DIMITRA THEOPHANOPOULOU - KONTOU

FAST SPEECH RULES AND SOME PHONOLOGICAL PROCESSES OF MODERN GREEK:
A PRELIMINARY INVESTIGATION*

1. Introduction

The phenomena of fast speech have only recently occupied the literature (Zwicky, 1969; Ohso, 1971; Dressler, 1972a, 1972b, Dressler et al., 1972) and it is only lately that investigators have started to examine more closely the phonological processes which are the result of casual, fast and very fast speech and to realize the importance that these results could have for a better understanding both of the nature of phonological processes in general and the psychological reality of the underlying segments.

There are, however, problems in the «theory and methodology of fast speech research» [1] which require a more systematic examination. To start with, the distinction between «fast» and «slow» speech processes is incomplete, if it has not been determined (i) what is meant by the terms «fast» and «slow» speech styles (ii) under what circumstances the terms are used, and (iii) according to what criteria the distinction is made. An explicit distinction of the different speech styles (very formal, careful, casual, very fast, etc.) by means of sociolinguistic factors has been recently attempted by Dressler (Dressler et al., 1972), who, using objective criteria, tries to show that these different speech styles depend mainly upon the general speech situation (place, time, environment), and that it is the choice of a particular style which forces the speaker to use a certain phonological process.

Before starting the exposition of my subject it is necessary to specify the following points:

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1. Some of these problems have been pointed out by W. Dressler in one of the lectures he gave in the Linguistic Seminar at the Ohio State University (D r e s s l e r, 1972a).

1) I do not include in this paper the slow (careful, formal) speech phonological rules which are connected with the morphology of the language «'dead' rules» [1] and which are not immediately related to casual and fast speech phenomena. For instance, I will examine here the processes of palatalization and spirantization, but not rules such as compensatory lengthening (e.g. *limin* 'harbour' from *limen-s*; Malikouti, 1967, 125).

2) I will deal with processes concerning especially the vowels in casual, fast and very fast speech and the influence these processes have on the adjacent consonants (within and across word boundaries). The rules under discussion are for the most part processes «triggered» in a certain way by the speed of speech or by fatigue (careless speech).

3) I have been myself the main informant, collecting on tape and transcribing sentences uttered in different speech situations (i.e. reading a newspaper-article while alone in the room, dictating a formal letter, having a conversation with some friends, talking with my husband, arguing about a scientific problem with a colleague). Since I have been the main informant in this investigation the processes I am dealing with represent my own idiolect (Athenian dialect).

4) Finally, I would like to point out that this study is only a preliminary examination of certain fast speech phenomena of Modern Greek, and not a complete analysis of the phonological and morphological processes in the various speech styles, for which a more systematic research would be required. I would also like to mention here that for any further research in this field sociolinguistic and psycholinguistic factors would have to be taken into account, in order to provide objective criteria for the differentiation of the phonological speech styles.

2. Observations to be tested

The investigation of the casual or fast speech phonological processes of Modern Greek is very important because it can throw light upon some aspects of the adult phonological system (the nature of the phonological processes, the psychological reality of the underlying representation of certain segments, syllabification, etc.). In addition, I consider the study of fast speech phenomena — along with processes such as the nativization of foreign words, slips of the tongue and language acquisition phenomena —

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1. The terms 'dead rule' and 'live rule' are used by G. Drachman in the lecture he gave at the Linguistic Seminar at the Ohio State University 'On the Interpretation of Phonological Primes', February 1972 (D r a c h m a n , 1972).

as a way to test the validity of some general hypotheses such as the speci-
fication of the rule units according to the «basis of articulation» of the lan-
guage (since casual and fast speech processes can show us the articulatory
tendency of the language) or the existence of «real tract» rules.

2.1. Fast speech rules are optional. It has been pointed out (Drach-
man, 1972) that fast speech rules are «low level» processes, i.e. they repre-
sent «live» rules of the language which for the most part are optional and
which do not have the absolute regularity of the derivational processes.
One can suppose therefore that fast speech rules are applied quite late in
the sequence of rules and that all of them are ordered after the obligatory
rules which constitute the grammar of the language «learned rules». I shall
try to show how much this applies to the casual and fast speech phenomena
of Modern Greek. It would also be interesting to see to what degree it is
true to say that different speech situations force us to choose a certain style
whose rules then become obligatory (Dressler, 1972b).

2.2. Fast speech rules are extensions of slow speech rules. It has been
shown (Zwicky, 1969, 7) that one characteristic of many «allegro variants»
is that they involve «extensions of (usually obligatory) rules of slow speech
phonology», i.e. deletion of morpheme or word boundaries or even gene-
ralization of the application of the rules to more segments. I shall try to
examine how much support one can bring to what Zwicky has ascertained
from the examination of Modern Greek fast speech phenomena. I shall
examine, in addition, whether there are certain fast speech rules which are
not extensions of slow speech rules (sandhi phenomena).

2.3. Fast speech rules and the basis of articulation. It has been point-
ed out by Drachman (Drachman, 1972) that fast speech processes show
the articulatory tendency of the language which depends upon the Basis of
Articulation. The basis of articulation primarily involves «tract settings».
According to Drachman (Drachman, 1970) the tract «conspires towards
such a Basis of Articulation as will automatically guarantee in detail the
phonetic outputs sanctioned for any given dialect or style of speech in the
language acquired». So, the Basis of Articulation constitutes a natural way
of predicting and ordering phonological processes. Fast speech phenomena
acquire a special interest because, as living processes, they can show us
more clearly than the so called «dead» or derivational rules the articula-
tory tendency of the language in which they occur and they can justify slow
speech rules (Dressler, 1972a,b). I shall try to point out if this limited examin-

ation of the fast speech phenomena of Moder Gnreek could bring any sup-
port to these hypotheses.

2.4. Fast speech phenomena and «real tract» rules. From some stu-
dies done on fast speech phenomena in English (Stampe, 1969; Drachman,
1970) it has been shown that even cases of «low level» processes of fast
speech involve ordered rules. For, at least, some of these cases «it is clear
that the rules cannot be interpreted in terms of processes occurring in real
time in the tract». How much evidence — if any — can the investigation of
the fast speech phenomena of Modern Greek bring out in support of these
hypothesis?

It goes without saying that the positive or negative evidence, if any,
from my examination of observations 3 and 4 is far from being conclusive.
The validity of the hypothesis of the Basis of Articulation as a way of inter-
preting phonological processes of a language or the answer to the questions
«are there rules in the tract» are too general to be proved or disproved by
a preliminary examination of some fast speech phenomena of Modern Greek,
since they would require at least on the one hand a complete examination
of the casual and fast speech phenomena of the language and on the other
hand the examination of processes such as slips of the tongue, language
acquisition, nativization of foreign elements, which I do not deal with here.
It is not also possible to deal here with the very interesting problem pointed
out by Dressler (Dressler, 1972a), about the relation between fast speech
rules and diachronic sound laws («do fast speech rules anticipate normal
diachronic sound laws?»).

3. Fast speech processes : the vowels [1]

3.1. «Laxing rule» of high vowels. A general rule of Modern Greek
Koine, occurring in almost all the speech styles (less formal, casual, fast),
the only exception being the «unnatural» speech situation of pronouncing
the words separately while stressing every syllable, is the «laxing» rule for
the high vowels /i/ and /u/ in unstressed position. The rule applies in all

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1. Modern Greek Koine has five vowels which can be described in terms of the
following distinctive features (they are all [+ voc., — cons.]) :

	i	e	a	o	u
High	+	—	—	—	+
Low	—	—	+	—	—
Back	—	—	+	+	+
Round	—	—	—	+	+

the environments, across and within morpheme boundaries. The vowels, still keeping their quality as [i] and [u], tend to become shorter, losing at the same time a part of their sonority [1].

The rule can be formulated as follows:

(1) $\begin{bmatrix} + \text{ voc.} \\ - \text{ cons.} \\ + \text{ high} \\ + \text{ tense} \end{bmatrix}$ → [— tense] in unstressed position [2].

Examples:

(a) In an absolute final position: *bói* → *bóι* 'size'; *tsái* → *tsáι* 'tea', etc.

(b) Before a consonant:

(i) Within a morpheme: *aidóni* → *aιdóνι* 'nightingale'; *eleinós* → *eleινós* 'miserable'; *máθima* → *máθιma* 'lesson'; *vasilópulo* → *vasιlópvlo* 'prince';

(ii) across morpheme boundaries: *γráfi to máθima* → *γráfι to máθιma* 'he's doing his homework'; *fovísu ton* → *fovísv ton* 'be afraid of him'.

(c) Before a vowel:

(i) within a morpheme: *tímios* → *tímιos* 'honest'; *diefθindís* → *dιefθindís* 'director' etc.

(ii) across morpheme boundaries: *vréχʹi ékso* → *vréχʹι ékso* 'it's raining outside'; *tréχʹi o Pétros* → *tréχʹι o Pétros* 'Peter is running', etc.

As a general phenomenon the duration of speech sounds may be affected by several phonetically-conditioned factors. To a certain extent the duration of a segment may be determined by the nature of the segment itself, that is by its point and manner of articulation. The term 'intrinsic duration' may be used to refer to the duration of the segments as determined by their own quality. The duration of the vowels appears to be correlated with tongue height: other factors being equal, a high vowel is shorter than a low one. It is quite probable that the differences in vowel length according to the degree of opening are physiologically conditioned and that this constitutes a phonological universal (Lehiste, 1970, 18 ff.). The greater length of low vowels is due to the greater extent of the articulatory movement involved in their production. Also the Greek /u/ is longer in comparison with /i/ because of the lip-rounding involved in its articulation [3].

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1. The reduction (and subsequently the loss) of a vowel can be realized (i) by centralization (cf. English, French, Breton, Russian, Latin, German, Tatarian etc.) (ii) by devoicing (Japanese, Tarasco; cf. D r e s s l e r, 1973, 5).

2. Modern Greek does not have an opposition [+ tense] : [— tense] in vowels, and the vowels can normally be considered as [+ tense]. I use the feature [— tense] by convention to represent the reduced high vowel in unstressed position [ι], [v].

3. But this is not the case in Japanese, where /u/ is unround (O s h o, 1971, 23).

It would be interesting to examine the correlation of stress and dura-
tion of vowels in Modern Greek Koine. Many changes of vowels (quantity,
quality) are due to the stress. There are languages in which unstressed syl-
lables are regularly longer than the stressed ones (Lehiste, 1970, 140). In
languages like English (cf. also French, Breton, Russian, Latin, etc.) there
is a tendency for most vowels in weakly stressed syllables to appear as a
schwa in quality (reduction accompanied by neutralization of their quality).
According to Stetson (Stetson, 1951) the precise amount of reduction is
related to the degree of stress placed upon the vowels. With an increase
of the rate of speech all vowels in unstressed position arrive at a common
schwa. But vowel reduction in Modern Greek careless speech is not follow-
ed by neutralization of the quality of the vowel in unstressed position. Lack
of stress in one syllable has as a result the reduction of the high vowel by
laxing. In the northern Greek dialects [1] the reduced high vowels are further
completely lost in unstressed position (cf. *skulík'i* → *skvlík'i* → *sklík'*
'worm') and the mid vowels are raised (cf. *peδí* → *piδí* 'child', *évaze* →
évazi 'put', *o manólis* → *u manóls* 'Manolis').

It is tempting to suppose that in careless or fast speech not only the
high vowels /i/ and /u/ but also the mid ones /e/ and /o/ in unstressed
position lose a part of their duration (less degree of effort, or a timing pro-
cess?), but that their reduction is not such as to make them change their
quality, which is the case for vowels of the northern Greek dialects.

It seems that the degree of reduction of the high vowels follows a hier-
archy which corresponds to the hierarchy of sonority, the maximum re-
duction occurring in the environment of the unvoiced fricatives /s/ and /θ/.
If there are two unstressed high vowels before a stressed one, it is the vowel
which precedes the stressed one to which the laxing rule applies in casual
and fast speech: *kunupíδi* → *kunvpíδi* 'cauliflower', *k'iniγó* → *k'iniγó*
'hunter', etc.

The degree of the vowel reduction depends also upon the syllabic struc-
ture of the word. Thus, the high vowels are slightly reduced (unnoticed
most of the times) in the following cases:

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1. The distinction between Southern and Northern dialects, (the 'Northern' dialects
are spoken in the mainland north of Attica, in northern Euboea and in the islands of the
northern Aegean, i.e. Thasos, Samothraki, Limnos, Lesbos Imbros), mainly established
by Chatzidakis (C h a t z i d a k i s, 1892, 342, ff.) is based upon the existence of two pho-
nological processes in the Northern group : high vowel loss and mid vowel raising. About
these phonological processes s. also A. P a p a d o p o u l o s. 1926. Γραμματική τῶν
βορείων ἰδιωμάτων τῆς νέας Ἑλληνικῆς γλώσσης. Ἀθῆναι : Σακελλαρίου. N e w t o n,
1972.

(a) In the environment of a cluster (preceding or following it): *δίχták'ι* 'small net', *éχ'ιδna* 'viper', *ksórk'izma* 'exorcism', *sirták'ι* 'sirtáki', *tuvló-spito* 'house of bricks', *kuklóspito* 'doll-house', *spuryítιs* 'sparrow', *fur-nárιδes* 'bakers', etc.; *kliδí* 'key', *bluzák'ι* 'blouse', *vrisúla* 'small tap', *skli-rós* 'hard' etc.

(b) If the vowel occurs in two identical adjacent syllables *pipílizma* 'sucking', *kukúla* 'hood', *bubúk'azma* 'sprouting', *bubunízι* 'it thunders', *zuzúnizma* 'buzz'.

Could we consider that these forms represent a general tendency of the language to keep intact the shape of the word? It is worth noticing that in such cases the vowel is also retained in the northern dialects.

3.2. Vowels before a consonant or in absolute final position. The reduced high vowels become unvoiced before a voiceless segment (devoicing rule):

$$\begin{bmatrix} + \text{voc.} \\ - \text{cons.} \\ + \text{high} \\ - \text{tense} \end{bmatrix} \rightarrow [- \text{voice}] \, / \begin{bmatrix} C \\ - \text{voice} \end{bmatrix} - (\neq) \begin{bmatrix} C \\ - \text{voice} \end{bmatrix}$$

The rule applies especially if the previous consonant is also voiceless; but in a very casual or fast speech the devoicing rule applies after a voiced consonant, as well. So, the reduced high vowels are unvoiced in words like *áfιse* 'left', *fisιká* 'naturally', *máθιma* 'lesson', *rávιs* 'you sew', *aδyázιs* 'you empty', etc. or *θιmísv to* 'remember it', *kvtí* 'box', *kvpí* 'oar', etc.

In casual or very fast speech the reduced high vowel [ι] in a palatal environment loses its vocality, becoming a semivowel (semivocalization rule); then it is lost after having palatalized the preceding consonant, by which, in this way, the information of the existence of a [+ high] sound is retained.

The semivocalization process can be formulated as follows:

$$\begin{bmatrix} + \text{voc.} \\ - \text{cons.} \\ + \text{high} \\ - \text{round} \\ - \text{tense} \end{bmatrix} \rightarrow [- \text{voc.}] \, / \begin{bmatrix} + \text{cons.} \\ - \text{voc.} \\ + \text{high} \end{bmatrix}$$

So, e.g. *fég'ιs* → *fég'i̯s* → *fég's* 'you illuminate'; *plék'ιs* → *pléki̯s* → *plék's* 'you knit'; *tréχ'ιs* → *tréχi̯s* → *tréχ's* 'you run', etc.

In a very fast speech the lax high vowel is lost after a nasal with sylla-bification of the preceding segment.

$$\begin{bmatrix} + \text{ cons.} \\ - \text{ voc.} \\ + \text{ nasal} \end{bmatrix} \rightarrow [+ \text{ syll.}] \; / - \begin{bmatrix} + \text{ voc.} \\ - \text{ cons.} \\ + \text{ high} \\ - \text{ tense} \end{bmatrix}$$

and then:

$$\begin{bmatrix} + \text{ voc.} \\ - \text{ cons.} \\ + \text{ high} \\ - \text{ tense} \end{bmatrix} \rightarrow \varnothing \; / \begin{bmatrix} + \text{ nas.} \\ + \text{ syll.} \end{bmatrix}$$

So, e.g., *ksenitχ'á* → *kseṇtχ'á* 'foreign country'; *koromil'á* → *koromḷ'á* 'plum-tree'; *anemómilos* → *anemóṃlos* 'windmill', *amvδyá* → *aṃδyá* 'seashore'.

In the northern Greek dialects, after the loss of the high vowel the cluster [ml] converts to [mbl] and by nasal deletion to [bl]. So, we find examples like: *kurubl'á, anemóblus, χamóblu (χamómilo)*, etc. [1]. These dialectal forms may be considered as the result of resyllabification after the loss of the high vowel (e.g. *ko-ro-ml'á* from *ko-ro-mi-l'á*). The syllable structure is retained in Athenian casual and fast speech after the loss of the high vowel by means of the syllabification of the nasal. Another solution would be to admit, for casual speech, a syllable structure like *ko-rom-l'á* instead of *ko-ro-m-l'á*; but in this case it would be difficult to exclude the possibility of formation of a parallel form *korombl'á* (which does not exist) by metathethis of the syllable boundary (cf. *kándo* and *kánto* from *káne to* 'do it'; i.e. *káne to* → *kánto* which can be syllabified as *ka-nto = kándo* or *kan-to = kánto*).

From the examples given above of the application of the laxing rule we can conclude that the only cases in which the high vowels are lost in casual or fast speech are those in which the vowel occurs after a palatal or nasal segment; and even in these cases the information of an i-segment is retained by the palatalization and syllabification processes. Forms like *stári (sitári* 'wheat'), *pervóli (perivóli* 'garden'), *peryáli (periyáli* 'seashore'), *skóti (sikóti* 'liver'), etc. (Kretschmer, 1905, 22), which show a complete loss of the unstressed vowel, must not be taken into account among the other cases of high vowel reduction. In these forms the [i] has been missing since the Byzantine period and they are accepted as such in the common Modern Greek Lexicon ([+ dhem.]).

3.2. Vowels before vowels. I shall examine in this section cases in which two vowels come into contact either within the same word or across

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1. The [u] instead of [o] because of the raising rule of the mid vowels.

a word boundary. I shall deal, at first, with the derivational processes which affect grammar and which are common to any speech style (formal, casual, fast). Then, I shall examine the processes which occur only in the casual and fast speech and which are applied mostly across word boundaries.

3.2.1. Semivocalization, palatalization, spirantization. The semivocalization of the high front vowel [— tense] before another vowel (within the same word) applies obligatorily in cases in which the word is marked as [+ dhem.] in the Lexicon (cf. *peδí — peδyá* 'child', *tópi — tópχ'a* 'ball', *níχ'i — níχ'a* 'nail', *portokáli — portokál'a* 'orange' etc.) [1].

The rule can be formulated as follows:

$$
\begin{bmatrix}
+ \text{ voc.} \\
- \text{ cons.} \\
+ \text{ high} \\
- \text{ round} \\
- \text{ tense}
\end{bmatrix}
\rightarrow [- \text{ voc.}] \, / \, \_\_ \, V
$$

Thus: *peδiá → peδiá* 'children'; *peδák'ia → peδák'ia* 'little children'; *ráfia → ráfia* 'shelves', *tópia → tópia* 'balls'; *portokália → portokál'ia* 'oranges', etc.

The further evolution of the semivowel depends upon the features [2] of the preceding consonant. If the preceding consonant is a palatal or a

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1. Cases which do not undergo the rule although they are also marked as [+ dhem.] in the Lexicon are problematic (s. M a l i k o u t i, 1970, 22).

2. A tentative represensation of the dinstinctive features of MGK ccnsonants and glide (C h o m s k y - H a l l e, 1968) :

	φ*	i̯	p	f	v	t	δ	θ	k	γ	x	s	z	ts	m	n	l	r
Voc.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	+
Cons.	+	—	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Obstr.	—	—	+	+	+	+	+	+	+	+	+	+	+	+	—	—	—	—
high	—	+	—	—	—	—	—	—	+	+	+	—	—	—	—	—	—	—
back	—	—	—	—	—	—	—	—	+	+	+	—	—	—	—	—	—	—
coron.	—	—	—	—	—	+	+	+	—	—	—	+	+	+	—	—	+	+
anter.	+	—	+	+	+	+	+	+	—	—	—	+	+	+	+	+	+	+
cont.	+	+	—	—	+	+	—	+	+	—	+	+	+	—	—	—	—	+
strid.	—	—	—	—	—	—	—	—	—	—	—	+	+	+	—	—	—	—
voic.	—	+	—	—	+	—	+	—	+	—	—	—	+	—	+	+	+	+
nasal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	+	—	—

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* (s. M a l i k o u t i, 1970, 17).

liquid l or a nasal m, n, then it palatalizes them. The palatalization rule can be formulated in approximately the following way:

$$\left\{\begin{array}{l}\left[\begin{array}{l}+\text{ cons.}\\+\text{ voc.}\\-\text{ cont.}\end{array}\right]\\\left[\begin{array}{l}+\text{ cons.}\\-\text{ voc.}\\+\text{ nas.}\end{array}\right]\end{array}\right\}\rightarrow[+\text{ high}]\,/\,-\left[\begin{array}{l}-\text{ voc.}\\-\text{ cons.}\\+\text{ high}\end{array}\right]V$$

In the case of palatals there is no change in the feature [+ high]. The liquid and nasals become [+ high]. Then the semivowel is lost:

$$\left[\begin{array}{l}-\text{ cons.}\\-\text{ voc.}\\+\text{ high}\end{array}\right]\rightarrow\varnothing\,/\,\acute{C}-$$

So: *peðák'ia* and subsequently *peðák'a* 'children'; *portok'ál'ia* → *portok'ál'a*; *kalám'ia* → *kalám'a* 'canes'.

In all the other environments there is spirantization of the semivowel, and then assimilation of the spirant in voicing or lack of voicing to the preceding consonant.

Thus: *mátia* → *mátχ'a* 'eyes', *trapézia* → *trapézya* 'tables', *kaláθia* → *kaláθχ'a* 'baskets', etc.

Another phonetic process which applies to Modern Greek in words marked in the Lexicon as [+ dhem.] is the semivocalization of the unstressed front vowel [e] before another vowel after the accent shift has taken place (e.g. *enéa* → *eneá* 'nine', cf. *yeneá* 'generation' which becomes *yen'á* in dhemotiki) [1].

The rule can be formulated as follows:

$$\left[\begin{array}{l}+\text{ voc.}\\-\text{ cons.}\\-\text{ high}\\-\text{ low}\\-\text{ back}\\-\text{ round}\end{array}\right]\rightarrow\left[\begin{array}{l}-\text{ voc.}\\-\text{ cons.}\\+\text{ high}\end{array}\right]/\,-\,V$$

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1. Another way of explaining forms like *eléa - el'á, enéa - en'á* would be by supposing the application of high dissimilation rule (N e w t o n, 1972, 30 ff.) which precedes the semivocalization of the high front vowel. So *enéa* becomes *enía* and then *eniá*. The existence of such a rule is probably supported by the existence of parallel forms with [e] or

Thus: *enéa* 'nine' becomes *eniá* in dhemotiki (from *eneá*); *eléa* 'olive tree' [+ kathar.] becomes *eliá* [+ dhem.] (from *eleá*), etc. (cf. *verikok'éa* 'apricot-tree' [+ kathar.], *verikok'iá* [+ dhem.]; *apidéa* 'pear-tree' [+ kathar.], *apidiá* [+ dhem.]). The rule must be ordered before the palatalization and the spirantization processes:

So: *eliá* → *el'á*; *eniá* → *en'á*; *verikok'iá* → *verikok'á*; *apidiá* → *apidyá*.

The semivocalization rule of a high front vowel is optionally extended across word boundaries (casual and fast speech) [1].

So: *févyi aftós*   →   *févyi aftós*   'he's leaving'
    plék'i aftós   →   *plék'i aftós*   'he's knitting'
    páli o ídyos   →   *páli o ídyos*   'the same again'
    méni edó   →   *méni edó*   'he lives here'

Then palatalization and affrication rules apply, giving respectively: *févyaftós*, *plék'aftós*, *pal'oídyos*, *mén'edó*, etc.

The semivocalization rule of the mid front vowel is also extended across word boundaries, but only if the preceding segment is a palatal (fast speech rule).

So: *éplek'e aftós*   →   *éplek'iaftós*   'he was knitting'
    éfevye aftós   →   *éfevyiaftós*   'he was leaving'
    iχ'e ádia   →   *iχ'iádia*   'he had a leave' [2].

This rule must be ordered before the palatalization rule (cf. Thus *éplek'iaftós* → *éplek'aftós*; *éfevyiaftós* → *éfevyaftós*; *iχ'iádia* → *iχ'ádia*.

3.2.2. Vowel contraction and casual speech. Sequences of different vowels within a word do not usually undergo contraction in casual speech (cf. *nearós* 'young man', *kakoíθia* 'wickedness', *aftoeksipirétisi* 'self-ser-

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[i] (cf. Zakynth. *karidía* near *karidéa*). But what about sandhi cases like *émene aftós* 'he was staying' in which the nasal is not palatalized (*émen'e aftós*), as would have been expected if the mid front vowel had become high before a back vowel by dissimilation (cf. *méni aftós* → *mén'aftós* 'he is staying'); unless the rule is restricted to apply only within word boundaries.

1. We could then formulate the semivocalization process as follows :

$$\begin{bmatrix} + \text{voc.} \\ - \text{cons} \\ + \text{high} \\ - \text{round} \\ - \text{tense} \end{bmatrix} \rightarrow [- \text{voc.}] / (\neq) \text{ V}$$

where ≠ means word boundary.

2. In *ádia* the vowel is only reduced but not semivocalized since the word is marked as [+ kathar.] in the Lexicon, which means that it will not undergo the semivocalization rule; s. also K o u r m o u l i s, 1967, XXVI - XXIX.

vice'), and the existence of parallel forms like *θεόδοros*, *θόδοros* 'Theodore', *χreostó*, *χrostó* 'owe' is the result of the speaker's use of two different styles (katharévusa and dhemotiki style) rather than of casualness or speed of speech. On the other hand a form like *θoró* which is undoubtedly derived from *θeoró* can not be considered, from a synchronic point of view, as a casual form of *θeoró*, since both forms are used today in a less careful speech with different meanings (*θeoró* 'consider', *θoró* 'see' look', etc.).

Sequences of different vowels undergo contraction across word boundaries. According to Chatzidakis (Chatzidakis, 1905, 211 - 228) when an end vowel and an initial vowel come together the most sonorant dominates. This order is known under the term of 'hierarchy of dominance'. According to this notion vowels are ordered in a scale so that the surviving vowel of a sequence of two is that which occurs first in the scale /a, o, u, e, i/.

Thus : a dominates o, u, e, i

       o   u, e, i

       u   e, i

       e   i

The hierarchy of dominance thus formulated can explain a lot of cases in casual speech such as *tu aδelfú* → *taδelfú* 'brother's', *to ayóri* → *tayóri* 'the boy', but leaves also out cases like *míδe* 'he saw me' (from *me íδe*) or completely uncontracted forms like *to úzo* 'ouzo', *ta érya* 'the works', *éχ'aftós* 'he has', from *éχ i aftós* etc.

Trying to specify the rules which determine vowel contraction in sandhi and the order in which they apply, I shall examine cases of different vowels in contact in a stressed or unstressed position.

    (a)   a + a, e, o, u, i

    (b)   e + e, a, o, u, i

    (c)   o + o, a, e, u, i

    (d)   u + u, a, e, o, i

    (e)   i + i, a, e, o, u

I shall also examine these sequences of vowels as they occur in different lexical categories (article + noun, pronoun + verb, adverb + verb, adverb + noun, adjective + noun, noun + adjective, etc.).

(a)   a + a :   *ta áfise* → *táfise* 'he left them'; *ta ayórase* → *tayórase* 'he bought them'.

      a + e :   *ta éfere* → *táfere* 'he brought them'; *píya ek'í* → *píyak'í* 'I went there'; *tráva ékso* 'go out' — uncontracted.

      a + o :   *ta ónira* 'the dreams' uncontracted; *éfiya olotaχós* 'I left at full speed' — uncontracted (or *éfiyolotaχós*?).

a + u : *éfera úzo* 'I brought ouzo' — uncontracted; *éfiγa url'ázondas*
'I left screaming' — uncontracted (or *éfiγurl'ázondas*).

a + i : *perímena ísiχa* 'I waited quietly' — uncontracted; *ta ikópeδa*
'building plots' — uncontracted.

(b) e + e : *me éδyokse* → *méδyokse* 'he made me go away'.

e + a : *me afíni* → *mafíni* 'he leaves me'; *mé áfise* → *máfise* 'he
left me'; *perímene áδika* → *perímenáδika* 'he waited in
vain'; *perímene anipómona* → *perímenanipómona* 'he waited
impatiently'; *k'e aftós* → *k'aftós* 'he too'.

e + o : *me órise* → *mórise* 'he appointed me'; *me onómase* → *monó-
mase* 'he named me'; *étrekse olotaχós* → *étreksolotaχós*
'he ran at full speed'.

e + u : *me urá* → *murá* 'with a tail'; *étrekse url'ázondas* → *étre-
ksurl'ázondas* 'he ran screaming'.

e + i : *mé íδe* → *míδe* 'he saw me'; *me irémise* → *mirémise* 'he
calmed me'; *perímene ísiχa* → *perímenísiχa* 'he waited
quietly'; *δyávaze istoría* → *δyávazistoría* 'he studied hi-
story'.

(c) o + o : *to óniro* → *tóniro* 'the dream'.

o + a : *to áspro* → *táspro* 'the white'; *to avγó* → *tavγó* 'the egg';
to áfise → *táfise* 'he left it'; *to afíni* → *tafíni* 'he leaves it'';
álo áδyo bukáli → *áláδyo bukáli* 'another empty bottle';
káto apó → *kátapo* 'down'.

o + e : *to éfere* → *tófere* 'he brought it'; *to etímase* 'he prepared it'
— uncontracted; *ékso épeze* 'he was playing outside' — uncon-
tracted; *ékso etimázun* 'they're preparing (something) out-
side' — uncontracted.

o + u : *to úzo* 'ouzo' — uncontracted; *to uzáki* — uncontracted.

o + i : *to iposχ'éθik'e* 'he promised it' — uncontracted.

(d) u + u : *tu uranú* → *turanú* of the sky'.

u + a : *tu áfise* → *táfise* — *tuáfise* 'he left him (something)'; *tu
afíni* → *tafíni* — *tuafíni* 'he leaves him (something)'; *χásu
apó δó* → *χásapoδó* 'get out of here'.

u + o : *mu órise* → *mórise* 'he pointed to me'; *tu oréu* → *toréu*
'of beauty'.

u + e : *mu éfere* → *múfere* 'he brought to me'; *k'imísu ékso* 'sleep
outside' — uncontracted.

u + i : *mu ípe* → *múpe* 'he told me'; *k'imísu ísiχa* 'sleep quietly'
uncontracted; *mu iposχ'éθik'e* 'he promised to me' — uncon-
tracted; *tu il'u* 'of the sun' — uncontracted.

(e) i + i : *i iméra* → *iméra* 'the day'; *periméni ísixa* → *periménísixa*
'he is waiting quietly'.

i + a : *plék'i aftós* → *plék'aftós* 'he is knitting'; *γráfi aftós* →
γráfχ'ftós — *γrafaftós* 'he is writing'; *periméni aftós* → *peri-
mén'aftós* 'he is waiting'.

i + e : *periméni eδó* → *perimén'eδó* 'he is waiting here'; *periméni
ékso* → *perimén'ekso* 'he is waiting outside'.

i + o : *páli o íδyos* → *pál'oíδyos* 'the same (person, thing) again';
pérni o íδyos → *pérn'oíδyos* 'he takes (something) himself'.

i + u : *píni úzo* → *pin'úzo* 'he is drinking ouzo'.

From the above examples I draw the following conclusions:

(i) Similar vowels are constantly simplified.

Thus: a+a → a; o+o → o; u+u → u; e+e → e; i+i → i

(ii) vowels are mainly contracted according to an hierarchy of sono-
rity. Thus:

(a) A back vowel dominates a front one:
to éfera → *tófera*; *ta éfera* → *táfera*; *tu éfera* → *túfera*; *ta ípa* → *tápa*;
tu ípa → *túpa*.

(b) A low vowel dominates a high one, in the case of a back vowel:
tu áfisa → *táfisa*, *to áfisa* → *táfisa*.

Nevertheless, the rules of vowel contraction do not apply to all the
cases where it might be expected to (cf. *ta éfera* → *táfera*, but *ta eláfχ'a*
'deer' — uncontracted, or *ta úza*, *ta ónira* — uncontracted).

Factors which interact on the hierarchy of sonority and prevent it
from applying are the following:

(i) The stress pattern of the word. Thus, if the higher back or even
front vowel are stressed, the vowels remain uncontracted: *ta ónira*, *ta úza*,
ta élata, etc.

(ii) the morpheme structure of the word; nouns or verbs with initial
unstressed vowel keep it and remain uncontracted: *tu iposχ'éθika*, *ta onó-
masa*, etc.

As far as I can see the principle which underlies both cases is the ten-
dency of the language to keep intact the shape of the word. The vowel is
deleted only if it does not constitute a part of the stem or if the stem of the
word could be reconstructed from other forms of the paradigm. So *ta éfera*
becomes *táfera*, *to éfera*, *tófera*, *tu éδosa*, *túδosa*, *ta én'osa*, *tán'osa*, etc.,
since the stem *fer-* or *n'óθ- /n'os-*, *δín- /δós* appear throughout the conjuga-
tion, the *e* being the augment, i.e. a separate morpheme (cf. *féro*, *θa féro*,
éχo féri; *n'óθo*, *θa n'óso*, *éχo n'ósi*; *δíno*, *éχo δósi*, etc.). But this is not the
case for verbs like *onomázo*, *ipósχome*, the initial vowel of which forms

a part of the stem (cf. *θα ονομάσο, ονόμασα; iposχ'έθika, έχo iposχ'eθí*, etc.), or for nouns like *elátoma* 'defect', *el'á* 'olive oil', *url'aχtó* 'screaming', etc. which also keep their initial vowel in contractions.

Another factor which prevents vowel from being deleted before another vowel is the so called «mentalistic stress» of the word (semantic factor). So, e.g. the final vowel of an adverb is not deleted in hiatus in a sentence like *ékso árχ'ise ná vréχ'i* 'it started to rain outside' (cf. on the contrary *éksapoδó* from *ékso apó eδó* 'get out of here' since the adverb in the sentence given above has been topicalized from *árχ'ise na vréχ'i ékso*, which makes it a «stressed» word. In such cases the word boundary is strong enough to prevent the final vowel from being deleted before another vowel.

3.2.3. Rule ordering. The rules which vowels in sandhi undergo apply in the order in which they are given and under the following conditions:

1. Semivocalization rule (of /i/ and /e/):
   (i) The rule does not apply in a very formal speech style. Vowels are here pronounced separately e.g. *étreχe olotaχós* 'he was running at full speed'; *étrekse amésos* 'he ran immediately'; *tréχi amésos* 'he runs immediately'; *γráfi oréa* 'he writes nicely'.
   (ii) The rule applies optionally for the vowel /i/ (a) in a less formal speech style in all the environments (b) in a casual or very fast speech style in all the environment except after a palatal segment, a nasal or a liquid (/l/ obligatory application): *γráfi̯ oréa, pláθi̯ ónira, rávi̯ éna fórema*, etc.
   (iii) The rule applies obligatorily in a very fast or casual speech style (a) to the vowel /i/ in the palatal, nasal and liquid (/l/) environment (b) to the vowel /e/ in the palatal environment: e.g. *tréχ'i̯ amésos étreχ'i̯ olotaχós, periméni̯ eδó, páli̯ o íδyos*, etc.

2. Palatalization rule.
   (i) The rule, being in feeding order with semivocalization, does not apply in the cases in which semivocalization has failed to apply.
   (ii) The rule applies obligatorily in a very fast or casual speech style palatalizing a palatal, nasal or liquid (/l/) segment preceding a [i̯]: *tréχ'a-mésos, étreχ'olotaχ'ós, perimén'eδó, pál'oíδyos*, etc.

   Spirantization rule.
   (i) The rule, being in feeding order with semivocalization, does not apply in the cases in which semivocalization has failed to apply.
   (ii) The rule applies obligatorily in a very fast or casual speech style to [i̯] in the environments in which palatalization has not applied, conver-

ting it to a spirant consonant which assimilates to the preceding con-
sonant in voice : *yráfχ' oréa, pláθχ'ónira, ra vyénafórema.*

3. Vowel contraction rules.

(i) Contraction rules do not apply in a formal or slow speech style
(cf. semivocalization).

(ii) The rules apply optionally in a less formal speech style (cf. hier-
archy of sonority).

Thus: *étrekse amésos* or *étreksamésos*; *yráfi oréa* or *yráfi̯ oréa* or
yráforéa.

(iii) In a very fast or casual speech style the rules apply obligatorily
(cf. also the case 1, II, b) if the semivocalization rule did not apply, unless
phonological, syntactic or semantic factors interfere, preventing them from
applying:

Thus: *éyraforéa, pláθónira, ra vénafórema,* etc.

4. General Conclusions

After the examination of the casual and fast speech processes concern-
ing vowels in Modern Greek I return to the hypotheses mentioned in sec-
tion 2 in order to see how much support, if any, they could be given from
the Greek evidence.

4.1. It goes without saying that the examination of the casual speech
of Modern Greek proves the optionality of these phonological processes.
Casual speech rules are 'low-level' processes applying after the obligatory
derivational rules. So, for instance, the laxing rule of high vowels between
consonants applies optionally at the end of the phonological rule compo-
nent after the compensatory lengthening rule has applied, providing a high
front vowel (e.g. **émensa → émina → émina* 'I stayed'; **éstelsa → ésti-
la → éstila* 'I sent').

The case of the semivocalization of /i/ and /e/ in the palatal environ-
ment which becomes an obligatory rule in a very fast speech brings sup-
port to the above mentioned hypothesis (Dressler, 1972a,b) that optional
rules of casual speech become obligatory with the choice of a certain speech
style (cf. also the vowel deletion rule before another vowel in sandhi which
becomes also obligatory in very fast speech if semivocalization fails to
apply). The same principle applies also for the laxing rule which, although
optional in a casual speech style, tends to become obligatory in fast speech
style, it being almost impossible to prevent the vowel from laxing as the
speed of speech increases.

4.2. From the examination of the casual and fast speech processes concerning the vowels in Modern Greek it has also been shown that many of the rules are extensions of slow-speech rules. By the term «extension» I mean on the one hand a phonological extension of the rule, i.e. the rule applies to more segments, and on the other hand morphological extension, i.e. the deletion of morpheme and word boundaries. As an example of the first case I could mention the semivocalization rule in sandhi. The rule in a less formal speech style applies optionally only to the high front vowel, converting it to [i̯]. With the increasing of speed it is extended to the mid front vowel which obligatorily becomes a semivowel. As an example of the second case I would like to mention the semivocalization rules of /i/ and /e/ which apply not only within words but also across word boundaries (cf. *k'aftós*, *fevyaftós*).

4.3. I do not think that only the examination of some casual and fast speech processes could provide a way of determining the «basis of articulation» of Modern Greek. Such an assumption would be arbitrary and not scientific, since I have not examined sufficient processes which could form a unit according to the 'tract conspiracy'. Nevertheless it is worth noticing that some phonological processes of casual speech, especially the laxing rule of high vowel /i/ in unstressed position, can show to a certain extent some aspects of the articulatory tendency of the language, justifying at the same time the processes of slow speech which they are extensions of.

That there is a general tendency in Greek to 'raise' the vowels is supported by the following facts:

(i) The phenomenon occurs in all speech styles in one dialectal isogloss (northern Greek dialects) where there is not only shortening of the high vowels, but a complete loss of them (*skulíki* → *sklík'*), as well. In the same isoglossic area a raising of the unstressed mid vowels /e/ and /o/ applies, changing them from [− high] to [+ high] (cf. *évaze* → *évazi*; *pedí* → *pidí*; *o manólis* → *u manóls*).

(ii) A raising of the long vowels ē, ē̦ and the back vowel /ọ/ (context-free rule) which finally merge with the long high vowels /ī/ and /ū/ respectively characterizes as a general phenomenon the Hellenistic period (cf. πολείτης, νείκη second century B.C.) [1]. This change causes a restructuring of the phonological system of the language and marks the beginning of

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1. L e j e u n e, 1955², 207; B u c k, 1955², 30, 31, 53, The change started earlier in some dialects (in Attic about 300 BC; cf. συμφέριν, Πιραιεῖ. In Boeotian about 400 BC, cf. λέγις, ἔχι, etc.).

the modern Greek system. It would be tempting to try to show that the context-free merger of mid (/ē/, /ę̄/) and high front vowels (/ī/) or mid (/ǭ/) and high back vowel (/ū/) to /ī/ and /ū/ occured at first in a careless speech style of that period. I do not have any evidence to support or deny such a view, at least at the present stage of this research. Nevertheless, I would like to point out as a hypothesis only that the merger of mid and high vowels which characterizes the transition from the ancient to the modern Greek phonological system along with the existence of living dialectal processes of high vowel loss and mid vowel raising on the one hand, and the lack of evidence of any centralized vowel (which are considered to be the result of another way of reducing and losing vowels) on the other hand, show that there has always been the same tendency in Greek language as far as vowels are concerned: the tendency to raise vowels in unstressed position. And it is this tendency which is also to be seen in the casual and fast speech styles. Finally it would be interesting to notice that the same tendency appears in child language. In the data I have examined so far [1] I have not found centralized vowels. On the other hand I have noticed a general tendency in children towards laxing the high vowels in unstressed position or raising the mid ones.

4.4. If fast speech rules can show the articulatory tendency of the language it is clear that they are not 'real tract rules', but ordered rules corresponding to the language system. According to Drachman (Drachman, 1970) 'all the rules for all the forms are applied before articulation begins, the rule of course corresponding to the speaker's knowledge that for particular dialects and styles certain pronounciations are sanctioned'. A proof for this assumption is the fact that the front vowels high and mid (in the palatal, nasal and liquid environment the high, and in the palatal environment the mid one) are not deleted in a casual or fast speech, i.e. the contraction rule is constrained in such an environment. If /i/ and /e/ were mechanically deleted before a more sonorant vowel, then the preceding consonant would automatically have lost its palatality which is conditioned by the adjacent front vowel. This deletion would affect the phonological system of the language. Such a change is prevented in fast speech by making semivocalization obligatory in such an environment.

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DIMITRA THEOPHANOPOULOU - KONTOU