Prosodic systems
Chapter 12
North Africa and the Middle East
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12.1 Introduction

This chapter reviews the prosodic systems of languages spoken in North Africa and the Middle East, taking in the Horn of Africa, the Arabian Peninsula and the Middle East (but excluding Kurdish, which belongs to chapter 14). The area's southern edge is formed by Mauretania, Mali, Niger, Chad, South Sudan, Ethiopia, Somalia, as illustrated in Figure 12.1 below.[1]

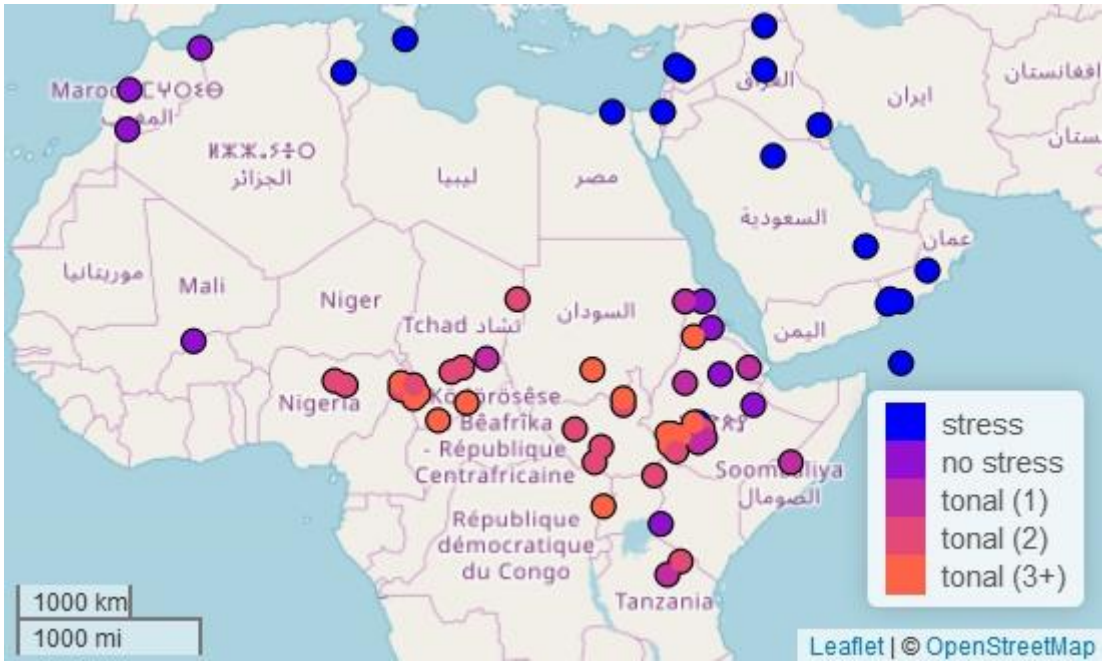

Fig 12.1 Map showing the geographical location of named languages discussed in this chapter, by word prosodic type, plotted using the lingtypology R package (Moroz 2017).

We outline the scope of typological variation within and across the Afroasiatic and Nilo-Saharan language families in word prosody, prosodic phrasing, melodic structure and prosodic expression of meaning (sentence modality, focus and information structure). The survey is organized around language sub-families (§12.2 and §12.3). We close with a brief discussion in §12.4, where we also set out priorities for future research.

In this chapter the term 'stress' denotes word level or lexical prominence. We assume tone and stress are independent, with no intermediate accentual category (Hyman 2006). The term 'pitch accent' thus always denotes a post-lexical prominence or sentence accent, as used in the Autosegmental-Metrical (AM) framework (Gussenhoven 2004; Ladd 2008).

[1] We also mention languages in the Nilotic family spoken further south, in Uganda, Kenya and into Tanzania.

12.2 Afroasiatic

12.2.1 Berber

The Berber – now known as Amazigh – languages are all non-tonal but appear to vary regarding presence of stress. The Eastern varieties (in Tunisia, Libya and Egypt) display word-level stress (Kossmann 2012), though without stress minimal pairs. Relatively little is known about the word prosody of most Libyan dialects, such as Ghadames (Kossmann 2013), but in Zwara stress generally falls on the penult (Gussenhoven 2017). In contrast, in the Northern varieties (in Morocco and Algeria), although it is possible to construe rules for stress assignment in citation forms, these do not hold in connected speech (Kossmann 2012). For example, in Tarifit, prosody marks both clause structure and discourse structure, but pitch and intensity do not routinely co-occur (McClelland 2000). Similarly, in Tuareg, although stress can be described for citation forms (lexically determined in nouns and verbs but on the antepenultimate otherwise), accentual phrasing overrides these citation form stress patterns in ways that are as yet poorly understood and require further investigation (Heath 2011: 98).

This variable pattern has been clarified in Tashlhiyt, through experimental investigation, as a non-tonal, non-stress language (without culminative stress). For example, in Tashlhiyt the intonational peak in polar questions varies probabilistically; sonorant segments tend to attract the pitch accent and tonal peaks are later in questions than in statements (Grice, Ridouane, & Roettger 2015), and a similar pattern is found in WH-questions (Bruggeman, Roettger, & Grice 2017). Intonational peaks in Tashlhiyt thus do not display the kind of consistent alignment which might indicate underlying association with a stressed syllable. In contrast, the intonation patterns of Zwara, which has word-level stress, are readily analyzed in terms of intonational pitch accents and boundary tones (Gussenhoven 2017).

In general, Amazigh languages make use of an initial or final question particle in polar questions and display WH-word fronting (Frajzyngier 2012). Focussed elements are usually fronted but can also be right-dislocated, with associated prosodic effects; a topic is similarly placed clause-initially and marked by intonation (Frajzyngier 2012). Verb focus can be marked solely prosodically in most Amazigh varieties, with the exception of Kabyle which requires the verb to be clefted (Kossmann 2012: 94).

12.2.2 Egyptian

The now extinct Egyptian language went through several stages (Old/Middle/Late/Demotic) before evolving into Coptic. There is no indication that the language had contrastive tone, at any stage. Egyptian had WH-in-situ, and it is assumed (Frajzyngier 2012) that at all stages a polar question could be realized on declarative syntax by changing the intonation contour. It had a set of stressed pronouns and a focus particle, and topicalization was realized through extraposition and a particle. Coptic language was spoken from C4th-14th, cohabiting with Arabic from C9th onwards, and survives only in the liturgy of the Coptic Orthodox church. Reconstructing from Coptic, it is likely that stress in Egyptian fell on either the final or penult syllable and is reported to be marked by ‘strong expiratory stress’ (Fecht 1960; cited in Loprieno & Müller 2012). Questions in Coptic were marked by particles and ‘possibly also by suprasegmental features such as intonation’ (Loprieno & Müller 2012: 134).

12.2.3 Semitic

The Semitic languages are almost all non-tonal stress languages (exceptions noted below).

East Semitic

Evidence from texts in the now extinct Akkadian language indicate that it did not have phonemic stress, but otherwise little is known about its prosody (Buccellati 1997). It displayed fronting of topics and right-dislocation with resumptive pronouns (Gragg & Hoberman 2012).

West Semitic: Modern South Arabian

In the western Modern South Arabian (MSA) languages (Hobyot, Bathari, Harsusi and Mehri), stress falls on the rightmost long syllable in the word, else on the initial syllable; in the eastern languages, Jibbali can have more than one prominent syllable per word, while in Soqotri stress falls towards the beginning of the word (Simeone-Senelle 1997, 2011). Polar questions are marked in the MSA languages by means of intonation alone, and WH-words are either always initial (e.g. Soqotri) or always final (e.g. Mehri) (Simeone-Senelle 1997, 2011). A recent investigation of speech co-gestures in Mehri and Shehri (Jibbali) notes that intonation is used in Mehri to mark the scope of negation, though without explicitly describing the prosodic means used to achieve this effect (Watson & Wilson 2017).

West Semitic: Ethio-Semitic

Although Ge'ez is no longer spoken, tradition suggests that stress fell on the penult in verbs, but was stem-final in nouns/pronouns, with some exceptions (Gragg 1997; Weninger 2011).

The position of stress in Tigrinya has been described as shifting readily from one position to another and is not always marked in parallel by dynamic stress correlates (intensity/duration) and pitch. Kogan (1997: 439) suggests therefore that 'sentence intonation is clearly predominant over the stress of an individual word', resembling descriptions noted above for Amazigh varieties which lack stress. A similar pattern is reported for neighbouring Tigré (Raz 1997). In Amharic stress is described as 'not prominent', falling primarily on stems, but displaying some interaction with syllable structure, and requiring further research (Hudson, 1997). In other Ethio-Semitic languages descriptions tend to be limited to a statement that stress is not phonemic, without elaborating further (e.g. Wagner 1997 for Harari), or make no mention of stress at all (Watson 2000). Hetzron (1997b) suggests that there is variation among Outer South Ethiopic languages, with the most 'progressive' (Inor/Ennermor) displaying discernible stress (typically on a final heavy syllable, else on the penult). In Amharic polar questions are marked either by rising intonation, a clause-final question marker or a verbal suffix (Hudson 1997); in wh-questions the wh-word occurs before the sentence-final verb (Frajzyngier 2012). Questions are formed by means of a question particle attached to the questioned constituent in Tigrinya (Kogan 1997), and by an optional sentence-final particle in the Outer South Ethiopic languages (Hetzron 1997b).

Central Semitic: Sayhadic

Little is known about the stress system or any other aspect of the prosody of the now extinct Sayhadic languages (Kogan & Korotayev 1997).

Central Semitic: North-West Semitic

In Biblical Hebrew, stress was generally final, with exceptions (Edzard 2011); stress markings in the codified Masoretic text of the Hebrew Bible show that stress position was contrastive, and that surface vowel length was governed by stress (Steiner 1997). Segmental sandhi, known as 'pausal forms', are observed at phrase boundaries (McCarthy 1979, 2012), and prosodic rhythm rules applied in the Tiberian system (Dresher 1994).

Stress in Modern Hebrew falls on the final or penult syllable, with some morphological exceptions (Berman 1997; Schwarzwald 2011), as it most likely did in early Aramaic; in the Eastern Neo-Aramaic languages stress tended to fall on the penult, whereas in the West Aramaic languages the position of stress depends on syllable structure, as for Arabic (Jastrow 1997; Arnold 2011; Gragg & Hoberman 2012).

Central Semitic: Arabian

Little is known of the prosody of the extinct Ancient North Arabian languages. The other members of the Arabian family form five regional groups of spoken dialects across North Africa, Egypt/Sudan, the Levant, Mesopotamia and the Arabian Peninsula (Watson 2011).

The position of primary stress in the word is in general predictable from syllable structure in Arabic dialects (as also in Maltese) and there is an extensive literature on micro-variation between dialects in stress placement, as illustrated in Table 12.1 (see summaries in: van der Hulst & Hellmuth 2010; Watson 2011; Hellmuth 2013).

Table 12.1: Stress assignment in different Arabic dialects (adapted from Hellmuth 2013: 60)

Standard Arabic	Palestinian Arabic	Lebanese Arabic	Cairene Arabic	Negev Bedouin	
kiˈtaːb	kiˈtaːb	kiˈtaːb	kiˈtaːb	kiˈtaːb	book
ˈkaːtib	ˈkaːtib	ˈkaːtib	ˈkaːtib	ˈkaːtib	writer
ˈmaktaba	ˈmaktaba	ˈmaktabe	makˈtaba	ˈmaktabah	library
ˈkatab	ˈkatab	ˈkatab	ˈkatab	kaˈtab	he wrote

Exceptions to the general rule of predictable stress in Arabic include Nubi (derived from an Arabic pidgin) which has an accentual system (Gussenhoven 2006), and Moroccan Arabic, in which the status of stress is disputed. Maas and Procházka (2012) argue that Moroccan Arabic (MA) and Moroccan Berber (MB, including Tashlhiyt) form a sprachbund, sharing a large number of features across all linguistic domains, including phonology. They thus argue that MA – like MB (see 12.2.1) – has post-lexical phrasal accentuation only, and no stress. There have been differing views on MA stress (Maas 2013), since a stress generalisation can be formulated for citation forms which no longer holds in connected speech (Boudlal 2001). One suggestion is that MA has stress but is an ‘edge-marking’ language with boundary tones only and no prominence-marking intonational pitch accents (Burdin et al. 2014). Indeed, the descriptive observation is that tonal peaks occurring on a phrase-final word display alignment with the syllable which would be stressed in citation form (Benkirane 1998), confirmed also in corpus data (Hellmuth, Louriz, Chlaihani, & Almbark 2015). This suggests the peak is neither solely prominence-marking nor edge-marking, forcing analysis as an edge-aligned pitch accent, as proposed for French (Delais-Roussarie et al. 2015), or as a non-metrical pitch accent (Bruggeman 2018). A recent comparative study (Bruggeman 2018) shows that MA and MB speakers both demonstrate perceptual insensitivity to lexical prominence asymmetries, of the type shown by speakers of other languages known to lack word level stress, such as French or Farsi (Rahmani, Rietveld, & Gussenhoven 2015).

Standard Arabic is not acquired by contemporary speakers as a mother tongue but is instead learned in the context of formal religious or state education. It is possible to formulate a stress algorithm for Standard Arabic (Fischer 1997), and stress rules are described for learners of Arabic (Alhawary 2011), but Gragg and Hoberman (2012: 165) note that the Arab traditional

grammarians did not describe the position of stress in Classical Arabic (CA), and take this as evidence that CA did not have stress and was 'like modern Moroccan Arabic'. Retsö (2011) similarly suggests that the absence of stress-morphology interaction in CA indicates it had a system in which prominence was marked only by pitch. The prosody of Standard Arabic, as used today in broadcasting and other formal settings, most likely reflects the prosodic features of a speaker's mother tongue spoken dialect (cf. Retsö 2011). For stress this generates micro-variation in stress assignment patterns in Standard Arabic in different contexts, such as Cairene Classical Arabic versus Egyptian Radio Arabic (Hayes 1995). For intonation, some sharing of tonal alignment features between colloquial and Standard Arabic was found in a small study of Egyptian Arabic speakers (El Zarka & Hellmuth 2009).

Prosodic juncture is marked in Standard Arabic by 'pausal forms', whereby grammatical case and other suffixes appear in a different form when phrase-final (Hoberman 2008; Abdelghany 2010; McCarthy 2012), as in Table 12.2. Accurate use of pausal forms is part of tajwīd rules for recitation of the Qur'ān (Al-Ali & Al-Zoubi 2009).

Table 12.2: Pausal alternations observed in Classical Arabic (McCarthy 2012)

	phrase-internal	at pause	
Absence of suffix case vowel	ʔalkitaːb-u	ʔalkitaːb	the book (nom)
Epenthesis of [h] after stem vowel	ʔiqtadi	ʔiqtadih	imitate (3ms.imp)
Metathesis of suffix vowel	ʔal-bakr-u	ʔal-bakur	the young camel (nom)
Absence of suffixal [n]	kitaːb-un	kitaːb	a book (nom)
[ah] for suffix [at]	kaːtib-at-un	kaːtib-ah	a writer (f.nom)

There are relatively few descriptions of cues to phrasing in spoken Arabic dialects (Hellmuth 2016), but it is likely that there is variation across dialects in the 'default' prosodic phrasing, similar to that seen in Romance languages: in Spanish, a phrase boundary is typically inserted after the subject in an SVO sentence, but not in Portuguese (Elordieta, Frota, & Vigario 2005), and a similar pattern appears to differentiate Jordanian Arabic and Cairene Arabic, respectively (Hellmuth 2016). Segmental sandhi mark prosodic boundaries in some dialects: laryngealization in dialects of the Arabian peninsula (Watson & Bellem 2011) and Tunisia (Hellmuth in press), diphthongisation of final vowels in the Levant and nasalization in western Yemen (Watson 2011). Further research is needed to determine whether these cues mark syntactic structure or some other aspect of discourse structure, such as turn-finality.

Focus and topic marking is achieved in spoken Arabic through a mix of syntactic and prosodic means, including clefts/pseudo-clefts with associated prosodic effects. In most varieties a polar question can be realized through prosodic means alone; dialects vary with respect to WH-fronting versus WH-in-situ (Aoun, Benmamoun, & Choueiri 2010). Focus can also be marked by prosodic means alone in many if not all dialects (see literature review in Alzaidi, Xu, & Xu 2018).

There is a growing body of literature on the intonational phonology of Arabic dialects (see summaries in: Chahal 2006; El Zarka 2017). So far, all Arabic dialects outside North Africa appear to display intonation systems comprising both pitch accents and boundary tones. Variation in the inventory of nuclear contours (nuclear accent + final boundary tone combinations), as reported in Chahal (2006), suggests dialectal variation in the inventory of

boundary tones, at least, and further comparative work may reveal variation in pitch accent inventories. Retsö (2011) notes variation across dialects in the phonetic realization of stress, differentiating 'expiratory accent' in Levantine varieties from 'tonal accent' in Cairene; this observation has been re-analyzed in the AM framework as variation in the distribution of pitch accents, occurring on every prosodic word in Cairene, but more sparsely distributed, at the phrasal level, in Levantine (Hellmuth 2007; Chahal & Hellmuth 2015).

12.2.4 Chadic

Chadic languages are tonal. Many Chadic languages (e.g. Migaama, Mofu and Mukulu) are open to analysis as 'accentual languages' in which there is at most one H tone per word which is accompanied by other indicators of prominence (Pearce 2006), but others (e.g. Kera, Masa and Podoko) have three tones and a variety of lexical tone melodies on nouns. A common explanation for this variety within the Chadic family is that a process of tonogenesis has generated a tonal split from a single tone system into two tones in some languages, and into three in others (Wolff 1987). A typical example, as illustrated for Musgu in (12.1) below, is a system where syllables with voiceless onsets usually carry an H tone and syllables with voiced onsets usually carry an L tone; sonorants and implosives may be associated with a third tone M, or they might pattern with one of the other groups.

(12.1) Musgu depressor and raiser consonants (Wolff 1987)

depressor:	L	zìrì	'align'	vìnì	'take'
raiser:	H	sírí	'squash'	fíní	'stay'
neutral:	L	yìmì	'trap'		
	H	yímí	'be beautiful'		

The wide variety of systems observed in Chadic suggests that tonogenesis probably occurred independently in separate languages rather than once in proto-Chadic (Jim Roberts, p.c.). Whatever the diachronic history, in the synchronic grammar, the roles may become reversed: in Kera it is now tone that is phonemic, with laryngeal VOT cues serving as secondary enhancement to the tone cues (Pearce 2005).

The function of tone in Chadic is lexical as well as grammatical (Frajzyngier 2012), and most languages appear to display little tone movement or spreading, and probably no downstep (Jim Roberts, p.c.); however, exceptions include Ga'anda which has floating tones and associated downdrift (Ma Newman 1971), and Ngizim which has tone spreading and downstep (Schuh 1971). Hausa has two basic tones, H~L; surface falling tones derive from adjacent underlying HL sequences (e.g. due to affixation) but can only be realized on a heavy syllable; in contrast, underlying LH sequences are truncated to a surface high tone (Newman 2000, 2009). A more complex case is Kera, which has three tones in rural speech communities, but in urban varieties (where there has been prolonged contact with French) the system reduces to two tones plus a voicing contrast in some contexts, and the change is sociolinguistically conditioned: among women in the capital, there is an almost complete loss of tone (Pearce 2013). Although Kera is cited as one of the few languages to exhibit long distance voicing harmony between consonants (Odden, 1994; Rose and Walker, 2004), the facts can be accounted for by proposing tone spreading with voice onset time (VOT) corresponding to the tone (Pearce, 2006). Similarly, it has been claimed that Kera voiced ('depressor') consonants lower the tone of the following syllable (Ebert 1979; Wolff 1987; Pearce 1999), but acoustic analysis confirms that although there is surface consonant and tone interaction, it is the tones that are underlying and distinct (Pearce 2006). Mawa has three tones in surface transcription, which can probably be reduced to two underlying tones, M and

L, with H as an allophone of L (Roberts 2013), and Roberts (2005) makes similar claims for Migaama. In sum, the typical Chadic tonal system has a two-way contrast between /H/ and a non-high tone [M] or [L] depending on the preceding consonant, which in some languages has developed into a three-way /H, M, L/ contrast.

Turning to sentence prosody, in Central and some West Chadic languages, word-final vowel retention (i.e. blocking of word-final vowel deletion) marks the right edge of prosodic phrases, for example in Hausa and Gidar, with similar blocking of vowel raising at phrase edges in Mafa; Wandala does not permit consonants in phrase-final position (Frajzyngier & Shay 2012). Polar questions are typically marked with a particle, whereas focus and topic can be marked in different ways, including particles, extraposition, tense-aspect markers or intonation (Frajzyngier 2012; Green 2007). Focus is not always prosodically marked, however, if marked at all (Hartmann & Zimmermann 2007).

12.2.5 Cushitic

All languages in the Cushitic family appear to be tonal, and generally of the non-obligatory type (in which a tone is not observed on every syllable, nor on every lexical item). In contrast to Chadic, in most Cushitic languages the function of tone is mostly grammatical, not lexical, marking categories such as negation, case, gender or focus (Frajzyngier 2012; Mous 2012).

Some languages in the family have a purely demarcative tonal system, such as K'abeena, whereas Awngi has demarcative phrasal stress as well as lexical tone (Hetzron 1997a). Somali has three surface word melodies, high LLH ~ falling LHL ~ low LLL (Saeed 1987), typically analyzed as a privative system in which presence of a high tone (underlying /H/) alternates with absence of a high tone (underlying 'Ø') realized phonetically with low tone (Saeed 1999; Hyman 2009). Iraqw also has either surface H or L on the final syllable but all non-final syllables realized with mid/low tone (Nordbustad 1988; Mous 1993), and can also be analyzed as /H/~ Ø (Hyman 2006). Beja has one culminative tone per word, whose position is contrastive, yielding minimal pairs such as [ˈhadhaab] 'lions'~ [haˈdhab] 'lion' (Wedekind, Wedekind, & Musa 2005). Sidaama has at most one tone per word, whose position is contrastive, but also subject to movement in connected speech (Kawachi 2007). Afar has an obligatory phrasal H tone on the first word in each accentual phrase, appearing on the accented syllable in lexically accented words, otherwise on the final syllable (Hayward 1991).

In some Cushitic languages (including Somali, Iraqw and Alagwa), when a sentence-final H tone is added to a word to form a polar question, all and any preceding H tones in the word or phrase are deleted, resulting in a low level contour with a final rise which is described as 'a phonologized intonational pattern' (Mous 2012: 352). More generally in Cushitic, polar questions are formed by a change to the prosodic pattern, such as a rise in pitch or a rise-fall (e.g. in Sidaama, Kawachi 2007), with the addition of further segmental material in some languages. In Iraqw this takes the form of a verbal suffix, whereas in K'abeena it is fully voiced (modal) rather than whispered realization of the utterance final vowel (Crass 2005; cited in Mous 2012); in southern Oromo dialects, the final fall in pitch is realized on a 'linker clitic' [áa] (Stroomer 1987).

Focus is marked in Cushitic by clefting and/or by use of focus particles, and topicalization by means of extraposition and determiners (Frajzyngier 2012). Iraqw and Somali display topic-fronting with a following pause (Mous 2012; Frascarelli & Puglielli 2009). In Oromo, a fronted syllable attracts sentence stress, as does a focus particle (Stroomer 1987). In Iraqw, a

polar question is realized by addition of a sentence-final particle, together with an H tone on the penult syllable of the phrase which is also lengthened (Nordbustad 1988). In Beja, the shape and direction of the prosodic contour at phrase edges also serves to disambiguate the function of connective co-verbs in marking discourse structure (Vanhove 2008).

12.2.6 Omotic

All Omotic languages are reported to have contrastive tone, with an overall tendency in the group towards marking of grammatical function rather than lexical contrast (Frajzyngier 2012). In some languages a tone is observed on every syllable, but in others tones do not necessarily appear on every lexical item, nor on every syllable if a word does have tone. Overall then, the tonal systems vary considerably across the languages in this putative group - which may contribute to doubts about the degree of their relatedness.[2] The number of contrastive tones and their distribution ranges from just one tone per word in Wolaitta, in which H tones contrast with toneless syllables, up to the typologically large system of six level tones in Bench, with a tone on every syllable. Dizi and Sheko each have a system of four level tones, and Nayi and Yem have three. This wide degree of variation may be due to contact with Nilo-Saharan languages (Amha 2012).

Hayward (2006) notes a constraint on tonal configurations in nominals in a subset of Omotic languages such that only one high tone may appear within the nominal phrase, with other syllables bearing low tone, yielding a LHL contour, which he calls the 'OHO' (one high only) constraint. He notes further that this constraint is confined to those languages which display consistent head-final syntax, and thus have post-modifers in the noun phrase.

Polar questions are formed in Maale by means of a question particle, optionally accompanied by rising intonation (Amha 2012), but in Zargulla, a question is marked by a change in verbal inflection, without any accompanying prosodic marking (ibid.). Focus is generally achieved by means of extra-position, again with no mention of accompanying prosodic marking (Frajzyngier 2012).

12.3 Nilo-Saharan

The Nilo-Saharan languages[3] are tonal, and most have two or three tonal categories with little tone spreading, but some interaction of tone with voice quality and vowel harmony.

12.3.1 Eastern Sudanic

Tone is used to mark case in a number of East African languages, with case often marked exclusively by tone, as in Maa and Datooga (König 2009); in all cases where case is marked by tone the language has a 'marked nominative' case system (König 2008). Hyman (2011, 2013) also notes tonal case-marking in Maasai. Similarly, the Ik language displays lexical tone (in verb and noun roots) realized differently according to grammatical context, with tonal changes which must accompany certain segmental morphemes (Schrock 2014, 2017); the underlying H/L tones each have surface 'falling' and downstepped variants and are also subject to downdrift and the effects of depressor consonants. Overall, the patterning of these

[2] The North Omotic and South Omotic languages are now treated as independent (Hammarström, Forkel, & Haspelmath 2018) due to lack of Afro-Asiatic features (Hayward 2003), despite earlier inclusion in Afroasiatic (Hayward 2000; Dimmendaal 2008). This section reviews the prosody of languages treated as members of the Omotic family at some point or spoken in south-western Ethiopia (within the geographical scope of Figure 1) without taking a position on affiliation of individual languages or sub-families to Afroasiatic.

[3] The Nilo Saharan languages are diverse and there is debate as to the integrity of the family (Bender 1996).

tonal processes in Ik indicates a role for metrical feet, alongside distinct intonational contours marking indicative, interrogative and 'solicitive' illocutionary force.

In Ama, tone plays a part in several grammatical constructions and – in contrast to Ik – there are cases where tone is the only change, as shown in (12.2) (Norton 2011):

		searching	sleeping	washing
(12.2)	Imperfective 3rd Pers Present	sāŋ	túŋ	ágēl
	Imperfective 1st/2nd Pers Present	sàŋ	tūŋ	āgèl

Dinka has a robustly demonstrated three-way vowel length contrast (Remijsen & Gilley 2008; Remijsen & Manyang 2009; Remijsen 2014), and appears to have developed from a vowel harmony type system into a contrast between breathy voice and creaky voice. Dinka is also rich in grammatical tone, for case marking and in verb derivations (Andersen 1995), with some dialectal variation in the number of tonal categories. Acoustic analysis has shown that Dinka contour tones contrast in the timing of the fall relative to the segmental content of the syllable, as well as in tonal height (Remijsen 2013). Contrastive alignment is also found in Shilluk (Remijsen & Ayoker 2014), thus challenging earlier typological claims that alignment in contour tones is never phonologically contrastive (Hyman 1988; Odden 1995). Shilluk has a complex tonal system involving three level tones and four contour tones (Remijsen, Ayoker, & Mills 2011). Tone has lexical function, marking morphemic status in verbs, but there is also some grammatical function, e.g. the possessive marker.

In Mursi, anticipatory 'tonal polarity' is observed at the end of any word ending in a toneless syllable, in anticipation of the tone on the following word (Muetze & Ahland 2017). As with the other Nilo-Saharan languages, there seems to be a limit of one syllable on tone spreading or displacement. Mursi appears to have a two-tone system plus a neutral 'toneless' option, and this may hint at a link between two- and three-tone languages in this family, that is, if a 'toneless' category developed into a mid M tone in some languages, or vice versa.

Kunama also has stable tones that don't move or spread, though tonal suffixes may cross syntactic boundaries and replace tones. Kunama has three level tones (H/M/L), three falls (HM, HL, ML) and one rise (MH), with contours observed only on heavy syllables or on word-final short vowels (Connell, Hayward, & Ashkaba 2000; Yip 2002, p. 142 ff.).

12.3.2 Central Sudanic

Sudanic languages typically have three tones. (Jim Roberts p.c.). In Ngiti (Central Sudanic, Zaire), the tone is largely grammatical, such as marking tense/aspect on verbs (Kutsch Lojenga 1994). The Sara language also has three level tones, but little grammatical tone or tonal morphology (Jim Roberts p.c.). In contrast to these three tone languages, Boyeldieu (2000) describes Modo, Baka and Bongo as having four melodies in disyllabic words, and no contour tones on individual syllables, suggesting a classic two-tone system: a phonetic M tone is derived from adjacent /H/ tones, the second of which drops to [M]. In Bongo, tone marks perfective aspect, and lexical tone on verbs is affected by preceding subject pronouns (Nougayrol 2006; Hyman 2016).

Gor has three tones, but could have originated from a two-tone system, as four melodies predominate: HM, LM, LL, MM, with no ML pattern (Roberts 2017). However, Gor cannot now be analyzed as a two-tone language because words with CV structure can carry any of

the three melodies H, M and L. Tonal person markers are found in noun suffixes: an H tone indicates possession, but the same segments with no H tone indicate the direct object.

12.3.3 Maban

In Massalit tone has low functional load; the language has a ten-vowel system exhibiting ATR harmony from suffix to root, though the [+ATR] close vowels are increasingly merging with their [-ATR] counterparts (Angela Prinz, p.c.). Weiss (2009) analyses Maba as a pitch accent system which affects the intensity, distinctiveness and quality of vowels, in a ten-vowel ATR system; the position of the accent is determined by presence of H tone, a long vowel and the syllabic structure.

12.3.4 Saharan

In Zaghawa**,** there appear to be two tones instead of the usual Sudanic three, as well as ATR harmony, but it is too early to make major statements about the tonal system.

12.4 Discussion

This survey yields a near-comprehensive picture for only one of the four aspects of prosody in our survey, namely, word prosody. That is, we can identify what type of word prosody each language has, i.e., whether a language has tone or stress, or both, or neither.

Frajzingier (2012) points to a basic divide in word prosody across Afroasiatic languages, between tonal and non-tonal languages and notes debate about the origin of such a divide. One view argues that if any members of the wider family have lexical tone, the common ancestor must also have had it, thus non-tonal languages must result from loss of tonal contrast over time, and this is argued to explain the large number of homophones found in Semitic. The competing view proposes tonogeneses of various kinds: due to laryngeal effects in Chadic, where tone more commonly has lexical function, or evolving from a predictable stress system coupled with segmental neutralization, and/or due to contact with robustly tonal languages from other language families.

It is beyond the scope of this chapter to resolve this debate, but our survey confirms that the tonal versus non-tonal divide does not equate to a simple ‘stress versus tone’ dichotomy: among tonal languages there is wide variation in the number, distribution and function of tonal contrasts, and it is now becoming clear that non-tonal languages do not all have stress. The non-binary nature of the stress versus tone distinction is well established in theoretical literature on tone (Hyman 2006) and is matched by more recent analyses of non-tonal but also non-stress languages as ‘edge-marking’ languages, in which tonal events associate with the edges of prosodic domains (only), within the AM framework (Jun 2014).

Our limited ability to document prosodic variation, with respect to prosodic phrasing, melodic structure and prosodic expression of meaning, is restricted by the availability of descriptions of these aspects of the languages under consideration. This is sometimes due to a general lack of description of a language, but, more commonly, to a lack of description of post-lexical prosody in those descriptions that do exist (with notable exceptions). Going before us, Frajzingier (2012, p. 606) also notes, in discussion of parataxis (marking of the relationship between clauses in complex sentences), that prosodic characteristics are ‘seldom indicated in grammars’, and our survey shows this is still the norm. Some of these gaps will be an artefact of methodological choices and priorities, but others may be due to the practical difficulties, perceived or real, involved in the performance of post-lexical prosodic analysis.

For example, Watson and Wilson (2017) highlight the importance of information about intonation patterns in contexts which are syntactically ambiguous in written transcription but note also the ‘cumbersome’ nature of prosodic annotation, and thus argue for collection and sharing of audio (and audio-visual) recordings of less-described languages. There is so much scope for further research on the prosodic systems of North Africa and the Middle East, and particularly on post-lexical prosody, that the work of overcoming these obstacles is merited.

References

Abdelghany, H. (2010). Prosodic phrasing and modifier attachment in Standard Arabic sentence processing. Unpublished PhD dissertation, City University of New York.,

Al-Ali, M. N., and Al-Zoubi, M. Q. (2009). Different pausing, different meaning: translating Qur'anic verses containing syntactic ambiguity. Perspectives: Studies in Translatology, 17(4), 227-241.

Alhawary, M. T. (2011). Modern standard Arabic grammar: A learner's guide: John Wiley & Sons.

Alzaidi, M. S., Xu, Y., and Xu, A. (2018). Prosodic Encoding of Focus in Hijazi Arabic. Speech Communication. doi: https://doi.org/10.1016/j.specom.2018.12.006

Amha, A. (2012). Omotic. In Z. Frajzyngier & E. Shay (Eds.), The afroasiatic languages (pp. 423-504). Cambridge: Cambridge University Press.

Andersen, T. (1995). Morphological stratification in Dinka: On the alternations of voice quality, vowel length and tone in the morphology of transitive verbal roots in a monosyllabic language. Studies in African Linguistics, 23(1), 1992-1994.

Aoun, J. E., Benmamoun, E., and Choueiri, L. (2010). The syntax of Arabic. Cambridge: Cambridge University Press.

Arnold, W. (2011). Western Neo-Aramaic. In The semitic languages: an international handbook (pp. 685-696). Berlin: DeGruyter Mouton.

Bender, M. L. (1996). The Nilo-Saharan languages: a comparative essay (Vol. 6): Lincom Europa.

Benkirane, T. (1998). Intonation in Western Arabic (Morocco). In D. Hirst & A. Di Cristo (Eds.), Intonation systems: a survey of twenty languages (pp. 345-359). Cambridge, MA: CUP.

Berman, R. A. (1997). Modern Hebrew. In R. Hetzron (Ed.), The Semitic Languages (pp. 312-333). London: Routledge.

Boudlal, A. (2001). Constraint interaction in the phonology and morphology of Casablanca Moroccan Arabic. (PhD), Universit, Mohammed V, Rabat, Morocco

Boyeldieu, P. (2000). Identit, tonale et filiation des langues sara-bongo-baguirmiennes (Afrique centrale). Köln: Rüdiger Köppe.

Bruggeman, A. (2018). Lexical and postlexical prominence in Tashlhiyt Berber and Moroccan Arabic. Unpublished PhD dissertation, Universität zu Köln.

Bruggeman, A., Roettger, T. B., and Grice, M. (2017). Question word intonation in Tashlhiyt Berber: is 'high' good enough? Laboratory Phonology: Journal of the Association for Laboratory Phonology, 8(1).

Buccellati, G. (1997). Akkadian. In R. Hetzron (Ed.), The Semitic Languages (pp. 69-99). London: Routledge.

Burdin, R. S., Phillips-Bourass, S., Turnbull, R., Yasavul, M., Clopper, C. G., and Tonhauser, J. (2014). Variation in the prosody of focus in head-and head/edge-prominence languages. Lingua: International Review of General Linguistics, 165, 254-276.

Chahal, D. (2006). Intonation. In K. Versteegh (Ed.), Encyclopedia of Arabic Language and Linguistics. Volume 2. (pp. 395-401). The Netherlands: Brill Academic.

Chahal, D., and Hellmuth, S. (2015). Comparing the Intonational Phonology of Lebanese and Egyptian Arabic. In S.-A. Jun (Ed.), Prosodic Typology. Volume 2. (pp. 365-404). Oxford: Oxford University Press.

Connell, B. A., Hayward, R. J., and Ashkaba, J. A. (2000). Observations on Kunama tone. Studies in African Linguistics, 29(1), 1-42.

Crass, J. (2005). Das K'abeena: deskriptive Grammatik einer hochlandostkuschitischen Sprache. Köln: Rüdiger Köppe.

Delais-Roussarie, E., Post, B., Avanzi, M., Buthke, C., Di Cristo, A., Feldhausen, I., . . . Rialland, A. (2015). Intonational Phonology of French: Developing a ToBI system for French. In P. Prieto & S. Frota (Eds.), Intonation in Romance: OUP.
Dimmendaal, G. J. (2008). Language ecology and linguistic diversity on the African continent. Language and Linguistics Compass, 2(5), 840-858.
Dresher, E. (1994). The prosodic basis of Tiberian Hebrew system of accents. Language, 70 1-52.
Ebert, K. (1979). Sprache und Tradition der Kera (Tschad), Teil III Grammatik. Berlin: Reimer.
Edzard, L. (2011). Biblical Hebrew. In S. Weninger, G. Khan, M. P. Streck, & J. C. E. Watson (Eds.), The semitic languages: an international handbook (pp. 480-514). Berlin: DeGruyter Mouton.
El Zarka, D. (2017). Arabic Intonation. Oxford Handbooks Online. doi:10.1093/oxfordhb/9780199935345.013.77
El Zarka, D., and Hellmuth, S. (2009). Variation in the intonation of Egyptian Formal and Colloquial Arabic Langues et Linguistique, 22, 73-92.
Elordieta, G., Frota, S., and Vigario, M. (2005). Subjects, objects and intonational phrasing in Spanish and Portuguese. Studia Linguistica, 59(2/3), 110-143.
Fecht, G. (1960). Wortakzent und Silbenstruktur: Untersuchungen zur Geschichte der „gyptischen Sprache. Gl□ckstadt: JJ Augustin.
Fischer, W. (1997). Classical Arabic. In R. Hetzron (Ed.), The Semitic languages (pp. 187-219). London: Routledge.
Frajzyngier, Z. (2012). Typological outline of the Afroasiatic phylum. In Z. Frajzyngier & E. Shay (Eds.), The Afroasiatic Languages (pp. 505-623). Cambridge: Cambridge University Press.
Frajzyngier, Z., and Shay, E. (2012). Chadic. In Z. Frajzyngier & E. Shay (Eds.), The afroasiatic languages (pp. 236-341). Cambridge: Cambridge University Press.
Frascarelli, M., and Puglielli, A. (2009). Information Structure in Somali. Evidence from the syntax-phonology interface. Brill's Journal of Afroasiatic Languages and Linguistics, 1(1), 146-175.
Gragg, G. (1997). Ge'ez (Ethiopic). In R. Hetzron (Ed.), The Semitic Languages (pp. 242-262). London: Routledge.
Gragg, G., and Hoberman, R. D. (2012). Semitic. In Z. Frajzyngier & E. Shay (Eds.), The Afroasiatic Languages (pp. 145-235). Cambridge: Cambridge University Press.
Green, M. (2007). Focus in Hausa. Oxford: Wiley-Blackwell.
Grice, M., Ridouane, R., and Roettger, T. B. (2015). Tonal association in Tashlhiyt Berber: Evidence from polar questions and contrastive statements. Phonology, 32(02), 241-266.
Gussenhoven, C. (2004). The phonology of tone and intonation. Cambridge Cambridge University Press.
Gussenhoven, C. (2006). Between stress and tone in Nubi word prosody. Phonology, 23 192-223.
Gussenhoven, C. (2017). Zwara (Zuwarah) Berber. Journal of the International Phonetic Association, 1-17. doi:doi:10.1017/S0025100317000135
Hammarström, H., Forkel, R., and Haspelmath, M. (2018). Glottolog 3.3. Retrieved 2018-12-04, from Max Planck Institute for the Science of Human History. http://glottolog.org
Hartmann, K., and Zimmermann, M. (2007). Focus strategies in Chadic: the case of Tangale revisited. Studia Linguistica, 61(2), 95-129.
Hayes, B. (1995). Metrical stress theory: principles and case studies. Chicago University of Chicago Press.
Hayward, R. J. (1991). Tone and accent in the Qafar noun. York Papers in Linguistics, 15, 117-137.
Hayward, R. J. (2000). Afroasiatic. In B. Heine & D. Nurse (Eds.), African languages: an introduction. Cambridge: Cambridge University Press.
Hayward, R. J. (2003). Omotic: The 'empty quarter' of Afroasiatic Linguistics. In J. Lecarme (Ed.), Research in Afroasiatic Grammar II: Selected papers from the Fifth Conference on Afroasiatic Languages, Paris, 2000 (pp. 241-261). Amsterdam: John Benjamin.
Hayward, R. J. (2006). The OHO constraint. In F. K. Erhard Voeltz (Ed.), Studies in African Linguistic Typology (Vol. 64, pp. 155-169). Amsterdam: John Benjamins.
Heath, J. (2011). A grammar of Tamashek (Tuareg of Mali) (Vol. 35): Walter de Gruyter.
Hellmuth, S. (2007). The relationship between prosodic structure and pitch accent distribution: evidence from Egyptian Arabic. The Linguistic Review, 24(2-3), 289-314.

Hellmuth, S. (2013). Phonology. In J. Owens (Ed.), The Oxford Handbook of Arabic Linguistics (pp. 45-70). Oxford: Oxford University Press.
Hellmuth, S. (2016). Explorations at the syntax-phonology interface in Arabic. In S. Davis & U. Soltan (Eds.), Perspectives on Arabic Linguistics: Proceedings of the 27th Arabic Linguistics Symposium, Bloomington Indiana February 28th - March 2nd 2013 (pp. 75-97). Amsterdam: John Benjamin.
Hellmuth, S. (in press). Prosodic Variation in Arabic. In E. Al-Wer & U. Horesh (Eds.), Routledge Handbook of Arabic Sociolinguistics. London: Routledge.
Hellmuth, S., Louriz, N., Chlaihani, B., and Almbark, R. (2015). F0 peak alignment in Moroccan Arabic polar questions. Proceedings of ICPhS Glasgow.
Hetzron, R. (1997a). Awngi phonology. In A. Kaye (Ed.), Phonologies of Asia and Africa Volume I (pp. 477-491). Winona Lake, Indiana: Eisenbrauns.
Hetzron, R. (1997b). Outer South Ethiopic. In R. Hetzron (Ed.), The Semitic Languages (pp. 535-549). London: Routledge.
Hoberman, R. D. (2008). Pausal forms. In K. Versteegh, M. Eid, A. Elgibali, M. Woidich, & A. Zaborski (Eds.), Encyclopedia of Arabic Language and Linguistics (pp. 564-570). Amsterdam: Brill.
Hudson, G. (1997). Amharic and Argobba. In R. Hetzron (Ed.), The Semitic Languages (pp. 457-485). London: Routledge.
Hyman, L. M. (1988). Syllable structure constraints on tonal contours. Linguistique Africaine(1), 49-60.
Hyman, L. M. (2006). Word-prosodic typology. Phonology, 23(2), 225-257.
Hyman, L. M. (2009). How (not) to do phonological typology: the case of pitch-accent. Language Sciences, 31(2-3), 213-238.
Hyman, L. M. (2011). Tone: Is it Different? In J. Goldsmith, J. Riggle, & A. Yu (Eds.), The Handbook of Phonological Theory, Second Edition (pp. 197-239).
Hyman, L. M. (2013). Morphological Tonal Assignments in Conflict: Who Wins? In UC Berkeley Phonology Lab Annual Report: UC Berkeley: Department of Linguistics.
Hyman, L. M. (2016). Morphological tonal assignments in conflict: Who wins? In E. Palancar & J. L. Léonard (Eds.), Tone and inflection: New facts and perspectives (pp. 15-39). Berlin/Boston: De Gruyter Mouton.
Jastrow, O. (1997). The Neo-Aramaic Languages. In R. Hetzron (Ed.), The Semitic Languages (pp. 334-377). London: Routledge.
Jun, S.-A. (2014). Prosodic typology: by prominence type, word prosody, and macro-rhythm. In S.-A. Jun (Ed.), Prosodic Typology Volume II. (pp. 520-539). Oxford: Oxford University Press.
Kawachi, K. (2007). A grammar of Sidaama (Sidamo), a Cushitic language of Ethiopia. Retrieved from
Kogan, L. (1997). Tigrinya. In R. Hetzron (Ed.), The Semitic Languages (pp. 424-445). London: Routledge.
Kogan, L., and Korotayev, V. (1997). Sayhadic (Epigraphic South Arabian). In R. Hetzron (Ed.), The Semitic Languages (pp. 220-241). London: Routledge.
König, C. (2008). Case in Africa: Oxford University Press.
König, C. (2009). Marked nominatives. In The Oxford handbook of case.
Kossmann, M. (2012). Berber. In Z. Frajzyngier & E. Shay (Eds.), The Afroasiatic Languages (pp. 18-101). Cambridge: Cambridge University Press.
Kossmann, M. (2013). A grammatical sketch of Ghadames Berber (Libya). Köln: Rüdiger Köppe.
Kutsch Lojenga, C. (1994). Ngiti: a central-Sudanic language of Zaire. Köln: Rüdiger Köppe.
Ladd, D. R. (2008). Intonational phonology (Second ed.). Cambridge: Cambridge University Press.
Loprieno, A., and Müller, M. (2012). Ancient Egyptian and Coptic. In Z. Frajzyngier & E. Shay (Eds.), The Afroasiatic Languages (pp. 102-144). Cambridge: Cambridge University Press.
Ma Newman, R. (1971). Downstep in Ga'anda. Journal of African Languages, 10, 15-27.
Maas, U. (2013). Die marokkanische Akzentuierung. In R. Kuty, U. Seeger, & S. Talay (Eds.), Nicht nur mit Engelszungen [Beiträge zur semitischen Dialektologie: Festschrift für Werner Arnold zum 60. Geburtstag]. Wiesbaden: Harrassowitz Verlag.

Maas, U., and Procházka, S. (2012). Moroccan Arabic in its wider linguistic and social contexts. STUF-Language Typology and Universals Sprachtypologie und Universalienforschung, 65(4), 329-357.
McCarthy, J. (1979). Formal problems in Semitic phonology and morphology. Massachusetts Institute of Technology,
McCarthy, J. (2012). Pausal Phonology and Morpheme Realization. In T. Borowsky, S. Kawahara, T. Shinya, & M. Sugahara (Eds.), Prosody Matters: Essays in Honor of Elisabeth Selkirk (pp. 341-373). London: Equinox.
McClelland, C. W. (2000). The interrelations of syntax, narrative structure and prosody in a Berber language. Lampeter: The Edwin Mellen Press.
Moroz, G. (2017). Lingtypology: Easy Mapping for Linguistic Typology. Retrieved from https://CRAN.R-project.org/package=lingtypology
Mous, M. (1993). A grammar of Iraqw (Vol. 9): Buske Verlag.
Mous, M. (2012). Cushitic. In Z. Frajzyngier & E. Shay (Eds.), The Afroasiatic Languages (pp. 342-422). Cambridge: Cambridge University Press.
Muetze, B., and Ahland, C. (2017). Mursi. In B. Wakjira, R. Meyer, & Z. Leyew (Eds.), The Oxford Handbook of Ethiopian Languages. Oxford: Oxford University Press.
Newman, P. (2000). The Hausa language: An encyclopedic reference grammar: Yale University Press.
Newman, P. (2009). Hausa and the Chadic languages. In B. Comrie (Ed.), The world's major languages (Vol. II, pp. 705-723). London: Routledge.
Nordbustad, F. y. (1988). Iraqw grammar: an analytical study of the Iraqw language (Vol. 8): D. Reimer.
Norton, R. (2011). Ama Verb Morphology: Categories, Tone, Morphophonemics. Retrieved from
Nougayrol, P. (2006). Tones and verb classes in Bongo. In A.-A. Abu-Manga, L. G. Gilley, & A. Storch (Eds.), Insights into Nilo-Saharan Language, History and Culture. Proceedings of the 9th Nilo-Saharan Linguistics Colloquium Institute of African and Asian Studies, University of Khartoum, 16-19 February 2004 (pp. 335-345). Köln: Rüdiger Köppe.
Odden, D. (1995). Tone: African Languages. In J. A. Goldsmith (Ed.), The handbook of phonological theory (pp. 444-475). Oxford: Blackwell.
Pearce, M. (1999). Consonants and tone in Kera (Chadic). Journal of West African Languages, 27(1), 33-70.
Pearce, M. (2005). Kera tone and voicing. In M. Pearce & N. Topintzi (Eds.), University College London Working Papers in Linguistics (Vol. 17, pp. 61-82). London: Department of Linguistics and Phonetics, University College London.
Pearce, M. (2006). The interaction between metrical structure and tone in Kera. Phonology, 23(02), 259-286.
Pearce, M. (2013). The interaction of tone with voicing and foot structure: evidence from Kera phonetics and phonology. Stanford, CA: CSLI Publications.
Rahmani, H., Rietveld, T., and Gussenhoven, C. (2015). Stress "deafness" reveals absence of lexical marking of stress or tone in the adult grammar. PloS one, 10(12), e0143968.
Raz, S. (1997). Tigre. In R. Hetzron (Ed.), The Semitic Languages (pp. 446-456). London: Routledge.
Remijsen, B. (2013). Tonal alignment is contrastive in falling contours in Dinka. Language, 89(2), 297-327.
Remijsen, B. (2014). Evidence for three-level vowel length in Ageer Dinka. In J. Caspers, Y. Chen, W. Heeren, J. Pacilly, N. O. Schiller, & E. van Zanten (Eds.), Above and Beyond the Segments: Experimental linguistics and phonetics. Amsterdam: John Benjamins (pp. 246-260).
Remijsen, B., and Ayoker, O. G. (2014). Contrastive tonal alignment in falling contours in Shilluk. Phonology, 31(3), 435-462.
Remijsen, B., Ayoker, O. G., and Mills, T. (2011). Shilluk. Journal of the International Phonetic Association, 41(1), 111-125.
Remijsen, B., and Gilley, L. (2008). Why are three-level vowel length systems rare? Insights from Dinka (Luanyjang dialect). Journal of Phonetics, 36(2), 318-344.

Remijsen, B., and Manyang, C. A. (2009). Luanyjang dinka. Journal of the International Phonetic Association, 39(1), 113-124.
Retsö, J. (2011). Classical Arabic. In S. Weninger, G. Khan, M. P. Streck, & J. C. E. Watson (Eds.), The semitic languages: an international handbook (pp. 782-810). Berlin: DeGruyter Mouton.
Roberts, J. S. (2013). The tone system of Mawa. In H. Tourneux (Ed.), Topics in Chadic Linguistics VII. Papers from the 6th Biennial International Colloquium on the Chadic Languages. Villejuif, September 22-23, 2011 (pp. 115-130). Köln: Rüdiger Köppe.
Roberts, J. S. (2017). The analysis of central vowels in Gor (Central Sudanic). Retrieved from
Saeed, J. (1987). Somali reference grammar: Dunwoody Press.
Saeed, J. (1999). Somali (Vol. 10). Amsterdam: John Benjamins Publishing.
Schrock, T. (2014). A grammar of Ik (Icé-tód): Northeast Uganda's last thriving Kuliak language. Utrecht: LOT.
Schrock, T. (2017). The Ik language: Dictionary and grammar sketch: Language Science Press.
Schuh, R. G. (1971). Ngizim phonology. UCLA, ms.
Schwarzwald, O. (2011). Modern Hebrew. In S. Weninger, G. Khan, M. P. Streck, & J. C. E. Watson (Eds.), The semitic languages: an international handbook (pp. 523-536). Berlin: DeGruyter Mouton.
Simeone-Senelle, M. C. (1997). The Modern South Arabian Languages. In R. Hetzron (Ed.), The Semitic Languages (pp. 378-423). London: Routledge.
Simeone-Senelle, M. C. (2011). Modern South Arabian. In S. Weninger, G. Khan, M. P. Streck, & J. C. E. Watson (Eds.), The semitic languages: an international handbook (pp. 1073-1113). Berlin: DeGruyter Mouton.
Steiner, R. C. (1997). Ancient Hebrew. In R. Hetzron (Ed.), The Semitic Languages (pp. 145-173). London: Routledge.
Stroomer, H. (1987). A comparative study of three Southern Oromo dialects in Kenya. Hamburg: Buske.
van der Hulst, H., and Hellmuth, S. (2010). Word accent systems in the Middle East. In R. Goedmans & H. van der Hulst (Eds.), A Survey of Word Accentual Patterns in the Languages of the World (pp. 615-646). Berlin: Mouton de Gruyter.
Vanhove, M. (2008). Enoncés hiérarchisés, converbes et prosodie en bedja. In B. Caron (Ed.), Subordination, dépendance et parataxe dans les langues africaines. (pp. 83-103). Louvain: Peeters.
Wagner, E. (1997). Harari. In R. Hetzron (Ed.), The Semitic Languages (pp. 486-508). London: Routledge.
Watson, J. C. E. (2000). Review of Robert Hetzron (ed.), The Semitic languages. London: Routledge, 1997. Pp. xx+ 572. Journal of Linguistics, 36(03), 645-664.
Watson, J. C. E. (2011). Word stress in Arabic. In M. Oostendorp, C. Ewen, E. Hume, & K. Rice (Eds.), The Blackwell Companion to Phonology. Volume 5 (pp. 2990-3018). Oxford: Blackwell.
Watson, J. C. E., and Bellem, A. (2011). Glottalisation and neutralisation in Yemeni Arabic and Mehri: An acoustic study. In Z. M. Hassan & B. Heselwood (Eds.), Instrumental Studies in Arabic Phonetics (pp. 235-256). Amsterdam: John Benjamins.
Watson, J. C. E., and Wilson, J. (2017). Gesture in Modern South Arabian Languages: variation in multimodal constructions during task-based interaction. Brill's Journal of Afroasiatic Languages and Linguistics, 9(1-2), 49-72.
Wedekind, K., Wedekind, C., and Musa, A. (2005). Beja pedagogical grammar.
Weiss, D. (2009). Phonologie et morphosyntaxe du maba. Unpublished PhD dissertation, Université Lumière Lyon 2,
Weninger, S. (2011). Old Ethiopic. In S. Weninger, G. Khan, M. P. Streck, & J. C. E. Watson (Eds.), The semitic languages: an international handbook (pp. 1124-1141). Berlin: DeGruyter Mouton.
Wolff, E. (1987). Consonant-tone interference in Chadic and its implications for a theory of tonogenesis in Afroasiatic. In D. Barreteau (Ed.), Langues et cultures dans le bassin du lac Tchad (pp. 193-216). Paris: ORSTOM.
Yip, M. (2002). Tone. Cambridge Cambridge University Press.