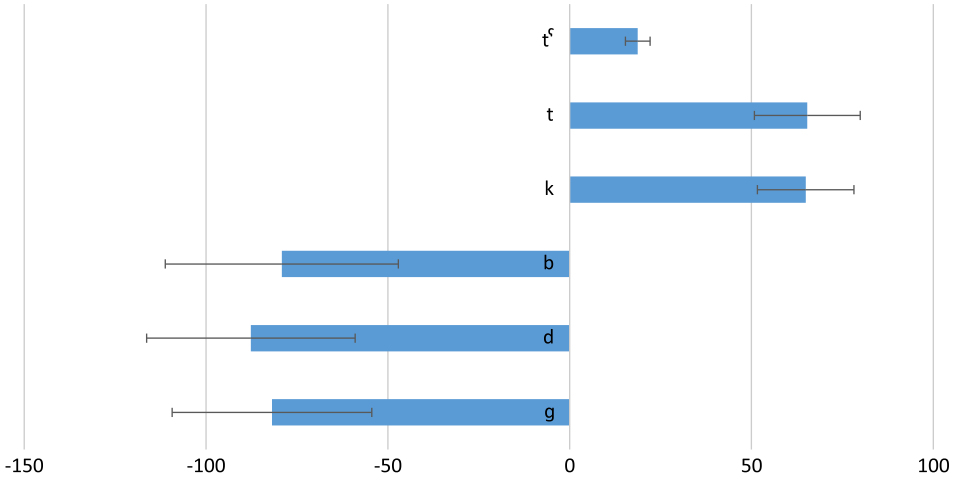

Figure 2. (Colour online) Mean length and standard variation (ms) of VOT in Abha Arabic plosives word-initially. Values taken from 770 tokens produced by six Abha Arabic native speakers (three males and three females).

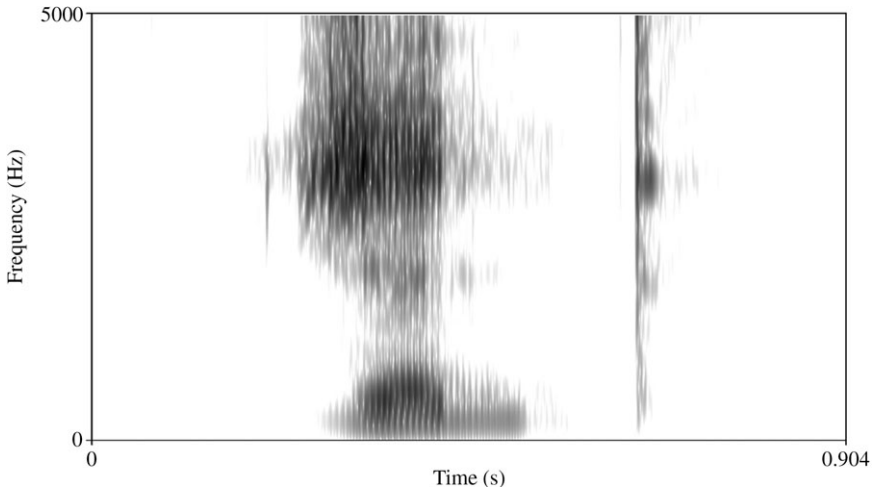

Figure 3. Partial devoicing of final /d/ in /ʒɐdd/ [ʒɐdt] 'grandfather'.

For instance, السبت /l-ˈsabt/ 'Saturday' is pronounced [ʔɐsˈsɐb̥t]. Another assimilation appears with the phoneme /n/. This consonant assimilates to the place of articulation of the following velar or labial consonants, for example, جنب /ʒɐnb/ 'side' is pronounced [ʒɐmb̥] and منك /mɪnk/ 'from you M.SG.' is pronounced [mɪŋkʰ].

Abha Arabic has one trill phoneme which is /r/. There is variation between speakers and /r/ can sometimes be pronounced as a fricative. Although the trill is the dominant, it can be pronounced as fricative when it's proceeded or followed by a front vowel. For instance /riːʃ/ 'feathers' and /raːs/ 'head' are pronounced as fricative and trill respectively.

Abha Arabic has fourteen fricatives, which makes it the largest consonant group in this dialect of Arabic. While other varieties of Arabic maintain /dʒ/, such as MSA and San'ani Arabic (Watson, 2002), MSA /dʒ/ corresponds to /ʒ/ in Abha Arabic as well as in Tihami Qahtani (Alqahtani, 2015). For example, the MSA word جميل /dʒaˈmiːl/ 'beautiful' is

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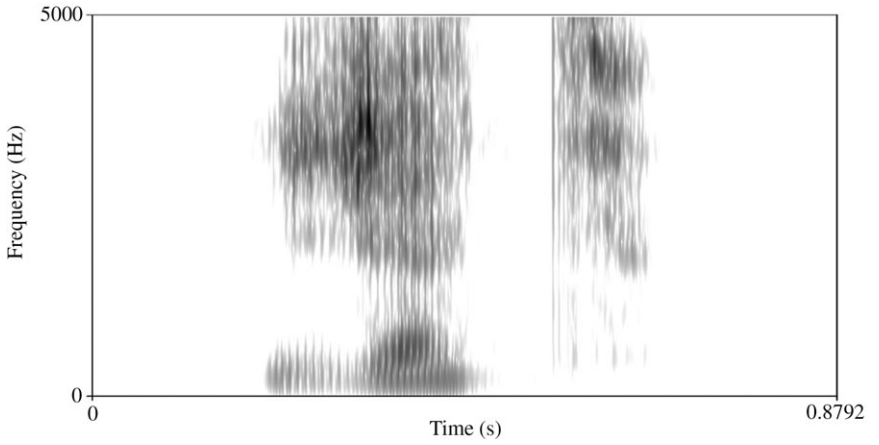

Figure 4. Aspirated final /t/ in /ʒɐt/ [ʒɐt^{h}] 'she came'.

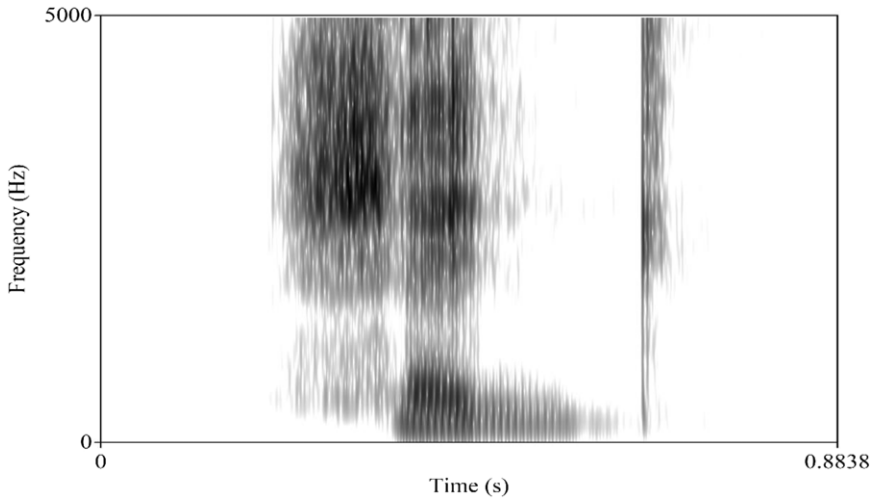

Figure 5. Partial devoicing of final /g/ in /ʃɐgg/ [ʃɐgk] 'crack'.

/ʒɐˈmiːl/ in Abha Arabic. Pronouncing /dʒ/ as /ʒ/ is a salient feature of Syro-Lebanese/Syro-Palestinian dialects. Yet, the same process has been recorded in a few dialects outside of this area as well, like certain Gelet-speaking tribes in Iraq and Khuzestan (Bahrani & Ghavami, 2021).

The consonant /ʕ/ shows the presence of continuous acoustic energy but no turbulent airflow, together with a high degree of constriction, "higher than is normally associated with strictures of open approximation" (Heselwood, 2007, p. 9). Therefore, following (Heselwood, 2007), Abha Arabic /ʕ/ could be described as a tight approximant as well (Figure 7).

While MSA has four pharyngealized consonant phonemes (/ðˤ/, /dˤ/, /tˤ/, and /sˤ/), Abha Arabic has three, since /ðˤ/ and /dˤ/ have merged into /ðˤ/. There is a similar tendency in many other Arabic dialects such as San'ani Arabic (Watson, 2002), Damascus Syrian Arabic (Daher, 1998), and Gulf Arabic (Hussain, 1985). The emphatic consonants /ðˤ/, /tˤ/ and /sˤ/

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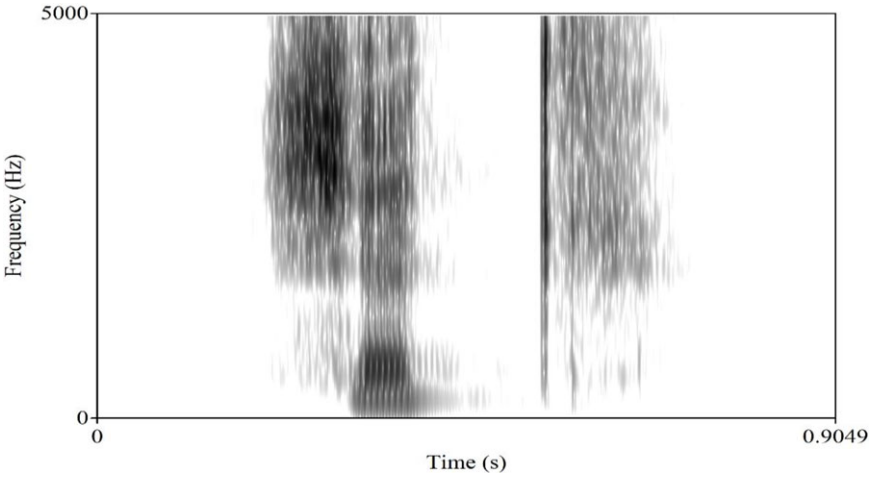

Figure 6. Aspirated final /k/ in /ʃɐkk/ [ʃɐkk^{h}] 'doubt'.

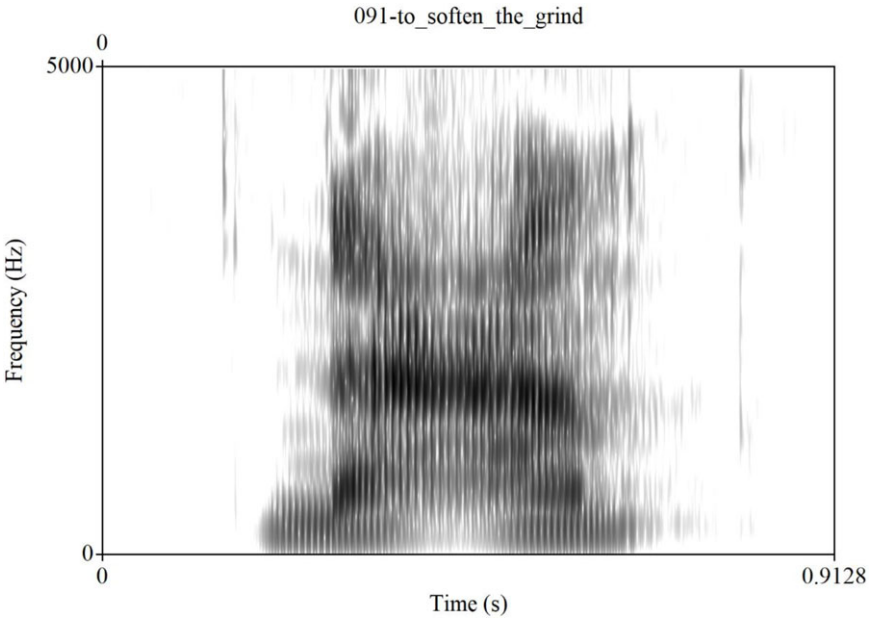

Figure 7. A geminated /ʕ/ in /ˈnɐʕʕɐm/ 'to soften the grind' pronounced by a male Abha Arabic speaker.

can trigger pharyngealization of neighbouring /r/ and /l/ in Abha Arabic. For instance, صار /sˤaːr/ 'happened' and طال /tˤaːl/ 'he became tall' are pronounced [sˤɑːrˤ] and [tˤɑːlˤ] in Abha Arabic, respectively. Furthermore, /l/ sometimes occurs as [lˤ] after a low vowel /ɐ/ and in specific lexical contexts, as in الله /ɐlˈlaːh/ [ʔɑlˤˈlˤɑːh] 'God'.

The lateral /l/ in the definite article /l-/ 'the' assimilates to the following consonant when it is followed by a coronal consonant; this process triggers gemination of the coronal consonant (Table 2). Some speakers, especially older speakers, however, use /ɪm-/ as the definite article instead of /l-/. If /ɪm-/ is used, no assimilation takes place. /ɪm-/ as the definite article

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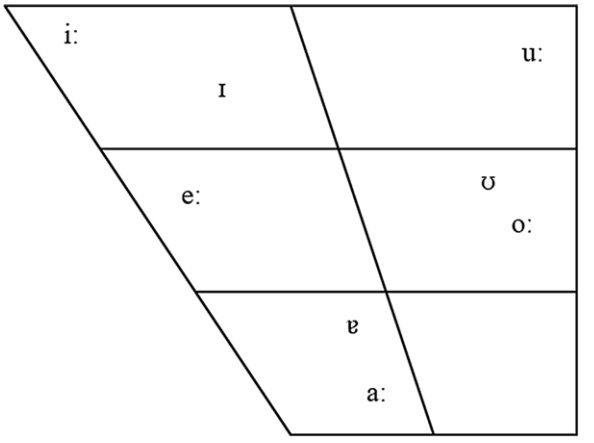
Table 2. Assimilation of /l-/ in the definite article

Phonemic representation	Phonetic representation	Orthography	Gloss
/l-ˈtiːn/	[ʔɐtˈtiːn]	التين	'the figs'
/l-ˈdiːn/	[ʔɐdˈdiːn]	الدين	'the religion'
/l-ˈtˤiːn/	[ʔɐtˤˈtˤiːn]	الطين	'the clay'
/l-ˈðˤeːf/	[ʔɐðˤˈðˤeːf]	الضيف	'the guest'
/l-ˈsˤeːf/	[ʔɐsˤˈsˤeːf]	الصيف	'the summer'
/l-ˈnoːm/	[ʔɐnˈnoːm]	النوم	'the sleep'
/l-ˈraːs/	[ʔɐrˈraːs]	الرأس	'the head'
/l-ˈθoːb/	[ʔɐθˈθoːb̥]	الثوب	'the dress'
/l-ˈzeːt/	[ʔɐzˈzeːtʰ]	الزيت	'the oil'
/l-ˈsinn/	[ʔɐsˈsɪnn]	السن	'the tooth'
/l-ˈðeːl/	[ʔɐðˈðeːl]	الذيل	'the tail'
/l-ˈʃeːx/	[ʔɐʃˈʃeːx]	الشيخ	'the tribe leader'
/l-ˈlaːm/	[ʔɐlˈlaːm]	اللام	'letter *L*'

has been observed in many dialects in southern Saudi Arabic such as Rejal Alma' dialect (Asiri, 2009) and Tihami Qahtani (Alqahtani, 2015).

Vowels

Monophthongs



Abha Arabic has eight vowel phonemes: three short and five long: /iː/, /ɪ/, /eː/, /aː/, /ɐ/, /uː/, /ʊ/, /oː/. It should be noted that, although /aː/ is technically a low front vowel in the IPA (Cardinal Vowel 4), we are using this symbol to denote a low central vowel. MSA, in

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Table 3. Mean F1 and F2 values (Hz) and duration of each vowel phoneme in Abha Arabic after /s/. Measurements obtained from a total of 320 tokens from ten speakers (five males and five females). Formant values normalised using the Nearey 1 formula and scaled to Hz. Standard deviation is given in brackets.

Vowels	Non-emphatic environment					
–	/sv(:)c(c)/	Gloss	Tokens	F1	F2	Length
/iː/	/siːb/	'hallway'	40	389 (22.4)	2096 (92.6)	156 (28.5)
/ɪ/	/sɪdd/	'block.IMP.M.SG.'	40	454 (27.3)	1720 (71.3)	59 (9.1)
/eː/	/seːf/	'sword'	40	513 (21.4)	1768 (94.2)	161 (27.1)
/aː/	/saːd/	'a snake type'	40	672 (37.8)	1509 (41.6)	171 (20.2)
/ɐ/	/sɐdd/	'dam'	40	561 (32.1)	1563 (68.7)	63 (7.9)
/oː/	/soːm/	'pricing sth'	40	536 (52.7)	1041 (83.2)	169 (26.1)
/uː/	/suːd/	'blacks'	40	416 (25.8)	1013 (69.1)	169 (22.1)
/ʊ/	/sʊmm/	'name a price. IMP.M.SG.'	40	491 (63.8)	1153 (89.8)	53 (9.8)

comparison, has three short and three long vowel phonemes: /iː/, /i/, /aː/, /a/, /uː/, /u/. Acoustic measurements for the F1 and F2 of each vowel phoneme in Abha Arabic after a non-emphatic consonant are included in Table 3. Vowel length is phonemic in Abha Arabic and the average length of each vowel in our samples is also included in Table 3; standard deviation is given in brackets. The words which have been analysed are those in Table 3. The vowels were measured in Praat (Boersma & Weenink, 2021). Segmentation was performed manually and the measurements were taken using a script developed by the second author (Herrero de Haro, 2021). All settings were standard Praat (Boersma & Weenink, 2021) except maximum formant, which was set at 5000 Hz for males, and 5500 Hz for females. The measurement taken for each vowel corresponds to the mean value of the first two formants from the middle 20% to 80% section of the vowel. Formant values have been normalised using the Nearey 1 formula (Nearey Terrance, 1977) and then scaled to Hz. The normalisation has been carried out using the NORM application (Thomas & Kendall, 2007) (Table 3). F1 and F2 ellipses mark 1 standard deviation. The same process in terms of normalisation has been followed for vowels after an emphatic consonant (Table 4). For vowel plots, non-normalised mean formant values were used for vowels after a non-emphatic consonant (Figure 8) and vowels after an emphatic consonant (Figure 9).

The data from Table 3 and Figure 8 support transcribing the Abha Arabic vowels /iː/, /ɪ/, /eː/, /aː/, /ɐ/, /oː/, /uː/ and /ʊ/ as [iː], [ɪ], [eː], [aː], [ɐ], [oː], [uː] and [ʊ], respectively, in their phonetic realisation. As in other varieties of Arabic, the short vowels /i/, /a/ and /u/ are pronounced as lax when compared to their long counterparts, as it is the case in Gaza City Arabic (Cotter, 2022).

A comparison of the data in Table 3 with the data in Table 4 shows that, although F1 does not seem to change much in vowels depending on whether they precede a non-emphatic or

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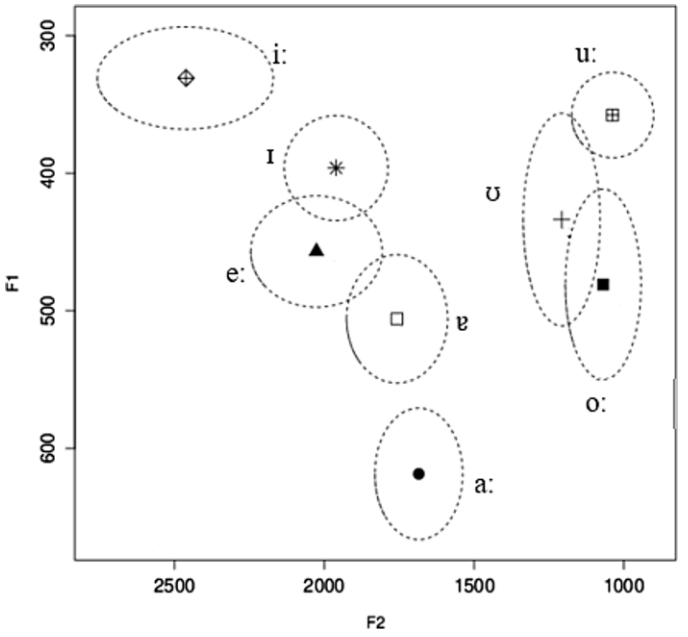

Figure 8. F1 and F2 mean values (Hz) for each vowel phoneme of Abha Arabic measured from the middle 20% to 80% section of each vowel after /s/. Measurements taken from 320 tokens from five male and five female Abha Arabic speakers. The ellipses show the F1 and F2 values to 1 standard deviation.

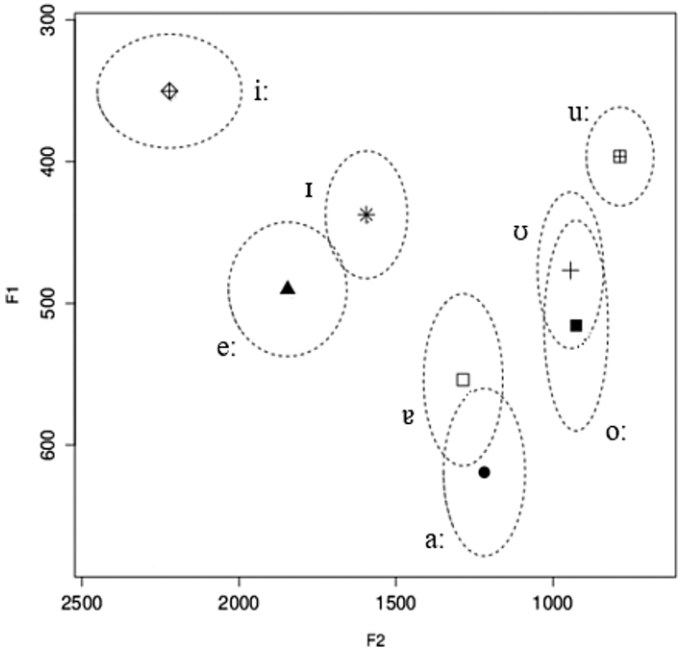

Figure 9. F1 and F2 mean values (Hz) for each vowel phoneme of Abha Arabic measured from the middle 20% to 80% section of each vowel after /sˤ/. Measurements taken from 320 tokens from five male and five female Abha Arabic speakers. The ellipses show the F1 and F2 values to 1 standard deviation.

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Table 4. Mean F1 and F2 values (Hz) and duration of each vowel phoneme in Abha Arabic after /sˤ/. Measurements obtained from a total of 320 tokens from ten speakers (five males and five females). Formant values normalised using the Nearey 1 formula and scaled to Hz. Standard deviation is given in brackets.

Vowels	Emphatic environment					
	/sˤ v(:)c(c)/	Gloss	Tokens	F1	F2	Length
/iː/	/sˤiːb/	'hit sth IMP.M.SG.'	40	323 (40.4)	1993 (143.4)	167 (27.7)
/ɪ/	/sˤɪdd/	'hunt IMP.M.SG.'	40	434 (34.8)	1551 (74.8)	63 (9.1)
/eː/	/sˤeːf/	'summer'	40	500 (32.5)	1727 (115.7)	169 (26.6)
/aː/	/sˤaːd/	'he hunted'	40	664 (50.2)	1285 (51.9)	171 (18.1)
/ɐ/	/sˤɐdd/	'he blocked'	40	581 (42.8)	1333 (44.1)	68 (8.3)
/oː/	/sˤoːm/	'fasting'	40	531 (62.7)	1080 (40.9)	171 (20.7)
/uː/	/sˤuːf/	'wool'	40	383 (45.4)	983 (58.5)	168 (21.7)
/ʊ/	/sˤʊmm/	'fast IMP.M.SG'	40	483 (43.9)	1095 (76.6)	56 (12.8)

an emphatic consonant, the situation is different for the F2. Vowels display a lower F2 when they are preceded by an emphatic consonant. This tendency seems to be larger in high front vowels and in low central vowels. Vowels seem to be slightly longer after an emphatic than after a non-emphatic consonant (Table 5).

Vowel length is phonemic in Abha Arabic and, as shown in Tables 3 and 4, long vowels have a duration which is over double that of short vowels. The long mid vowels /eː/ and /oː/ correspond to MSA diphthongs /aj/ and /aw/, respectively. For example, MSA جيش /dʒajʃ/ 'army' and ثوب /θawb/ 'dress' are /ʒeːʃ/ and /θoːb/ in Abha Arabic, respectively. The emergence of the two long mid vowels is due to the coalescence of vowel-glide sequences, as has been reported in many Arabic dialects such as Cairene Arabic (Youssef, 2010) and Syrian Arabic (Almbark & Hellmuth, 2015).

Abha Arabic low vowels /aː/ and /ɐ/ usually undergo lowering and backing to [ɑː] and [ɑ] in emphatic environments. For example صام /sˤaːm/ 'he fasted' and صف /sˤɐff/ 'line' are pronounced as [sˤɑːm] and [sˤɑff] in Abha Arabic. Furthermore, /r/ can trigger backing in /aː/ as /raːs/ 'head' is pronounced as [rɑːs].

Closed syllable shortening is a process that occurs in Abha Arabic and in many Arabic dialects such as Cairene Arabic (Watson, 2002), San'ani Arabic (Watson, 2002), and Palestinian Arabic (Hall, 2017). Closed syllable shortening happens when consonant-initial subject suffixes are added to the root of /CVːC/ verbs, as shown in Table 6.

Defective verbs are subject to another type of vowel alteration. As explained in Nakshabandi (1988), when a consonant-initial subject suffix is connected to a defective verb that ends with /aː/, /aː/ surfaces as [eː]. However, when the verb is connected to a vowel-initial subject suffix, /aː/ is omitted (Table 7).

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Table 5. Differences between the normalised means of F1 and F2 values (Hz) of Abha Arabic vowels after /s/ and after /sˤ/. Measurements obtained from a total of 640 tokens from ten speakers (five males and five females). Formant values normalised using the Nearey 1 formula and scaled to Hz

Vowel phoneme	F1 of vowel after /s/ minus F1 of vowel after /sˤ/	F2 of vowel after /s/ minus F2 of vowel after /sˤ/	Duration of vowel after /s/ minus duration of vowel after /sˤ/
/iː/	8	223	-10
/ɪ/	-19	231	-4
/eː/	12	40	-8
/aː/	20	168	-0
/ɐ/	66	103	-4
/oː/	4	-39	-1
/uː/	8	57	0
/ʊ/	33	30	-2

Table 6. Closed syllable shortening in Abha Arabic

/CVːC/ verb	Suffix	Verb + suffix	Closed syllable shortening
/ʃaːf/	–	/ʃaːf/ 'he saw'	No
/ʃaːf/	/-ɐt/	/ʃaːf-ɐt/ 'she saw'	No
/ʃaːf/	/-t/	/ʃɪf-t/ 'I saw'	Yes
/ʃaːf/	/-naː/	/ʃɪf-naː/ 'we saw'	Yes
/gaːm/	–	/gaːm/ 'he stood up'	No
/gaːm/	/-oː/	/gaːm-oː/ 'they stood up'	No
/gaːm/	/-t/	/gʊm-t/ 'I stood up'	Yes
/gaːm/	/-naː/	/gʊm-naː/ 'we stood up'	Yes

Table 7. Pronunciation of /aː/ in defective verbs

Defective verb	Consonant-initial subject suffix		Vowel-initial subject suffix	
/ˈbɐdaː/ 'he started'	/ˈbɐdaː/ + /-t/	[bɐˈdeːt] 'I started'	/ˈbɐdaː/ + /-ɐt/	[ˈbɐdɐt] 'she started'
	/ˈbɐdaː/ + /-naː/	[bɐˈdeːnaː] 'we started'	/ˈbɐdaː/ + /-oː/	[ˈbɐdoː] 'they started'
/ˈmɐʃaː/ 'he left'	/ˈmɐʃaː/ + /-t/	[mɐˈʃeːt] 'I left '	/ˈmɐʃaː/ + /-ɐt/	[ˈmɐʃɐt] 'she left'
	/ˈmɐʃaː/ + /-naː/	[mɐˈʃeːnaː] 'we left'	/ˈmɐʃaː/ + /-oː/	[ˈmɐʃoː] 'they left'

Prosodic features

Syllable structure

Syllable structure in Abha Arabic consists of onset, nucleus and coda. Utterance-initially, the onset is filled with [ʔ] if it is empty. The nucleus of a syllable is always either a short

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Table 8. Abha Arabic Syllable Structure

Syllable	Example	Gloss
CV	/wɐ/	'and'
CV:	/fiː/	'in'
CVC	/mɪn/	'from'
CV:C	/sɛːf/	'sword'
CVCC	/kɐlb/	'dog'

or a long vowel. The coda is optional and may comprise either one or two consonants. The observed syllable structures in Abha Arabic are included in Table 8.

Lexical stress

The placement of word stress is predictable based on syllable weight. Abha Arabic has three syllable weights: light (CV), heavy (CV: and CVC), and super-heavy (CVCC and CV:C). The placement of word stress in Abha Arabic seems to act similarly to other Arabic dialects such as Hijazi Arabic (Abaalkhail, 1998) and Khuzestani Arabic (Bahrani & Ghavami, 2021). Word stress in Abha Arabic is governed by three rules:

(1) If the last syllable is superheavy, CV:C or CVCC, this last syllable carries the stress.

Phonemic Transcription	**Phonetic Transcription**	**Gloss**
/kɐ.ˈθiːr/	[kʰɐ.ˈθiːr]	'plenty'
/dɐ.ˈlaːl/	[dɐ.ˈlaːl]	'a female proper name'
/ɐ.ˈkɐlt/	[ʔɐ.ˈkɐltʰ]	'I ate'
/kɐ.ˈtɐbt/	[kʰɐ.ˈtɐbtʰ]	'I wrote'

(2) If the last syllable is not superheavy, the stress falls on the penultimate syllable when the penultimate syllable is heavy, comprising of either CV: or CVC.

Phonemic Transcription	**Phonetic Transcription**	**Gloss**
/bɐ.ˈnaː.tɐ/	[bɐ.ˈnaː.tɐ]	'his daughters'
/kɐ.ˈsɐr.naː/	[kʰɐ.ˈsɐr.naː]	'we broke'
/kɐ.tɐ.ˈbɐt.lɐ/	[kʰɐ.tɐ.ˈbɐt.lɐ]	'she wrote for him'

(3) If the last syllable is not superheavy and the penultimate syllable is not heavy, the stress falls on the antepenultimate syllable in polysyllabic words and on the penultimate in disyllabic words.

Phonemic Transcription	**Phonetic Transcription**	**Gloss**
/ˈmɐ.rɐ.gɐ/	[ˈmɐ.rɐ.gɐ]	'broth'
/ˈgɐ.raː/	[ˈgɐ.raː]	'he read'
/ˈkɐ.tɐ.bɐt/	[ˈkʰɐ.tɐ.bɐtʰ]	'she wrote'

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Table 9. Intensity, f0, and duration of the vowels in /kɐ.ˈtɐbt/ 'I wrote', /kɐ.tɐ.ˈbɐt.lɐ/ 'she wrote for him', and /ˈkɐ.tɐ.bɐt/ 'she wrote'. Stressed vowels are marked in bold. Data were measured in ten repetitions of each word (thirty words resulted in ninety vowels) pronounced by a male Abha Arabic native speaker. Standard deviations are reported in parentheses.

Words	Feature	Vowels /ɐ/	/**ɐ**/	–	–
/kɐ.ˈtɐbt/ 'I wrote'	Mean intensity	59 (13.1)	58 (11.9)		
	Mean f0	120 (9.9)	113 (5.4)		
	Duration	32 (5.4)	45 (6.6)		
		/ɐ/	/ɐ/	/**ɐ**/	/ɐ/
/kɐ.tɐ.ˈbɐt.lɐ/ 'she wrote for him'	Mean intensity	67 (1.9)	70 (1.1)	70 (0.8)	61 (1.4)
	Mean f0	120 (4.3)	125 (3.8)	124 (3.9)	98 (1.9)
	Duration	34 (5.3)	33 (3.7)	54 (4.1)	49 (4.9)
		/**ɐ**/	/ɐ/	/ɐ/	–
/ˈkɐ.tɐ.bɐt/ 'she wrote'	Mean intensity	71 (1.3)	68 (2.2)	61 (2.2)	
	Mean f0	124 (4.2)	114 (5.8)	95 (3.1)	
	Duration	48 (4.4)	40 (5.7)	42 (6.7)	

Different acoustic correlates were measured to quantify stress in Abha Arabic. These correlates include intensity, pitch, and duration. The following table shows the stress correlations in three words pronounced ten times each by a male Abha Arabic speaker. It appears that the duration is the most prominent parameter for stress (Table 9).

Transcription

The transcriptions are based on a reading by the first author, a thirty-four-year-old male native speaker of Abha Arabic. The English version of 'The North Wind and the Sun' was translated into Abha Arabic by the first author. Even though Abha Arabic has no official writing system, the translation is written in Arabic script adapted to Abha Arabic.

The order of the presentation is:

Broad phonetic transcription
Orthographic version
Morphemic glossing
Translation

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tʰɐˈxɑːsˤɑmoː	rɪˈjaːħ	ʃʃɐˈmaːl	wɐʃˈʃams
تخاصموا	*رياح*	*الشمال*	*والشمس*
argue.PRF-3F.PL.	wind	DEF-north	and-DEF-sun

The North Wind and the Sun were disputing

ˈʕɐlaː	ˈmɪn	ˈɪlliː	ˈʔɐgwaː
على	*من*	*اللي*	*اقوى*
about	who	REL.who	Stronger

about who was the stronger

ˈjoːm	ˈmɐrr	mʊˈsaːfɪr	ˈlaːbɪs	ˈfɐrwɐ	ˈdaːfɪjɐ
يوم	*مر*	*مسافر*	*لابس*	*فروة*	*دافية*
when	pass.by.PRF.3M.SG	traveller	wearing	Cloak	warm-F.

when a traveller came along wrapped in a warm cloak

ʔɪtˈtɐfɐgoː	ˈʔɪnn	ˈʔɐwwɐl	ˈwɐħdɐ
اتفقوا	*ان*	*اول*	*وحده*
agree.PRF-3F.PL.	that	First	one-F.

They agreed that the first one

tɪˈxɐlliː	lmʊˈsaːfɪr	jɪˈfɐsˤsˤɑx	ˈfɐrwɐtɐ
تخلي	*المسافر*	*يفصخ*	*فروته*
3F.SG.make.IPFV.	DEF-traveller	3M.SG.take.off.IPFV.	cloak-3M.SG.POSS.

succeeded in making the traveller take his cloak off

bɪtˈkuːn	ˈhɪjɐ	ˈʔɐgwaː	ˈmɪn	θˈθaːnɪjɐ
بتكون	*هيه*	*اقوى*	*من*	*الثانية*
will-3F.SG.be.IPFV.	PRN.3F.SG.	stronger	from	DEF-second-F.

will be stronger than the other.

bɐʔˈdeːn	ˈhɐbbɐtʰ	rɪˈjaːħ	ʃʃɐˈmaːl
بعدين	*هبت*	*رياح*	*الشمال*
then	blow.PRF-3F.SG.	wind	DEF-north

ˈbɪkʊl	gʊwˈwɐthaː
بكل	*قوتها*
with-all	strength-3F.SG.POSS.

Then the North Wind blew as hard as it could,

wˈlaːkɪn	ˈkʰʊllmaː	ˈhɐbbɐtʰ	ˈʔɐkθɐr
ولكن	*كلما*	*هبت*	*اكثر*
and-but	every.time.ADV.	blow.PRF-3F.SG.	more

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but the more it blew

ˈkʰʊllmaː	ˈlɐff	lmʊˈsaːfɪr	ˈfɐrwɐtɐ
كلما	*لف*	*المسافر*	*فروته*
every.time.ADV.	fold.PRF.3M.SG.	DEF-traveller	cloak-3M.SG.POSS.

ʕɐˈleːh	bʊˈgʊwwɐ
عليه	*بقوة*
around-3M.SG.OBJ.	with-force

the more closely did the traveller fold his cloak around him

fɪlʔɐˈxiːr	ˈwɐggɐfɐtʰ	rɪˈjaːħ	ʃʃɐˈmaːl	ʔɐlmʊˈħaːwɐlɐ
في الاخير	*وقفت*	*رياح*	*الشمال*	*المحاولة*
at-DEF-end	stop.PRF-3F.SG.	wind	DEF-north	DEF-try

at last the North Wind gave up the attempt

wˈbɐʕdɐhaː	ˈʔɐʃrɐgat	ʃˈʃɐms	bħɐˈraːrɐthaː
وبعدها	*اشرقت*	*الشمس*	*بحرارتها*
and-after-3F.SG.OBJ.	shine.out.PRF-3F.SG.	DEF.sun	with-heat-3F.SG.POSS.

Then the Sun shined out warmly,

wmʊˈbaːʃɐrɐ	ˈfɐsˤsˤɑx	lmʊˈsaːfɪr	ˈfɐrwɐtɐ
ومباشرة	*فصخ*	*المسافر*	*فروته*
and-immediately	take.off.PRF.3M.SG.	DEF-traveller	cloak-3M.SG.POSS.

and immediately the traveller took off his cloak.

fɐðˤˈtˤɑrˤrˤɐtʰ	rɪˈjaːħ	ʃʃɐˈmaːl	ˈʔɐnn	ˈtʰɐʕtɐrɪf
فاضطرت	*رياح*	*الشمال*	*ان*	*تعترف*
so-oblige.PRF-3F.SG.	wind	DEF-north	that	3F.SG.confess.IPFV.

so the North Wind obliged to confess

ˈʔɐnnɐ	ʃˈʃɐms	ˈkʰaːnɐtʰ	ˈʔɐgwɐ
ان	*الشمس*	*كانت*	*اقوى*
that	DEF-sun	be.PRF-3F.SG.	stronger

that the Sun was the stronger.

Abbreviations

3	third person
ADV	adverb
DEF	definite
F	feminine

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f0	fundamental frequency
F1	1st formant
F2	2nd formant
IPM	imperative
IPFV	imperfective
M	masculine
MSA	Modern Standard Arabic
OBJ	Object
PRF	perfect
POSS	possessive
PRN	pronoun
PL	Plural
REL	relative
SG	singular
VOT	voice onset time

Acknowledgements We would like to thank the participants for their participation in the study. We are also very grateful to the editors, audio manager, and the two anonymous reviewers of the *Journal of the International Phonetic Association* for their insightful comments and suggestions during the revision process of this illustration.

Supplementary material To view supplementary material for this article, please visit https://doi.org/10.1017/S0025100323000269

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Cite this article: Al Malwi Ibrahim, Herrero de Haro Alfredo, and Baker Amanda (2023). Abha Arabic. *Journal of the International Phonetic Association*. https://doi.org/10.1017/S0025100323000269