[NB: This is work in progress. *Please* send comments to me at adg1@cornell.edu !]

Stress Placement in Munster Irish*

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0. INTRODUCTION

While the Irish dialects of Connacht and Ulster show initial stress on almost all words, in the Munster dialect, stress is attracted to heavy syllables (by which we mean syllables containing a long vowel or diphthong, not CVC syllables) in a complicated manner. In this paper I will propose the binary colon (Halle & Clements 1983, Hammond 1987, Hayes 1995) to account for the placement of stress in Munster Irish (MI). Previous analyses of stress in MI include van Hamel (1926), O'Rahilly (1932), Blankenhorn (1981), Ó Sé (1989), Doherty (1991), and Gussmann (1995). The facts here are complicated; for specifics, refer to the data below, which are taken from the following sources: BB (= Ó Cuív 1947), CD (= Ó hÓgáin 1984), DOC (= Dillon & Ó Cróinín 1961), H (= Holmer 1962), L (= Loth 1913), LA (= Wagner 1964), Mk (= Ó Cuív 1944), Rg (= Breatnach 1947), S (= Sommerfelt 1927), SCD (= Breatnach 1961). Occasionally I have quoted forms directly from Gussmann when I could not find them in a primary source. Further information on the Munster dialect can be found in Sjoestedt-Jonval (1938), Nic Pháidín (1987), Ó hAirt (1988), and Ua Súilleabháin (1994).

In § 1 I give the data that show the idiosyncratic manner in which stress is attracted to heavy syllables. (Coda consonants do not contribute to weight in Irish, so heavy syllables are only those that contain a long vowel or a diphthong.) In § 2 I give the data relating to the fact that the vowel **a** in the second syllable attracts stress like a heavy syllable when it is followed by **x**, either in the same syllable or in the next syllable. In §§ 3–4 I discuss the prosodic structure of MI and propose that the binary colon can be employed to explain the occurrence of stress; for this I use a constraint-based method following Optimality Theory (McCarthy & Prince 1993b and Prince & Smolensky 1993) and Correspondence Theory (McCarthy & Prince 1995, Benua 1995). In §§ 5 I discuss other instances of noninitial stress, caused by the unstressability of **ə** and the special prominence of **a** before **x**. In § 6 I discuss a variant stress pattern.

1. STRESS PLACEMENT: THE DATA

In the data that follow, L means a light (CV or CVC) syllable and H means a heavy (CV: or CVV) syllable. In the phonetic transcription, the acute accent (´) indicates stress, and the prime (') indicates that the preceding consonant is palatalized.

We shall begin with the placement of stress in two- and three-syllable words. First of all, if the second syllable of a word is heavy, it is stressed (1).[1]

(1)	Stress 2d σ if H		
a.	L H́	kər . ká:n	'pot' (H 42, Mk 50)
b.	L H́ L	f'r'ə . há: . lə	'feeding' (SCD 202)
c.	L H́ H	a . sé:n . ti:xt	'disagreement' (BB 99)

* I should like to express my gratitude to Abby Cohn, Máire Ní Chiosáin, Bill Ham, David Parkinson, and Draga Zec for their helpful advice and comments, and to Conor Devane for his intuitions of Munster Irish.

[1] I am abstracting away here from the following facts: (i) certain suffixes with heavy syllables never attract stress, and (ii) other heavy suffixes attract stress even when, prosodically speaking, they should not (Ó Siadhail and Wigger 1975, 78, Ó Siadhail 1989, 30, Gussmann 1995).

d.	H H́	d'i: . ví:n'	‘idle’ (Mk 113, Rg 69)
e.	H H́ L	re: . sú:n . tə	‘reasonable’ (Rg 77)
f.	H H́ H	ma:r . n'é: . li:xt	‘navigation’ (BB 152)

If the second syllable is light, and there is at least one heavy syllable in the word, the leftmost heavy syllable is stressed (2).

(2) Stress leftmost H

a.	H́ L	bó: . hər	‘road’ (Rg 54, S 220)
b.	L L H́	mar . kə . ré:r	‘mackerel’ (BB 153)
c.	H́ L L	t'ə́i . lə . kə	‘gift’ (Mk 27)
d.	H́ L H	ú: . də . ra:s	‘authority’ (Mk 36)

If all the syllables are light, the first syllable is stressed (3).

(3) Stress leftmost σ

a.	Ĺ L	á . səl	‘donkey’ (CD 170)
b.	Ĺ L L	á . lə . gər	‘loud talk’ (BB 7, CD 85)

In four- and five-syllable words, the pattern is more complicated. If the word ends in [H L], it is stressed […H́ L] (4).

(4) Stress [… H́ L]

a.	L L H́ L	fo . dər . lúə . səx	‘bustling’ (SCD 196)
b.	L L L H́ L	a . də . r'ə . gá: . lə	‘mediation (gen.)’ (SCD 166)
c.	L L H H́ L	i . m'ə . g'e: . n'ú: . lə	‘distant (pl.)’ (Gussmann)

There seems to be dialectal variation in the case of [H L H L] words: one variety has penultimate stress [H L H́ L] (5a), and another variety has initial stress [H́ L H L] (5b). In the discussion of stress that follows, I will examine only the variety with penultimate stress; I shall return to the variety with initial stress in § 7 below.

(5) [H L H L] words

a.	H L H́ L	sla: . nə . hó: . rə	‘savior (gen.)’ (L 324)
b.	H́ L H L	d'íə . gə . su: . ləxt	‘piety’ (BB 87)

If the word begins with [L L L], it is stressed [Ĺ L L…] (6). (This is overridden by the preceding generalization, as shown by [L L L H́ L] (4b).)

(6) Stress [Ĺ L L …]

a.	Ĺ L L L	á . n'ə . m'ə . xəs	‘name’ (SCD 11)
b.	Ĺ L L H	pá . tə . lə . xa:n	‘a plump creature’ (BB 171)
c.	Ĺ L L H H	é . t'ə . r'ə . xa: . ni:	‘vulgar person’ (SCD 171)
d.	Ĺ L L L H	l'é . h'ə . l'ə . xə . s'u:l'	‘stand-offish’ (BB 146)

If a four- or five-syllable word neither ends in [H L] nor begins with [L L L], then the leftmost heavy syllable is stressed (7).

(7) Stress leftmost H

a.	L L H́ H	ga . n'ə . v'í: . n'i:	‘grains of sand’ (BB 118)
b.	H́ L H H	áum . pə . ra: . ni:xt	‘affliction’ (CD 112)
c.	L L H́ L L	a . mə . ró: . d'ə . h'ə	‘unfortunate’ (BB 8)

Gussmann (1995) was the first researcher to find instances where the primary stress falls on the fourth syllable (4b–c), thereby disproving the hypothesis of the three-syllable “stress window” of Ó Sé (1989) and Doherty (1991). This stress window had been proposed to explain the absence of final stress in the words in (6b, d).

For the sake of completeness I should mention that Irish has stressed monosyllables of both shapes [L] and [H], as shown in (8).

(8) Stressed monosyllables

a.	Ĺ	bá	‘cows’ (Mk 18, Rg 12)
b.	H́	b'ó:	‘alive’ (H 32, Rg 14)

It is impossible to state a descriptive generalization of stress placement that accounts for all forms. Although stress usually falls on a heavy syllable (when a heavy syllable is present), the patterns in (6b–d), [Ĺ L L (L) H (H)]), violate that generalization. If a word has more than one heavy syllable, the stress usually falls on the second heavy syllable, as long as the second heavy syllable is not also word-final. But the pattern in (7b), [H́ L H H], violates that generalization. And yet, as we shall see below, all these facts can be accounted for in a simple and elegant manner.

2. THE **ax** PROBLEM

The picture is further complicated by the behavior of **a** before **x**. As pointed out by Rg 77, Ó Siadhail & Wigger (1975, 78), Ó Siadhail (1989, 31), Doherty (1991, 122 ff.), Ua Súilleabháin (1994, 481), and Gussmann (1995, 6–7), **a** before **x** can attract stress like a heavy syllable if it is in the second syllable of the word and all other syllables are light. The data in (9) show **a** before **x** acting like any other light syllable (often reduced to **əx**), while in (10) **ax** attracts primary stress as if it were heavy. Note that this is true regardless of whether the **x** is in the coda of the syllable or the onset of the following syllable.[2]

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[2] The sequence **ax** in the second syllable does not generally attract stress if the onset of the second syllable is **h**: e.g. **fáhəx** ‘giant’ (H 87, Mk 66, S 229, Ó Siadhail 1989, 31). However, there does seem to be some variation in Muskerry: **fáhəxə ~ fəháxə** ‘disease of horses’ (BB 104). I shall not attempt to account for this fact here.

(9) /ax/ behaving like a light syllable

a. fá: . səx ‘desert’ (Mk 44, S 202)

b. mol . hə . xá:n ‘wether’ (Mk 48, S 200)

c. krúə . t'ə . xa:n ‘hard substance’ (BB 73)

d. s'a . xə . rá:n ‘wandering’ (Mk 19)

e. sá . sə . nəx ‘Englishman’ (L 330)

f. á . n'ə . m'ə . xəs ‘name’ (SCD 11)

(10) /ax/ attracting stress like a heavy syllable

a. b'ə . náxt ‘blessing’ (H 66, S 199)

b. bə . ká . xə ‘lame (pl.)’ (Mk 23)

Gussmann points out a fact not mentioned by Ó Siadhail or Doherty: the nominalizing suffix **-əxt**, roughly ‘-ness’, does NOT bear stress even when in the same prosodic environment as the examples in (10). Examples of unstressed **-əxt** are shown in (11).

(11) Behavior of **-əxt** ‘-ness’

a. bóx . təxt ‘poverty’ (SCD 51)

b. b'r'ís' . t'əxt ‘brokenness’ (BB 39)

As Gussmann points out, this fact indicates that there must be an underlying contrast between /a/ and /ə/—something not considered by previous researchers. A near-minimal pair is found between /at'-ax/ = **ət'áx** ‘strange’ (CD 78) with the adjectival suffix /-ax/, and /at'-əxt/ = **át'əxt** ‘strangeness’ (CD 78) with /-əxt/. However, this does not mean that all instances of surface **əx** are from underlying /əx/: the form in (12) shows that sometimes /ax/ remains unstressed and then surfaces as **əx**.

(12) /f'arəg-ax/ = **f'árəgəx** ‘angry’ (BB 106, Mk 38)
(/f'arəg/ ‘anger’ + adj. suffix /-ax/)

Stress is not attracted to the epenthetic vowel inserted in certain nonhomorganic consonant clusters (Ó Siadhail & Wigger 1975, 70–1, Ó Siadhail 1989, 20 ff., Ní Chiosáin 1991, 178 ff., 1995), showing that this vowel is underlying /ə/: **dórəxə** ‘dark’ (DOC 224, Mk 44, Rg 16, S 200).[3]

Stress is also not attracted to the past impersonal ending **əx**, e.g. **kásəx** ‘one turned’ (Ó Siadhail 1989, 31). This may be underlyingly /aɣ/, which is certainly its historical origin, or it may have underlying unstressable /ə/.

There are, of course, other words with noninitial short full accented vowels. Previous researchers, not recognizing the difference between underlying /ə/ and the full vowels, had treated these as lexically marked for noninitial stress, but it is simpler to suppose that the initial syllable of these words contains underlying /ə/. Examples are shown in (13).[4]

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[3] This epenthetic vowel is not underlying, but for purposes of stress placement it behaves like an underlying vowel. Therefore, for convenience, I shall be including epenthetic **ə** in input forms.

[4] The words in (13a–c) receive noninitial stress even in the other dialects of Irish, where initial stress is much more persistent than it is in Munster (Ó Siadhail 1989, 26). In (13d–g), on the other hand, noninitial stress is limited to Munster.

Between palatalized consonants, **ə** is pronounced **i**, so that **ənír'əg'** and **b'r'ək'f'ást**, for example, sound like **ənír'ig'** and **b'r'ik'f'ást**.

(13) /ə/ in the initial syllable

a.	ə . n'ís'	‘now’ (CD 136, Rg 78)
b.	ə . ní . r'əg'	‘last year’ (CD146)
c.	tə . bák	‘tobacco’ (H 166)
d.	k'ə . ná . hə	‘features’ (DOC 219)
e.	kə . hín'	‘when’ (DOC 218)
f.	b'r'ək' . f'ást	‘breakfast’ (Mk 66)
g.	d'ə . má . l'əx	‘wasteful’ (SCD 150)

With the addition of /ə/ to the underlying inventory of short vowels, the difference between words like **án'əs'** ‘ungainly’ (CD 51) and words like **ən'ís'** ‘now’ (13a) can be explained under a theory that prohibits stress from falling on **ə**. Such a theory will be proposed below.

3. A FIRST ATTEMPT, AND A PARADOX

Let us begin with the simple cases, where there are no heavy syllables and stress falls on the initial syllable. We may suppose that syllables are parsed into moraic trochees, beginning at the left edge of the word. Except in initial position, however, [L L] sequences are NOT parsed into (L L) feet. Doherty (1991) simply states this as a stipulation; Ní Chiosáin (1995), on the other hand, proposes that this is due to the ranking of ALIGN-L (14) above PARSE-σ (15).

(14) **ALIGN-L**[5]
Align(Ft,L,PrWd,L)
The left edge of every foot is aligned with the left edge of some PrWd.

(15) **PARSE-σ**
Syllables are parsed into feet

The ranking ALIGN-L » PARSE-σ is shown in the tableau in (16) for the word **án'əm'əxəs** ‘name’ (6a), which is underlyingly probably /an'əm'axas/, but short vowels surface as reduced **ə** when they are not foot-heads.

(16) /an'əm'axas/	ALIGN-L	PARSE-σ
☞ (.a.n'ə.)m'ə.xəs.		**
(.a.n'ə.)(m'a.xəs.)	* !	

Noninitial heavy syllables, however, are footed, because the WSP (17) is ranked higher than ALIGN-L (Ní Chiosáin 1995). FOOT FORM (18) and FOOT BINARITY (19) are also ranked above ALIGN-L, as well as PARSE-σ (20). This ranking is shown for the word **kərkán** ‘pot’ (1a) in the tableau in (21).

(17) **WSP** (Hung 1993, 1994)
A heavy syllables is the head of a foot.

(18) **FTFORM** (moraic-trochaic) (Cohn & McCarthy 1994, 8)
Feet are trochaic (i.e. (Ĺ L) or (H́)).

(19) **FOOT BINARITY** (moraic)
Feet are binary at the moraic level of analysis.

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5 Exactly this constraint is found also in McCarthy & Prince (1994), where it is called ALL-FT-LEFT.

(20) **PARSE-σ**
Syllables are parsed into feet.

(21) /korka:n/	WSP	FTFORM	FTBIN	ALIGN-L	PARSE-σ
(.kór.)(ka:n.)			* !	*	
(.kór.ka:n.)	* !	* !			
(.kər.ká:n.)		* !			
(.kór.)ka:n.	* !		* !		*
☞ .kər.(ká:n.)				*	*

When there is room for two feet in a word, we find that the constraint ALIGN PROSODIC WORD (22) works to build a foot at the left edge, but that the head of the second foot in the word receives main stress. This may be assigned to a constraint PROSODIC WORD RIGHT (23), which is ranked below ALIGN PROSODIC WORD and above PARSE-σ, but cannot be ranked with respect to ALIGN-L. The tableau in (24) illustrates this ranking in the words **markəré:r** 'mackerel' (2b), **d'i:ví:n'** 'idle' (2d), and **t'ə́iləkə** 'gift' (2c). Although the initial syllable in the optimal candidate in (24a) does not receive primary stress, the fact that it is not reduced to **ə** shows that is the head of a foot.

(22) **ALIGN PROSODIC WORD**
Align(PrWd,L,Ft,L)
The left edge of every PrWd is aligned with the left edge of some foot.

(23) **PROSODIC WORD RIGHT**
Prosodic words are right-headed.

(24) Candidates	WSP	ALIGNPW	PRWDRT	ALIGN-L	PARSE-σ
a. ☞ (.mar.kə.)(ré:r.)				*	
(.mar.kə.)re:r.	* !				*
.mər.kə.(ré:r.)		* !	*	*	**
(.már.kə.)(re:r.)			* !	*	
b. (.d'í:.)(vi:n'.)			* !	*	
☞ (.d'i:.)(ví:n'.)				*	
.d'i:.(ví:n'.)	* !	*		*	*
(.d'í:.)vi:n'.	* !				*
c. (.t'ə́i.)(la.kə.)			* !	* !	
(.t'əi.)(lá.kə.)				* !	
☞ (.t'ə́i.)lə.kə.					**
.t'əi.(lá.kə.)	* !	*		*	*

Another way to comply with the WSP would be to shorten a noninitial heavy syllable.[6] This is prohibited by high-ranking IDENT-IO[v-length] (25), as shown in the tableau in (26).

(25) **IDENT-IO[v-length]** (Benua 1995)
Vowel length in the output is identical to that in the input.

(26) /markare:r/	IDENT-IO[v-length]	WSP	ALIGN-L	PARSE-σ
(.már.kə.)rer.	* !			*
☞ (.mar.kə.)(ré:r.)			*	

[6] This is the strategy employed in the Ulster dialect.

The data given above in (1a, b, d, e), (2a, b, c), (3), (4), (5a), (6a), (7c), and (8) can all be accounted for with only these constraints. But consider forms such as **asé:nti:xt** ‘disagreement’ (1c), **ma:rn'é:li:xt** (1f), and **ú:dəra:s** ‘authority’ (2d). As shown in (27), the constraints as given above would predict ***ase:ntí:xt**, ***ma:rn'e:líxt**, and ***u:dərá:s**.

(27)	Candidates	FtBin	Align-PW	PrWdRt	Align-L	Parse-σ
a.	(.á.)(se:n.)(ti:xt.)	* !		*	**	
	.a.(sé:n.)(ti:xt.)		*	* !	**	*
	*☞ .a.(se:n.)(tí:xt.)		*		**	*
b.	(.má:r.)(n'e:.)(li:xt.)			* !	**	
	(.ma:r.)(n'é:.)(li:xt.)			* !	**	
	*☞ (.ma:r.)(n'e:.)(lí:xt.)				**	
c.	*☞ (.u:.)də.(rá:s.)				*	*
	(.ú:.)də.(ra:s.)			* !	*	*

A common means of preventing stress from falling on the final syllable is with the constraint NONFIN(σ́) (28), which corresponds to right-edge extrametricality.

(28) **NONFIN(σ́)** (Prince & Smolensky 1993, 43, Hung 1994, Cohn & McCarthy 1994, Ní Chiosáin 1995)
The head syllable of a PrWd is not final in the PrWd.

Ranking NONFIN(σ́) above PRWDRT will give us the right result in **ú:dəra:s** but falsely predicts ***márkəre:r** instead of **markəré:r**, as shown in (29).

(29)	Candidates	NONFIN(σ́)	PRWDRT
a.	☞ (.ú:.)də.(ra:s.)		*
	(.u:.)də.(rá:s.)	* !	
b.	*☞ (.már.kə.)(re:r.)		*
	(.mar.kə.)(ré:r.)	* !	

Of course, the opposite ordering will yield the opposite results: **markəré:r** but ***u:dərá:s**. Apparently NONFIN(σ́) is simply not the relevant constraint here.

What is needed, therefore, is some mechanism to take the final syllable of **ú:dəra:s** out of consideration while leaving the final syllable of **markəré:r** in consideration. That mechanism is the colon.

4. THE COLON

The colon (plural *cola*; abbreviated κ) was first proposed by Halle & Clements (1983) as a prosodic entity between the prosodic word and the foot. Hammond (1987) picked up on the idea in his analysis of Hungarian, and Hayes (1995) uses the colon to explain stress facts in Maithili, Malecite–Passamaquoddy, Eastern Ojibwa, and Asheninca.

Like feet, binary cola can be right-headed or left-headed.[7] Hayes proposes that binary cola must have only feet as their terminals, which results in temporarily allowing degenerate feet in his analysis of Asheninca. I propose instead that a binary colon may consist either of two feet or of a foot plus an unfooted syllable, but only a foot can be the head of a colon.[8]

By building a right-headed binary colon at the left edge of the word, we can capture the distinction between **ú:dəra:s** and **markəré:r**, as shown in (30), where ( ) indicate the boundaries of a foot, [ ]$_\kappa$ the boundaries of a colon, and [ ]$_\omega$ the boundaries of a prosodic word.

(30)
a. [[(.ú:.)də.]$_\kappa$ (ra:s.)]$_\omega$
b. [[(.mar.kə.)(ré:r.)]$_\kappa$]$_\omega$

Because the final syllable of **ú:dəra:s** falls outside of the colon, it is not eligible to become the head syllable of the word, i.e. receive primary stress. The single ALIGN-L constraint given above in (14) can now be replaced by ALIGN FOOT-COLON (31) and ALIGN COLON-PROSODIC WORD (32).

(31) **ALIGN FOOT-COLON**
Align(Ft,L,κ,L)
The left edge of every foot corresponds to the left edge of some colon.

(32) **ALIGN COLON-PROSODIC WORD**
Align(κ,L,PrWd,L)
The left edge of every colon corresponds to the left edge of some PrWd.

The data that could not be accounted for without the colon now can be accounted for with the ranking ALIGN COLON-PROSODIC WORD » ALIGN FOOT-COLON » PARSE-σ, as shown in (33).

(33) Candidates	ALIGNκ-PW	ALIGNFT-κ	PARSE-σ
a. ☞ [[.a.(sé:n.)]$_\kappa$ (ti:xt.)]$_\omega$		**	*
[.a.[(se:n.)(tí:xt.)]$_\kappa$]$_\omega$	* !	*	*
b. ☞ [[(.ma:r.)(n'é:.)]$_\kappa$ (li:xt.)]$_\omega$		**	
[(.ma:r.) [(n'e:.)(lí:xt.)]$_\kappa$]$_\omega$	* !	**	
c. ☞ [[(.ú:.)də.]$_\kappa$ (ra:s.)]$_\omega$		*	*
[(.u:.) [də.(rá:s.)]$_\kappa$]$_\omega$	* !	*	*

The forms **adər'əgá:lə** ‘mediation (gen.)’ (4b) and **im'əg'e:n'ú:lə** ‘distant (pl.)’ (4c) can be accounted for by proposing that more than one colon may be built if there is room; in other words, that PARSE-FT (34) outranks ALIGN COLON-PROSODIC WORD (32), as shown in (35).

(34) **PARSE-FT**
Feet are parsed into cola.

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[7] Cola can apparently also be unbounded, like prosodic words (see Hayes’ discussion of Maithili (1995: 149 ff.)).

[8] This follows from the Continuous Column Constraint of Prince (1983): the head of a prosodic category (here, the colon) must also be the head of the next lower category (here, the foot).

(35) Candidates	PARSE-FT	ALκ-PRWD
a. [[(.á.də.)r'ə.]$_{\kappa}$ (ga:.)lə.]$_{\omega}$	* !	
☞ [[(.a.də.)r'ə.]$_{\kappa}$ [(gá:.)lə.]$_{\kappa}$]$_{\omega}$		*
b. [[(.i.m'ə.)(g'é:.)]$_{\kappa}$ (n'u:.)lə.]$_{\omega}$	* !	
☞ [[(.i.m'ə.)(g'e:.)]$_{\kappa}$ [(n'ú:.)lə.]$_{\kappa}$]$_{\omega}$		*

But now we have a problem with some forms that end with two heavy syllables, like those in **ét'ər'əxa:ni:** 'vulgar person' (6c) and **áumpəra:ni:xt** 'affliction' (7b): exhaustive parsing of feet into cola predicts ultimate stress, as shown in (36).

(36) Candidates	PARSE-FT	ALκ-PRWD
a. *☞ [[(.e.t'ə.)r'ə.]$_{\kappa}$ [(xa:.)(ní:.)]$_{\kappa}$]$_{\omega}$		*
[[(.é.t'ə.)r'ə.]$_{\kappa}$ (xa:.)(ni:.)]$_{\omega}$	*!*	
b. *☞ [[(.aum.)pə.]$_{\kappa}$ [(ra:.)(ní:xt.)]$_{\kappa}$]$_{\omega}$		*
[[(.áum.)pə.]$_{\kappa}$ (ra:.)(ni:xt.)]$_{\omega}$	*!*	

The extrametricality constraint NONFIN(σ́) (28), along with the constraint COLON FORM RIGHT (37) can help us here.

(37) **COLON FORM RIGHT**
Cola are right-headed.

COLON FORM RIGHT and NONFIN(σ́) are for the moment unranked with respect to each other, but both outrank PARSE-FT. As shown in (38), this means that it is better to leave feet on the right uncolified than to stress the final syllable or make a left-headed colon.

(38) /et'ər'əxa:ni:/	COLFMRT	NONFIN(σ́)	PARSE-FT
[[(.e.t'ə.)r'ə.]$_{\kappa}$ [(xa:.)(ní:.)]$_{\kappa}$]$_{\omega}$		* !	
[[(.e.t'ə.)r'ə.]$_{\kappa}$ [(xá:.)(ni:.)]$_{\kappa}$]$_{\omega}$	* !		
☞ [[(.é.t'ə.)r'ə.]$_{\kappa}$ (xa:.)(ni:.)]$_{\omega}$			**

Forms that end [… H L], such as **adər'əgá:lə** above, are unaffected by COLON FORM RIGHT since their final light syllable is unstressed without violating it. Therefore PARSE-FT decides that the exhaustively parsed candidate is optimal (39).

(39) /adər'əga:lə/	COLFMRT	NONFIN(σ́)	PARSE-FT
☞ [[(.a.də.)r'ə.]$_{\kappa}$ [(gá:.)lə.]$_{\kappa}$]$_{\omega}$			
[[(.á.də.)r'ə.]$_{\kappa}$ (ga:.)lə.]$_{\omega}$			* !

NONFIN(σ́) is violated only in words that are too short to accommodate more than one colon. Here, compliance with NONFIN(σ́) would require violation of the higher-ranked constraints M-PARSE (40), COLON BINARITY (41), and FOOT BINARITY (42).

(40) **M-PARSE** (McCarthy & Prince 1993b, 112)
Morphemes are parsed into morphological constituents.

(41) **COLON BINARITY** (for Munster Irish)
Cola are binary over feet and unfooted syllables.

(42) **FOOT BINARITY** (moraic) (Prince & Smolensky 1993, 47)
Feet are binary at the moraic level.

Loss of all prosodic structure violates M-PARSE, and truncating the size of the colon or foot violates COLON BINARITY or FOOT BINARITY respectively. The ranking M-PARSE, COLON BINARITY, COLON FORM RIGHT, FOOT BINARITY » NONFIN(σ́) is shown in the tableau in (43). (The third candidate in each group is the one with no structure.)

(43)	Candidates	M-PARSE	COLBIN	COLFMRT	FTBIN	NONFIN (σ́)
a.	☞ [[.kər.(ká:n.)]$_\kappa$]$_\omega$					*
	[[(.kór.)ka:n.)]$_\kappa$]$_\omega$				* !	
	korka:n	* !				
b.	☞ [[(.d'i:.)(ví:n'.)]$_\kappa$]$_\omega$					*
	[[(.d'í:.)(vi:n'.)]$_\kappa$]$_\omega$			* !		
	[[(.d'í:.)]$_\kappa$ (vi:n'.)]$_\omega$		* !			
	d'i:vi:n'	* !				

In spite of this reluctance to truncate colon and foot size, in some cases cola and feet must be degenerate. Irish has words of the shape [L L] and [H], which are a single foot, and words of the shape [L], which are a single mora. Since these words are fully stressed content words, they must have full prosodic structure in spite of their subminimal size. Examples are shown in (44).

(44)

a.	[[(.á.səl.)]$_\kappa$]$_\omega$	‘donkey’ (3a)
b.	[[(.b'ó:.)]$_\kappa$]$_\omega$	‘alive’ (8b)
c.	[[(.bá.)]$_\kappa$]$_\omega$	‘cows’ (8a)

Roots like these violate COLON BINARITY and FOOT BINARITY in order to comply with IDENT-IO[v-length] (25) and DEP-IO (45).

(45) **DEP-IO** (McCarthy & Prince 1995, 16)[9]
Every segment of the output has a correspondent in the input.

The behavior of Munster Irish is in contrast to that of languages like Axininca Campa and Lardil (McCarthy & Prince 1993 and elsewhere), which augment subminimal roots. The MI ranking DEP-IO » COLON BINARITY, FOOT BINARITY is illustrated in the tableau in (46).

(46)	Candidates	IDENT-IO[v-length]	DEP-IO	COLBIN	FTBIN
a.	☞ [[(.á.səl.)]$_\kappa$]$_\omega$			*	
	[[(.á.səl.)□□.]$_\kappa$]$_\omega$		* ! *		
b.	☞ [[(.b'ó:.)]$_\kappa$]$_\omega$			*	
	[[(.b'ó:.)□□.]$_\kappa$]$_\omega$		* ! *		
c.	☞ [[(.bá.)]$_\kappa$]$_\omega$			*	*
	[[(.báˑ.)]$_\kappa$]$_\omega$	* !		*	
	[[(.báˑ.)□□.]$_\kappa$]$_\omega$	* !	* ! *		

[9]DEP-IO replaces the older constraint FILL (Prince and Smolensky 1993, 25)

We have now seen how the colon can be used successfully to account for the entire range of facts concerning the attraction of stress to heavy syllables in MI. We shall now move on to the other cases where stress is not initial: when the initial syllable contains **ə**, and when the second syllable contains **ax**.

5. OTHER INSTANCES OF NONINITIAL STRESS

5.1 Schwa in an initial syllable

The vowel **ə** has a special status in many languages as a reduced vowel; a typical result of this special status is that it often cannot be stressed, and sometimes cannot be footed at all. In their analysis of Indonesian, Cohn & McCarthy (1994) propose a constraint NON-HEAD(ə), which prevents **ə** from being the head of a foot (47).[10]

(47) **NON-HEAD(ə)** (Cohn & McCarthy 1994, 24)
Stressed **ə** is prohibited.

NON-HEAD(ə) is relevant in MI as well: if the first syllable in a word contains **ə**, the first syllable must not be stressed, as we saw in the examples in (13) above. Two representative examples are repeated in (48).

(48)

a. .ə.ní.r'əg'. ‘last year’ (13b)
b. .b'r'ək'.f'ást. ‘breakfast’ (13f)

It is not immediately clear what the prosodic structure of these words is. Either the initial syllable of each form is unfooted, or the first two syllables are parsed into an iamb rather than a trochee. These options are shown in (49).

(49)

a. [[.ə.(ní.r'əg'.)]$_{\kappa}$]$_{\omega}$
b. [[(.ə.ní.)r'əg'.]$_{\kappa}$]$_{\omega}$
c. [[.b'r'ək'.(f'ást.)]$_{\kappa}$]$_{\omega}$
d. [[(.b'r'ək'.f'ást.)]$_{\kappa}$]$_{\omega}$

All of these potentially optimal candidates violate certain constraints; it would be beneficial to consider what the violated constraints are. (49a) violates ALIGN FOOT-COLON and PARSE-σ. (49b) violates FOOT FORM and PARSE-σ. In (21) it was established that FOOT FORM dominated ALIGN-L; ALIGN-L was then subsumed by ALIGN FOOT-COLON, so it may be assumed that FOOT FORM dominates ALIGN FOOT-COLON, making (49b) the optimal candidate for **ənír'əg'**, as shown in (50). Any form stressing **ə** will of course violate NON-HEAD(ə).

(50) /ənir'əg'/	FTFORM	NHEAD(ə)	ALIGNFT-κ	PARSE-σ
☞ [[.ə.(ní.r'əg'.)]$_{\kappa}$]$_{\omega}$			*	*
[[(.ə.ní.)r'əg')]$_{\kappa}$]$_{\omega}$	* !			*
[[(.ə́.ni.)r'əg']$_{\kappa}$]$_{\omega}$		* !		*

[10] Of course, this does not apply to the schwas in the diphthongs **iə uə ə i**.

The case of (49c–d) is less clear. (49c) violates FOOT BINARITY, ALIGN FOOT-COLON, and PARSE-σ. (49d) violates FOOT FORM and COLON BINARITY. We know, again from (21), that FOOT BINARITY dominates ALIGN FOOT-COLON, so the highest ranking constraints to be considered are FOOT FORM, FOOT BINARITY, and COLON BINARITY. We have no independent evidence to help us decide on a ranking for these constraints, since (49c) and (d) are phonetically identical. If, perhaps, the three are unranked with respect to each other, but all dominated by NON-HEAD(ə), the decision will be made in favor of (49c), because (49d) violates two of these constraints and (49c) violates only one, as shown in the tableau in (51).

(51) /b'r'ək'f'ast/	NH(ə)	FTFORM	FTBIN	COLBIN	ALIGNFT-κ
☞ [[.b'r'ək'.(f'ást.)]$_{\kappa}$]$_{\omega}$			*		*
[[(.b'r'ək'.f'ást.)]$_{\kappa}$]$_{\omega}$		* !		* !	
[[(.b'r'ə́k'.f'ast.)]$_{\kappa}$]$_{\omega}$	* !			*	

Simply put, because **ə** cannot be stressed, a word with this vowel in the first syllable must be stressed on the second syllable.

5.2 **ax** in the second syllable

To explain the behavior of /ax/, we must first discuss the notion of prominence. Hayes (1995, 270 ff.) discusses many languages in which one type of syllable may be more prominent than another type of syllable, without necessarily being heavier. For example, in Golin (Hayes 279) syllables with high tone are more prominent than syllables with low tone, and in Asheninca (Hayes 291) syllables with **i** before a nasal are more prominent than other syllables with **i**. This appears to be true regardless of whether or not the nasal consonant is tautosyllabic with the **i**. For MI, I propose that a syllable with **a** before **x** (regardless of whether **x** is tautosyllabic with **a**) is more prominent than other light syllables.[11] In optimality-theoretic terms, the constraint PKPROM (52) is met when **ax**[12] is the head of its foot.

(52) **PKPROM** (Prince & Smolensky 1993, 39)
Peak(x) › Peak(y) if |x| > |y|.

In other words, *x* is a better peak than *y* if the prominence of *x* is greater than the prominence of *y*. Since **ax** is more prominent than other light syllables, it makes a better peak than other light syllables. This constraint does not apply if **ax** is left unfooted, as shown by the examples in (53).

(53)

a. (.fá:.)sax. = fá:səx ‘desert’ (9a)

b. (.sá.sə.)nax. = sásənəx ‘Englishman’ (9e)

The tableau in (54) shows the ranking PKPROM » FT-FORM for /b'anaxt/ **b'ənáxt** ‘blessing’ (10a) and /bakaxa/ **bəkáxə** ‘lame (pl.)’ (10b).

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[11] This special prominence of **ax** is seen also in the Ulster dialect, where unstressed **ax** is not reduced to **əx**: **pə́rtax** ‘bog’ (Quiggin 1906, 12, Wagner 1959, 189).

[12] I shall be using this notation to indicate **a** before **x**: I emphasize that **x** need not be in the coda.

(54)	Candidates	PKPROM	FTFORM
a.	[[(.b'á.nəxt.)]$_{\kappa}$]$_{\omega}$	a !	
	☞ [[(.b'ə.náxt.)]$_{\kappa}$]$_{\omega}$	ax	*
b.	[[(.bá.kə.)xə.]$_{\kappa}$]$_{\omega}$	a !	
	☞ [[(.bə.ká.)xə.]$_{\kappa}$]$_{\omega}$	ax	*

PKPROM is overridden, however, by a higher-ranking constraint NO CLASH (55).

(55) **NOCLASH**
Two adjacent syllables should not both be foot-heads.

The effect of NOCLASH on the phrases **k'ip'í:n'** 'small stick' and **k'íp'i:n' d'árəg** 'small red stick' (Ó Siadhail 1989, 31) is seen in the tableau in (56), which shows the ranking NOCLASH » FTFORM.

(56)	Candidates	NOCLASH	FTFORM
a.	[(.k'í.p'i:n'.)]		* !
	☞ [.k'i(p'í:n'.)]		
b.	☞ [(.k'í.p'i:n') (d'árəg.)]		*
	[.k'i(p'í:n') (d'árəg.)]	* !	

As shown in the tableau in (57), NOCLASH also dominates PKPROM, which in turn dominates FTFORM. The candidates evaluated in (57) are for /molhaxa:n/ **molhəxá:n** 'wether' (9b). In each candidate, the short vowel that is not reduced to **ə** is the head of the foot.

(57)	/molhaxa:n/	NOCLASH	PKPROM	FTFORM
	☞ [[(.mol.hə.)(xá:n.)]$_{\kappa}$]$_{\omega}$		o	
	[[(.məl.ha.)(xá:n.)]$_{\kappa}$]$_{\omega}$	* !	ax	*

Stress can fall on the sequence **ax** in the second syllable, therefore, because of the special prominence of that sequence.

6. INITIAL STRESSING OF [H L H L]

As mentioned above, while in some varieties of MI [H L H L] words are stressed on the penult, in other varieties such words are stressed on the initial syllable. The difference between initial-stress varieties and penultimate-stress varieties would seem to be that while that while the penultimate-stress forms require exhaustive parsing of feet into cola (58), the initial-stress forms require that a single binary colon be built at the left edge of the word, as shown in (59).

(58) [[(.sla:.)nə.]$_{\kappa}$ [(hó:.)rə.]$_{\kappa}$]$_{\omega}$ 'savior' (5a)
(59) [[(.d'íə.)gə.]$_{\kappa}$ (su:.)ləxt.]$_{\omega}$ 'piety' (5b)

ALIGN COLON-PROSODIC WORD (32) must be outranking PARSE-FT in order for the structure in (60) to be optimal. The tableau in (56) illustrates the ranking ALIGN COLON-PROSODIC WORD » PARSE-FT in these varieties of MI.

(60) /d'iəgasu:ləxt/	ALIGNκ-PRWD	PARSE-FT
[[(.d'iə.)gə.]$_κ$[(sú:.)ləxt.]$_κ$]$_ω$	* !	
☞ [[(.d'íə.)gə.]$_κ$(su:.)ləxt.]$_ω$		*

The opposite ranking, PARSE-FOOT » ALIGN COLON-PROSODIC WORD, was illustrated above in (35) and accounts for the dialects in which the penult is stressed.

(61) /sla:naho:ra/	PARSE-FT	ALIGNκ-PRWD
☞ [[(.sla:.)nə.]$_κ$[(hó:.)rə.]$_κ$]$_ω$		*
[[.slá:.)nə.]$_κ$(ho:.)rə]$_ω$	* !	

7. CONCLUSIONS

The full range of stress placement facts for Munster Irish, so peculiar that they defy descriptive generalizations, can be easily and elegantly accounted for once the colon has been added to the prosodic hierarchy. The colon succeeds in circumscribing the relevant feet and syllables and in excluding those feet and syllables that must be left out of the equation.

The Weight-to-Stress Principle is of course of primary importance in determining stress placement. In my dissertation I plan to show the relevance of the WSP not only in Munster Irish but also in Connacht Irish, Ulster Irish, and the closely related languages Scots Gaelic and Manx.

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