29 Suprasegmental phonology

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This chapter examines what is an under-researched field encompassing stress, tone, and intonation. Apart from summarizing the relatively little that is known about intonation in the area under scrutiny, the chapter is primarily concerned with stress systems. Of particular interest is that recent research has suggested that for several western Austronesian languages, including most notably Indonesian, stress is entirely absent. The sporadic appearance of tone in western Austronesian languages (including Chamic and West New Guinea) is notable for the variety of tonal systems found and the role of contact with non-Austronesian tonal languages.

1.0   Introduction

In this chapter, we investigate stress, tone and intonation as it relates to western Austronesian languages and offer a typological overview of the region's prosodic systems. A major focus of the chapter is on the difficulties posed by Austronesian languages for canonical analyses of stress systems. Although the stress systems of many Austronesian languages have been described and most grammars contain a short note on stress, these descriptions have been almost entirely impressionistic. It is now clear that perception biases have colored these impressions and, as a result, wide swaths of the descriptive literature. A small body of work examines this problem with regard to Malay varieties and concludes that several of these varieties, contrary to traditional descriptions, show no word stress at all. On this analysis, typical correlates of stress, i.e. prominence in pitch, duration and intensity, originate on the phrase level rather than the word level. The distribution of Austronesian languages without word stress and the implications of stresslessness are still open questions which can only be solved through careful documentation of prominence patterns across contexts and genres. We show below that stresslessness also plays a role in Philippine prosodic systems, even those which are described as showing a lexical penultimate vs. ultimate stress distinction. On the other hand, we also find robust evidence for word-based stress patterns in the Pamona-Kaili and South Sulawesi languages, among others. The western Austronesian area shows an impressive diversity of prosodic patterns and the current chapter seeks to bring some order to the descriptive landscape. We hope this contribution can aid those who would take up the challenge of finding an underlying unity between these systems and their diachronic development.

2.0   Typological overview

The typology of stress systems has been investigated rather vigorously over the last decade and a half. Work on prosodic typology, on the other hand, has gotten a later start and is, comparatively speaking, still in its nascence (see the papers in Hirst & DiCristo 1998 and Jun 2005, 2014, and the chapters in Gussenhoven 2004 and Ladd 2008), with very little work as of yet dealing with Austronesian languages. We thus first discuss how Austronesian languages have been described in the stress typology literature and introduce what appears to be a more appropriate typology.

   The StressTyp database (Goedemans & van der Hulst 2009) together with the four chapters by Goedemans & van der Hulst in the World Atlas of Linguistic Structures (Goedemans & van der Hulst 2013a, 2013b, 2013c, 2013d) are the first to provide a wide-

scale typological overview of the Austronesian family. Van Zanten & Goedemans (2007), Van Zanten et al. (2010) and Goedemans & van Zanten (2014) provide surveys and summaries specifically targeting Austronesian languages based on this database.

Goedemans & van der Hulst find that 80% of the WALS sample contains regular (rule-based) word stress. They make a primary division between fixed stress and variable stress languages which corresponds closely to the common notions of weight-insensitive and weight-sensitive stress, respectively. They categorize fixed stress patterns into various types based on the location of stress with regard to the word edge. In the "variable" type, stress assignment may be sensitive to syllable weight, vowel quality and, in rare cases, even tone. Other parameters handle the direction of footing, trochaic versus iambic stress and extrametricality. Van Zanten & Goedemans (2007:78), in their review of the Austronesian and Papuan data in the StressTyp database, note that 80% of Austronesian languages within their sample show fixed penultimate stress, noting that for "the Western MP sub-group this percentage is even higher" (2007: 80). Initial stress, despite being found in roughly one third of the world's languages, is vanishingly rare in Austronesian. Very few Austronesian languages in the StressTyp database are said to use stress distinctively. Finally, they note that "Austronesian languages basically follow the main global patterning in that stress is located at the right-hand side of the word, mostly on the penultimate syllable" (van Zanten & Goedemans (2007: 87).

Unfortunately, the impressions gleaned from this work are somewhat misleading in several respects.[1] First, there are numerous cases where a language's prosodic system appears to have been misrepresented.[2] Second, the category "no fixed stress" is problematic as it conflates languages with mobile stress (e.g. to avoid stressed schwa) together with languages that have phonemic stress distinctions. These properties are unrelated to each other and grouping them together occludes an important pattern in the western Austronesian area. Namely, phonemic prominence distinctions on the root level are common in the Philippines but very rare in Indonesia. Third, the geographic distribution of final syllable prominence/stress tilts strongly towards the western edges of the Austronesian area, although this does not emerge clearly from the sample.

Thus, the generalization that Austronesian systems mostly have penultimate stress must be qualified carefully.[3] In order to make better sense of the typological landscape, we tentatively propose to classify western Austronesian languages into the following prosodic prototypes:

> **Philippine prototype:** Phonemic vowel length distinction in open penultimate syllables. Long vowels and both initial and final phrase edges are tonal targets. Suffixes but not clitics shift length rightwards.

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[1] The developers realize the inherent weaknesses of such a far-reaching survey. StressTyp is presented as a guide to the literature and a tool for finding languages of interest for further investigation. "[U]sers of StressTyp are recommended to always consult the primary sources (if not speakers) before making hard-and-fast claims about a certain language." (Goedemans & van der Hulst 2014:120).

[2] Tiruray, for instance, is classified as being an antepenultimate outlier in the Philippines but is not described by the relevant sources as such. Tagalog is categorized as a trochaic language with penultimate stress, neither of which are correct. Bikol, which is nearly identical to Tagalog in relevant respects, is described as trochaic with no fixed stress. Cebuano and Aklanon which crucially do show minor evidence for trochaic patterning are conversely categorized as iambic languages. Section 4 below provides further details for these assessments. Acehnese is treated as a trochaic language by Goedemans and van der Hulst (2013d) but, based on the same sources, its stress pattern is summarized by van Zanten et al (2010) as "Primary stress on the final syllable. Secondary stress on the first syllable, unless this syllable contains the vowel /ɯ/."

[3] See Tadmor (2000), Zorc (1978, 1993), Wolff (1993), Blust (2013:175-80) and Kaufman (in progress) for further discussion.

Eastern prototype: No phonemic length/stress distinctions. Predictable penultimate word-level stress commonly shifting to final stress if penult contains schwa. Suffixes and possibly certain enclitics included in the stress window. Penultimate prominence may be phrasal rather than word-based, especially in fast speech, i.e. prominence only occurs on the penultimate syllable of a phrase and not on every (phonological) word.

Java prototype: No length distinctions and no word-level prominence. Prominence in pitch, duration and intensity is inherited from higher prosodic levels (prosodic phrase and intonational phrase). Effects of suffixes and enclitics on prominence are variable and difficult to discern.

Western Rim prototype: Final prominence either on the word or phrase level.

Good exemplars of these types include Tagalog (Philippine prototype), Kulawi (East prototype), Javanese (Java prototype) and Acehnese (Western Rim prototype). As areal prototypes, we of course find many exceptions. Many if not most of the indigenous languages of Mindanao in the Philippines have no length distinction on roots and thus appear more compatible with the Eastern or Java prototype. Tboli and Blaan, on the southern coast of Mindanao, pattern with the Western Rim prototype. In some cases, closely related Philippine languages appear to differ in whether they have phonemic length/stress contrasts. As Lobel (2013:287) notes, Maranao does not appear to have stress contrasts but its sister language, Maguindanao does (Sullivan 1986:11). Lobel further notes the loss of phonemic stress/length in Rinconada Bikol while Zorc (1978) and Himes (1998) discuss the same phenomenon in the South Cordilleran of Philippine languages. The exact delimitation of the Eastern and Java prototypes, both in their phenomenology and their geographic extent, is complex, as further discussed below.

The Western Rim Prototype is likely the result of contact with Mon-Khmer languages, in mainland Southeast Asia where final prominence is the norm.[4] This has been well documented for those Austronesian languages that have had the heaviest contact, namely, the Chamic languages (Thurgood 1999), Moken (Larish 1999, 2005) and Acehnese (Durie 1985), all of which show strong final syllable prominence. In the case of the Chamic languages, the adoption of a Mon-Khmer prosodic template has even led to canonical sesquisyllabic words and the development of register and tone (Thurgood 1999, Brunelle 2005). The distribution of this pattern in Austronesian, however, is not simple. In addition to the languages just mentioned, final syllable prominence is also found in western and northern Borneo, e.g. Salako (Adelaar 2005:21), Bidayuh (Rensch 2006:48-49), Begak (Goudswaard 2005:35), as well as Sumatra, e.g. Sikule (Kähler 1955), Gayo (Eades 2005:31), Besemah (McDonnell 2014), Lampung (Walker 1975) but exceptions abound. For instance, two languages of the Barrier Islands, Nias and Mentawai have penultimate prominence despite being located on the far western Rim of the Austronesian area. Batak languages make morphological use of prosodic prominence but have a generally penultimate pattern. Thus, there is no solid area of final syllable prominence in Indonesia in the same way that we find large penultimate zones throughout eastern Indonesia. Nonetheless, the center of gravity clearly sits on the border of

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[4] Jenny et al (2015:38) summarize the situation, "The vast majority of AA [Austroasiatic] languages, which are sesquisyllabic, are strongly iambic, i.e. the first minor syllable is weak and unstressed and followed by a strong stressed main syllable. This pattern is not confined to AA languages in mainland Southeast Asia but is also found in other languages of the area, e.g. in Thai (Bennett 1994), or Burmese (Green 2005)." Note that this holds true for Austroasiatic languages that have been in heavy contact with Austronesian, as with the Aslian languages of Malaysia. Kruspe (2004:40) states that in Semelai, "the domain of word stress is the final syllable and there is no secondary stress. Only phonological words bear stress. In the case of words bearing suffixes, stress shifts from the root to the suffix." Burenhult (2005:38) describes a similar pattern for Jahai.

the Southeast Asian mainland and this is likely to have developed through contact.[5] Lacking essential information and first hand experience, we will have nothing more to say on prosodic characteristics of the Western Rim languages in the remainder of this chapter and all generalizations we offer should be understood *not* to include these languages.

The distribution of the stressless Java prototype has yet to be investigated systematically, as it has only recently gained acceptance as an independent type. On Java itself, Javanese, Sundanese, Madurese and local varieties of Malay all appear to lack a consistent pattern of word stress (cp. Goedemans & van Zanten 2014:90, Stoel 2006 and references therein). Davies' (2010:51) description of the Madurese state of affairs seems to hold equally for other languages of Java:

> "Word stress is not a salient feature of Madurese, and receives little mention in the literature, e.g. Stevens (1968) mentions it only in passing. As pointed out by Ogloblin (1986), it is likely that the intonation group is the lowest relevant phonological unit in Madurese (which roughly coincides with what Uhlenbeck (1975) refers to as the 'sentence segment' in Javanese). Words uttered in isolation exhibit stress on almost any syllable in the root; in consecutive repetitions of single words stress may fall on the first syllable in the first instantiation and on the second in the next and vice versa."

It is unclear whether many Malayic languages of Borneo and Sumatra also belong to this type. Ngaju Dayak in Central Kalimantan, impressionistically, at least, appears to show remarkably even prominence across syllables. Tadmor (2000) posits that lack of lexical accent is a general western feature that extends through Sumatra and Borneo. It seems, however, that Sumatra and Borneo show considerable variation, in addition to ongoing changes induced by contact with varieties of Malay.[6]

It is relatively clear that the Java Prototype is very rare in the Philippines, with Central Tagbanwa, perhaps, being the best candidate based both on Scebold's (2003) description and our own auditory impressions. It may also be present in the northern half of Sulawesi where the Tomini-Tolitoli languages would appear to show the relevant characteristics, even though to date they have been generally described as being of the "fixed penultimate stress" type. Regarding the eastern boundaries, Himmelmann (2010) notes that Waima'a, in East Timor, can also be classified as a language without word-based prominence distinctions, and speculates whether the pattern is more widespread than previously recognized.

The case of the Tomini-Tolitoli languages is particularly interesting because most Sulawesi languages further south, including the neighbouring Kaili-Pamona languages, belong to the Eastern prototype, the exact extent of which also still needs to be determined. We have opted to call this the "Eastern prototype" rather than the "Sulawesi prototype" based on the speculation that it stretches as far east as the Oceanic languages (and actually includes most of these). Note that east of Java/Madura there is a strong tendency towards penultimate prominence. This also holds, for example, for Waima'a, the Tomini-Tolitoli languages as well as all eastern Malayic varieties such as Manado, Ambon or Papuan Malay. It is not straightforward to determine whether these languages belong to the Java or the Eastern prototype. They belong to the Java prototype if they lack word-based prominence-distinctions,

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[5] This corresponds to another areal feature first noted by Skeat and Blagden (1906:773, 435-438) and discussed further by Adelaar (1995:93-98): the presence of word-final preploded nasals found in Malayic languages (e.g. Salako, Kendayan, Mualang), Land Dayak languages and in the Austroasiatic Aslian languages of Malaysia. Adelaar suggests this could be the result of an Austroasiatic substrate in Borneo.

[6] In their discussion of stresslessness in Austronesian, Goedemans & van Zanten (2014:87) list the following as "likely candidates for reclassification as no-stress languages": Betawi Malay (Ikranegara 1988; Roosman 2006), Indonesian, Javanese (Ras 1985), Kulamanen (Dubois 1976), Malay (Malaysia: Winstedt 1927; Wehl 1961), Minangkabau (Adelaar 1995), Mongondow (Dunnebier 1929), Sundanese (Clynes 1995), Wetan (de Josselin de Jong 1987).

the characteristic penultimate prominence audible in these varieties being phrasal, not lexical. Otherwise, they would belong to the Eastern prototype. Section 4 further expounds this problem.

The eastern Indonesian languages Manggarai, Ngad'a, Lamaholot, Woisika, Leti, Selaru, Wolio are classified as "no fixed stress" in the StressTyp database because they avoid stressed schwa and thus show "variability". However, all of them are otherwise described as displaying penultimate stress and fall squarely within the Eastern Prototype. Even Dobel, a rare example of an eastern Indonesian languages that shows phonemic/lexical stress, as shown in (1), is described as having penultimate stress as its basic pattern (Hughes 2000:135).

(1)   *Dobel* (Hughes 2000:135)
        /da-ˈtabay/   'they carry (on shoulder)'   /ˈʔala-y/   'its/his skin'
        /da-taˈbay/   'they hit'   /ʔaˈla-y/   'kind of lemon'

We have introduced here a tentative geographic typology of prominence patterns in Austronesian languages (excluding Oceanic and Formosan languages) which hopefully begins to further clarify the picture emerging from previous surveys. Further work in filling out the geography of prosody in Sumatra, Borneo and many parts of eastern Indonesia should reveal if the prototypes discussed above represent valid areal generalizations. Before taking a closer look at the details of the Philippine, Java and Eastern prototypes, it will be useful briefly to summarize the basic observations on intonation available to date as it is the interaction between lexical and phrasal prominences that is at heart of the distinction between these prototypes.
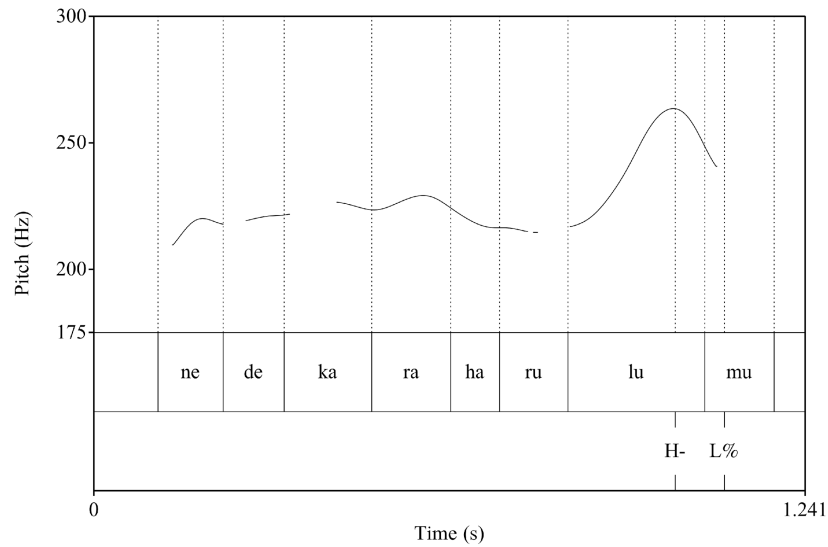
3. Intonation

Stoel (2005, 2006) has proposed analyses of the intonation of Manado Malay and Banyumas Javanese, the essential features of which have also been found for Malaysian Malay (Zuraidah et al. 2008), Waima'a (Himmelmann 2010), and Ambon Malay (Maskikit-Essed & Gussenhoven 2016). Note, however, that to date there is no well established standard analysis for intonational contours in western Austronesian languages and that much of what is reported here is still tentative.

The only truly obligatory part of an intonational contour in the western Austronesian languages investigated so far is a pitch excursion marking the right edge of intonational phrases (IP). This typically involves a rise to a prefinal H target followed by either a further rise (H%) or a fall (L%), as in example (2). There also tends to be a minor pattern where the prefinal target is L(ow), polar questions being a typical example. Throughout this section we will refer to the combination of the two tonal targets as edge tones, the final pitch excursion as a boundary tone (T%) and the target preceding it simply as "prefinal target". The core issue regarding the analysis of the prefinal target is the question of how it is linked to the segmental string. We will return to this issue below.

(2)   *Waima'a* (elicited)
        ne   de   kara   haru   lumu
        3s   NEG   like   shirt   green
        'S/he doesn't like the green shirt.'

Figure 1: Pitch track for (2)

Note that while the penultimate syllable of the phrase in Figure 2 obtains strong durational and intonational prominence (by virtue of the phrasal H tone), the penultimate syllable of the preceding word, *haru* 'shirt', which is incidentally the head of the noun phrase, receives no durational or intonational prominence whatsoever. It is this type of data that crucially separates out the role of word-based prosody and phrase-based prosody.

While it is widely acknowledged that in the national standard varieties Indonesian and Malaysian Malay, IP edge tones are not systematically associated with either of the two unit-final syllables, this appears to be more systematic in many other varieties including Toba Batak, Waima'a as well as eastern varieties of Malay (Manado, Ambon, Papuan). Here, the prefinal target appears to be regularly associated with the penultimate syllable and the final boundary tone with the final syllable, as seen in (3a) and (3b), from Papuan Malay. It is this type of example of a word spoken "in isolation", i.e. as a short IP, which has given rise to the widely made claim that all these languages have regular penultimate stress.

(3)   *Papuan Malay* (elicited)
    a.   baju   b.   baju mera
       shirt   shirt red

Figure 2: Pitch track for (3)
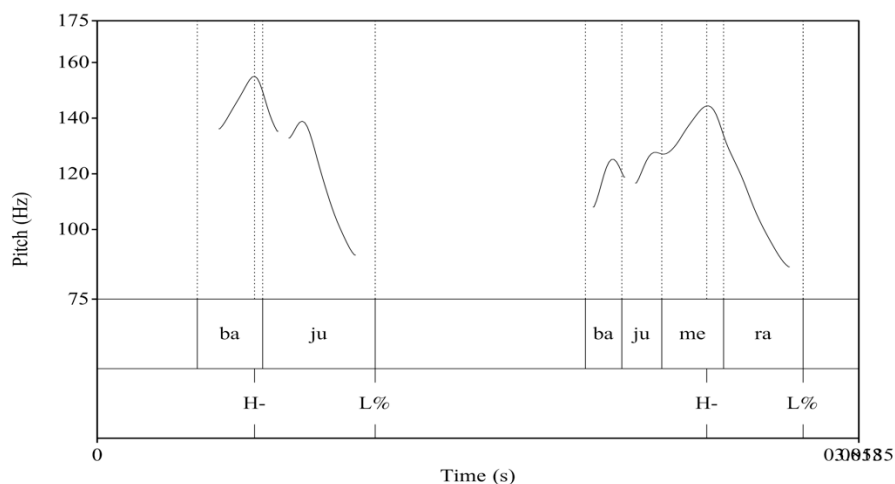
However, as seen in (3a) and (3b), all signs of prosodic prominence typically disappear when a given word does not appear in IP-final position, major pitch changes being limited to the final word of the phrase. This lack of prosodic prominence on units not occurring at the right edge of an IP is the perhaps most conspicuous difference between the Eastern and Java prototypes proposed in the preceding section. Compare the preceding two examples with (4) from Kulawi, a Pamona-Kaili language exemplifying the Eastern prototype. In this example, every phonological word is associated with a prosodic prominence (indicated by ʹ), not only the last one in the unit.

(4)   *Kulawi* (from a spoken narrative)
       nam-peˈgika   ˈdike=na   no-pa-ˈdapa   hiˈnoko=ra
       RLS.TR-wait   dog=3s.GEN   RLS.INTR-CAU-hunt   prey=3p.GEN
       '... his dog was waiting while he was hunting their prey.'

Figure 3: Pitch track for (4)

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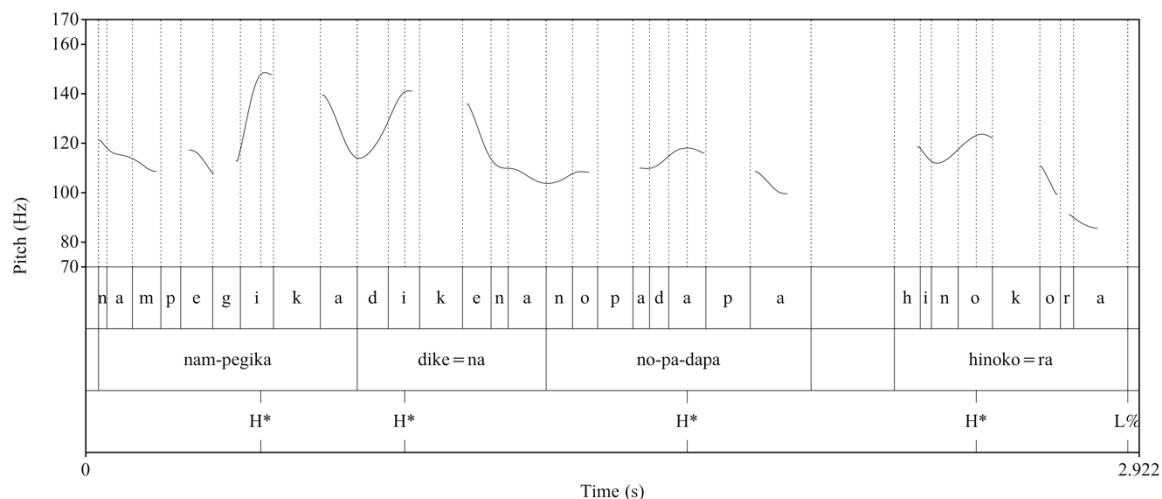
Regarding the association of the prefinal target with the penultimate syllable in languages of the Java prototype such as Waima'a and Papuan Malay, it should be noted that Maskikit-Essed & Gussenhoven's (2016) careful investigation of Ambon Malay shows that the f0 peak of the prefinal rise does not clearly align with either the final or the prefinal syllable. Instead, the best predictor for its placement is the duration of the IP-final rhyme, syllable or word, with a strong tendency for it to occur in the final syllable the longer these constituents are. They therefore propose an analysis of the IP-final edge tone combination as "floating boundary tones" (HL%). Obviously, further investigations are needed to determine whether such an analysis can also be supported for other instances of a presumed stress difference based on what is heard as a difference in alignment of the IP-final edge tone combination.

In addition to the bitonal target at the right edge, it has also been noted for many western Austronesian languages belonging to the Java and the Philippine prototypes that IPs often begin with a rise on the initial word, starting from an onset position typically in the middle of the speakers range. This rise is usually followed by a fall back to mid-range, the rest of the pitch trajectory in the IP being relatively level until the major excursion marking the right edge. In Philippine languages, IP-initial tones typically dock to the first or second syllable in the domain regardless of whether this syllable belongs to a lexical word or function word. The placement of domain-initial tones appears less strict than the positioning of domain-final tones in Philippine languages. An example can be seen in (5), where the initial H tone is located on the second syllable of the plural marker proclitic *maŋa*.

(5)   *Tagalog* (elicited)
        [maŋa baːtaː ŋaː pala sila]
        /maŋa=baːtaʔ=ŋaʔ=pala=sila/
        PL=child=EMPH=MIRA=3p.NOM
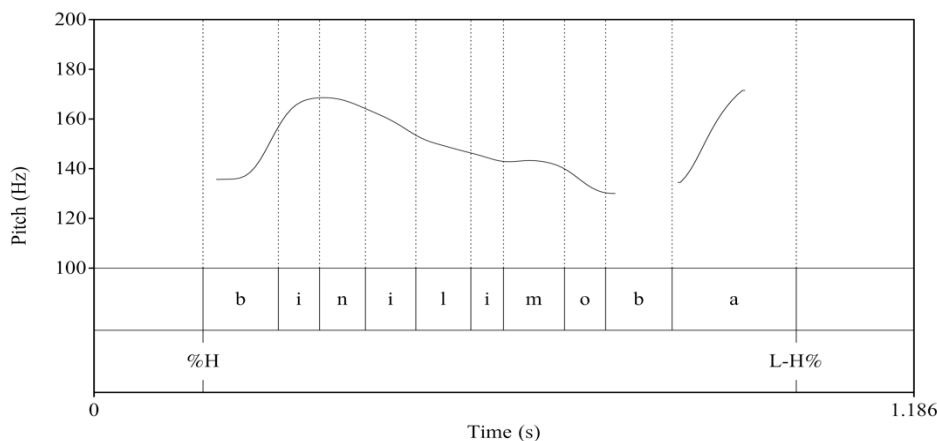   'They are really children!'

Figure 4: Pitch track for (5)
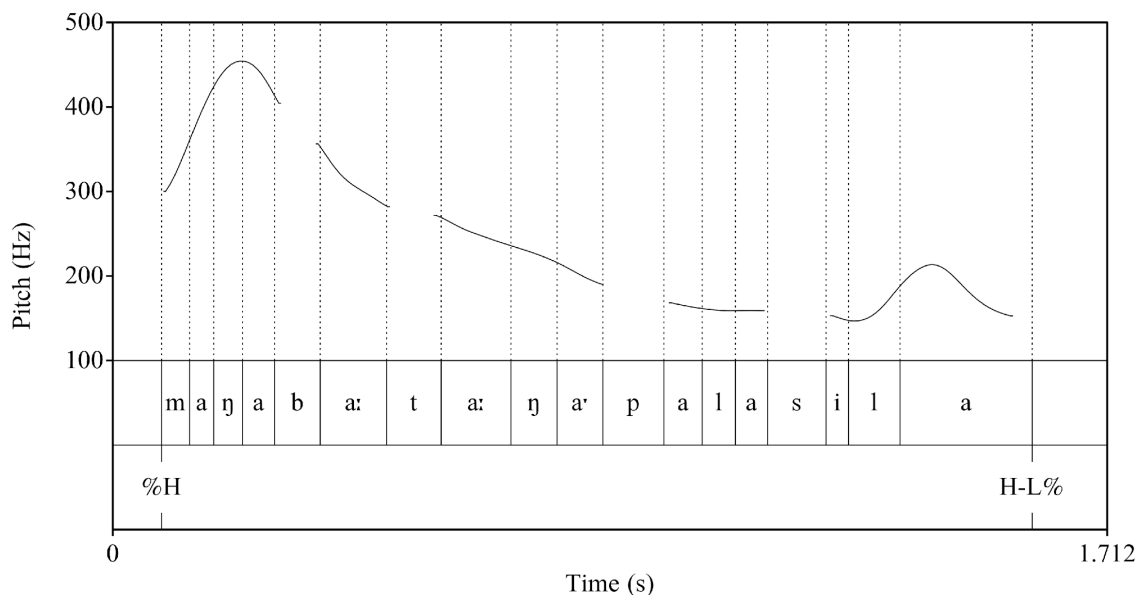
In (6), the initial rise is associated only with the first syllable of the verb *binili*. Note that no further prominence is associated with this verb, the final edge tone combination occurring on the question marking clitic *ba*.

(6) *Tagalog* (elicited)
  b<in>ili=mo=ba?
  <PRF.PV>buy=2s.GEN=QM
  'Did you buy (it)?'

Figure 5: Pitch track for (6)

As also illustrated by Figures 4 and 5, there are further crosslinguistic differences in aligning the IP-final edge tones to the segmental string. In languages belonging to the Java prototype, the association of the prefinal target is either highly variable in its association within a 3-syllable window or tends to associate with the penultimate syllable. In Philippine-type languages, IP-final edge tones are regularly associated with the final syllable, unless the penultimate syllable contains a long vowel. In the latter case, the prefinal target is typically reached on the long vowel. Importantly, penultimate closed syllables do not attract edge tones in Tagalog. As noted by Zorc (1993:19), this seems to be an important locus of variation in Central Philippine languages. Languages like Cebuano contrast here in that a closed penult does coincide with prosodic prominence e.g. [ˈtan.ʔaw] (Wolff 1972:x). An underlying form such as /basbas/ thus appears to have final prominence in Tagalog [bas.ˈbas] but penultimate prominence in Cebuano [ˈbas.bas], as discussed further below in section 3.2.

Languages belonging to the Java prototype typically show a layer of prosodic structure in addition to the initial rise and the bitonal target at the right edge. Longer IPs are often (but not necessarily) divided into smaller prosodically marked phrases, which we call phonological phrases (PhP) here (a widespread alternative term is *intermediate phrase*). The example in (7) from Waima'a contains two PhPs where H$ represents the PhP boundary tone.[7]

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[7] This is an ad-hoc device as we do not want to commit ourselves at this point, as to how this tonal target relates to the tonal targets on the IP level. We also do not commit ourselves to a specific analysis for the last bit of this example (*wake nini*) which in most ToBI-style analyses would also be interpreted as a PhP where the PhP boundary tone is overwritten by IP-level tones.

(7)   *Waima'a* (from a narrative)[8]

ne   kara data naha barse ne   whaka ige la   rihu ne'i wake nin(i)
3s   want alight if   seem   3s   fly   PTL LOC   fog   PRX   below POSS
   if it were about to land, then it should fly below the clouds

Figure 6: Pitch track for (7)
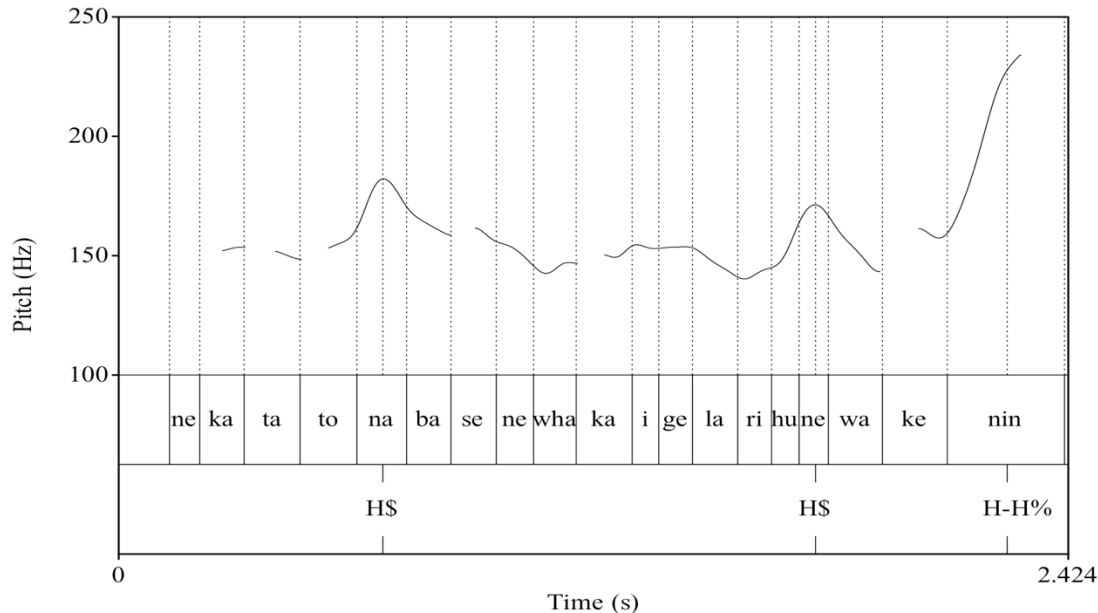
Importantly, as also seen in this example, no pauses or other rhythmic boundary markers occur at PhP boundaries. Similarly, there is no interruption of the overall pitch contour (i.e. no offset-onset phenomena). However, there is always a tonal reset in that the beginning of the following unit involves a (consecutive) fall to a lower pitch level. This PhP-initial low(er) target is often reached within the first syllable of non-initial PhPs, but it may also occur somewhat later (2nd or even 3rd syllable).

PhPs are of variable size but they are usually larger than a single phonological word and may span complete (subordinate) clauses, cp. the first PhP in (7) where *na(ha)* is a clause-final subordinator. The boundary marker for PhPs is a H(igh) tone on the unit-final syllable, its peak usually being located at the very end of it. This syllable is not markedly lengthened or otherwise prosodically highlighted in addition to hosting the boundary tone. In case there are two or more consecutive PhPs in an IP, the unit-final Hs tend to be downstepped. However, downstepping does not regularly include the IP-final edge tones, i.e. the prefinal H target or the final boundary tone of an IP are often (but not necessarily) higher than any of the preceding H targets marking PhPs, as again illustrated by (7). Himmelmann (2018) provides further details on PhP structure in languages of the Java prototype.

Returning to the more general discussion of intonation in Austronesian languages, it is very likely that the prosodic framework sketched here is not sufficient to capture all the relevant

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[8] Elision of syllables is common in natural Waima'a discourse. In (7), for example, the initial conditional clause *ne kara data naha* is shortened to *ne katatona*. The regularities of syllable elision and concomitant sound changes are, however, not yet understood.

intonational contrasts. Thus, for example, it has been noted for Manado Malay and the Javanese Palace language (see chapters in van Heuven & van Zanten 2007) that questions may involve a (more or less) continuous rise across most of an IP, usually after a minor initial drop. Furthermore, echo questions may have specific features such as being produced on a higher pitch level than the preceding statement. In fact, there appear to be various ways to expand the IP at right edge, after the IP-marking edge tone combination. Stoel (2005), for example, reports the option for Manado Malay to add a single further phrase after the IP-edge tones which tends to be flat and involves a highly compressed pitch range. But there are also various options for what may be termed intonational clitics, often determiners or conjunctions, which may occur after the IP-marking edge tone combination.

Similarly, systematic durational effects on the higher prosodic levels remain largely unexplored although it is a potentially rich area for uncovering the mapping of syntactic structure to PhPs. One recent exception is Hsieh (2016) who examines Tagalog verb durations in two conditions and shows evidence for closer prosodic integration of transitive subjects with preceding verbs when compared with objects. Richards (2010:165-182) also explores the structure of higher prosody in Tagalog with a view towards syntactic analysis and suggests an algorithm for locating edge tones associated with PhP. The prosodic typology of focus across western Austronesian languages is also still poorly understood but see Himmelmann (2018), Stoel (2005, 2007) and Kaufman (2005) for some discussion.

4. The problematic nature of word stress in western Austronesian languages

As discussed above, it has only been recently that the notion of word-stress in Indonesian languages has come under critical scrutiny, with the result that several languages are now generally analyzed as not making use of word-level stress at all. However, languages that appear to show phonemic use of word-level prominence distinctions, as in the Philippines, also present serious challenges to traditional notions of stress and prominence. In section 4.1, we review the literature on stresslessness as characteristic of the Java prototype and in 4.2 we discuss prominence patterns in Philippine languages. Section 4.3 provides a few more details regarding the Eastern prototype where clitics play an important role in determining the boundaries of the stress window.

4.1   Stressless languages of Indonesia (Java prototype)

Little effort has been made in the traditional descriptive literature to distinguish between bona fide word-based prominence and phrase-based prominence (a general problem for the study of word stress, as noted by Hyman 2014, Roettger & Gordon 2017). The bulk of the specialist work on stress relates to Standard Indonesian, the variety of Malay serving as the national language of Indonesia. As many other varieties of Malay, Indonesian has widely been claimed to have penultimate (primary) stress, unless the penultimate syllable contains a schwa, stress then shifting to the ultima (see Halim 1981, chap. 2 for a summary of the early literature and Cohn 1989, 1993 for a formalization of such an analysis). Beginning with Odé (1994), however, a group of Leiden phoneticians and phonologists has questioned this view in acoustic and perceptual investigations of presumed stress phenomena in Indonesia.

Van Heuven & van Zanten (2007) contains a detailed report on this work, which also extends to other Malayic varieties.[9] The main findings of this work can be summarized as follows:

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[9]   See van Heuven et al. 2008 for Betawi, Manado Malay and Kutai Malay, as well as Toba Batak; Zuraidah et al. 2008 on Malaysian Standard Malay; Maskikit-Essed & Gussenhoven 2016 on Ambon Malay. Further experimental and theoretical work in this area includes van Zanten, Goedemans & Pacilly 2003, Zanten & van Heuven 1998, 1994, Goedemans & van Zanten 2007, van Heuven & Faust 2009 and Goedemans & van Zanten 2014.

- strong L1 effects exist for the production and perception of potentially stress-related parameters in Indonesian, with L1 Javanese speakers having the least clear evidence for stress.
- speakers of Manado Malay and L1 Toba Batak speakers of Indonesian are more consistent in rendering a fixed (typically penultimate) syllable within words more prominent.
- perceptually, speakers rate examples where one of the final three syllables is made acoustically prominent by manipulating pitch, duration or overall intensity as roughly equivalent. Using a different methodology, Riesberg et al. (2018) find that speakers of Papuan Malay are unable to agree on which syllables are prominent in short excerpts of spontaneous narrative Papuan Malay speech.
- prominence distinctions among words appear to lack a communicative function in Indonesian. Thus, in gating experiments Indonesian speakers were unable to make use of prominence differences in the initial syllables. They were also unable to understand contrastive stress on the subword level (e.g. 'cof[FER] not cof[FIN]') as shown by their inability to judge the pragmatic appropriateness of examples involving such contrasts (van Heuven & Faust 2009).

Much of this work argues that what has been analyzed as word stress in Indonesian has no functional relevance for native speakers and that Indonesian and other varieties of Malay have no word-based prominence. These empirical studies build on older observations in the literature to the effect that Indonesian has phrasal rather than word-based accent (Halim 1974, Wallace 1976) and even older descriptive work during the Dutch colonial period work noting the weakness of stress in many languages of Indonesia. Goedemans & van Zanten (2014) propose a set of diagnostics for suspicious stress claims, noting that these apply to a broad range of Austronesian languages. At the same time, they posit that "the absence of stress might well be a family trait of the Malay languages, but that this feature has been introduced in the family through regional influences, be it in the distant past, or more recently" (Goedemans & van Zanten 2014:90). As noted earlier, the geographical centering of this pattern around Java suggests that regional influences may indeed be at play.

A purely phrasal analysis of prosodic prominence in Indonesian and other languages of the Java type, however, also faces certain challenges. The avoidance of intonational prominence on schwa, in particular, requires sensitivity to syllable-level distinctions. Given the findings of the research just discussed, it is fair to ask whether the avoidance of "stressed" schwa could also be a byproduct of perceptual bias on the part of Western linguists. This is unlikely, as it has been preserved in Malay varieties of eastern Indonesia where historical *ə has merged with other vowels (typically /a/). In these cases, the syllable with historical schwa still avoids prominence and thus subverts an apparent penultimate prominence pattern, e.g. Manado Malay *kobong* [koˈboŋ] 'field' from Malay *kəbun*.

Based on this phenomenon, word-level prominence has been described as contrastive in Kupang Malay (Steinhauer 1983), Manado Malay (Stoel 2007) North Moluccan Malay (Taylor 1983) and Papuan Malay (Kluge 2017). While this is a later development, as noted by Goedemans and van Zanten (2014), it clearly stems from the phonology of the Malayic parent language.[10] Moreover, we find similar prominence avoidance on schwa in Philippine languages, both those which have phonemic prominence distinction on roots and those that do not (Zorc 1993, Himes 1998). Languages like Ratahan, which have a predominant penultimate prominence pattern, have also developed a class of words with final prominence

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[10] This is not a feature of all Malay dialects that have lost the schwa. Soderberg (2014:204), for instance, notes that words with unstressed penultimate schwa in Malay, e.g. [ləˈsuŋ] 'mortar' correspond to stressed penultimate /a/ in Kedayan, e.g. [ˈlasuŋ].

from roots that historically contained *ə in the penult, as shown in (8) (van Zanten et al 2010:93-95).

(8)   *Ratahan* (Sneddon 1984, van der Hulst et al 2010:718)
   a.   mun-ˈdupa   b. mun-duˈpa (< PMP *dəpa 'fathom', Blust & Trussel ongoing)
       'to put'   'to measure a span'

Maskikit-Essed & Gussenhoven (2016) argue against word-level prosody in Ambon Malay, which was previously described by van Minde (1997) as having developed contrastive stress via the same process as the other Malay varieties cited above. They treat the /a/ derived from *ə as a mora-less vowel which they call "a-caduc" (on analogy with French *e-caduc*). The success of this analysis, however, depends very much on a detailed substantiation of their proposal that the tone combination occurring at the edge of an IP is a floating boundary tone linked to the phrase-edge.

The parameters of stressed schwa avoidance in other languages have properties that point more strongly in the direction of more typical word-based prominence, i.e. stress, systems. In Karo Batak, stressed schwa is avoided only in open syllables, as seen in the contrast between (9a) and (b). Furthermore, it is better to stress a penultimate syllable with schwa rather than shift the stress to a final syllable which begins with /ŋ/ or /h/, as seen in (9c) and (d). Such sensitivity to segmental context would be surprising for a purely phrasal phenomenon, unless inherent durational properties of the segments involved still allow for a phrase-based alignment of the edge-tone combination.

(9)   *Karo Batak* (Woolams 1996:11-12): schwa avoidance
   a. /pəkpək/   [ˈpəʔpəʔ]   c. /ləŋa/   [ˈləŋa]
   b. /mədəm/   [məˈdəm]   d. /ŋənəhən/ [ŋəˈnəhən]

Nonetheless, even in varieties of Malay/Indonesian that show more robust evidence for schwa avoidance and hence possibly word stress (e.g. Manado Malay), prosodic prominence never plays a morphological role, despite being unpredictable in a relatively small set of words. Speakers of Manado Malay and other eastern varieties may therefore also show signs of "stress deafness" just as speakers of Jakarta Malay do (see Riesberg et al 2018 for Papuan Malay). In the case of Batak and most Philippine languages, however, prominence does play a morphological role and speakers are consequently sensitive to its existence and location (van Zanten, Goedemans & Pacilly 2003, Roosman 2006). Importantly, then, a clear distinction should be made between acoustic/phonological and perceptual evidence for prominence distinctions. "Stress deafness" – as in the classic experiment by Peperkamp & Dupoux (2002) – primarily shows that prominence distinctions do not have a functional role to play in a given language. Such stress deafness does not necessarily preclude that a given system makes use of (more or less) fixed prominence distinctions of the word-level.

4.2   The Philippine challenge to universal stress

Philippine languages present different problems for stress typology as the majority of these languages have a phonemic distinction in prosodic prominence on the root level.[13] In Tagalog, the best studied language of the Philippines, this prominence has been alternatively analyzed either as the outcome of underlying stress or vowel length. Official Tagalog orthographic

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[13] See Zorc (1978, 1993), Ross (1992:47-54), Wolff (1993), and Blust (1997) for attempts to understand the history and proper reconstruction of this phonemic prosodic distinction in Austronesian.

conventions for indicating stress imply that final stress is word based: <gandá> 'beauty' and that penultimate stress is unmarked <ulo> 'head'. Both of these assumptions are likely wrong. Firstly, what has been analyzed as word-final stress is most likely a right-aligned edge tone. Secondly, it has been noted that roots with apparent "final stress" in Tagalog and other Philippine languages with distinctive prosody are significantly more common that those with "penultimate stress" (Blust 2013:178-180). Penultimate prominence should thus be considered the marked case for most Philippine languages.

The situation becomes clearer when we examine words in non-final positions, as shown in the examples below, where all syllables would be typically pronounced with even duration, intensity and pitch except the final one. The provisional stress marks in (10) simply indicate some form of perceived prominence.

(10)   *Tagalog*

    a. [taˈŋa]   b. [aŋ ta~taŋa   niˈla]

       stupid   DET PL~stupid 3p.GEN

       'stupid'   'How stupid they are!'

The "final stress" shown in (10a) is an artifact of the word's phrase-final position. When enclitics are added, as in (10b), there is no special prominence on the last syllable of the lexical word. It is therefore fair to say that "final stress" in Tagalog and many related languages is not word-based. Unlike this final prominence, penultimate prominence in the Tagalog word does *not* disappear in non-final contexts such as (10b). It does, however, shift with suffixation or, alternatively, is positioned according to word boundaries rather than root boundaries. For instance, [ˈbasag] 'break' becomes [baˈsagin] 'break (patient voice)' with the *-in* suffix. Again, unlike final prominence, penultimate prominence does not shift when the word is followed by clitics or other lexical material, e.g. [baˈsagin mo!] (break-PV 2S.GEN) 'break it!'. This, prima facie, looks like a proper stress system.

Treating Tagalog and similar Philippine languages as inherently stress-based (as French 1988 does), leads to a paradox in which closed syllables repel stress.[14] While roots with an open penult allow for penultimate (trochaic) or final (iambic) prominence, no possibility exists for a trochaic pattern when the penultimate syllable is closed, as shown schematically in (11).

(11)   Tagalog syllable structure with word-level stress analysis

    open penult   ˈCV.CV(C)   CV.ˈCV(C)

    closed penult   *ˈCVC.CV(C)   CVC.ˈCV(C)

This suggests strongly that length is the phonemic category that underlies penultimate prominence (following Schachter & Otanes 1972:15-18, Wolff et al. 1991:12, Wolff 1993:1, Zorc 1993 and contra Bloomfield 1917:141f; French 1988:63). The penultimate syllable of native roots can bear a long vowel, as in /ba:sag/ 'break' or not, as in /taŋa/ 'stupid'. Long vowels can only occur in the penultimate syllable when it is open, a cross-linguistically common pattern in which "super-heavy" syllables are avoided. The paradox of heavy syllables repelling stress is thus illusory. It must be stipulated that long vowels cannot occur

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[14] As Blust (2013:168-9) notes, the same is true for Ilokano, and other languages of the Philippines.

in final syllables, but this is also common cross-linguistically due to the neutralizing effects of final lengthening.[15]

Evidence from loanword phonology in Tagalog also suggests that vowel length is the key underlying feature. Spanish words with penultimate stress in open syllables, such as [ˈbala] 'bullet', retain prominence on the penultimate syllable via vowel length, i.e. [baːla]. Loan words with penultimate stress on closed syllables in the source language, on the other hand, such as [ˈlibɾo] 'book' [ˈbasta] 'enough, only', lose their penultimate prominence in Tagalog, becoming [libˈɾo] and [basˈta] (with final prominence in isolation).

An unusual aspect of Philippine prosodic systems is that they instantiate "length shift", a phenomenon far more familiar from stress. That is, the forms cited above as [ˈbasag] 'break' and [baˈsagin] 'break (patient voice)' are underlyingly /baːsag/ and /basaːg-in/. This can be explained as a structure preservation effect in light of the fact that long vowels never appear in (native) roots earlier than the penultimate syllable. Length shift thus preserves this generalization over suffixed words.

Length also plays an active morphological role in most Philippine languages and multiple long vowels can exist in morphologically complex words as a result. A minimal pair can be seen in (12), where reduplication without length yields a deaspectual nominalization and reduplication with length produces a form in the imperfective aspect. In both forms, however, a final edge tone docks within a disyllabic window aligned to the end of the phrase. If a long vowel exists within that window it serves to host the prefinal tonal target in the unmarked case.

(12)   *Tagalog*
     a. mag-na~ˈnaːkaw   b. mag-naː~ˈnaːkaw
         AV-NMLZ~steal   AV-IMPRF~steal
         'thief'   'will steal'

Following Wolff (1993) and others, the fundamental prosodic distinction in Philippine roots thus boils down to the possibility of long vowels in open penultimate syllables. The attraction of edge tones to long vowels gives the impression that some roots are inherently trochaic while others are inherently iambic but the reality is that in both instances phrasal tonal targets are associated with the final syllables of an IP, the association rules taking into account weight differences between penultimate and ultimate syllable.

        Some Philippine languages to the north of Tagalog also allow phonemically long vowels in *closed* syllables, at least on the word level if not the root level. Kapampangan, for instance, distinguishes between short /mag-/ and /pag-/ prefixes and their long counterparts to indicate aspectual distinctions, as shown in (13) (Gonzalez 1981:15-16). This type of length distinction on closed syllables is generally impossible in Central Philippine languages.

(13)   *Kapampangan*
     a. mag-doktor=ya   b. maːg-doktor=ya
        AV.PROS-doctor=3S.NOM   AV.PROG-doctor=3S.NOM
        'is going to become a doctor'   'is becoming a doctor'

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[15] Barnes (2002:260) notes in his typological survey that, "[l]anguages in which there is contrast between phonologically long and short vowels in all positions save word-final are extremely common cross-linguistically."

As already briefly mentioned above, the Visayan languages of the Central Philippine group provide for an interesting minimal pair with Tagalog. Just as in Tagalog, when the penult contains a long vowel, it attracts a pitch accent. Unlike Tagalog, the penult also attracts the prefinal target when it is a closed syllable. If both codas and long vowels are moraic, then the Visayan pattern can be described as in (14) (cp. Zorc 1972, Wolff 1972, van Zanten and Goedemans 2007:69), where H represents a heavy syllable, L represents a light (short and open) syllable and underlining represents the position of prosodic prominence.

(14)   Visayan prominence patterns

      H̲L   H̲H   LH̲   LL̲

The difference between Visayan languages and Tagalog could *prima facie* be modeled as a difference in what types of syllables are considered heavy; Tagalog only treats syllables with long vowels as heavy whereas Visayan also includes closed syllables in this category

      In yet other Philippine languages, such as Itawis, Pangasinan, Hanunóo and Palawan Batak, prominence is said to not be predictable on words with a closed penult at all (Blust 2013:177). The phonetics of prosodic prominence in these languages remains to be investigated and it is possible this type of pattern will require a considerably different analysis.

4.3   The stress window in the Eastern Prototype

Languages of the Eastern Prototype have word-based prominence, as already briefly exemplified above with (4) from Kulawi. The hypothesis here is that stress in these languages is generally penultimate. However, as also already seen in (15), surface prominence sometimes occurs on the penultimate syllable (*nampe'gika* and *nopa'dapa* in (15)), sometimes on the antepenultima (*'dikena* and *hi'nokora* in (15)). This can be explained as variation as to which clitics are included in the stress window. In Kulawi, both adverbial enclitics and possessor enclitics are excluded from the stress window, e.g. *bóne* 'field', *bóneku* 'my field' (Adriani and Esser 1939:9) in additions to *'dikena* and *hi'nokora* in (15). Enclitics in Kulawi do not attract prominence even when they are disyllabic, e.g. *hóu-kami* 'our house'. Function words such as *padena* 'then' in (16) do not attract prominence even when they appear to form a prosodic word of their own.

(15) *Kulawi* (from a spoken narrative)

    padena   mo-ˈmuli=komi

    then   IRR.AV-create=2p.NOM

    'you (go) create'

Figure 7: Pitch track for (15)
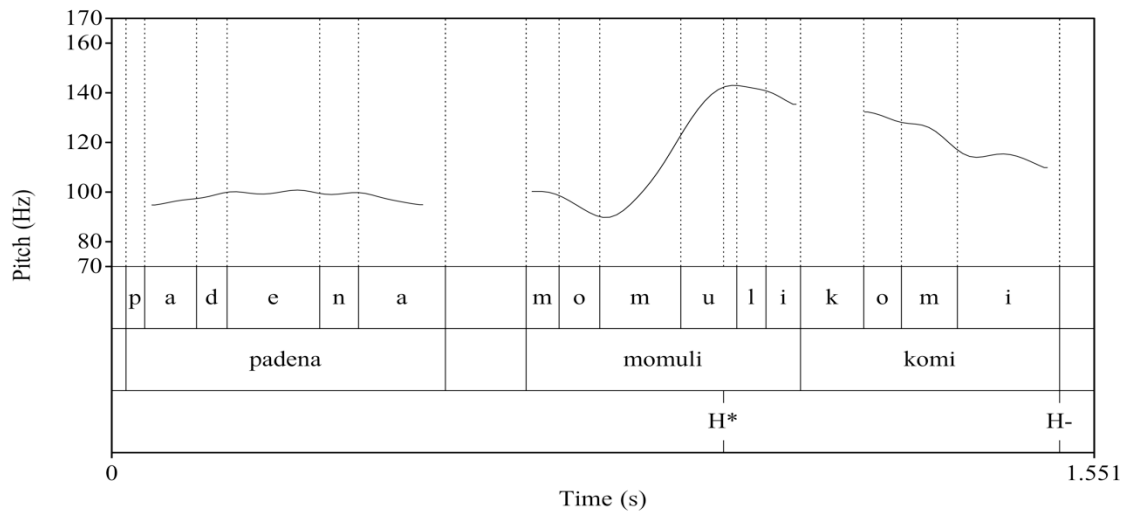
In Ledo, a neighboring Pamona-Kaili language, the stress window includes both possessor enclitics as well as second position adverbial clitics such as =*mo*, which is seen shifting the stress rightwards from what would be [naˈkuya] 'why' in (16).

(16)   *Ledo* (Kaufman 2010:43)

Nakuˈya=mo ˈledo ne-ˈguru   ˈia?

why=ALRD   NEG AV.BEG-study 3S

'Why is he not studying anymore?'

In yet other Pamona-Kaili languages, there are two classes of adverbial clitics, those which are included in the stress window and those which are not. Such a case is described by Martens (1988:172) for Uma where a small number of adverbial clitics such as *mpu'u* 'really' and *oa'* 'anyway' are included in the stress window. Excluded from this window is a large number of other types of clitics including those with pronominal, aspectual and adverbial functions.

In the South Sulawesi languages, possessor clitics, which attach to the right edge of noun phrases, are included in the stress window but second-position subject clitics and adverbial are excluded. We thus find accentual contrasts like that in (17).

(17)   *Makassarese* (cp. Jukes 2006)

a.   teˈdoŋ=ku   b.   ˈtedoŋ=ko

buffalo=1s.GEN   buffalo=2FAM.NOM

'my buffalo'   'you are a buffalo'

As shown by Jukes (2006), clitic stacking yields the expected results in Makassarese. Prominence remains penultimate within the prominence window and is unaffected by additional adverbial or absolutive clitics.

(18) *Makassarese* (Jukes 2006:90)

[ka-gassing-gassing-án=na]=mo

NMLZ-SUPER~strong-NMLZ=3s.GEN=CMP

'already at the peak of his strength'

In languages that avoid codas through the use of paragogic vowels, such as Lauje and Selayarese, among others, these vowels are ignored for purposes of assigning stress (Makassarese) or the association of edge tones (Lauje). Thus we find that epenthesis creates the appearance of antepenultimate prominence in words with an underlying word-final coda (Himmelmann 2005:118, Mithun & Basri 1986, Broselow 2000).

4.4   Concluding remarks

We have seen in this section that the western Austronesian languages pose different problems to typical metrical stress analyses in accordance with the prominence prototype they belong to. In the case of languages of the Java prototype, it appears that prominence comes from the phrase level rather than the word level and in some of these languages is positioned rather freely, in others it tends to be associated with the penultimate syllable. In the case of Philippine languages such as Tagalog, the stress literature tends to obscure the true nature of the system by not distinguishing between phrase-level (edge tones) and word-level phenomena (phonemic length distinctions). A better analysis is that long vowels attract edge tones and the possibility of a long vowel in open penultimate syllables (and typically only in such syllables) is a defining feature of a Philippine prosodic template.[18] Finally, in the Eastern prototype, the presence of a fairly robust penultimate stress pattern tends to be obscured by the fact that these languages differ quite significantly with regard to which (clitic) function words are included in the stress window. But they all agree in that at least some function words do not attract prosodic prominence quite unlike many of the languages belonging to the Java and Philippine prototypes where phrase-final function words may generally serve as anchors for edge tones in the same way as content words.

Segmental effects of prosodic prominence are scattered and irregular across western Austronesian languages but may also help disentangle word-based phenomena from phrase-based effects. Kapampangan shows vowel centralization, as in (19). Here it seems that lexical or morphological vowel length blocks /a/→[ə], as in (19b), but that the phrase final prominence that would obtain with a short penult is more variable in its blocking effects, as shown in (19a). This has not yet been well described and remains to be investigated further.

(19) *Kapampangan*

a.	[ənak] ~ [ənək]	b.	[aːnək]
	/anak/		/a~anak/
	child		PL-child

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[18] Zorc (1993) discusses several sources of length but many of these are secondary and not directly relevant to the system described here, which underlies many Philippine languages. For instance, some languages have developed distinctive word-final vowel length from the loss of codas, although this is very rare. As with many of the generalizations over areas and subgroups made here, the precise distribution of this prosodic template has yet to be determined.

Similarly, Kluge (2017:91 passim) claims for Papuan Malay that some vowels may be centralized in unstressed syllables and the (rather rare) palatalization of /s/ is restricted to unstressed syllables but these appear to be very sporadic processes, possibly reflecting acrolectal usage rather than a regular phonological alternation. A clearer example of segmental effects is the stress dependent ə/o alternation in Begak described by Goudswaard (2005).

5. Lexical tone

Most Austronesian languages do not use tone to distinguish lexical items. Distinctive lexical tone patterns have only been reported for a few geographically widely separated language groups, for which see Edmondson & Gregerson (1993), Remijsen (2001), Brunelle (2005), Blust (2013:657-659). In most instances, distinctive lexical tone is transparently due to contact influences and provides important evidence for tonogenesis. Tonal distinctions usually are restricted, either phonotactically (e.g. contrast only on final syllable) or with regard to permissible tone patterns per word (e.g. words bear either high or low tone). Tonogenesis often involves a shift from the strong preference for disyllabic words characteristic for the family to monosyllables as the most common word type. Edmondson & Gregersen (1993) contain specialist chapters for a number of the better studied Austronesian tone languages. With the notable exception of Arnold (2017) briefly discussed below, none of the available literature discusses intonation, hence nothing is known as to whether and how lexical tone interacts with postlexical tonal targets.

The most widely quoted examples for Austronesian tone languages are the Chamic languages spoken in southern Vietnam, Cambodia and Hainan (see Chap. **18 Chamic languages)**. Here tonal distinctions are claimed to be emergent due to contact with Mon-Khmer languages (Tai-Kadai languages and Chinese in the case of Tsat on Hainan) and are heavily constrained by syllable structure and segment type, being closely correlated with voice quality distinctions (Thurgood 1999). In fact, it has recently been questioned whether the relevant contrast in some of these languages may properly be analysed as tonal or rather as involving register distinctions (Brunelle 2005). Incipient tonal contrasts have also been claimed for varieties of Moklen spoken in Thailand (Larish 2005), but this is in need of further scrutiny.

The little that is known about the West New Guinea languages, which are mostly spoken on the islands along the Bird's Head and Cenderawasih Bay in eastern Indonesia, points to a bewildering variety of word-prosodic systems. These languages are part of the extended contact zone between Austronesian and Papuan languages along the island of New Guinea.

Monosyllabic words have a six-way tone contrast in Magey Matbat according to Remijsen (2007). From the few examples he gives, it appears that at least one syllable in polysyllabic words is toneless, but the position of tone-bearing syllables is not predictable. This contrasts with Moor, which is analysed by Kamholz (2014:101–106) as having four tonal patterns, largely confined to the final two syllables. More importantly, and rather unusually for a tone language, "tones are realized only on phrase-final words" (Kamholz 2014:102). Kamholz (2014:116 passim) also briefly mentions Yerisiam and Yaur as languages with a complex word tone system plus contrastive vowel length.

A particularly complex – and cross-linguistically unusual – word-prosodic system is found in Ma'ya, spoken on the Raja Ampat Islands. Remijsen (2001, 2002) makes a convincing case for an analysis in terms of both lexical stress and lexical tone. There are three tonal contrasts which are confined to the final syllable. In addition, lexical bases differ in whether they are stressed on the penultimate or ultimate syllable. That is, there are minimal pairs which differ only with regard to tone, e.g. sa^{12} 'to sweep' vs. sa^{3} 'to climb' vs. toneless sa 'one' (Remijsen 2002:596). And there are minimal pairs differing only in stress, e.g. $'mana^{3}$ 'light (of

weight)' vs. *ma'na³* 'grease' (Remijsen 2002:600). Importantly, Remijsen (2002:602–610) provides detailed acoustic evidence for the proposed stress difference, which includes not only duration measures, but also differences in vowel quality and spectral balance.

In Ambel, another Raja Ampat language, stress does not play a role according to Arnold (2017) and the overall organization of the system appears to be very different again. Here, words may, but do not have to, carry a high lexical tone, and there is at most one such tone per lexical word. That is, lexical tone is not obligatory, but cumulative. The H tone may occur on any syllable of a polysyllabic word. It also occurs on monosyllables, including some monosyllabic function words. In addition, there is a complex interaction between the lexical tone and a HL% boundary tone marking the end of declarative and imperative IPs (there are slightly different boundary tones for questions and continuations). This boundary tone is in general associated with the final syllable of the phrase, but its realization depends on whether the final word is lexical or functional, whether the final syllable is toneless or bears a lexical H tone, and whether the final syllable is light or heavy (the rhyme consisting of a vowel and a sonorant consonant). The final L is generally truncated when the final syllable is monomoraic. In case the final word is a toneless polysyllabic function word, the HL% boundary combination is spread across the final two syllables, hence the H target occurs on the penult. See Arnold (2017, chapter 2) for further details.

Systems such as the one just reported for Ambel are widely known as "lexical pitch accent" systems in the literature, a concept that has engendered controversy and confusion (cp. Hyman 2009 and Beckman & Venditti 2011 for very different views). In this regard, it is worth noting that inasmuch as word-based prominence in the languages belonging to the Eastern prototype manifests itself exclusively in a (typically high) pitch target, these languages would also be considered lexical pitch accent languages. Utsumi (2011) in fact uses a lexical pitch accent analysis for Bantik, a Sangiric language of northeastern Sulawesi.

6. Conclusion

In conclusion, we should like to emphasize the preliminary nature of the proposals contained in this chapter. The study of prosody in western Austronesian languages is still in its infancy and many of the claims found in the literature, especially regarding the presence and placement of lexical stress, are in need of further scrutiny, carefully combining evidence from production and perception and keeping phrase-level phenomena clearly separate from word-level ones.

The areal typology of prosodic systems sketched in section 2 cannot be but a first hypothesis hypothesis as to what kinds of prosodic systems to expect in the area. A major parameter of variation across the area appears to be the regularities of the association between phrase-marking edge tone combinations – so far found in all languages investigated – and the segmental string. This association may be highly variable as in the Java prototype or it may target the penultimate (Eastern) or the final syllable (Philippine and Western Rim prototype). A second parameter in this regard appears to be the role played by syllable weight, with vowel length distinctions being an important aspect in Philippine prosodic systems. A third parameter that comes into play in various systems is the distinction between lexical and functional items, the latter often showing slightly different regularities for association rules.

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