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EXCEPTIONAL STRESS PATTERNS IN THE ABSENCE OF MORPHOLOGICAL CONDITIONING

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ABSTRACT

This article investigates which stress pattern emerges as the preferred one in the absence of morphological conditioning in a morphologically-determined system like Greek. More specifically, we explore the stress behavior of a particular category of indeclinable words, namely, acronyms in order to discover whether the antepenultimate default represents the most frequent choice in the speakers' productions. A production experiment revealed that a stress pattern different than the language-specific default emerges in the absence of overt morphological information.

Keywords: acronyms, phonological default, morphologically-determined stress, reading aloud experiment

1. Introduction

Lexical stress systems are referred in the literature as an extreme case of unpredictability in the position of stress. More specifically, in such systems the computation of stress relies heavily on the lexically pre-specified information that morphemes may be endowed with. Naturally, when a string of morphemes is concatenated to form a word, the lexically-assigned stress of a given morpheme may be in conflict with the lexically-encoded stress preferences of other morphemes in a word. The examples in (1) and (2) from Russian and Greek, respectively, are instructive. In (1b), for example, the inflectional ending /-á/ is assumed to be inherently stressed and, as such, it surfaces with primary stress. However, the same ending loses prominence to the inherent stress of the root /bolót-/ in (1d). The same applies to the genitive plural suffix /-ón/ in the Greek examples (2b) and (2d), respectively.

(1)   Russian: Inflected neuter nouns in -o (nom.sg), -a (nom.pl)

a.	zérkalo	/zerkal-o/	'mirror'
b.	zerkalá	/zerkal-á/	
c.	bolóto	/bolót-o/	'swamp'
d.	bolóta	/bolót-á/	

(2)   Greek: Inflected feminine nouns in -a (nom.sg), -on (gen.pl)

a.	θálasa	/θalas-a/	'sea'
b.	θalasón	/θalas-ón/	
c.	aɣeláða	/aɣeláð-a/	'cow'
d.	aɣeláðon	/aɣeláð-ón/	

Crucially, in the absence of lexically pre-specified stress, a language-specific elsewhere or default stress pattern arises. In our examples, the default is represented by the examples in (1a) and (2a); that

is, it is initial in Russian and antepenultimate in Greek due to a three-syllable restriction that is obligatorily enforced in the language. However, the issue of which stress pattern represents the default is not an easy one to answer. In Russian, for instance, both initial (Halle, 1973, 1997; Kiparsky & Halle, 1977; Melvold, 1990, among others), and post-stem stress (Alderete, 1999, 2001a, 2001b) have both been proposed to represent the default, as shown in (3) and (4), respectively.

(3)   Russian default stress is initial
        a.   gólovy   /golov-y/   'head-nom.pl'
        b.   skóvorody   /skovorod-y/   'frying pan-nom.sg'

(4)   Russian default stress is post-stem
        a.   gospož-á   /gospož-a/   'lady-nom.sg'
        b.   gospož-í   /gospož-i/   'lady-nom.pl'

To complicate things more, a series of nonce-probe experiments on Russian (Nikolaeva, 1971; Crosswhite, Alderete, Beasley, & Markman, 2003) revealed that the speakers' productions favored stem-final stress. These results are complemented by the findings of recent (experimental) studies (Andreev, 2004; Fainleib, 2008; Lavitskaya & Kabak, 2011a, 2011b) which appoint stem-final stress as the default in consonant-ending words and penultimate stress as the default in vowel-ending words in Russian.

Similarly in Greek, most analyses appoint antepenultimate stress as the phonological default (Malikouti-Drachman & Drachman, 1989; Ralli & Touratzidis, 1992; Revithiadou, 1999, 2007; Apoussidou, 2003; Burzio & Tantalou, 2006) whereas experimental studies that include reading tasks of pseudowords revealed that speakers show a strong preference for penultimate stress (Protopapas, Gerakaki, & Alexandri, 2006). As evident from the above discussion, it is far from clear which stress pattern represents the default.

In order to shed light on this issue, we examine how stress in a morphology-dependent system like Greek is shaped when: (a) morphology is inert, that is, when elements that normally interfere through their underlying stress in accentuation, such as inflectional suffixes, are not available to the speaker, and (b) the stem lacks inherent accentual properties. For this purpose, we designed and conducted a production experiment using infrequent/unfamiliar acronymic constructions as stimuli. Acronyms constitute an ideal case study because they lack fixed stress and, more importantly, they come in specific word sizes and syllable shapes, which allows us to exercise better control of the factors that may influence stress assignment.

The remainder of this paper presents a detailed account of a production experiment and its results, and provides a valuable insight in the nature of 'default' in morphology-dependent stress systems like Greek.

2. Acronyms

Acronymic constructions are very productive and common in everyday use. Unlike the vast majority of the Greek vocabulary, they are inflectionless and are deprived of pre-assigned stress.[1] The latter characteristic distinguishes them from place names, loanwords and brand names (e.g., Monacó, Sóftware, Lacóste, etc.) which are usually endowed with an inherent accentual property.

According to Anastassiadis-Symeonidis (1986) acronymic constructions in Greek, together with various types of initialisms (e.g., M.M.E. [mí mí épsilon] /mésa mazikís enimérosis/ 'Mass Media', Φ.Π.Α. [fí pí á] /fóros prostiθémenis aksías/ 'Value Added Tax') are instances of word creation (Booij, 2005). Acronyms are formed by extracting a portion from the beginning of words that belong to the same nominal phrase and by linearly arranging them into a template-shaped construction (Vazou, 2004; Vazou & Xydopoulos, 2007; Nikolou, 2010). More specifically, they can be formed: (a) by copying the initial segment of the constituent words (5a), (b) by copying parts of the initial syllables that are the size of a close or an open syllable (5b), and (c) by both the above ways (5c):

(5)   a.   [ika]   /Íðrima Kinonikón Asfalíseon/   'Social Security Organization'

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[1] Only highly frequent ones, which are felt as common words, e.g., A.E.K. [áek] 'Athletic Union of Constantinople', ΕΛ.ΤΑ. [eltá] 'Hellenic Post', etc. have fixed stress.

b.   [ðipeθe]   /DImotikó PEriferiakó ΘEatro/   'Municipal Regional Theater'
c.   [eiðap]   /Etería IDrefsis Apoxétefsis Protévusas/ 'Athens Water Supply and
                                                           Sewerage Company'

Sizewise, Greek acronyms are mostly monosyllabic and disyllabic. Three- and four-syllable long acronyms are less frequent or rare. Table 1 presents a list of the attested and unattested acronymic templates in Greek. Interestingly, trisyllabic and quandrisyllabic acronyms with a closed syllable in a non-final position are practically unattested.

	attested acronymic templates	unattested /rare acronymic templates
2σ	CV.CV CVC.CV CV.CVC CVC.CVC	___
3σ	CV.CV.CV CV.CV.CVC	CV.CVC.CV CV.CVC.CVC CVC.CV.CVC CVC.CV.CV (rare)
4σ	___	CV.CV.CV.CV (rare) all others

Table 1 Shapes and sizes of attested and unattested acronyms

3. Reading aloud experiment

The purpose of this experiment was to investigate the stress patterns that arise in both vowel- and consonant-ending acronyms and to unveil the factors that determine stress. For this reason, we designed and conducted a reading aloud experiment. In this section, we present the main methodological tools and we report on the main results of our experimental task.

3.1 Methodology

3.1.1   Participants

Twenty-one Greek students of the Aristotle University of Thessaloniki (19 females and 2 males; mean age: 18.1 years, age range: 18-19 years old) participated in the experiment. All of them were native speakers of Greek and naive as to the purpose and scope of this research. Students were awarded a 0.5 grade for their participation in the experiment.

3.1.2   Materials

The experimental stimuli consisted of 140 sentences of a simple SVO order. There was a gap in the subject position which had to be filled with a non-frequent acronym (e.g. Τ.Ε.Α.Δ.Υ. [teaði] 'Insurance Aid Fund of Public Servants') or a pseudoword. The relevant item was provided next to the gap. There were 60 gaps for non-frequent acronyms and 80 gaps for pseudowords/fillers. The factors our items were controlled for were: (a) the type of final segment (consonant vs. vowel), (b) the size of the word (two- vs. three-syllable words), (c) the effect of syllable type, i.e. close vs. open penultimate syllable.
    Given that there are six attested types of acronyms in Greek (depending on size and syllable structure, see Table 1), we used 10 items for each template and hence 60 experimental stimuli in total. There were 40 gaps for disyllabic acronyms and 20 gaps for trisyllabic ones. These data were

interspersed with fillers/pseudowords, constructed from the most productive morphological classes.[2] More specifically, we constructed 10 items for each class, hence 40 disyllabic and 40 trisyllabic pseudowords were employed for the experiment. We collected 2940 items in total, which were codified by the experimenters according to speaker, type of word (acronym or filler), word size and stress pattern. A sample of the experimental material is provided in Appendix A. A complete list of all the acronyms used in the experiment is given in Appendix B.

3.1.3   Procedure

The experiment took place in a quiet room, where the participants were individually tested by the first author. The participants were asked to read out 140 sentences containing an acronym or a pseudoword (filler) presented as a power point presentation on a laptop screen. Each slide contained five SVO sentences with a gap in the subject position. The acronym or filler was given next to the gap in capital letters, which required no diacritic for stress, and in a simplified orthography. The speaker was free to choose the gender for each word s/he filled in the gap with. The participants' responses were recorded with the help of a Marantz PMD661 digital recorder and a Sennheiser E-901 microphone. There was no time limitation in the completion of the task although most participants completed the experiment within 30 minutes.

3.2 Results

The experimental procedure yielded 960 data points (60 acronyms x 21 participants). Table 2 demonstrates the overall stress pattern attested in the data assembled.

Stress pattern	Percentages	Raw numbers
U	72.06%	908
PU	27.14%	342
APU	0.80%	10
Sum	100%	1260

Table 2 Overall stress pattern of acronyms

As shown in Table 2, stress on the ultimate syllable (U) is strongly preferred compared to stress on the penultimate syllable (PU). Strikingly, APU stress, that is, the phonological default by all analyses of Greek stress, is highly under-represented in the speakers' productions. In what follows, we delve more thoroughly into the factors that affect the position of stress in the acronym constructions under examination. More specifically, we focus on the type of the final segment, the role the size of the acronym and the type of its final syllable have on stress.

3.2.1   Type of final segment and size of acronym

The multiple regression analyses revealed that the final segment affected stress. Therefore, we examine separately the stress patterns of acronyms ending in consonants from those ending in vowels. Within each category, we also address the impact of word-size. We begin by focusing on acronyms ending in consonants (Figure 1). Our speakers show a strong preference for stem-final stress ($\chi^2_{(2)}$=957.800, p=.000) regardless of the number of syllables since the percentage of U stress is significantly high in both disyllabic ($\chi^2_{(1)}$=268.800, p=.000) and trisyllabic acronyms ($\chi^2_{(2)}$=346.200, p=.000).

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[2] Fillers/pseudowords were constructed on the basis of real words by changing: (a) the initial vowel of the stem and (b) the initial and final consonants of the stem, while respecting the syllabic structure and the phonotactic restrictions of the language.
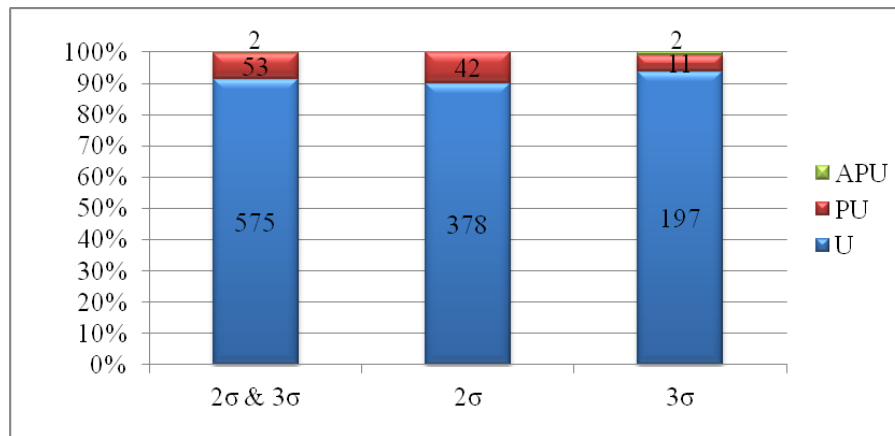
Figure 1 Stress results in C-final acronyms

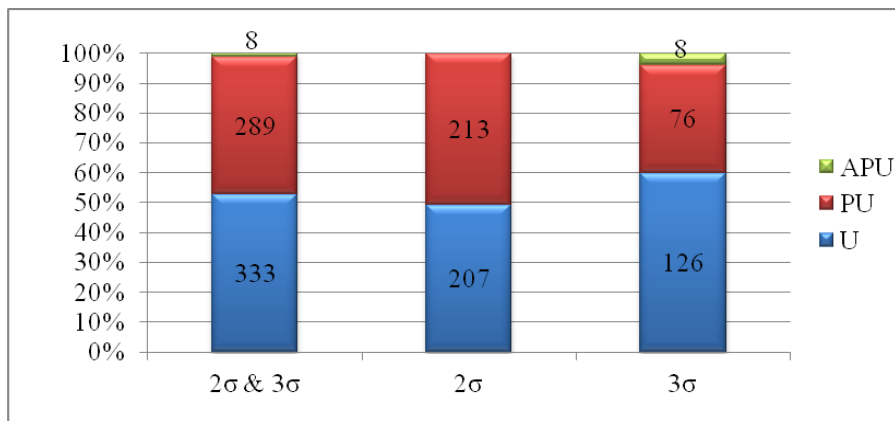The situation is dramatically different in V-ending acronyms, as shown in Figure 2:

Figure 2 Stress results in V-final acronyms

The difference among the stress responses is statistically significant ($\chi^2_{(2)}$=296.067, p=.000), which is due to the few APU responses. However, the preference for U over PU stress was found to not be significant (p>.1). Interestingly, speakers are split between PU and U stress when confronted with disyllabic acronyms ($\chi^2_{(1)}$=.086, p=.770). Three-syllable long acronymic constructions, on the other hand, show a robust preference for U stress (U vs. PU: $\chi^2_{(1)}$=12.376, p=.000; U vs. APU: $\chi^2_{(1)}$=103.910, p=.000), which suggests that, if the final syllable is open, the number of syllables seems to affect the position of stress.

3.2.2   Syllable type of PU

Our experiment was also designed to check whether the closed- or openedness of the PU has an effect on the position of stress. Figures 3 and 4 illustrate the impact of the PU syllabic structure on the stress patterns in consonant- and vowel-ending acronyms, respectively.
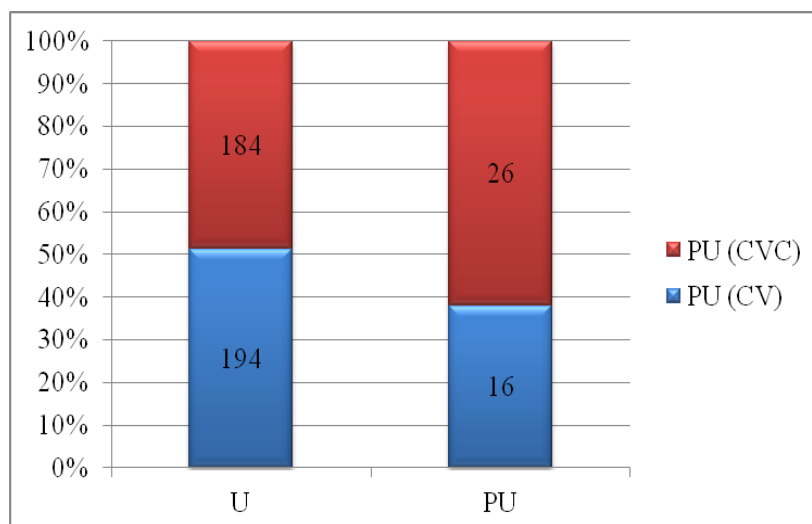
Figure 3 Stress in 2σ C-final acronyms depending on the syllable type of the PU
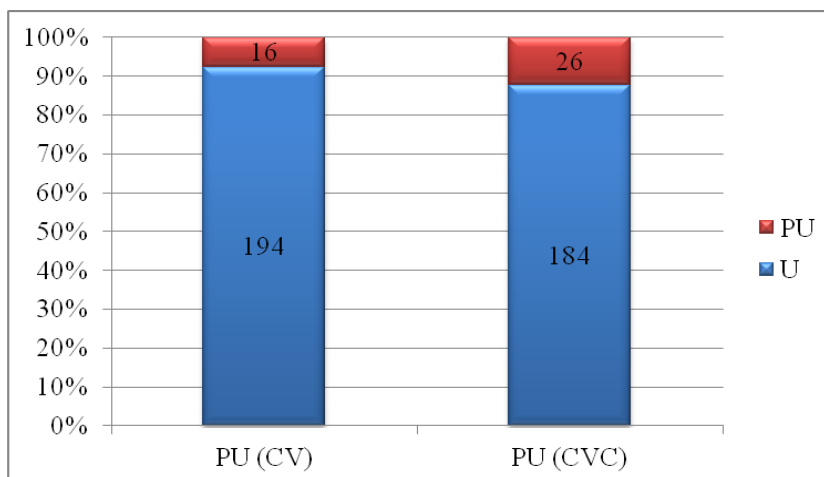

Figure 4 Stress in 2σ V-final acronyms depending on the syllable type of the PU

As shown in the above figures, a closed PU attracts stress more than an open one. However, the closedness of the PU was found to not have a statistically significant impact on C-final acronyms (p>.1). However, it had a marginally significant effect on stress in V-final acronyms ($\chi^2_{(1)}$=3.439, p=.064, η^2=.090, Cramer's V=.090, Contingency Coefficient=.090). We infer from these results that in C-final acronyms a final closed syllable attracts stress more than a PU one regardless of whether the lattter is open (χ^2=150.876, p=.000) or closed (χ^2=118.876, p=.000).

4. Discussion and concluding remarks

The results of the production experiment show a marked preference for U or stem-final stress in C-final acronyms and a curious vaccilation between PU and U stress in V-ending acronyms. The latter category presents us with the most intriguing stress patterns because the position of stress seems to hinge on the overall size of the acronym, a finding that future analyses of Greek stress ought to take into consideration. In general, the outcome of the statistical analyses suggests that the type of final segment and the syllabic composition of the acronym are controlling factors for the position of stress; final closed syllables attract stress more than open ones. Furthermore, a closed penultimate is more likely to attract stress than an open one.

Importantly, the elsewhere pattern, that is, APU stress, which takes charge of accentuation when morphemes lack lexical stress, is virtually absent in our data. This result clearly shows that, in the absence of morphological conditioning, default stress subsides to the dictates of the inherent stress-encoding mechanism which promotes instead PU and U stress. In other words, the speakers of a

morphology-determined stress system like Greek, who have tacit knowledge of the abstract representation of stress in their Mental Lexicon, feel more comfortable applying the lexical stress-encoding mechanism when confronted with new or unknown words than the predictable APU default.

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Appendix A

Sample of experimental items from Reading aloud experiment

Greek:	Translation:
Ο/Η/Το ………… (ΘΑΣΤΑ) δεν ισχύει πια.	The (masc/fem/neut) ………… is not valid. [θasta]
Ο/Η/Το ……………. (ΑΚΕ) υπερασπίζεται τους αγρότες.	The (masc/fem/neut) ……………. defends the farmers. [ake]
Ο/Η/Το …………….(ΛΕΧΘΟΣ) πέταξε μακριά.	The (masc/fem/neut) …………flew away. [lexθos]
Ο/Η/Το …………. (ΟΑΣΠ) οργανώνει σεμινάρια τον άλλο μήνα.	The (masc/fem/neut) …………. organizes seminars next month. [oasp]
Ο/Η/Το ……………(ΠΟΣΚΙ) δεν είναι έτοιμο.	The (masc/fem/neut) …………… is not ready. [poski]

Appendix B

Acronym list handed to the participants in Reading aloud experiment

Acronyms	IPA	Acronyms	IPA
ΣΕΘΑ	[seθa]	ΠΟΣΔΕΠ	[posðep]
ΣΑΤΑ	[sata]	ΕΛΤΡΟΠ	[eltrop]
ΝΕΔΕ	[neðe]	ΕΚΠΑΖ	[ekpaz]
ΙΒΕ	[ive]	ΓΕΔΣΑΠ	[ɣeðsap]
ΟΒΒΟ	[ovo]	ΗΛΠΑΠ	[ilpap]
ΕΜΕ	[eme]	ΛΙΠΤΟΛ	[liptol]
ΔΟΝΑ	[ðona]	ΠΕΝΟΨΥ	[penopsi]
ΓΑΔΑ	[ɣaða]	ΣΕΛΕΤΕ	[selete]
ΑΚΕ	[ake]	ΤΑΠΟΤΕ	[tapote]
ΒΕΑ	[vea]	ΥΠΕΘΑ	[ipeθa]
ΛΑΦΚΑ	[lafka]	ΤΕΑΔΥ	[teaði]
ΠΕΡΠΑ	[perpa]	ΟΜΕΠΟ	[omepo]
ΣΕΛΜΕ	[selme]	ΔΙΠΕΧΩ	[ðipexo]
ΚΕΠΚΑ	[kepka]	ΑΒΕΑ	[avea]
ΠΕΚΔΥ	[pekði]	ΚΕΘΕΑ	[keθea]
ΕΛΠΑ	[elpa]	ΟΣΥΠΑ	[osipa]
ΚΕΔΚΕ	[keðke]	ΣΕΒΙΤΕΛ	[sevitel]
ΤΑΝΠΥ	[tanpi]	ΠΑΣΟΝΟΠ	[pasonop]
ΕΛΚΕ	[elke]	ΠΑΣΙΔΙΚ	[pasiðik]
ΔΙΠΚΑ	[ðipka]	ΤΕΑΜΕΖ	[teamez]
ΠΕΦΙΠ	[pefip]	ΕΛΕΓΕΠ	[eleɣep]
ΚΕΝΑΚ	[kenak]	ΑΠΟΕΛ	[apoel]
ΙΦΕΤ	[ifet]	ΠΟΕΔΗΝ	[poeðin]
ΝΕΧΩΠ	[nexop]	ΠΑΣΕΓΕΣ	[paseɣes]
ΟΔΕΓ	[oðeɣ]	ΕΛΑΣΕΤ	[elaset]
ΤΑΠΕΜ	[tapem]	ΑΣΕΤΕΜ	[asetem]
ΙΤΕΣΚ	[itesk]	ΟΛΚΕΣ	[olkes]
ΑΒΕΚΤ	[avekt]	ΕΔΚΕΠ	[eðkep]
ΟΑΣΠ	[oasp]	ΑΣΔΑΚ	[asðak]
ΕΤΕΡΠΣ	[eterps]	ΑΔΣΕΝ	[aðsen]