The Unstressable Word Syndrome in 2-Syllable Words

Hye-Sung Cho
(Mokpo National Maritime University)

Cho, Hye-Sung. (2014). The Unstressable Word Syndrome in 2-Syllable Words. *The Linguistic Association of Korea Journal, 22*(4), 39-58. The goal of this paper is to examine the unstressable word syndrome in 2-syllable words with final extrametricality within Optimality Theory (OT). The way a language selects its repair strategies depends on both the avoidance of final stress and its possible minimal word size. In order to account for the generalization with respect to repair strategies such as lengthening/gemination, incorporation, and revocation of extrametricality, we propose a repair-specific NONFINALITY($\sigma_{\text{weak-in-foot}}$) constraint as a replacement of NONFINALITY(FT) constraint. The observation that the domain of repairs is 2-syllable words straightforwardly leads to our argument against the traditional application of NONFINALITY(FT) to them since it assumes its maximal domain is more than 2-syllable words in size when words are only light syllables. With the NONFINALITY($\sigma_{\text{weak-in-foot}}$) constraint we can account for the disyllable-specific unstressable word syndrome in a consistent and coherent way which previous OT accounts cannot. Furthermore, different ranking relations established among NONFINALITY($\acute{\sigma}$), NONFINALITY($\sigma_{\text{weak-in-foot}}$) and PARSE-SYL provide a typological prediction for all repair strategies.

Key Words: optimality, unstressable word syndrome, 2-syllable words, repair strategies, extrametricality, NONFINALITY constraints.

1. Introduction

2-syllable words have drawn attention from the contexts of reduplication (McCarthy and Prince 1986), hypocoristic formation, (Ito and Mester 1992),

truncation (Alber 2010), and word size limitation (Kager 1996) in the literature. In so far as stress is concerned, they are outstanding because of their exceptional behaviors. Yet, disyllable-focused analyses have never been submitted so far, except for Hayes's (1995) derivational ones.

The purpose of this paper is to explore unstressable word syndrome in 2-syllable words within Optimality Theory (OT) and provide more consistent and coherent accounts to the exceptional 2-syllable word stress. This paper is organized as follows. Section 2 refers to the unstressable word syndrome and lists up all the attested repair strategies cross-linguistically and within a language. Section 3 indicates distinct repair options between 1-syllable words and 2-syllable words, basically due to the difference in their sizes. Section 4 argues against the overuse of NONFINALITY(FT) in explaining 2-syllable word stress patterns. A new repair-specific NONFINALITY($\sigma_{\text{weak-in-foot}}$) constraint is proposed as a replacement of NONFINALITY(FT) constraint to unify unrelated repair strategies employed by individual languages. Section 5 presents constraint-based analyses of the attested repairs in both iambic and trochaic system languages through the constraint interactions mainly among NONFINALITY($\acute{\sigma}$), NONFINALITY($\sigma_{\text{weak-in-foot}}$) and PARSE-SYL. Section 6 discuss that the role of NONFINALITY(FT) is confined to mirroring foot extrametricality. The conclusion of this paper is given in section 7.

2. The Unstressable Word Syndrome and its Repair Strategies

Generally, a large majority of languages do not allow degenerate foot forms. However, a sole foot must be assigned to 2-syllable words even though their erected one may be degenerate due to syllable extrametricality otherwise headless. The 2-syllable word form given in (1) refers to "the unstressable word syndrome" defined by Hayes (1995). "(σ_L)" denotes a monomoraic foot and "< >", extrametricality.

(1) $[(\sigma_L)<\sigma>]_{WD}$

Eliminating the illicit (σ_L) foot constructed over 2-syllable words is the core

part of repair strategies extensively employed by individual languages. Below are the repair lists summarized by Hayes (1995).

(2) Attested repair strategies (Hayes 1995)[1)]
  a. Lengthening/Gemination: $[(\sigma_L)<\sigma>]_{WD} \rightarrow [(\sigma_H)<\sigma>]_{WD}$
  b. Incorporation /plus Iambic Shortening:
     $[(\sigma_L)<\sigma_L>]_{WD} \rightarrow [(\sigma_L\sigma_L)]_{WD}$ / $[(\sigma_L)<\sigma_H>]_{WD} \rightarrow [(\sigma_L\sigma_L)]_{WD}$
  c. Revocation of extrametricality: $[\sigma_L\sigma_L]_{WD} \rightarrow [(\sigma_L\sigma_L)]_{WD}$
  d. Violation of culminativity: No metrical structure within the word phonology[2)]

The patterns of repairs seem identical in either iambic or trochaic system languages, as shown in (3), which are cited from Hayes (1995) in part.

(3) a. Iambic systems
  (i) Lengthening/Gemination: Hixkarayana, Fijian, Carib Ojibwa, Potowatomi
  (ii) Incorporation: Axininca Campa, Yidiñ, Choctaw, Hopi, Southern Paiute, Ignaciano, Ulwa
  (iii) Revocation of Extrametricality: Araucanian, Seminole/Creek

  b. Trochaic systems
  (i) Lengthening/Gemination: Chamorro, English, Finnish, Italian, Norwegian
  (ii) Incorporation: English, Latin, Tonkawa
  (iii) Revocation of Extrametricality: English

1) Hayes's (1995) original version is a little different from the list given in (2) in that Iambic Shortening comprises of an independent repair item. Considering only the final heavy syllable experiences Iambic Shortening within 2-syllable word domains, it is reasonable not to separate it from incorporation option, like here.
2) According to Hayes (1995), cases of violation of culminativity are very rare with only a single language, Central Cierra Miwok, in the world. We will not discuss it anymore, here.

3. Distinct Repair Options between 1-Syllable Words and 2-Syllable Words

Monosyllabic words composed of a single light syllable are usually under strong pressure to expand in order to satisfy bimoraic minimal word requirement. In 1-syllable words, the elimination of the illegal foot form, [(σL], is performed through either lengthening/gemination of the light syllable available or the epenthesis of a vowel into bisyllabic words.

(4) Repair options used by 1-syllable words.
  a. Lengthening/Gemination: /da/→ [dá:] 'give' in Latin (Prince 1990)
  b. Epenthesis: /wik/→[wíka] 'shade-Nom' in Ladil (Ketner 2006)

2-syllable words have more repair options than 1-syllable word cases. Let us compare the options between them one-by-one. Firstly, lengthening/gemination options are equally available in both sized words, as in (4a) and (5a). Next, the epenthesis repair of 1-syllable words is no more available in 2-syllable words since it would cause otherwise trisyllabic word minima in size there.[3] Instead, languages, either iambic or trochaic, adopt the incorporation repair by which a final extrametrical syllable is foot-paired with the lone monomoraic foot, as in (5b). A final repair of 2-syllable words is the revocation of extrametricality, which allows final syllables to be parsed freely into feet, as in (5c).

(5) Repair options employed by 2-syllable words
  a. Lengthening/gemination
    (i) Lengthening: /kwaya/→[(kwá:)<ya>] 'red and green macaw' in Hixkarayana (Hayes 1995)

3) Ketner (2006) notes that in disyllabic words, epenthesis is available as a second choice repair, rather than a first one. For example, Aljutor is an iambic language with final extrametricality, but has trochaic stress in 2-syllable words by adopting incorporation repair. Nevertheless, when the first syllable of 2-syllable words is a schwa, an inappropriate stress-bearer, then epenthesis becomes available: /səgaj/→[sə̀gáj<jə>] 'sand', not [(səgáj)] and [ˈ(sə<gaj>].

(ii) Gemination: /mitaan/→[(mít)<taan>] in Finnish (Kager 1989)

b. Incorporation

(i) Incorporation: /co<mo>/→[(cómo)] 'hill' in Hopi (Buckley 1996)

(ii) Incorporation along with Iambic Shortening: /pu<ta:>/→[(púta)] 'I think (sg)' in Latin (Mester 1994)

c. Revocation of extrametricality

/police/→[po(líce)] in English (Hayes 1995)

As for incorporation, iambic system languages avoid final stress by simply making a rhythmic reversal into trochaic, as in (5bi). Trochaic languages are sensitive to the weight of a final syllable. When the syllable is heavy, they cannot form harmonious [(σ$_{L}$σ$_{L}$)] trochee without the help of Iambic Shortening process, as in (5bii).

4. A Proposal

4.1 A Problem of Previous OT Accounts: NonFinality(Ft)

Within the framework of derivational approaches, the standard concept of syllable extrametricality is two-fold. It excludes final syllable from the stress domain and also requires it unstressed. Constraint-based OT accounts duplicate the effect of syllable extrametricality through the conjoined applications of NonFinality(σ) and NonFinality(Ft).

A clear illustration comes from Latin which has final syllable extrametricality. McCarthy (2003) analyzed non-iterative antepenultimate Latin stress patterns with the constraint ranking of NonFinality(Ft) >> Align-R(Ft, Wd) >> Parse-Syl. The top-ranked NonFin(Ft) makes sure that footing is not possible at the end of the word.

(6) NonFinality(Ft) (McCarthy 2003)

*Ft/_____]$_{Wd}$ 'Word-final feet are prohibited.'

(7) /spatula/→[spátula] in Latin

/spatula/	NONFIN(FT)	ALIGN-R	PARSE-SYL
☞ a. (spátu)la		*	*
b. spa(túla)	*!		*
c. spa(tú:)la		*	**!

Now, let us move on to 2-syllable words. Unlike longer word like [spátula], 2-syllable words implement final footing to become a well-formed prosodic word, avoiding final stress. Avoidance of final stress is fulfilled through NONFINALITY(σ́) which is ranked over NONFINALITY(FT) in the constraint hierarchy.

(8) /homo:/→[hómo]

/homo:/	FTBIN	NONFIN(σ́)	NONFIN(FT)	ALIGN-R	PARSE -SYL
☞a. (hómo)			*		
b. ho(mó:)		*!	*		*
c. (ho)mo:	*!			*	*

Conjoined applications of NONFIN(σ́) and NONFIN(FT) select candidate (8a) a winner because it respects higher-ranked FTBIN and NONFINALITY(σ́) although it violates lower-ranked NONFIN(FT).

From Latin cases, we observe that final stress avoidance through NONFIN(σ́) does not matter word size, but final footing through NONFIN(FT) does. As mentioned above, within previous OT framework, NONFINALITY(FT) is expected to constrain final footing. In more than two-syllable words final footing is always prohibited and therefore NONFINALITY(FT) is always respected there. Alternatively, with 2-syllable words the final footing is always enforced with the constant violation of NONFINALITY(FT). What triggers this difference? Note that NONFINALITY(FT) is a device of making sure of antepenultimate stress patterns by detaching a foot boundary from the end of words. Its domain is minimally more than trisyllabic in size when words are only light syllables along with final extrametricality. Obviously, 2-syllable words are undersized for the application of NONFINALITY(FT) at the same situation. It does not work in

shorter forms. Consequently, the unstressable word syndrome which is disyllable-specific cannot be explained in a consistent and coherent way by existing constraint systems, including NONFINALITY(FT).

4.2 A New Repair-Related Type of NONFINALITY Constraint: NONFINALITY($\sigma_{\text{weak-in-foot}}$)

Syllabic positions are prosodically strong and weak. Word-finally, weak positions are further subdivided into either weak footed, as in (9b), or unfooted, as in (9c).

(9) Prosodic status, word-finally
   a. foot-head: $\acute{\sigma}]_{WD}$ (stressed)
   b. non-foot-head, foot-included: $(\acute{\sigma}\sigma)]_{WD}$ (unstressed/weak footed)
   c. non-foot-head, non-foot-included: $\sigma)\sigma]_{WD}$ (unstressed/unfooted)

Independent of foot headship, foot-membership is a prosodically deployable notion and independently motivated in the previous analyses. Noting Kager's (1989) observation that weak footed syllables are more subject to vowel reduction than unfooted syllables in Dutch, de Lacy (2006) proposes more specific *V-Place$_{\text{Weak-in-foot}}$ constraint than V-Place$_{\text{Unstressed}}$ constraint. As a replacement of existing NONFINALITY(FT) constraint, we introduce a repair-related type of NONFINALITY($\sigma_{\text{weak-in-foot}}$) constraint which constrains only final foot-inclusion matter for shorter forms.

(10) NONFINALITY($\sigma_{\text{weak-in-foot}}$): No weak footed syllable is final in PRWD.

The above NONFINALITY($\sigma_{\text{weak-in-foot}}$) constraint prohibits weak syllable from being footed word-finally. Its intermediate rank between NONFINALITY($\acute{\sigma}$) and PARSE-SYL generates incorporation repair, as we will see in the next section.

4.3 The Derivation of Repair Options through Constraint Interaction

This paper argues that repair selections of languages be accounted for by interaction of NONFINALITY($\acute{\sigma}$) and NONFINALITY($\sigma_{\text{weak-in-foot}}$) with PARSE-SYL, along with other basic prosodic constraints such as FTBIN, FTFORM=Iambic/Trochaic

etc. To be more specific, selection of lengthening/gemination, incorporation, and revocation of extrametricality is determined by the designated ranking among NONFINALITY(σ), NONFINALITY($\sigma_{\text{weak-in-foot}}$), and PARSE-SYL.

Cross-linguistic variations with respect to repair strategies are captured by different constraint ranking relations among NONFINALITY(σ), NONFINALITY($\sigma_{\text{weak-in-foot}}$), and PARSE-SYL. For languages preferring the foot expansion through lengthening/gemination, both the NONFINALITY(σ) and NONFINALITY($\sigma_{\text{weak-in-foot}}$) constraints are ranked over PARSE-SYL. In comparison, for languages choosing incorporation option, NONFINALITY(σ) >> PARSE-SYL >> NONFINALITY($\sigma_{\text{weak-in-foot}}$) ranking should be posited. NONFINALITY(σ) and NONFINALITY($\sigma_{\text{weak-in-foot}}$) constraints are lower-ranked for the sake of the revocation of extrametricality option. They are summarized in (11).

(11) Constraint ranking relations for distinct repair options
  a. Lengthening/Gemination:
     NONFINALITY(σ); NONFINALITY($\sigma_{\text{weak-in-foot}}$) >> PARSE-SYL
  b. Incorporation:
     NONFINALITY(σ) >> PARSE-SYL >> NONFINALITY($\sigma_{\text{weak-in-foot}}$)
  c. Revocation of extrametricality:
     PARSE-SYL>> NONFINALITY(σ); NONFINALITY($\sigma_{\text{weak-in-foot}}$)

As we will see in the next section, the way a languages select its own repair strategies is dependent upon both minimal word size and the avoidance of final stress.

5. A Constraint-Based Analysis

5.1 Iambic System Languages

The unstressed property of final syllables is a very common attribute in iambic system languages. Here we follow Kager's (2001) generalization that strictly binary iambs are rightward. Let us first consider (11a) type, Carib, which adopts a lengthening repair option. Carib has syllable extrametricality

and Iambic Lengthening which creates uneven iambs, non-finally. No degenerate foot is allowed and its minimal word is trimoraic in size, like Hixkarayana.

(12) a. Stress in longer words (van der Hulst and Visch 1992)

akami	→ aká:mi	'trumpeter bird'
asaparapi	→ asá:pará:pi	'species of fish'
kuriyara	→ kurí:yara	'mythical snake'

b. Initial stress in 2-syllable words

api	→ á:pi	'red, ripe'
ka:mi	→ ká:mi	'pale red'

As we can see in (12a), the last two syllables can end unfooted in 4-syllable words, as in [kurí:yara] case. It results from the total exclusion of the final syllable from foot structure. With 2-syllable words, the leftover light penult cannot support its own foot and is compelled to be expanded for the sake of minimal word requirement. The whole constraint hierarchy for Carib is in (13).

(13) Constraint Ranking for Carib

FTBIN; FTF=I; NONFINALITY('σ); NONFINALITY($\sigma_{\text{weak-in-foot}}$) >> UNEVEN-IAMB[4]; PARSE-SYL

Higher-ranked NONFINALITY('σ) and NONFINALITY($\sigma_{\text{weak-in-foot}}$) strongly prohibits the final syllable form being foot headed and foot included. Thus, final syllable cannot contribute to mora count. Tableaux (14i) and (14ii) demonstrate that although their final two syllables look identical at the right edge like in [(kurí:)ya<ra>] and [a<pi>], their stress results appear quite different. In (14i)

4) Hayes (1995) proposes that the light-heavy quantitative syllable make-up forms the best rhythmic shape of the iamb. Following Hayes, Kager (1999) gives UNEVEN-IAMB constraint to constraint shapes of iambic feet. It says that (LH) is a better iamb than (LL) or (H). Since Carib is a typical iambic system language, it requires every feet be a canonical (LH) iamic shape. The underlined part represents foot heads.

(i) UNEVEN-IAMB (Kager 1999)
(LH) > (LL), (H)

the prefinal syllable is not parsed into a foot since a monosyllabic foot cannot be built if it is not the only foot. On the other hand, in (14ii) a foot is constructed on the only available syllable and further lengthened to be two moras in length.

(14) i. /kuriyara/→[kurí:yara] 'mythical snake'

/kuriyara/	FT BIN	FTF =I	NON FIN(σ)	NONFIN (σweak-in-foot)	UNEVEN -IAMB	PARSE -SYL
☞a. (kurí:)ya<ra>						**
b. (kurí:)(yará:)			*!			
c. (kyrí:)(yá:)<ra>					*!	*
d. (kurí:)(yára)		*!		*		

ii. /api/→[á:pi] 'red, ripe'

/api/	FTBIN	FTF=I	NON FIN(σ)	NONFT (σweak-in-foot)	UNEVEN -IAMB	PARSE -SYL
☞a. (á:)<pi>					*	*
b. (á)<pi>	*!					*
c. (apí:)			*!			
d. (ápi)		*!		*		

Now, turn to the (11b) type, incorporation repair case. Most of the iambic system languages show strong tendency of stress conversion just in case an iambic parse would otherwise result in final stress. One of the languages, Hopi, strongly disallowing degenerate feet and final stress, shows exceptional trochaic stresses in 2-syllable words. Its word minima is bimoraic.

(15) a. Peninitial stress in longer words

tayati	→	tayáti	'to laugh'
koyoŋo	→	koyóŋo	'turkey'

b. Initial stress in 2-syllable words

como	→	cómo	'hill'
wari	→	wári	'to run'

Only in 2-syllable words stress is shifted to penultimate syllable, as

indicated in (15b). It results from incorporating the final syllable into the insufficient feet to be bimoraic. The higher ranking of PARSE-SYL over NONFINALITY($\sigma_{weak\text{-}in\text{-}foot}$) and in turn FTFORM=IAMBIC gives rhythmic reversal into trochaic.

(16) Constraint Ranking for Hopi
FTBIN; NONFINALITY(σ́) >> PARSE-SYL >> NONFINALITY($\sigma_{weak\text{-}in\text{-}foot}$) >> FTFORM=IAMBIC

Under the constraint ranking (16) for Hopi, NONFINAITY(σ́) >> PARSE-SYL >> NONFINALITY($\sigma_{weak\text{-}in\text{-}foot}$) achieves iambic stress in longer words like (17i), avoiding final stress. However, the ranking ensures final syllable incorporation in 2-syllable words, as in (17ii).

(17) i. /tayati/→[tayáti] 'to laugh'

/tayati/	FTBIN	NONFIN(σ́)	PARSE -SYL	NONFIN ($\sigma_{weak\text{-}in\text{-}foot}$)	FTF=I
☞ a. (tayá)ti			*		
b. (táya)ti			*		*!
c. (tayá)(tí)	*!	*			
d. ta(yáti)			*	*!	*

ii. /como/→[cómo] 'hill'

/como/	FTBIN	NONFIN(σ́)	PARSE-SYL	NONFIN ($\sigma_{weak\text{-}in\text{-}foot}$)	FTF=I
☞a. (cómo)				*	*
b. co<mo>			**!		
c. (có)<mo>	*!		*		
d. (comó)		*!			
e. (có:)mo			*!		

In (17i), satisfaction of both NONFINAITY(σ́) and NONFIN($\sigma_{weak\text{-}in\text{-}foot}$) is possible in (17ia) since [tayati] is 3-syllable word. In (17ii), in contrast, the final extrametrical syllable is incorporated into a lone foot to be bimoraic, causing

stress shift to trochaic. Trochaic stress is guaranteed even in iambic system languages by the NONFINALITY(σ́) >> PARSE-SYL >> NONFINALITY($\sigma_{\text{weak-in-foot}}$); FTF=I ranking.

Finally, (11c) type, the revocation of extrametricality repair, is exemplified by Seminole/Creek. No unstressable word syndrome is not found in these languages since NONFINALITY(σ́) and NONFINALITY($\sigma_{\text{weak-in-foot}}$) constraints are ranked lower and therefore inactive.

(18) a. Final stress in longer words
isimahicita → isìmahìcitá 'one to sight at one'
b. Final stress in 2-syllable words
coko → cokó 'house'

Words with even-numbered syllables exhibit final stress due to higher ranking of FTBIN, FTF=I and PARSE-SYL over NONFINALITY(σ̀) and NONFINALITY($\sigma_{\text{weak-in-foot}}$). Two of the NONFIINALITY constraints are positioned at the bottom in the hierarchy.

(19) Constraint ranking for Seminole/Creek
FTBIN; FTF=I; PARSE-SYL >> NONFINALITY(σ̀); NONFINALITY($\sigma_{\text{weak-in-foot}}$)

(20) i. /isimahicita/→[isìmahìcitá] 'one to sight at one'

/isimahicita/	FT BIN	FTF=I	PARSE -SYL	NON FIN(σ̀)	NONFIN ($\sigma_{\text{weak-in-foot}}$)
☞a. (isì)(mahì)(citá)				*	*
b. (isì)(mahì)cita			**!		
c. (isì)(mahì)(cí)<ta>	*!		*		
d. (isì)(mahì)(cíta)		*!			*

ii. /coko /→[cokó] 'house'

/coko/	FTBIN	FTF=I	PARSE-SYL	NON FIN(σ̀)	NONFIN ($\sigma_{\text{weak-in-foot}}$)
☞a. (cokó)				*	
b. (cóko)		*!			*
c. (có)<ko>	*!		*		
d. co<ko>			**		

Here, dominant FTBIN, FTF=I and PARSE-SYL constraints are prevailing out over NONFINALITY(σ́) and NONFINALITY($\sigma_{\text{weak-in-foot}}$). As a result, final syllable is parsed iambically even in 2-syllable words.

5.2 Trochaic Stress Systems

Unlike Iambic system languages, prosodic parsing in trochaic system can occur either a left-to-right direction or a right-to-left direction or from both ways. In this section we consider trochaic instances of repair options through Italian, Latin, and English, respectively. Firstly, a trochaic language with a lengthening option, Italian. In this case, lengthening does not occur on the antepenultimately stressed syllable of longer words. However, in 2-syllable words, penultimate syllable is definitely lengthened under stress, but only when they occupy monomoraic feet, as in (21). If only a single light syllable remains available for a stress foot in 2-syllable words, the vowel of the light syllable is lengthened to meet bimoraic word minima.

(21) Italian (Prince 1990)
a. médico
sécolo
b. píede < pede
míele < mele

The constraint ranking responsible for Italian trochaic stress patterns and its lengthening repair is given in (22).

(22) Constraint Ranking for Italian
FTBIN; FTF=T >> NONFIN(σ́); NONFIN($\sigma_{\text{weak-in-foot}}$) >> PARSE-SYL

(23) i. /medico/→[médico]

/medico/	FTBIN	FTF=T	NON FIN(σ́)	NONFIN ($\sigma_{\text{weak-in-foot}}$)	PARSE-SYL
☞a. (médi)<co>					*
b. (medí)<co>		*!			*
c. me(díco)				*!	*
d. me(di:)<co>					**!

ii. /pede/→ [píede]

/pede/	FTBIN	FTF=T	NON FIN(σ)	NONFIN (σweak-in-foot)	PARSE-SYL
☞a. (píe)<de>					*
b. (pé)<de>	*!				*
c. (péde)				*!	
d. (píede)	*!			*	

Since PARSE-SYL is lower ranked than two of the NONFINALITY constraints, exhaustive parsing is not derived even in 2-syllable words.

Secondly, within Latin the incorporation repair is employed. Latin data is given in (24). In 2-syllable words, Latin incorporates final syllable into a lone foot even in the expense of shortening final long syllable.

(24) a. Antepenultimate stress in longer words (Hayes 1995)

simula	→	símula	'stimulate (2 sg. imp.)'
inimi:kitia	→	inimi:kítia	'hospitality'

b. Penultimate stress in 2-syllable words (Mester 1994)

puta:	→	púta	'I think (sg)'
wolo:	→	wólo	'I want'

As a language choosing incorporation option, Latin is expected to employ the ranking hierarchy like NONFIN(σ) >> PARSE-SYL >> NONFIN($\sigma_{\text{weak-in-foot}}$) under the present analysis. ALIGN-R is lowest ranked since final syllable is excluded from the stress domain in Latin.

(25) Constraint ranking for Latin

FTBIN; FTFORM=T; NONFIN(σ) >> PARSE-SYL >> NONFIN($\sigma_{\text{weak-in-foot}}$) >> ALIGN-R

(26) i. /simula/→[símula] 'stimulate (2 sg. imp.)'

/simula/	FT BIN	FTF =T	NON FIN(σ)	PARSE -SYL	NONFIN ($\sigma_{weak\text{-}in\text{-}foot}$)	ALIGN -R
☞a. (símu)<la>				*		*
b. si(múla)				*	*!	
c. (simú)<la>		*!		*		*
d. (sí)mu<la>	*!			**		*

ii. /puta:/→[púta] 'I think (sg)

/puta:/	FT BIN	FTF =T	NON FIN(σ)	PARSE -SYL	NONFIN ($\sigma_{weak\text{-}in\text{-}foot}$)	ALIGN -R
☞ a. (púta)					*	
b. (putá:)	*	*!	*			
c. pu(tá:)			*!	*	*	
d. (pú)<ta:>	*!			*		*

In (26i) the optimal candidate (26ia) respects both NONFIN(σ) and NONFIN($\sigma_{weak\text{-}in\text{-}foot}$) from the hierarchy. However, its strong competitor (26ib) fatally violates NONFIN($\sigma_{weak\text{-}in\text{-}foot}$), which is a tie-breaker. Tableau (26ii) presents the case of 2-syllable word stress. Since Latin adopts incorporation option, NONFIN(σ) >> PARSE-SYL >> NONFIN($\sigma_{weak\text{-}in\text{-}foot}$) ranking makes word-final syllable weakly parsed into a sole foot at the cost of its shortening. The optimal candidate (26iia) is selected as a winner over (26iic).

Finally, English adopts multiple solutions to unstressable word syndrome in 2-syllable words. Due to lexical characters of word stress, English presents a case of employing three repair options within a language. Iambic Shortening is conducted in English, as we can see from the so-called "Arab rule" (Ross 1972) cases like *Árab* and *prèsentátion*. It is shown in (27a,b).

(27) Repair strategies adopted by English
a. Lengthening: Áràb[(éy)(ræb)]
b. Incorporation: cíty, próduct, Árab[(érəb)]
c. Revocation of Extrametricality: políce, canóe

Here we exemplify the revocation of extrametricality repair selection in

(27c). Under the present analysis, NONFINALITY(σ́) and NONFINALITY($\sigma_{\text{weak-in-foot}}$) constraints are at the bottom of the hierarchy for the sake of the revocation of extrametricality option.

(28) Constraint ranking for revocation of extrametricality in English
FTBIN; FTF=T; Weight-to-Stress >> PARSE-SYL >> NONFINALITY(σ̀); NONFINALITY($\sigma_{\text{weak-in-foot}}$)

(29) /poli:ce/→[polí:ce]

/poli:s/	FTBIN	W-to-S	FTF =T	PARSE -SYL	NON FIN(σ̀)	NONFIN ($\sigma_{\text{weak-in-foot}}$)
☞a. po(lí:s)				*	*	
b. (póli:s)		*!				*
c. (pó)<li:s>	*!			*		

NONFINALITY(σ̀) and NONFINALITY($\sigma_{\text{weak-in-foot}}$) constraints are inactive alike in the [police] case. Thus, the satisfaction of higher-ranked FTBIN, FTF=T and Weight-to-Stress is more important than that of both NONFINALITY constraints to be optimal like (29a).

5.3 NONFINALITY(FT) Constraint

Hayes (1995) observes that the traditional foot extrametricality is found only in a rightward foot parse. Therefore, trochaic systems do not possibly show foot extrametricality with leftward foot parse. We do not argue for eliminating NONFINALITY(FT) from the constraint lists. Rather, the unstressable word syndrome indirectly reveals that as an OT counterpart of foot extrametricality, NONFINALITY(FT) is necessary to adequately account for the foot extrametricality case.

With foot extrametricality, 2-syllable words are automatically exempted from unstressable word syndrome otherwise the entire domain would be outside of the stress domain. In that case, default stress patterns would emerge on the surface.

Let us use Negev Bedouine Arabic for this example. The stress patterns of Negev Bedouine Arabic appear much similar to those of Carib in that final two

syllables remain successively unstressed. Unlike Carib with syllable extrametricality, however, Negev Bedouin Arabic has foot extrametricality with it. As predicted here, the language presents default iambic stress behavior in 2-syllable words, as displayed in (30b).

(30) Negev Bedouin Arabic stress (Hayes 1995)
  a. no final stress in longer words
    aʔama → [aʔáma] 'blind'
    zalamatak → [zalámatak] 'your man'
  b. final stress in 2-syllable words
    bina → [biná] 'he built'
    ǰimal → [ǰimál] 'camel'

(31) Constraint ranking for Negev Bedouin Arabic
  LX≈PR[5]; FTBIN; FTF=I >> PARSE-SYL >> NONFINALITY(FT)

(32) i. /aʔama/→[aʔáma] 'blind'

/aʔama/	LX≈PR	FTBIN	FTF=I	PARSE-SYL	NONFIN(FT)
☞a. (aʔá)<ma>				*	
b. a<ʔama>	*!			***	
c. (á)<ʔama>		*!		**	
d. (áʔa)<ma>			*!	*	
e. a(ʔáma)			*!	*	*

ii. /bina/→[biná] 'he built'

/bina/	LX≈PR	FTBIN	FTF=I	PARSE-SYL	NONFIN(FT)
☞a. (biná)					*
b. <bina>	*!			**	
c. (bí)<na>		*!		*	
d. (bí:)<na>				*!	
e. (bína)			*!		*

5) Like many languages, Negev Bedouine Arabic requires that the lexical word be a prosodic word as well. It is never violated and top-ranked like FTBIN and FTF=I in the language.

(i) LX≈PR (Prince & Smolensky 1993)
A member of the morphological category MCat corresponds to a PrWd.

Negev Bedouin Arabic puts the priority on constant iambic stress patterns. Iambic systems can be held stable because of higher ranked FTFORM=IAMBIC than PARSE-SYL and NONFINALITY(FT).

6. Conclusion

In this paper, we have analyzed unstressable word syndrome within constraint-based OT frameworks. We argue that 2-syllable words have their own repair options to the syndrome, distinct from those of 1-syllable words. Two factors determining language-particular repair options are minimal word size as either trimoraic or bimoraic and final stress avoidance. It is contended that since 2-syllable words are undersized for the application of NONFINALITY(FT), disyllabic-specificity cannot be adequately explained by the existing constraint systems, including NONFINALITY(FT). Within constraint-based frameworks, repairs such as lengthening/gemination, incorporation, and revocation of extrametricality are explained by the designated ranking among NONFINALITY(σ́), NONFINALITY($\sigma_{\text{weak-in-foot}}$), and PARSE-SYL along with basic prosodic constraints.

The result implies that the asymmetry of rhythmic reversal occurs between iambic rhythm and trochaic rhythm. Rhythmic conversion is only possible from iambic to trochaic, not vice versa.

Excluding NONFINALITY($\sigma_{\text{weak-in-foot}}$) constraint proposed here, the family of NONFINALITY constraints may be extendable to handle attested edge-specific phonological processes. It will expand the opportunity for further research there.

References

Alber, B. (2010). An exploration of truncation in Italian. *Rutgers Working Papers in Linguistics,* 3, 1-30.

Buckley, E. (1996). Levels vs. domains: The case of Kashaya vowel length. *Proceedings of Berkeley Linguistic Society,* 22, 36-45.

de Lacy, P. (2006). *Markedness: Reduction and preservation in phonology*. Cambridge: University of Cambridge Press.

Hayes, B. (1995). *Metrical stress theory: Principles and case studies*. Chicago: University of Chicago Press.

Hulst, H. van der, & Visch, E. (1992). Iambic lengthening in Carib. In R. van Hout & R. Bok-Bennema (Eds.), *Linguistics in the Netherlands 1992* (pp. 113-124). Berlin: Foris.

Ito, J., & Mester, A. (1992). Weak layering and word binarity. *LRC Working Papers, LRC-92-09*. University of California, Santa Cruz.

Kager, R. (1989). *A Metrical theory of stress and dstressing in English and Dutch*. Dordrecht: Foris.

Kager, R. (1996). Stem disyllabicity in Guugu Yimidhirr. In M. Nespor & N. Smith (Eds.), *Dam phonology: HIL phonology papers* II (pp. 59-101). Den Haag: Holland Institute of Generative Linguistics.

Kager, R. (1999). *Optimality theory*. Cambridge: Cambridge University Press.

Kager, R. (2001). *Rhythmic directionality by positional licensing. Handout of presentation given at HILP-5*, University of Potsdam, 11 January, 2001. ROA-514.

Ketner, K. (2006). *Size restrictions in prosodic morphology.* Unpublished doctoral dissertation, University of Cambridge, Selwyn.

McCarthy, J. (2003). OT constraints are categorical. *Phonology, 20*, 75-138.

McCarthy, J. (2008). The serial interaction of stress and syncope. *Natural Language and Linguistic Theory,* 26, 499-546.

McCarthy, J., & Prince, A. (1986). *Prosodic morphology*. Ms, University of Massachusetts, Amherst & Brandeis University.

Mester, A. (1994). The quantitative trochee in Latin. *Natural Language and Linguistic Theory,* 12, 1-61.

Prince, A. (1990). Quantitative consequences of rhythmic Organization. *Chicago Linguistic Society, 26*(2), 355-398.

Prince, A., & Smolensky, P. (1993). *Optimality theory: Constraint interaction in generative grammar*. ROA-537. Ms. Rutgers University.

Ross, J. (1972). A reanalysis of English word stress. In M. Brame (Ed.), *Contribution to generative phonology* (pp. 229-323). Austin, TX: University of Texas Press.

Hye-Sung Cho
Division of Liberal Arts
Mokpo National Maritime University
91 Haeyang Daehakro, Mokpo, Rep. of Korea
Phone: 82-61-240-7358
Email: hscho@mmu.ac.kr

Received on September 11, 2014
Revised version received on November 25, 2014
Accepted on December 1, 2014