The phonological word in Mycenaean

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Abstract

The phonological word is a domain of application in which phonological processes do or do not apply with regularity. In this preliminary study I will discuss the phonological word in Mycenaean. After examining the diagnostic tests to determine the domain of the phonological word, I will give a formal account of it within the theoretical framework of Optimality Theory. My aims are to make a contribution to the general discussion on the phonological word by analysing it in Mycenaean and to give a better insight into the internal structure of this language.

Keywords: phonology, phonological word, Mycenaean Greek, Optimality Theory, historical linguistics

1. Introduction

The phonological word is a domain of application in which phonological processes do or do not apply with regularity (Hall 1999: 2). Over the last years, the subject has gained the attraction of a growing number of phonologists. This is reflected in the literature in which the phonological word is being discussed in a variety of languages (cf. Hall 1999:1). In all these studies, it is shown that the phonological word consists of one or more morphemes. This implies that the boundaries of the phonological word must fall together with the morpheme boundaries. On the other hand, not every morpheme may form an independent phonological word. As a result, the phonological word may be smaller or larger than the morphological one. Its precise definition may change from language to language (cf. Vigário 1999: 271). In order to define the boundaries of the phonological word, one should examine the phonological processes and their domain of application in the language. These examinations are the 'diagnostic tests' (Raffelsiefen 1999: 133). In this paper I will discuss the phonological word in Mycenaean. I will focus on two processes: a) labiovelar dissimilation (Vilborg 1960: 53; Ruijgh 1967: 42; Lejeune 1972: 43; Bartonek 2003: 139) and b) the avoidance of hiatus. My aims are to contribute to the general discussion on the phonological word by analysing it in Mycenaean. The second (and main) aim of this article is to give a better insight into the internal structure of this language and to solve some long-standing problems.

The organization of this article is as follows. In section 2 I give a brief survey of the Mycenaean language and the data I use. In section 3 I discuss the diagnostics used to determine the phonological word. In section 4 I give a theoretical account of these data in the framework of Optimality Theory (OT). In section 5 I discuss variation in the language and I conclude in section 6.

2. The Mycenaean language

Mycenaean is the language of the so-called Mycenaean culture, which flourished in the south of today's Greece around 1400-1200 BC. The language is attested on approximately 7000 clay tablets which were used for the purpose of the administration of the political centres, the palaces. After every administrational year, the tablets were melted in water and re-used for the new year. Thanks to the destruction of the palaces by fire, the tablets of the last administrational year were burnt and thus preserved. This happened in the period 1250-1200 BC. As a result, the tablets from every finding spot have the same chronology.

With respect to the geographical distribution of Mycenaean, most tablets have been found in Pylos (Peloponnesus) and Knossos (Crete). Other minor finding places are Tiryns, Mycenae (both Peloponnesus) and Thebes (mainland Greece) among others. Though geographically scattered, the language shows a remarkable linguistic unity; variation within the language can hardly be contributed to geographical diversity.

Thanks to the decipherment of the tablets by Michael Ventris and John Chadwick in 1953, it is known that the language is a form of Greek. The tablets were written in a system of syllabograms of the CV-type (called Linear B). This orthographic system didn't meet the linguistic structure of the language and as a result there are many interpretational problems. When reading the Linear B tablets, one should have in mind the following orthographic characteristics: (1) laryngeal features are hardly reflected, (2) there is no orthographic distinction between long and short vowels or between [l] and [r], (3) codas are omitted, and (4) onset clusters are spelled in full, using more than one syllabogram. For the Latin transcription of the tablets I will use the agreements of the Salamanca convention, though omitting the dashes and spelling the doublets in full.

The data for this study are taken from the standard editions of Knossos (Chadwick et al. 1986, 1990, 1997, 1998), Pylos (Benett 1955), Tiryns, Thebes and Mycenae (Sacconi 1974a; Godart & Sacconi 1978; Melena & Olivier 1991), Khania (Godart & Tzedakis 1992), and the Vase inscriptions (Sacconi 1974b). As additional sources I used the Mycenaean dictionary (Aura Jorro 1999) and Waanders' (1996) article on compounds.

3. Diagnostics for the phonological word

In this section I will provide evidence for the phonological word in Mycenaean. The phonological word may be defined as a phonological unit consisting of a root plus its affixes. Cross-linguistically, however, it has turned out that the exact definition of what is an 'affix' and what is a 'root' may differ from language to language. In order to define the boundaries of the phonological word, one should examine the domain of application of the phonological processes of the language: if a phonological process takes place across the morphological boundary, this implies phonological coherency and thus provides a negative indication for a phonological boundary. On the contrary, any violation of a phonological process across the morphological boundary implies phonological incoherency and, as a result, it provides a positive indication for a phonological boundary. These examinations are the diagnostic tests.

As pointed out before, the deficient orthography combined with the fact that there are few data with a secure interpretation makes it hard to give an account of all the phonological processes in Mycenaean. Nevertheless, two processes provide enough material to give a definition of the phonological word. These are labiovelar dissimilation and the avoidance of hiatus. In the following sections I will discuss both diagnostic tests.

3.1 Labiovelar dissimilation

One of the best attested phonological processes in Mycenaean is the dissimilation of labiovelars (Vilborg 1960: 53; Ruijgh 1967: 42; Lejeune 1972: 43; Bartonek 2003: 139). Any labiovelar adjacent to [u] dissimilates to a plain velar, i.e. /k^{w}u/, /uk^{w}/ > [ku], [uk][1]. Taking the whole language corpus into consideration, we may formulate the following constraint:

C_1. *VO [α-PLACE] – VO[α-PLACE]
Adjacent vocoids (=vowels and glides, also as secondary articulation) with the same place of articulation are not allowed.

Motivation for this constraint can be found throughout the language; sequences like [ji], [wu] and [k^{j}i] (no further examples discussed) cannot be found. Also underlying morpheme internal sequences of a *labiovelar + [u]* and *vice versa* undergo the dissimilation process.

	Input	*Output*	*Gloss*	*Orthography*
(1a)	/g^{w}unaia/	[gunaja]	'female'	kunaja
(1b)	/luk^{w}os/	[lukos]	'wolf'	ruko

The same process can be seen in compounds:

(2a)	/g^{w}ou+k^{w}olos/	[g^{w}oukolos]	'cow-herd'	qoukoro
(2b)	/ehu+k^{w}olos/	[ehukolos]	'easy-going'	eukoro
(2c)	/ou+k^{w}is/	[oukis]	'not any'	oukis

However, not all compounds follow this process:

(3a)	/ou+k^{w}e/	[ouk^{w}e]	'and not'	ouqe
(3b)	/g^{w}ou+g^{w}o:ta:s/	[g^{w}oug^{w}o:ta:s]	'cow-herd'	qouqota
(3c)	/su+g^{w}o:tahos/	[sug^{w}otahos]	'swine-herd'(gen.)	suqotao
(3d)	/polu+k^{wh}onta:s/	[poluk^{wh}onta:s]	'killing I'	poruqota
(3e)	/euru+k^{wh}onta:s/	[euruk^{wh}onta:s]	'killing from afar'	euruqota

The examples in (3) are usually considered as irregularities in the bibliography on the Mycenaean language. The current explanation is in terms of analogy (Lejeune 1972: 45). According to this, a stronger, basic type imposes its form onto other related types. For instance, in example (3b) the analogy is supposed to be with the word for "herd" *[g^{w}o:ta:s]. Henceforth, this form is preserved in its derivations. Strangely, this basic word does not occur on the tablets, or in alphabetical Greek. Another objection is the following: why should the word [g^{w}o:ta:s] be strong enough to impose itself to the compound and the form [k^{w}olos] (cf. 2a, b) is not? The explanation in terms of analogy therefore seems to be arbitrary.

Instead of analogy, I propose that the concept of the phonological word causes this apparently inconsistent phonological behaviour. The examples of (2) obey the process of labiovelar dissimilation and as a result show phonological coherency. These examples have to be analysed as consisting of a single phonological word, viz.

[1] The domain of application of labiovelar dissimilation is the phonological word. See section 4 for a detailed analysis.

[g^{w}oukolos]$_{\omega}$. On the contrary, the examples in (3) fail to undergo the process of labiovelar dissimilation; they point to a phonological incoherency. For that reason, we may assume that these examples consist of two independent phonological words, viz. [g^{w}ou]$_{\omega}$[g^{w}o:ta:s]$_{\omega}$. If one assumes this phonological boundary between the morphemes, it will make these words perfectly regular and there would be no need of an explanation by means of analogy.

3.2 The avoidance of hiatus

Another main phonological process in Mycenaean is the avoidance of hiatus. The language doesn't accept hiatus, which follows from constraint C_2:

C_2. *V.V
Adjacent, heterosyllabic vowels are not allowed.

In order to avoid hiatus, Mycenaean exhibits several ways of solving it: diphthong formation, glide formation, glide insertion and deletion (cf. Casali 1998). Examples of morpheme internal hiatus solutions are given in (4):

(4a)	/duo:/	[duwo:] – [dwo:]	'two'	duwo/dwo
(4b)	/hik^{w}ia/	[hik^{w}ija] – [hik^{j}a]	'chariot'	iqija/iza
(4c)	/koriadna/	[korijadna]	'coriander'	korijadana

The same solutions are observed when hiatus comes to exist across morpheme boundaries:

(5a)	/tri+ok^{w}a:s/	[trijok^{w}a:s]	'three possessions'	tirijoqa
(5b)	/tri+o:wes/	[trijo:wes]	'with three handles' (pl.)	tirijowe
(5c)	/ana+agehen/	[anagehen]	'to lead up' (inf.)	anakee
(5d)	/apo+ehontes/	[apehontes]	'being absent' (pl.)	apeote
(5e)	/ait^{h}i+ok^{w}s/	[ait^{h}ijok^{w}s]	'with burnt face'	aitijoqo
(5f)	/ehu+a:gora:s/	[ehuwa:gora:s]	'good leader'	euwakora
(5g)	/ehu+e:to:r/	[ehuwe:to:r]	'with a good character'	euweto
(5h)	/pera+aigolahija:/	[peraigolahija:]	'thither side of Aigolahija'	perakoraija
(5i)	/dahi+agreus/	[dahijagreus]	'sharer of land'	daijakereu

In all the compounds of (5) one of the repair strategies (deletion, glide-insertion) is used across the morpheme boundary in order to avoid hiatus. This indicates that there is no phonological boundary between the morphemes. All examples of (5) consist of a single phonological word, viz. [anagehen]$_{\omega}$.

There are several examples in which constraint C_2 is violated:

(6a)	/hik^{w}ia+art^{h}mois/	[hik^{j}aart^{h}mois]	'horse-chariot' (dat. pl.)	izaatomo
(6b)	/pa:ga:+ak^{h}aris/	[pa:ga:ak^{h}aris]	'unpleasant source'	pakaakari
(6c)	/dewero+aigolahija:/	[deweroaigolahija:]	'hither side of Agolahija'	deweroaikoraija
(6d)	/pera+aigolahija:/	[peraaigolahija:]	'thither side of Agolahija'	peraakoraija[2]
(6e)	/io:+o:p^{h}lon/	[jo:o:p^{h}lon]	'thus he is debted' (aor.)	jooporo

[2] See §5 for an account of the attested variation between the forms of (5h) ~ (6d) and (5b) ~ (6h).

(6f)	/alkei+e:to:r/	[alkeie:to:r]	'Braveheart'	akeeto
(6g)	/amp^{h}i+ontos/	[amp^{h}iontos]	'Surrounding'	apioto
(6h)	/tri+o:wes/	[trio:wes]	'with three handles'	tiriowe

All examples of (6) exhibit hiatus, which implies a violation of constraint C_2. As a result, these words provide a positive indication for a phonological boundary and should therefore be analysed as consisting of two phonological words, viz. [hik^{j}a]$_{\omega}$[art^{h}mois]$_{\omega}$[3].

Concluding the analysis of the data, I propose that the constraints C_1 and C_2 have the phonological word as their domain of application. The fact that the examples of (2) and (5) obey these constraints points to phonological coherency; they consist of a single phonological word. The examples of (3) and (6) show incoherency in their phonological behaviour. For that reason they should be analysed as consisting of two phonological words[4].

4. Parsing the phonological word

In the previous section I analysed Mycenaean compounds and their sometimes apparently irregular phonological behaviour. I explained this by using the concept of the phonological word. In this section I shall discuss why some compounds are parsed as one phonological word and others in two.

It has been observed (Raffelsiefen 1999) that some items may be parsed as independent phonological words and others not. For convenience, I will use the term 'Root' for the former, phonologically independent items and the term 'Affix' for the latter, phonologically dependent ones.[5]

Two phonological words are, e.g. the following compounds from example (3):

(3a)	[ou]$_{\omega}$[k^{w}e]$_{\omega}$	'and not'
(3b)	[g^{w}ou]$_{\omega}$[g^{w}o:ta:s]$_{\omega}$	'cow-herd'
(3c)	[polu]$_{\omega}$[k^{wh}onta:s]$_{\omega}$	'killing I'
(3d)	[pera]$_{\omega}$[aigolahija:]$_{\omega}$	'thither side of Aigolahija'
(3e)	[jo:]$_{\omega}$[o:p^{h}lon]$_{\omega}$	'thus they were depted' (aor.)

[3] The phenomenon of hiatus and its repair strategies have, as far as I know, been unnoticed. For that reason, these examples have never been discussed for this purpose in the literature.

[4] Another very common diagnostic for determining the phonological boundaries is syllable structure, which, according to Raffelsiefen (1999: 156), is actually one of the most reliable diagnostic tests. Assuming that syllabification can be used as a diagnostic test, the following seem to be counterexamples:

(i) /aut+haimo:n/[au.t^{h}ai.mo:n] 'with the same blood' autamo

(ii) /leuk+onuk^{h}s/[leu.ko.nuk^{h}s] 'with white 'onuks' (meaning of <onuka> uncertain) reukonuka

(iii) /poikil+onuk^{h}s/[poi.ki.lo.nuk^{h}s] 'with 'onuks' of different colors' pokironuka

Syllabification crosses the morpheme boundaries in the examples of (i)-(ii), which indicates phonological coherency according to Raffelsiefen. However, compounds of this type, adjective+substantive, show phonological incoherency elsewhere in the language (cf. (3d)-(3e)). One may assume for Mycenaean that the well-formedness of the phonological word is sacrificed in favour of well-formed syllables:

SYLL >> PWORD

[poi.ki.lo.nuks] >> *[poi.kil.o.nuks]

This preliminary hypothesis would imply that syllabification cannot always be used as a reliable diagnostic test in order to define the boundaries of the phonological words. The details however remain open for future work.

[5] The phonologically independent items are also referred to as 'words'; the phonologically dependent items as 'function words' or 'roots'. Due to the preliminary character of this study, I cannot discuss in detail the phonological status with respect to the lexical category. In order to give an account of this issue, one should examine more languages. It seems, at least, that some lexical categories have more phonological independency than others. The details remain open for future studies.

Considering the above analyses, we may conclude that all these morphemes are phonologically independent items. As a result, they belong to the category of 'Roots'.

Parsed as one phonological word, for example, are the compounds:

(2a) $[g^{w}oukolos]_{\omega}$ 'cow-herd'
(2b) $[ehukolos]_{\omega}$ 'easy-going'
(2c) $[oukis]_{\omega}$ 'not any'
(5b) $[trijo:wes]_{\omega}$ 'with three handles' (pl.)
(5c) $[anagehen]_{\omega}$ 'to lead up' (inf.)
(5d) $[apehontes]_{\omega}$ 'being absent' (pl.)
(5e) $[ait^{h}ijok^{w}s]_{\omega}$ 'with a black face'
(5i) $[dahijagreus]_{\omega}$ 'sharer of land'

Of these compounds at least one of the morphemes is phonologically dependent. As a result, all compounds consist of at least one 'Affix'. Bearing this in mind, two generalizations can be drawn:

(i) If one element of the compound is an 'Affix', there is no indication of a phonological boundary. These words are parsed as a single phonological word.
(ii) If both morphemes are 'Roots' there is an indication of a phonological boundary. These words are parsed as two phonological words.

In order to implement these generalizations in the theoretical framework of OT (Prince & Smolensky 2002 [1993]), I propose the two negative alignment constraints (McCarthy & Prince 1993):

C_3 *ALIGN (AFFIX, L; PWORD, L) } *PARSE AFFIX
*ALIGN (AFFIX, R; PWORD, R) }
No 'Affix' must be parsed as an independent phonological word.

The second generalization concerns the 'Roots'. They may form an independent phonological word. In order to make an OT account of this generalization, the following twin-constraints are needed:

C_4. ALIGN (ROOT, L; PWORD, L) } PARSE ROOT
ALIGN (ROOT, R; PWORD, R) }
Every 'Root' must be parsed as a single, independent phonological word.

The generalization that 'Affixes' must not be parsed as independent phonological words follows from the undominated ranking of constraint C_3: *PARSE AFFIX>> PARSE ROOT (see (7)).

(7) $[g^{w}oukolos]_{\omega}$ >> $*[g^{w}ou]_{\omega}[k^{w}olos]_{\omega}$

/g^{w}ou+k^{w}olos/	*PARSE AFFIX	PARSE ROOT
a) $[g^{w}oukolos]_{\omega}$ ☜		*
b) $[g^{w}ou]_{\omega}[k^{w}olos]_{\omega}$	*!	

Candidate (7a) does not parse any 'Affix' as phonological word and for that reason it is the optimal candidate. It has a mark at the Parse Root constraint because the 'Root' $[g^{w}ou]$ is not parsed as a phonological word. This is however not a severe violation.

Candidate (7b) is less optimal because it parses the 'Affix' [k^wolos] as a phonological word.

Though lower in rank, from the PARSE ROOT constraint it follows that compounds consisting only of 'Roots' are parsed as two independent phonological words (see (8)):

(8) $[su]_\omega[g^wo:ta:s]_\omega$ >> $[sugota:s]_\omega$

/su+g^wo:ta:s/	*PARSE AFFIX	PARSE ROOT
a) $[sugo:ta:s]_\omega$		*!*
b) $[su]_\omega[g^wo:ta:s]_\omega$ ☜		

Because the input /su+g^wo:ta:s/ doesn't contain any 'Affix', the *Parse Affix constraint doesn't affect it. At the Parse Root constraint, candidate (8a) has two violation marks because both 'Roots' of the phonological input are not parsed as independent phonological words. Candidate (8b) on the other hand does and for that reason it is the optimal candidate.

5. Variation

In the previous sections I have made clear, that the concept of the phonological word plays an important role in the phonology of Mycenaean. This assumption has enabled me to explain the phonological realizations of some forms which haven not been interpreted in a satisfactory way yet. As a conclusion, I have given a preliminary, formal definition of the phonological word in the theoretical framework of Optimality Theory. In this section I will discuss variation in the language.

Throughout the examples in (2)-(6), one may have noticed that variation occurs in the language. It concerns types which, with respect to their phonological behaviour, should sometimes be parsed as one phonological word and sometimes as two. Due to the fact that these alternations are not restricted to one geographical region, I assume that variation is a property of the language system itself.

The first instance of alternation I will discuss here is $[trijo:wes]_\omega$ (5b) *vs* $[tri]_\omega[o:wes]_\omega$ (6h). As shown clearly by the glide insertion, the former is parsed as one phonological word, whereas the hiatus in the latter indicates two independent phonological words. A possible explanation may be the ambiguous status of /tri/ in the mental lexicon. For some speakers, /tri/ is stored as 'Root', whereas for other speakers this is considered an 'Affix'. This explanation may seem a little bit arbitrary, however, a similar explanation has been discussed in Raffelsiefen (1999: 165) for the status of the prefix [e:] (<a>) in English. She ascribes the variation of $[e:]_\omega[sefaləs]_\omega$ *vs* $[əsefaləs]_\omega$ (=acephalous) to the ambiguous status of [e:] in the mental lexicon. For some speakers, in this case it constitutes an independent phonological unit while for others it is part of the stem.

The second variation which can be found in the tablets is $[pera]_\omega[aigolahija]_\omega$ (5h) vs. $[peraigolahija]_\omega$ (6d). The former case should be parsed as two phonological words, whereas the deletion in the latter indicates a single phonological word. Also in this case, I assume that the status of /pera/ varies in the mental lexicon from speaker to speaker. In the former case, it should be considered as a 'Root'. In the latter case the speaker has it stored as an 'Affix'.

6. Conclusion

In this paper I have discussed the phonological word in Mycenaean. The diagnostic tests which I have applied to the data clearly show that the phonological word and the morphological word are not necessarily the same. An inventory of all the boundary indications, negative and positive, resulted in the conclusion that only compounds of which both elements can be classified as 'Roots' are parsed as two separate phonological words. If one or both elements are an 'Affix', the whole grammatical word is parsed as a single phonological word.

Though some details remain open for future work, both aims of this study have been met. As I have demonstrated, this analysis is necessary in understanding the phonology of Mycenaean; I have explained examples which until now have been considered irregularities due to apparently irregular phonological behaviour. As a result, the number of uncertain interpretations has been reduced considerably. Secondly, this analysis may also be useful for the cross-linguistic study of the prosodic structure of words.

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