Statistical Generalizations in the stress distribution of Italian and Spanish. Michael Kenstowicz & Kie Zuraw, June 2002

It is well known that both Spanish and Italian confine stress to a three-syllable window at the right edge of the word.

In Italian–*are* verbs the stress can fall on either the penultimate or antepenultimate syllable of the stem when combined with the singular or 3 pl. inflection. Stress is on the desinence of the 1 and 2 plural. In (1) we show two contrasting patterns.

macin-'are	'to grind'	lavor-'are	'to work'
m'acin-o	mancin-'iamo	lav'or-o	lavor-'iamo
m'acin-i	macin-'ate	lav'or-i	lavor-'ate
m'acin-a	m'acin-ano	lav'or-a	lav'or-ano

Here we report the results of a study of the statistical frequencies that favor one pattern or the other. Our corpus consists of the 1,271 polysyllabic verb stems drawn from a corpus of the most frequent 30,000 words in contemporary Italian compiled by Delmonte (1999).

The first result is that when the final syllable of the stem is closed, then the stress always falls on this syllable when the desinence permits. There are 712 verbs of this structure.

ascolt-'are	as.c'ol.to	'listen'
bilan-c'iare	bi.l'an.cio	'balance'
tempest-'are	tem.p'es.to	'bombard'
aspett-'are	as.p'et.to	'wait'

Second, when the stem-final syllable is open and hence light (L), the location of stress as penultimate or antepenultimate is distributed as follows.

'HLL	78	c'al.co.lo	'calculate'
H'LL	173	car.b'u.ro	'attune'
'LLL	174	c'a.li.bro	'calibrate'
L'LL	134	cu.c'i.no	'cook'

The following matrix is highly significant and shows a skewing away from the 'HLL structure.

	open antepenult	closed antepenult
penult stress	134	173
antepenult stress	174	78

two-tail: p = 1.87 e-9

HLL is a marked configuration in the Romance languages and cross-linguistically; it is the site of conflict among constraints calling for foot binarity, exhaustive parsing, and nonfinal stress (cf. Mester 1994).

HLL	Ft-Bin	Parse-s	Non-Finality
(HL)L	*	*	
(H)(LL)			*
(H)LL		**	
(H)(L)L	*	*	

The 'LLL vs. L'LL opposition shows a trend in favor of nonfinal feet [i.e. (LL)L] while H'LL vs. 'HLL shows a strong preference for bimoraic grouping [i.e. (H)(LL)].

The relative dispreference for the 'HLL configuration also shows up in various dialectal developments in Italian. For example, the diphthongization of stressed syllables in the Abbruzzi dialects documented by Fong (1976) regularly occurs in paroxytones but is systematically blocked in proparoxytones. Assuming that diphthongization adds a mora or otherwise contributes to the weight of the syllable, the failure of proparoxytones to participate in this change can be understood as a dispreference for the 'HLL configuration.

In a number of languages the sonority of a vowel plays a role in the locus of stress with higher sonority (lower or peripheral) vowels attracting stress (cf. Kenstowicz 1997). One might wonder if the relative sonority of the vowels in the penult vs. antepenult has an effect on the placement of stress in Italian. When we compare the extremes of the vowel space in terms of sonority (i..e. the most sonorous /a/ and the least sonorous /i/), another significant difference emerges.

	antepenult stress	penult stress
a-i	28	41
i-a	2	18

two tail: p = .014

Generalizing to include the other high vowel /u/, the significance level increases slightly.

	antepenult	penult
low-high	34	58
high-low	2	21

two tail: p = .010

Finally, we looked at stems in which the vowels occupying the final two syllables were identical. Here another sonority difference emerged. The low vowel stands out from the other vowels in favoring penultimate stress in stems with identical vowels in the final two syllables.

	antepenult	penult
low	3	15
non-low	53	24

Two tail: .0005

This pattern might reflect a preference to parse identical vowels in a single foot (alignment of metrical and harmonic domains) vs. low vowel as strong—longest duration and hence an (aa) foot could be too large.

Vowel height distinctions also stand out in various dialectal developments concerning metrical weight. In the well-known Borgo San Sepolcro studied by Merlo (1929) (see Repetti 1992 for discussion) a penultimate geminate consonant degeminates and compensatorily lengthens the preceding vowel when that vowel is [a,ɛ,ɔ]--i.e. the most sonorous vowels. And in Romangolo (Baroni 1994) [a,ɛ,ɔ] lengthen in (stressed) open syllables. Looking beyond Italian, there are other examples where stress shifts from its normal locus to avoid a low sonority vowel. For example, in penultimate stress Polish a handful of words (mostly loans) have antepenultimate stress (Comrie 1980). All have the vowel [i] in the penult (e.g. uniw'ersytet 'university'). Davis (1992) points to several cases in English where stress is sensitive to vowel height. For example, in words whose penultimate syllable nucleus is followed by an sC cluster stress tends to fall on the antepenult when the penult is orthographic /i,e/ (cf. cf. *b'anister* and *'orchestra* vs. *dis'aster* and *ap'ostate*).

A major question raised by our study is whether the statistical generalizations we have uncovered have any psychological reality for the Italian speaker. We hope to address this question in future research. See Zuraw (2000) for a study of nasal substitution with nonce words in Tagalog showing that subjects' judgments mirror the statistical distribution in the lexicon.

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