

A NOTE ON UNSTRESSABILITY

強勢不可能性に関する一考察

Armin Mester*[†] & Junko Ito*[‡] (アーミン・メスター, 伊藤順子)

*University of California, Santa Cruz (カリフォルニア大学サンタクルーズ校)

[†]National Institute for Japanese Language and Linguistics
(国立国語研究所) [2010.9-2010.12]

[‡]International Christian University (国際基督教大学)

Abstract: A familiar case of unstressability is the fact that crosslinguistically schwa is often excluded as a stress-bearing element. Here we show that in some languages, such as German, there is evidence for a different kind of requirement: Schwa must occupy the weak position of a trochaic foot, attracting stress to the preceding syllable.

《要旨》 シュワー母音が多数の言語において強勢不可能な要素であることはよく知られているが、本稿では、ドイツ語等のシュワーが強勢を担えないのは他の理由から説明されることを指摘する。シュワーは無強勢であると同時に、韻律構造の中で強弱格フットの弱音節に位置付けされなければならないため、その先行音節は強音節に位置し、必ず強勢が付与される。つまり、これらの言語におけるシュワーは、先行音節に強勢を引きつける特徴があると言える。

1. Introduction*

Many languages exclude schwa as the nucleus of a stressed syllable. The restriction comes in different flavors. In some languages, such as Dutch or English,¹ the ban is absolute, as shown in (1).

- (1) *cut* (x)
[¹kʌt]
- market* (x .)
[¹maɪkət]
- * (x)
[¹kət]

This is evidence for the existence of a constraint as in (2), where "x" indicates the head of a foot, its prominent position.

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¹ I.e., in varieties of English that maintain a distinction between (unstressed) [ə] and (stressed) [ʌ].

(2) NoSTRESSED-ə

* x
ə

While (2) is undominated in the grammar of a language like English, in another type of language it is a dominated constraint. As a result, stressed schwa is permitted, but only under special conditions. Thus in French, schwa-syllables that constitute clitics can be bearers of phrase-final stress, but final schwa-syllables in content words cannot, as shown by the segmentally similar pair of forms in (3).²

(3)	prens- ¹ lə	* ¹ prens-lə	<i>take it</i>
	*pren ¹ drə	¹ prendrə	<i>take</i>

To take another example, in the Austronesian language Tondano (see Sneddon 1975, Ball 2003, and Piggott 2010), canonical stress is penultimate or final. It falls on the penult when the final is light (has a short vowel) (4).

(4)	¹ wale	<i>house</i>	¹ wɛ:nu	<i>will be given by you</i>
	¹ wuter	<i>heavy</i>	ti ¹ kɔ:kɔ	<i>my throat</i>
	¹ ɔɔəm	<i>inside</i>	ki ¹ na:ŋku	<i>has been eaten by me</i>
	wa ¹ nua	<i>village</i>	manu ¹ a:sa	<i>one village</i>
	kari ¹ mɔŋkaʔ	<i>spider</i>	kapa ¹ ja:səm	<i>sour papaw</i>

When the final is heavy (has a long vowel), it attracts the stress (5).

(5)	¹ kɔ:	<i>arm</i>
	ma ¹ wɛ:	<i>is giving</i>
	məŋa: ¹ ŋa:n	<i>is continually eating</i>
	wa ¹ mɔ:ʔ	<i>will drink</i>
	ti ¹ kɔ:	<i>throat</i>

In other words, a standard analysis builds a quantity-sensitive trochee at the right word edge, as shown in (6).³

(6)	(x .)	(x .)	(x)	(x)
	... L L	... H L	... L H	... H H

In an OT analysis, the ranking WSP, FT=TROCHEE >> RIGHTMOST:ALIGN-R (¹σ, ω), where "ω" stands for "prosodic word", produces such a system.

² It is perhaps not irrelevant in this context that French schwa phonetically possesses a significant degree of lip rounding, and, as Ryan Bennett points out, that French stress is really phrasal, and arguably not foot-based.

³ Here shown with a classical quantity-sensitive trochee, with HL feet permitted. Moraic-trochaic footing would be another option.

(7)

a. LLL	WSP	Ft=Trochee	Al-R ($'\sigma, \omega$)
▶ L ('LL)			*
('LL) L			**!
L (L'L)		*!	
b. LHL			
▶ L ('HL)			*
('LH) L	*!		**
L (H'L)	*!	*	
c. LLH			
▶ LL ('H)			
('LL) (H)			*!*
L ('LH)	*!		*
d. LHH			
▶ L (H) ('H)			
('LH) (H)	*!		**
L ('H) (H)			*!

Tondano shows an elaborate system of stress-avoidance for schwa, with the option of stressing schwa when no other vowels are available. In words ending with the sequence schwa-syllable followed by a final L, the expected stress should fall on the penultimate schwa. This is not what happens: When the word has three or more syllables, stress falls on the antepenult, provided its vowel is not schwa (8) .

- (8)
- | | |
|------------|--|
| wiŋ'kɔtəna | <i>will be asked by him</i> |
| 'ka:nəna | <i>will be eaten by him</i> |
| ikə'tɔrəna | <i>will be used by him to cut with</i> |
| kə'tɔrəna | <i>will be cut by him</i> |

This is evidence for the ranking NoStressed-ə above RIGHTMOST.

(9)

wiŋkɔtəna	NoStressed-ə	Ft=Trochee	Al-R ($'\sigma, \omega$)
▶ wiŋ ('kɔtə) na			**
wiŋkɔ ('təna)	*!		*
wiŋkɔ (tə'na)		*!	

When the vowel of the antepenultimate syllable is also schwa, or there is no antepenult because the word has only two syllables, stress falls on the final syllable, provided its vowel is not schwa (10) .

- (10)
- | | |
|------------|-------------------------|
| rəmə'dej | <i>is standing</i> |
| mərərə'dej | <i>intends to stand</i> |
| sə'ra? | <i>fish</i> |
| ə'sa | <i>one</i> |

This means that NoStressed-ə outranks Ft=Trochee, resulting in iambic footing and satisfying RIGHTMOST.

(11)

rəmə'dej	NoStressed-ə	Ft=Trochee	Al-R ('σ, ω)
▶ rə (mə'dej)		*	
rə ('mədej)	*!		*
('rəmə) dej	*!		**

Finally, in all-schwa-words like those in (12), stress falls on the penult (attested examples of this kind are apparently all disyllabic).

(12)

'rəpət	<i>fast</i>
'wəʔŋəl	<i>stupid</i>
'pərəŋ	<i>blind</i>
'ələw	<i>lid</i>

The OT analysis developed so far (WSP, NoStressed-ə >> Ft=Trochee >> RIGHTMOST, with high ranking IDENT-VPLACE and HEADEDNESS (ω)) correctly predicts penult schwa stress.

(13)

rəpət	Headedness (ω)	Ident-VPlace	NoStressed-ə	Ft=Trochee	Al-R ('σ, ω)
▶ ('rəpət)			*		*
(rə'pət)			*	*!	
('repət)		*!			*
rəpət	*!				

2. German schwa

German is a language where stressed schwa is categorically ruled out. Interestingly, recent work has shown that, over and above the unstressability of schwa, a different restriction is at work: Schwa should be the weak member of a foot – i.e., besides being ruled out as the prominent member of a foot, it is also ruled out as an unfooted syllable. Observationally speaking, schwa-syllables need to occur in post-stress positions. As will be seen, this constraint is a dominated one and hence violated under certain conditions, but there are many situations where it is operative. This kind of pattern is of interest because it provides a window on the hidden underlying rhythmic structure whose overt manifestation is stress, in the conception of metrical form inaugurated in the work of Liberman and Prince (1977) and others. Beyond the dichotomy of the "stressed" and the "unstressed", there is a dichotomy between two kinds of unstressed syllables: the "footed" and the "unfooted" (McCarthy 2008, Bennett 2009).

As background, we begin with a short summary of the stress system of German. With very few exceptions, word stress is limited to the last three syllables of the word and, as in Dutch and English, works along the lines of the familiar Latin stress rule, with some variations and modifications. First, superheavy finals (long vowel followed by one or more consonants, short vowel followed by two or more consonants, diphthong with or without following

consonants) are stressed in the majority of cases.⁴

(14)	V:C ₁	VCC ₁	VVC ₀	Glosses		
	Ban'di:t	A'larm	Ab'tei	<i>robber</i>	<i>alarm</i>	<i>abbey</i>
	Ath'le:t	At'test	a'hoi	<i>athlete</i>	<i>certificate</i>	<i>ahoy</i>
	Atten'ta:t	Ef'fekt	al'lein	<i>assassination</i>	<i>effect</i>	<i>alone</i>
	Des'po:t	Hori'zont	Ap'plaus	<i>despot</i>	<i>horizon</i>	<i>applause</i>
	Dis'pu:t	Kon'zert	Papa'gei	<i>dispute</i>	<i>concert</i>	<i>parrot</i>
	Ko'me:t	O'lymp	Par'tei	<i>comet</i>	<i>Olymp</i>	<i>party</i>
	Pa'pi:r	Pro'dukt	Poli'zei	<i>paper</i>	<i>product</i>	<i>police</i>
	Para'di:s	Re'zept	Ra'dau	<i>paradise</i>	<i>recipe</i>	<i>row</i>
	Pi'ra:t	Ta'lent	Samu'rai	<i>pirate</i>	<i>talent</i>	<i>samurai</i>
	Ta'ri:f	Tu'mult	Thera'peut	<i>tariff</i>	<i>riot</i>	<i>therapist</i>

In final position, superheaviness reduces to heaviness (bimoraic status) if word-final consonants do not carry a mora. With this assumption, the rest follows along familiar lines: When the penult is heavy, it is stressed; when it is light, stress falls on the antepenult (in words of three or more syllables). Writing "σ" for "syllable" (of any weight), "H" for "heavy syllable", and "L" for "light syllable", we have the following.

(15)	... σ σ'H]ω	... σ'H L]ω	... 'σ L L]ω			
	Papagei	Hibiskus	Tremolo	<i>parrot</i>	<i>rose mallow</i>	<i>quaver</i>

The pattern here amounts to a quantity-sensitive trochee at the right word edge, with final consonants not carrying moras.

(16)	x	x .	x . .
	L L (H)	L (H L)	(L L) L
	Papagei	Hibiskus	Tremolo

As in Dutch, the most controversial issue in German is the behavior of open syllables with long vowels. Besides the question of whether length or vowel quality (tense vs. lax) is the operative feature, there has been a long-standing debate whether long vowels make syllables heavy. For our purposes, we can proceed under either assumption. There are good reasons to assume, however, that such syllables behave as light for purposes of the stress system, different from both closed syllables and from open syllables with diphthongs. This is no doubt related to the fact that there is a process of vowel lengthening in open syllables. For concreteness, we follow Zonneveld, Trommelen, Jessen, Rice, Bruce and Árnason (1999)(see also the literature cited there) in assuming that long vowels per se do not make syllables heavy. This is why we generally get antepenultimate stress when the penult is open and has a long vowel (underlined), provided the final is not superheavy (see (14) above).

⁴ Examples are given in German orthography, with phonetic details only indicated when essential (e.g., schwa and vowel length).

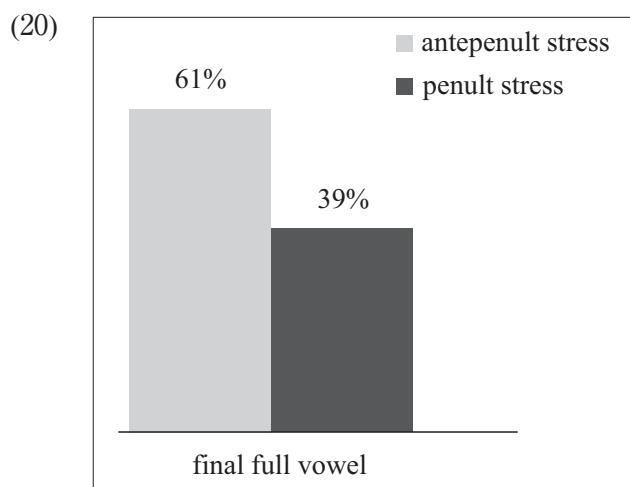
(17)	E'lisabeth	'Alibi	'Exodus	(name)	alibi	exodus
	'Domino	'Marabu	'Albatros	domino	(name)	albatross
	'Tremolo	'Anorak	'Lexikon	quaver	anorak	lexicon
	'Kolibri	Indi'viduum	Cur'riculum	hummingbird	individual	curriculum
	'Gigolo	A'naphora		gigolo	anaphor	
	'Paprika	in'cognito		paprika	incognito	

The issue is not entirely straightforward because this pattern in (17) is not exceptionless, but only a statistical tendency. Penult stress is also found under these circumstances, as the examples in (18) show. The choice is lexically determined, and the antepenultimate pattern is considerably more frequent.

(18)	A'roma	Mos'kito	Ar'thritis	aroma	mosquito	arthritis
	Bi'kini	Mu'seum	Hi'atus	bikini	museum	hiatus
	Ka'sino	Bo'tanik	Abraka'dabra	casino	botany	abracadabra

On the basis of the data presented in Féry (1998), which are extracted from the large lexical database CELEX developed at the Max-Planck-Institute in Nijmegen, and focusing on trisyllabic monomorphemic words (and disregarding all cases of final stress), we find the following distribution of antepenult and penult stress in words with full vowels in their last syllable.

(19)		final full vowel
	antepenult stress	217 (61%)
	penult stress	136 (39%)
	Total	353 (100%)



Against this background, it is significant that in words ending with a schwa syllable the antepenultimate pattern is very rare. Word stress in such examples is overwhelmingly penultimate, as in (21).

- (21) Apothe'osə Lokomo'tivə Kara'wanə *apotheosis locomotive caravan*
 Me'thodə Zi'tronə Anti'löpə *method lemon antelope*
 Ta'petə West'falən O'boə *wallpaper Westphalia oboe*
 A'ka[zjə] Ok'tobər Tro'phäə *acacia October trophee*

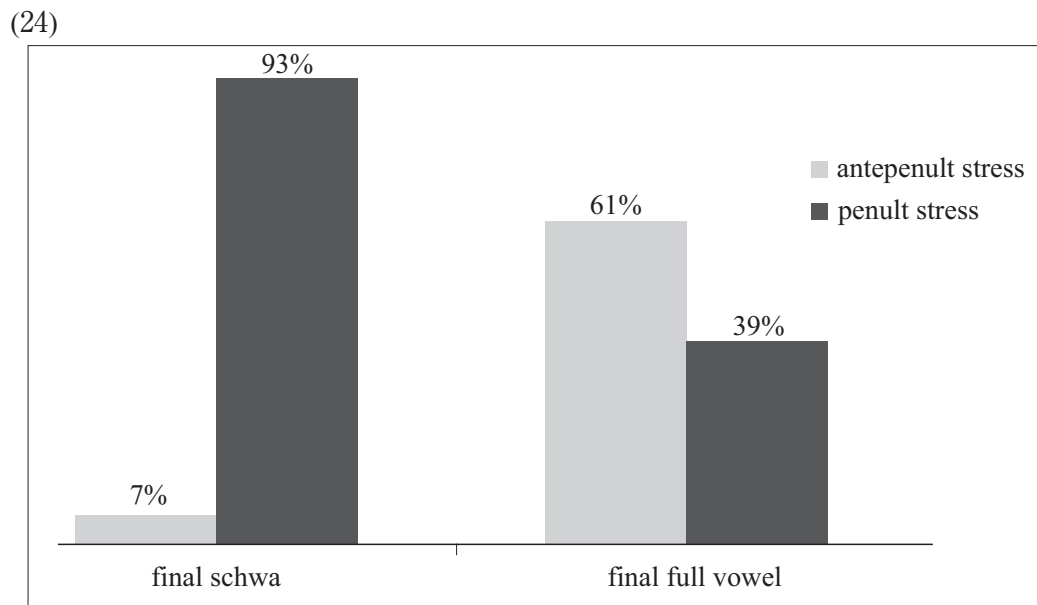
The post-stress generalization for schwa-syllables has exceptions, but as Zonneveld, Trommelen, Jessen, Rice, Bruce and Árnason (1999) show, most of these are obscure compounds or pseudo-compounds as in (22) (there are often independent indicators for this, such as the onset [ʔ] in *Einöde* 'wasteland' ['ʔam.ʔø:də, *'ʔa:nø:də], indicating a syllabification which can only be induced by compound structure and is impossible in monomorphemes.

- (22) 'Almosən 'Eidechsə *alms lizard*
 'Ameisə 'Einödə *ant wasteland*
 'Brosamən 'entwedər *crumbs either*
 'Herbergə 'Urkundə *hostel document*
 'Alkovən 'Darlehən *alcove loan*

Returning to the survey in Féry (1998) and again focusing on trisyllabic monomorphemic words with non-final stress, we find the following distribution of antepenult and penult stress in words with full vowels and schwa in their last syllable.

(23)

	final schwa	final full vowel
antepenult stress	38 (7%)	217 (61%)
penult stress	528 (93%)	136 (39%)
Total	566 (100%)	353 (100%)



The remaining 7% of antepenult stress in words with final schwa in (23)/(24) include not only compound-like exceptions as in (22), but also, as Féry notes, words like *Akazie*, which have a pronunciation with three syllables [a.'ka.ziə], with a glided [i] and thus actually conform to the penult stress generalization. As Zonneveld, Trommelen, Jessen, Rice, Bruce and Árnason (1999) point out, this interpretation is independently supported by the observation that words whose final schwa-syllable is unambiguously onsetless, such as *O'boə* and *Tro'phäə* in (21), are indeed stressed on the penult and not on the antepenult. Onsetless final schwa therefore does not result in antepenult stress. Overall, the post-stress generalization for schwa-syllables is very firmly anchored in the prosodic system of German.

Independent support for the generalization that schwa attracts stress to the syllable that precedes it can be found in cases, as in (25), whose last vowel has historically been reduced to schwa. Here, we find stress shifting from antepenult to penult.

- (25) 'Genesis > Ge'nesə
 'Viola > Vi'olə
 Di'astol[ε] > Dias'tol[ə]

Koepcke (1995) notes borrowings with a similar stress shift to the pre-schwa syllable ((26a) from English, (26b) from Spanish; there is also a variant *cani'bal* with stress on the last syllable) .

- (26) a. 'mormon > Mor'mon[ə]
 'shaman > Scha'man[ə]
 'Iroquoise > Iro'kes[ə]
 b. ca'nibal > Kanni'bal[ə]

The pre-stressing character of schwa amounts to the generalization that the schwa syllable must appear in immediate post-stress position, as the weak member of a trochaic foot. This is a subset of all unstressed positions, which also include unfooted occurrences.

Referring to this position as "foottail", we can state the constraint as in (27), which should be understood as being violated by any schwa not occurring in the position indicated.⁵

(27) FOOTTAIL-ə

Obligatory position for ə: (x .)
 ə

Constraint (27) is violated by two kinds of schwa, stressed schwa and unfooted or loose schwa. A schwa syllable needs another syllable to depend on. The unstressability of schwa in a language like German, known as a separate constraint (2) operative in languages like Eng-

⁵ The formulation doesn't cover iambic feet, and it is at present unclear to us whether it should be generalized or not. Another possibility to consider is a parsing constraint: PARSE-SCHWASYLL-INTO-FEET, separate from PARSE-SYLL-INTO-FEET, which would collaborate with NoSTRESSED-ə in restricting schwa to weak positions of feet. As Ryan Bennett points out, PARSE-SCHWASYLL-INTO-FEET has an intrinsic problem: When dominating NoSTRESSED-SCHWA and ranked sufficiently high (e.g., PARSE-SCHWASYLL-INTO-FEET >> ALLFEET-RIGHT >> PARSE-SYLL-INTO-FEET), it predicts systems where only schwa is stressed in certain positions, to the exclusion of all other vowels. Another potential problem is the existence of languages like Indonesian where it has been argued that they show evidence for a constraint that schwa-syllables must not be footed at all (see Cohn and McCarthy 1994).

lish, thus follows already from (27), which is a stricter limitation.

FOOTTAIL-ə also provides an explanation for the systematic stress shift in nouns ending in *-or* when a schwa-syllable is added (28). More examples are given in (29).

- (28) (x .) . (x .) (x .) .
 'Doktor Dok'torən *'Doktorən
 Pro'fessor Profes'sorən *Pro'fessorən
 'Traktor Trak'torən *'Traktorən

- (29) Ad'duktor⁶ 'Doktor In'vestor 'Lektor Pro'zessor 'Sensor
 Ag'gressor Di'rektor 'Kantor 'Mentor 'Quantor 'Tensor
 'Aktor Ef'fektor Kom'paktor Pro'fessor Re'aktor 'Traktor
 'Cursor 'Faktor Kor'rektor Pro'jektor 'Reflektor Tran'sistor
 De'skriptor In'duktor Korrepe'titor 'Proktor 'Sektor 'Vektor
 De'tektor In'spektor Kol'lektor Pro'tektor 'Senior 'Zensor

Cf. also the shift by two syllables in (30) (besides the pronunciation variants *Mete'or*, *Sema'phor*, with no shift).

- (30) 'Me.te.or~Me.te.'o.rən, 'Se.ma.phor~Se.ma.'pho.rən

The analysis proceeds as in (31), with an unviolated FTFORM=TROCHEE constraint.

(31)

a. Tremolo	WSP	Foottail-ə	NonFin	Al-R ('σ, ω)
▶ ('Tremo) lo				** (σ σ)
Tre ('molo)			*!	*
b. Hibiskus				
('Hibis) kus	*!			**
▶ Hi ('biskus)			*	*
c. Papagei				
('Papa) gei	*!			**
Pa ('pagei)	*!		*	*
▶ Papa ('gei)			*	
d. Zitronə				
('Zitro) nə		*!		**
▶ Zi ('tronə)			*	*

Another consequence of FOOTTAIL-ə is that schwa should not be able to follow another schwa-syllable:

- (32) *əC₀ə

⁶ The English equivalents here are virtually identical to the German forms.

In the inflectional system, we find violations of this generalization, and sequences of schwa syllables can arise, leading to a violation of the FOOTTAIL-ə constraint. There is still evidence that the constraint is at work here, as well. First, it is easy to find examples of inflected forms with schwa syllables which are clearly not in post-stress position, as in (33).

- (33) 'trok.k[ə]n dry 'trok.k[ə].n[ə] ADJ+INFLECTION
 'trok.k[ə].n[ə]r COMPARATIVE 'trok.k[ə].n[ə].r[ə] ADJ+COMPARATIVE+INFLECTION

This outcome is due to the fact that other constraints dominating FOOTTAIL-ə, such as IDENT (VPLACE), NOSTRESSED-ə, and MAX, preclude any other outcome.

(34)

trockənər Base: ('trockən)	Ident (VPlace)	NoStressed-ə	Max	Foottail-ə	Al-R (σ, ω)
▶ ('trockə) nər				*	**
troc ('kənər)		*!		*	*
troc ('kenər)	*!				*
('trocknər) ⁷			*!		*

The stressed schwa in *[troc. ('kə.nər)] violates both NOSTRESSED-ə and FOOTTAIL-ə and shows that both constraints are operative. There is probably also a dominant Output-Output constraint such as (35) (following Benua 1997:176) at work here, requiring the derived form to preserve the stress of the base.

- (35) OO-IDENT (FOOTHEAD)
If $\alpha x \beta$ is derived from x, segment $s \in x$ corresponds to $s' \in \alpha x \beta$, and s is part of a foot-head, then s' is part of a foot-head.

The prosodic parse of a form with three schwas such as ['troc.kə] .nə.rə] leads to two violations of FOOTTAIL-ə. An alternative hypothesis about the prosodic parse of such forms posits an additional foot whose head is occupied by the second schwa-syllable, but realized without phonetic stress: [('troc.kə) (nə.rə)]. This is undeniably another possibility, and relevant evidence is hard to come by. One piece of evidence arguing against this kind of prosodic interpretation is found in parallel examples of words with four syllables with a non-schwa syllable in the third position. Thus the plural forms of ('Lehrə) rin 'teacher fem' and ('Kündi) gung 'dismissal' are ('Lehrə) (,rinnən) and ('Kündi) (,gungən), respectively, with perceptible secondary stresses on their third syllables. Comparing these forms with 'troc.kə.nə.rə, the intuitive feel of their prosodic profile is quite different. Needless to say, this issue cannot be regarded as settled, and further investigation is needed.

On the other hand, some inflectional suffixes have allomorphs with and without schwa, and here we see the restriction against successive schwas (36a) and more generally against ə following an unstressed syllable (36b), again clearly in operation. When this factor is not at stake (36c), both variants are possible.

⁷ This variant, which fulfills the FOOTTAIL-ə constraint by deleting the medial schwa, is actually possible as a fast-speech form, showing that MAX is variably ranked w.r.t. FOOTTAIL-ə.

- (36) a. des 'Regəns *des 'Regənəs *rain*
 des 'Sessəls *des 'Sessələs *armchair*
 des 'Lehrərs *des 'Lehrərəs *teacher*
- b. des 'Monats *des 'Monatəs *month*
 des 'Schicksals *des 'Schicksaləs *fate*
 des 'Autos *des 'Autoəs *car*
- c. des 'Manns des 'Mannəs *man*
 des 'Tags des 'Tagəs *day*
 des Er'folgs des Er'folgəs *success*
 des Er'trags des Er'tragəs⁸ *yield*

What about initial schwa, i.e., schwa in first syllables? Given (27), it should be impossible, unless (27) is outranked by another constraint demanding realization of such schwas and hence to a violation of (27). It is slightly unclear what the facts are. On the one hand, it is a fact about German that schwa does not occur in strictly initial position, there are no words like *about* [ə'baʊt].

This leaves cases where the schwa is preceded by a word-initial consonant, as in *Beamter* 'civil servant', or in the prefixes *be-* and *ge-*. It is not unreasonable to assume that FOOTTAIL-ə is violated in such cases. It turns out, however, that at least for certain speakers something else happens. Such speakers do not have [ə] there, but instead a reduced version of [ɛ] which is clearly distinct from [ə].

- (37) das Haar b[ɛ]nutzen *to use the hair*
 das hab[ə] Nutzen *that is said to be of use*

A rich area of the lexicon where the FOOTTAIL-ə constraint has a pervasive influence is names for inhabitants of countries (henceforth "country demonyms"). As Fuhrhop (1998:152 sqq.) has shown, the schwa-suffixes deriving such forms are strictly required to follow a stressed syllable. The case is especially interesting because superficially parallel names for inhabitants of cities are not governed by this restriction.

Two main allomorphs are used in German to derive country demonyms, *-ə* and *-ər*. Each occurs either alone, or with an additional interfix (*-es-* and *-an-*), depending on the base word.

(38)

without interfix	-ə	-ər
with interfix	-es-ə	-an-ər

The interfix occurs mainly (but not exclusively) to attract the word stress to the pre-ə syllable, as schematically shown in (39). Overall, the number of country demonyms where stress falls on the pre-ə syllable is overwhelming.

⁸ Segmental factors can also force the appearance of [ə], as in *des 'Klotzəs* (**des 'Klotzs*).

(39)	Af'ghanistan	Af ('ghan-ə)	Ä'gypten	Ä ('gypt-ər)
	'Senegal	Senega ('l-es-ə), * ('Sene) gal-ə, *Sene ('gal-ə)	'Mexiko	Mexi ('k-an-ər), * ('Me.xi) ko-ər, * ('Mexi) k-ər, *Me ('xik-ər)

Besides a small number of other formations, exemplified in (40), the overwhelming number of country demonyms are formed as in (39).

(40)	Others			
	'Israel	Isra'el-i	'Ungarn	'Ungar
	'Jemen	Jeme'n-it	'Zypern	Zypri'ot

We begin with a list of country demonyms in -ər (41). As can be seen, various adjustments take place in order for stress to lodge on the pre-schwa syllable.

(41) Country demonyms in -ər

Ä'gypten	Ä'gypt-ər	'Indien	'Ind-ər
Al'banien	Al'ban-ər	Indo'nesien	Indo'nes[i]-ər
Al'gerien	Al'ger[i]-ər	I'rak	I'rak-ər ⁹
Äquatorialgui'nea	Äquatorialgui'ne-ər	I'ran	I'ran-ər
Argen'tinien	Argen'tin[i]-ər	I'talien	Ita'l[i]en-ər
Ar'menien	Ar'men[i]-ər	'Ja,pan	Ja'pan-ər
Aserbai'dschan	Aserbai'dschan-ər	Jor'danien	Jor'dan[i]ər
Äthi'opien	Äthi'op[i]-ər	'Kanada	Ka'nad[i]ər
Aus'tralien	Aus'tral[i]-ər	Kap 'Verde	Kap 'Verd[i]-ər
Bah'rain	Bah'rain-ər	Ka'tar	Ka'tar-ər
Bangla'desch	Bangla'desch-ər	Kiri'bati	Kiri'bat[i]-ər
Bar'bados	Bar'bad[i]-ər	Ko'moren	Ko'mor-ər
Bela'rus	Bela'russ-ə	,Ku'wait	,Ku'wait-ər ¹⁰
'Belgien	'Belg[i]-ər	Le'sotho	Le'soth-ər
Be'lize	Be'liz-ər	'Lib[i]en	'Lib[i]-ər
Be'nin	Be'nin-ər	Ma'lawi	Ma'law[i]-ər
Bhu'tan	Bhu'tan-ər	Ma'laysia	Ma'lays[i]-ər
'Bosnien	'Bosn[i]-ər	Male'diven	Male'div-ər
Botsu'ana	Bo'ts[u]an-ər	'Mali	'Mal[i]-ər
Bru'nei	Bru'nei-ər	Maure'tanien	Maure'tan[i]ər
Bur'kina Faso	Bur'kin-ər	Mau'ritius	Mau'rit[i]-ər
Bu'rundi	Bu'rund[i]-ər	Maze'donien	Maze'don[i]-ər
Côte d'I'voire	I'vor-ər	Mikro'nesien	Mikro'nes[i]-ər

⁹ Besides I'rak-i.

¹⁰ Besides 'Ku,wait, 'Ku,wait-ər.

Dschi'buti	Dschi'but[i]-ər	Monte'negro	Montene'grin-ər
Eri'trea	Eri'tre-ər	Na'mibia	Na'mib[i]-ər
Ga'bun	Ga'bun-ər	'Niger	'Nigr-ər
'Gambia	'Gamb[i]-ər	O'man	O'man-ər
Ge'orgien	Ge'org[i]-ər	'Pakistan	Pakis'tan-ər ¹¹
Gre'nada	Gre'nad-ər	Papua-Neugui'nea	Papua-Neugui'ne-ər
Grena'dinen	Grena'din-ər	,Philip'pinen	,Philip'pin-ər ¹²
Gui'nea	Gui'ne-ər	Ru'anda	Ru'and-ər
Gu'yana	Gu'yan-ər	Salo'monen	Salo'mon-ər
Herze'gowina	Herzego'win-ər	St.'Kitts	St.'Kitts-ər
'Sambia	'Samb[i]-ər	'Syrien	'Syr-ər
São To'mé	São To'mé-ər	Tansa'nia	Tansa'ni-ər
'Schweiz	'Schweiz-ər	'Tschad	'Tschad-ər
Sey'chellen	Sey'chell-ər	Tu'nesien	Tu'nes[i]-ər
Sierra Le'one	Sierra Le'on-ər	Tu'valu	Tuva'lu-ər
Sim'babwe	Sim'babw-ər	U'ganda	U'gand-ər
So'malia	So'mal[i]-ər	Ukra'ine	Ukra'in-ər
'Spanien	'Span[i]ər	'Zypern	'Zypr-ər
Sri-'Lanka	Sri-'Lank-ər		

In a special set of cases primary stress does not manage to fall on the pre-schwa syllable, but there is still a secondary stress in this position, securing a foottail-status for the schwa syllable.

(42) Secondary stress before -ər ('Nieder,länd-ər; etc.)

a. Compounds and pseudo-compounds

'Eng,land	'Eng,länd-ər	'Nor,wegen	'Nor,weg-ər
'Is,land	'Is,länd-ər	'Öster,reich	'Öster,reich-ər
'Liechten,stein	'Liechten,stein-ər	'Swasi,land	'Swasi,länd-ər ¹³
'Luxem,burg	'Luxem,burg-ər	'Thai,land	'Thai,länd-ər
'Mol,dau	'Mol,dau-ər	,Neu'see,land	,Neu'see,länd-ər
'Nieder,lande	'Nieder,länd-ər		

b. Others

'Kame,run	'Kame,run-ər ¹⁴	'Singa,pur	'Singa,pur-ər
'Para,guay	'Para,guay-ər	'Suri,name	'Suri,nam-ər ¹⁵

¹¹ Besides Pakis'tan-i.

¹² Besides ,Filip'pin-o.

¹³ Besides 'Swas-i.

¹⁴ Besides ,Kame'run, ,Kame'run-ər.

¹⁵ Besides ,Suri'nam-ər, and ,Surina'm-es-e.

Next, we give examples with the interfix *-an-*, which attracts the stress and so makes sure that the FOOTTAIL-ə constraint is fulfilled.

(43) Country demonyms in *'-an-ər*

An'dorra	Andor'r-an-ər ¹⁶	Ko'rea	Kore-'an-ər
An'gola	Ango'l-an-ər	'Kuba	Ku'b-an-ər
An'guilla	Anguil'l-an-ər	Li'beria	Liberi'an-ər
An'tigua	Anti'g[u]-an-ər	Ma'ca.u	Maca.u-'an-ər
A'rubá	Aru'b-an-ər	Ma'rokko	Marok'k-an-ər
Bar'buda	Barbu'd-an-ər	'Mexiko	Mexi'k-an-ər
Ber'mudas	Bermu'dan-ər	Mosam'bik	Mosambi'k-an-ər
Bo'livien	Boli'v[i]-an-ər	Nica'ragua	Nicara'g[u]-an-ər
Bra'silien	Brasi'l[i]-an-ər	Ni'geria	Nigeri'an-ər
Costa'Rica	Costa Ri'c-an-ər	'Niue	Niu-'an-ər
Do'minica	Domini'c-an-ər	Pe'ru	Peru-'an-ər
Ecuador	Ecuadori-'an-ər	Puerto 'Rico	Puerto Ri'c-an-ər
El 'Salvador	Salvadori-'an-ər	Sa'moa	Samo-'an-ər
'Fidschi	Fidschi-'an-ər	St. 'Helena	St. Hele'n[i]-an-ər
Fu'tuna	Futu'n[i]-an-ər	St. Lu'cia	St. Luci-'an-ər
'Guadeloupe	Guadeloupi-'an-ər	Süd'afrika	Südafri'k-an-ər
Gu'am	Gua'm-an-ər	'Uru,guay	,Uru'g[u]ay-'an-ər ¹⁷
Ha'iti	Haiti-'an-ər	Vanu'atu	Vanuatu-'an-ər
Hon'duras	Hondu'r-an-ər	Venezu'ela	Venezo'lan-ər ¹⁸
Ja'maika	Jamai'k-an-ər	Vereinigte Staaten von A'merika	Ameri'k-an-ər
Kam'bodscha	Kambo'dsch-an-ər	'Wallis	Walli's[i]-an-ər
'Kenia	Keni-'an-ər	Zentralafri'kanische Repu'blik	Zentralafri'k-an-ər
Ko'lumbien	Kolumbi-'an-ər		

Also:

'Malta	Mal't-es-ər
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Finally, we turn to country demonyms in *-ə*. A list of forms derived by this suffix alone appears in (44). In all of these cases, stress falls on the pre-ə syllable.

¹⁶ Another morphological interpretation takes the *a* as part of the base and analyses the interfix as *-n-*.

¹⁷ Besides 'Uru, g[u]ay-ər and ,Uru'g[u]ay-ər.

¹⁸ Besides Venezue'l-an-ər.

(44) Country demonyms in -ə

Af'ghanistan	Af'ghan-ə	Maze'donien	Maze'don-ə
Bul'garien	Bul'gar-ə	Mo'naco	Mone'gass-ə
'Dänemark	'Dän-ə	Mongo'lei	Mon'gol-ə
'Deutschland	'Deutsch-ə	Myan'mar	Myan'mar-ə
'Estland	'Est-ə	'Polen	'Pol-ə
'Finnland	'Finn-ə	Ru'mänien	Ru'män-ə
'Frankreich	Fran'zos-ə	'Russland	'Russ-ə
'Griechenland	'Griech-ə	'Schottland	'Schott-ə
Grossbri'tannien	'Brit-ə	'Schweden	'Schwed-ə
Guate'mala	Guatemala'tek-ə	'Serbien	'Serb-ə
'Ir,land	'Ir-ə	Slowa'kei	Slo'wak-ə
Jugo'slawien	Jugos'law-ə	Slo'wenien	Slo'wen-ə
'Kasachstan	Ka'sach-ə	Ta'dschikistan	Ta'dschik-ə
Kir'gisistan	Kir'gis-ə	'Tschechien	'Tschech-ə
Kro'atien	Kro'at-ə	Tür'kei	'Türk-ə
'Laos	La'ot-ə	Turk'menistan	Turk'men-ə
'Lettland	'Lett-ə	Us'bekistan	Us'bek-ə
Mada'gaskar	Mada'gass-ə		

Next, we give examples with interfixes (-es-, and some others) , which attract the stress and so make sure that the FOOTTAIL-ə constraint is fulfilled.

(45) Country demonyms in -'es-ə

'China	Chi'n-es-ə	San Ma'rino	San Mari'n-əs-ə
Ka'labrien	Kala'br-es-ə	'Senegal	Senega'l-es-ə
'Kongo	Kongo'l-es-ə	Su'dan	Suda'n-es-ə
'Libanon	Liba'n-es-ə	Tai'wan	Taiwa'n-es-ə
Ne'pal	Nepa'l-es-ə	Viet'nam	Vietnam-'es-ə

Also:

'Chile	Chi'l-en-ə	Sa'voyen	Savo'y-ard-ə
'Portugal	Portu'gies-ə		

There are some exceptions to the pre-ə stress generalization among country demonyms, but they are few in number.

(46) Exceptions to the pre-ə stress generalization:

Ba'hamas	Ba'hama-ər	'Panama	'Panama-ər
'Ghana	'Ghana-ər	Saudi-A'rabien	Saudi-'Arab-ər
Gi'braltar	Gi'braltar-ər	St. 'Vincent	St. 'Vincent-ər
Gui,nea-Bis'sa.u	Gui,nea-Bis'sa.u-ər	'Timor	'Timor-ər
'Litauen	'Litau-ər	To'bago	To'bago-ər
'Marshallinseln	'Marshall-ər	'Togo	'Togo-ər
Na.'uru	Na.'uru-ər	'Tonga	'Tonga-ər
'Nevis	'Nevis-ər	'Trinidad	'Trinidad-ər
Pa'la.u	Pa'la.u-ər		

It is significant that most of the demonyms in (46) have alternate variants which conform to the generalization (47). Even a form like *Saudi-A'rab[i] -ər*, which sounds outlandish because of the well-established word *Arabər*, is attested in non-facetious uses.

(47) Alternate variants of the demonyms in (46)

Baha'm-an-ər	Pana'm-es-ə~Pana'm-en-ə
Gha'n-es-ə	Saudi-A'rab[i]-ər
Gibral't-an-ər	St. Vin'cent-ər
Guinea-Bissau-'an-ər	Timo'r-an-ər~Timo'r-es-ə
	Tobago'l-es-ə
Marchal'l-an-ər, Marshall-Insu'lanər	Togo'l-es-ə
Na.uru-'an-ər	Ton'g-an-ər~Tonga'l-es-ə~Tonga'n-es-ə
Nevi's-an-ər	Trinida'n-es-ə
Pala.u-'an-ər	

The fact that this is not simply some kind of internet noise can be deduced from the fact that speakers are explicitly aware of the prosodically problematic status of the forms in (46), as shown by blog entries such as the following: "[W]ie nennt man auf Deutsch wohl einen Menschen aus Guinea-Bissau? Guinea-Bissauer, Guineer (Bissau), Guinea-Bissauaner oder gar Guinea-Bissauai? Das ist keine Scherzfrage. Ich muss einen Bericht schreiben..." ("What does one call a person from Guinea-Bissau in German?... This question is not a joke. I have to write a report...", and "was bin ich den[n]nun...? ein lituaner., litaunese..., litaunippizaner...?"¹⁹ ("So what am I?...").

Matters are different with demonyms derived from city names. In this case, *-ər* is added without any stress-related restrictions, as can be seen in (48). We can attribute the behavior of this suffix to the OO-IDENT (FOOTHEAD) constraint formulated in (35) above.

¹⁹ <http://www.wer-weiss-was.de/themel43/article4660166.html> and <http://board1.2min.eu/showthread.php?t=20&page=12>, both retrieved on 11/19/2010.

(48) Demonyms derived from city names

'Altona	'Altona-ər	'Köln	'Köln-ər
Bad 'Oeynhausən	Bad 'Oeynhausən-ər ²⁰	'Krefeld	'Krefeld-ər
Ber'lin	Ber'lin-ər	'Leipzig	'Leipzig-ər
'Bielefeld	'Bielefeld-ər	'Lemgo	'Lemgo-ər
'Bochum	'Bochum-ər	'Lokkum	'Lokkum-ər
'Deggendorf	'Deggendorf-ər	'Moskau	'Moskau-ər
'Düsseldorf	'Düsseldorf-ər	'Münchən	'Münchən-ər
'Einbeck	'Einbeck-ər	'Passau	'Passau-ər
'Enschede	'Enschəd-ər	Pa'ris	Pa'ris-ər
'Frankfurt	'Frankfurt-ər	'Potsdam	'Potsdam-ər
'Göttingen	'Götting-ər	'Wien	'Wien-ər
'Hamburg	'Hamburg-ər	'Wilsəde	'Wilsəd-ər
'Herford	'Herford-ər	'Wuppertal	'Wuppertal-ər
'Jena ²¹	'Jena-ər		

Some of these cases probably have a secondary stress on the pre-suffixal syllable (*'Bielefeld-ər*, etc.), the issue is difficult to decide and requires a separate investigation. Except for cases that have compound status (such as *'Krefeld-ər*), a secondary stress can generally be excluded immediately after a stressed syllable (*'Leipzig-ər*, * *'Leip,zig-ər*) and is out of the question when the syllable in question contains schwa (*'Münchən-ər*, *Bad 'Oeynhausən-ər*). Some special cases appear in (49)—unsurprisingly, all of these fulfill the poststress-ə restriction.

(49) Special cases

Han'nover	Hannover-'an-ər
'Halle	Hal'l-ens-ər

3. Conclusion

The theory of prosodic constituent structure is built on a three-way distinction between foot-head positions, foot-nonhead positions, and unfooted positions. One kind of empirical evidence for distinguishing two kinds of weak positions, the footed and the unfooted, going beyond the simple dichotomy of the stressed vs. the unstressed, comes from the observation that certain items must not just be unstressed, but are required to occupy the weak position of a foot. German schwa, with its characteristic post-stress prosodic signature, is an example of this kind.

²⁰ Besides *Bad 'Oeynhaus-ər*.

²¹ Besides *Je'n-ens-ər*.

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Armin Mester

Invited Professor, NINJAL (September 2010–December 2010)

Present Position:

Professor of Linguistics, University of California, Santa Cruz (since 1997)

University Education:

1978 Erstes Staatsexamen, Georg-August-Universität Göttingen, Germany

1986 Ph.D. in Linguistics, University of Massachusetts, Amherst

Major Publications and Papers:

1986 The phonology of voicing in Japanese: Theoretical consequences for morphological accessibility [with Junko Ito]. *Linguistic Inquiry* 17: 49–73.

1990 Patterns of truncation. *Linguistic Inquiry* 21: 478–485.

1994 The quantitative trochee in Latin. *Natural Language and Linguistic Theory* 2: 1–61.

1999 The structure of the phonological lexicon [with Junko Ito]. In: Natsuko Tsujimura (ed.) *The handbook of Japanese linguistics*, 62–100. Malden, MA, and Oxford, U.K: Blackwell.

2010 Recursive prosodic phrasing in Japanese [with Junko Ito]. In the Proceedings of the 18th Japanese/Korean Conference. Stanford, CA: CSLI.

Junko Ito

Present Positions:

-Professor of Linguistics, University of California, Santa Cruz (since 1996)

-Director, University of California, Tokyo Study Center (since 2009)

-Invited Professor, International Christian University, Tokyo

University Education:

1979 M.A., B.A. International Christian University, Tokyo

1986 Ph.D. in Linguistics, University of Massachusetts, Amherst

Major Publications and Papers:

1985 Melodic dissimilation in Ainu. *Linguistic Inquiry* 15: 505–513.

1989 A prosodic theory of epenthesis. *Natural Language and Linguistic Theory* 7: 217–259.

1990 Prosodic minimality in Japanese. In: K. Deaton, M. Noske and M. Ziolkowski (eds.) *CLS 26: Parasession on the Syllable in Phonetics and Phonology*, 213–239. Chicago, Chicago Linguistic Society.

2003 Japanese morphophonemics: Markedness and word structure [with Armin Mester]. *Linguistic Inquiry Monograph Series* 43. Cambridge, Massachusetts: MIT Press.

2009 Lexical classes in phonology [with Armin Mester]. In: Shigeru Miyagawa and Mamoru Saito (eds.) *Handbook of Japanese linguistics*, 84–106. Oxford: Oxford University Press.