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Stem-based versus Word-based Morphological Configurations: The Case of Modern Greek Preverbs[*]

0.   Introduction

Preverbs constitute an interesting phenomenon in the grammar of Modern Greek (hereafter Greek). The basic properties of these elements can be summarized as follows. First, there are preverbs that are always bound forms, while others behave like free non-inflected words, and share properties with prepositions, conjunctions, and/or adverbs. Second, some preverbs bring only external specifications to the meaning of the verb base, while there are preverbs that cause a radical change of the root meaning. Third, the combination of a preverb with a verb may be subject to structural and phonological irregularities.

In this paper, I argue that the analysis of Greek preverbs is of particular interest to morphology since their combination with a verbal base leads to word complexes that have the typical characteristics of morphological formations, that is, form irregularity and non-compositionality. I propose that preverbs are mainly distinguished into two structural categories, prefixes and words, depending on how close to the base they are (phonologically and structurally), the property to have a lexical content, and their ability to be used as bound or free elements. Generally, prefixal preverbs participate in derivational structures whereas word preverbs are parts of compounds. Crucially, however, this prefix/word classification accounts only partially for the characteristics of preverbs, in that they display properties that cut across the word-formation processes of prefixation and compounding.

In what follows, I assume that word formation is represented configurationally, involving the combination of a head and a non-head, and categories such as stem, affix and word, are the basic structural nodes of word-internal representations. Following van Marle (2003), I believe that the notion of stem is essential in that it captures the way the morphological base manifests itself in morphologically-complex words. Stems are concrete basic units differing from lexemes, in that the latter are abstract notions, not related to specific forms. In this sense, a particular stem and the corresponding word are forms of the same lexeme. However, as pointed out by Aronoff (1994), languages may differ in the ways stems and their associated words relate to each other. In fact, in a highly inflected language, like Greek, a stem is the element that generally constitutes the base for the morphological operation of inflection, while derivation and compounding may be based on stems or words, depending on the case.[1] Within this

[1]As shown by Ralli (1988, 1999, to appear), in Greek derivative structures, inflected words may be used as bases only in prefixation, while derivational suffixation is generally stem-based since inflectional suffixes always follow the derivational ones. As far as compounding is concerned, stems and words may

framework, I show that preverbs are non-heads, since they do not change the syntactic category of the base, and combine with a head that may be a stem or a word, depending on the particular case. Since in the [preverb verb] configurations the head may belong to the morphological categories of stem or word, and the non-head to the categories of prefix or word, the combination of a head with a non-head leads to four kinds of structures, [prefix stem], [prefix word], [word stem] and [word word], for each of which there is empirical evidence. On the basis of these structures, I further propose that preverbs are distinguished into those that are adjoined to stems and those that are attached to words. In fact, I argue that the possibility of having two different combination sites in morphology, that is combination with a stem and combination with a word, may interpret some of the basic properties of preverbs that cannot be sufficiently accounted for by the traditional distinctions of prefix vs. non-prefix, or bound vs. free element. Two of the advantages for proposing different combination sites in [preverb verb] structures are the following:

a)   Since a stem is a piece of morphological structure, as opposed to a word that may be used for syntactic purposes as well, a combination with a stem represents the fact that there is a closer relation between the stem and the item that is adjoined to it than the relation that exists between a word and its combining element. It will be demonstrated that some preverbs are more bound to the verb than other preverbs, which have a loose relation to it. I propose that the first attach to stems while the second attach to words.

b)   The postulation of different kinds of bases to which preverbs are preposed may account for some peculiar characteristics of preverbs that cannot be explained in terms of a prefixal or non-prefixal status. In fact, there are preverbs of a free-word status that share properties with prefixes, while other preverbs of a prefixal status may display characteristics of words that are usually found in composition. I propose that the first combine with stems while the second combine with words.

This work is divided into three main sections. In the first section, several important questions are raised with respect to the inherent properties of five preverbs that constitute representative examples of the range of Greek preverbs, and the different structural, phonological and semantic characteristics that they display in verbal formations. The issue of how preverbs may co-occur or appear in a particular order in word formation is examined in the second section. [Preverb verb] combinations are theoretically analyzed in the third section according to the thesis that morphology is an independent grammatical module. The paper ends with a summary of the basic conclusions of the previous sections.

1.   Greek preverbs

In this paper, I deal with data from five preverbs (*kse, apo, para, ksana, poli*) that constitute a representative sample of the range of Greek preverbs, the properties of which are examined on structural, phonological and semantic grounds. Preverbs may be distributed into two classes, prefixes and non-prefixes, according to their property to appear as bound or free elements. However, a third class cuts across this distinction, which contains prefixes that may also have an independent use as prepositions or conjunctions, but under a slightly different meaning. Thus, I would like to suggest the following classification:

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serve as bases in a variety of structures, depending on well-defined criteria (see Nespor & Ralli 1996 for a detailed account of these structures). It should be noticed that while inflection usually follows derivation and compounding, in word-based structures, inflection is ordered before the two processes.

a) Class I. This class contains prefixes that is, items that are only used as bound forms, with no prepositional or conjunctional use. *kse* is the only member of this class that attaches to verbs since the rest of class I elements attach to nouns and adjectives;[2]

b) Class II. Preverbs of Ancient Greek origin are listed here. Most of them appear as prefixes today, but also have a prepositional or a conjunctional use, and are still in use. Among the members of this class, *apo* still keeps its Ancient Greek character, while *para* has developed some new features;

c) Class III. The members of this class are adverbs that can appear as phrasal elements, as well as first constituents of words, with more or less the same adverbial meaning. Among them, *ksana* 'again', is a medieval formation, while the adverb *poli* 'much' goes back to Ancient Greek.

It should be noticed that this variety of preverbs is proper to Modern Greek since in Ancient Greek, preverbs usually belonged to class II elements.

1.1 Class I preverbs: bound forms.

As already mentioned, Greek has only one verbal prefix belonging to this category, *kse. kse* has no independent word status in that it never appears separately, is always prefixed to verb bases, and bears no primary stress. Mendes-Dosuna (1997) has shown that *kse* is a late medieval formation of the language, deriving from the combination of the Ancient Greek preverb *εκ /ek/* (*eks* prevocalically) with the verbal syllabic augment *e-* which was used in past indicatives (*ek + e > eks + e > kse*).[3] In its most productive formations, *kse* expresses a reversing of the event (1a), while it may also show an intensive character and denote a high degree of realization of the verbal notional properties (1b):[4]

(1)a. ksedino[5]   < kse dino   b. ksaɣripno   <   kse aɣripno
      to undress   un   to dress   to be awake   to stay up

According to Mendes-Dosuna (1997) and Karantzola & Giannoulopoulou (2000: 194-200), there is still a semantic relation between the new formation *kse* and the Ancient Greek preverb *ek* which *kse* derives from, in that the idea of outward movement, separation or extraction, originally expressed by *ek,* is indirectly present in *kse*. Secondarily, the ancient *ek-* expressed the idea of completion or intensification, a meaning that is also indirectly expressed by *kse* today (compare the Ancient Greek verb *εκκαθαίρω* [/ekkathairo:/] 'to clean thoroughly' to the Modern Greek verb *ksekaθarizo* 'to make clear').

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[2]*a* and *ðis* are typical examples of prefixes that are added to both nouns (ia) and adjectives (ib):

(i)a. ðistixos < ðis+tix+os   b. aveveos < a+veve+os
    unlucky un-luck-NOM.SG   uncertain un-certain-NOM.SG

Modern Greek examples are given in a broad phonetic transcription, according to the characters of the International Phonetic Alphabet. Ancient Greek data are transcribed according to the characters of the Greek Alphabet.

[3]According to Mendes-Dosuna (1997), the verbal augment *e-* was often misanalyzed as part of the prefix in Medieval Greek.

[4]It is shown by Mendes-Dosuna (1997) and Ralli (2002b) that the reversative and the intensive meanings belong to one polysemous *kse*. It is further shown by Ralli that *kse* may attach to nominal bases as well:

(ii)a. *ksefoto*   <   *kse+fos*   b. *ksekaθaros*   <   *kse+kaθaros*
      place with light   light   all clean-up   clean

[5]By convention, Greek verbs are given in the first person singular form of the present tense.

On the basis of their non-separability in various syntactic contexts, as well as their structural and/or semantic properties, sequences involving *kse* with verbal bases could be considered to form one-word units. Their behavior is similar to that of complex, morphologically derived items, in that they have the typical characteristics of non-syntactic formations: limited productivity, non-compositional meaning, and phonological as well as structural irregularities.

a) Limited productivity compared to syntactic formations. As the following examples illustrate, *kse* is usually combined with verbs denoting an accomplishment (2a,b), while the selection of verbs expressing a state (2c), or an activity (2d) is not generally allowed:

(2)	Verb	kse (reversative)	kse (intensive)	
a.	skonizo	kseskonizo		
	to cover with dust	to dust		
b.	pulo		ksepulo	
	to sell		to sell-out	
c.	lipame			*kselipame
	to be sorry			
d.	kolibo			*ksekolibo
	to swim			

b) Non-compositional meaning that does not directly derive from the meaning of the constituent parts. As mentioned above, *kse* assumes a function of reversing the verbal notional properties, or contributes to bring these properties to a high degree of realization (intensive meaning). However, there are cases where the presence of *kse* may affect the valency of the verb (3a), or cause a complete change of its meaning (3b):

(3)	Verb	kse
a.	aplono	ksaplono
	to lay	to lie-down
. b.	ðino	kseðino
	to give	to distract oneself

c) Phonological irregularity. Although *kse* has no primary stress, stress-shift to the antepenultimate syllable is triggered by its presence in deverbal formations. Compare, for instance, the stress position on the *kse* formations below with the position of stress on the related deverbal adjectives:[6]

(4)	deverbal nominal	kse
a.	/karfotós/	/ksekárfotos /
	nailed	out of place, irrelevant
b.	/fuskotós/	/ksefúskotos/
	inflated	uninflated

As claimed by Nespor and Ralli (1996), this stress shift often occurs in Greek prefixed structures of nominal category, and is generally due to the presence of

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[6]In (4), I suppose that *kse* is added to the deverbal adjective and not to the verb base directly, otherwise, we could not explain the stress shift: were *kse* added to the verb and –*tos* attached to the prefixed verb, the stress should appear on the syllable –*tos (e.g., *ksekarfotós, *ksefuskotós)*. That *kse* may also select a nominal base is not so rare in Greek. See footnote 4 for relevant examples.

prefixes. It is also the case that when *kse* is attached to a base beginning by a vowel, a vowel deletion occurs at the boundary between the two: [7]

(5)   Verb   kse
  a. /angistrono/   /ksangistrono/   */kseangistrono/ (reversative meaning)
     to hook   to un-hook
  b. /orcizo/   /ksorcizo/   */kseorcizo/   (intensive meaning)
     to put under oath   to exorcise/conjure

d) Structural irregularity. It is worth noticing that *kse* may sometimes be preposed to sequences that are not actual words:

(6)a. ksefonizo   vs.   *fonizo   <   foni
    to shout   voice
  b. ksemaljazo   *maljazo   <   mali
    to ruffle, to dishevel   hair

In the examples of (6), the occurrences of *fonizo* and *maljazo* do not exist, as opposed to *ksefonizo* and *ksemaljazo* that are well-attested verbs. As proposed by Ralli (1988, to appear), strings like *foniz-* and *maljaz-* may be viewed as belonging to a particular kind of stems, the so-called 'bound stems', which, as opposed to other stems, never become actual words with the addition of the appropriate inflectional affix (in our case, with the addition of −*o*).[8] In fact, bound stems are most common in the history of the Greek language, since the Homeric period (see Chantraine 1973). It is worth noticing that the examples displayed in (6) belong to the well-known phenomenon of parasynthetic derivation, a common and well-studied case in the Romance languages as well (see Scalise 1994). One could argue that parasynthetic constructions are formed on the basis of a ternary preverb-base-suffix structure (e.g., *[[kse-mali-az]-o]*).[9] However, following Scalise's analysis of similar cases in Italian (e.g., *[in-[[giall]-ire]]* 'to make yellow'), I prefer adopting a binary structure for the items in (6) since structures containing a noun base and a derivational suffix −*iz*- or −*az*- are most common in Greek (e.g., *[[[plut]-iz]-o]* 'to become rich' < *plut*- 'richness' −*iz*-DER.AFFIX −*o*INFL.AFFIX.1P.SG). First, the noun bases (*foni* and *mali*) are combined with the derivational suffixes, −*iz*-, -*az*-, respectively, in order to produce the bound stems *foniz*- and *maljaz*. These affixes are responsible for the verbal category of their formations. Second, *kse* is added to *foniz*- and *maljaz*-. Third, the presence of the inflectional affix −*o* transforms the stems into actual words: *[[kse-[[foni/mali]-iz/-az]]-o]*.

1.2 Class II preverbs: forms with a dual character.

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[7]According to Mirambel (1959), vowel deletion in Greek is subject to restrictions imposed by a vowel hierarchy: at the contact of two vowels, the stronger vowel triggers the deletion of the weak.
[8]In principle, bound stems do not lead to the formation of possible words too, since a possible word could become actual without any additional linguistic restrictions.
[9]As suggested by an anonymous reviewer, the preverb (*kse*) with the derivational suffix (-*iz*-/-*az*-) may also be seen as parts of a discontinuous affix (circumfix, *kse...-iz-/-az-*) that changes the category of the noun base (*foni/mali*). In my opinion, this hypothesis leads to a certain amount of redundancy since the parts of the hypothetical circumfix double both the preverb *kse* and the suffixes, which are independently motivated as separate constituents.

The members of this class keep the same form as in Ancient Greek where most of which could also be used as prepositions.[10] In Ancient Greek, the separation from the verb base was called "tmesis" and, according to Kuryłowicz (1964) and Humbert (1974), it goes back to Indo-European stages. Most Ancient Greek preverbs are still in use, certain preverbs are not productive (e.g., αμφι /amphi/, see footnote 10), and some of them have developed new meanings or functions (e.g., παρα /para/). In what follows, I examine two of the most frequent cases of class II preverbs, *apo* and *para*. *Apo* and *para,* as well as other productive class II elements, are prefixed to verb bases (7), and cannot be separated from it (8).[11] However, under a different (or a slightly different) meaning, they may also appear as free constituents with a prepositional or a conjunctional function (9).

(7) a. apofilacizo   <   apo   filacizo   b. apovlepo   <   apo   vlepo
     to release from jail   out   to imprison   to aspire, to aim   to see
     c. parafuskono   <   para   fuskono   d. paravlepo   <   para   vlepo
     to over-inflate   over   inflate   to ignore   to see

(8) a. i   stratiotici xunda   apofilacise   ton aktivisti.
      the military   junta   released   the   activist
    b. *i stratiotici xunda filacise ton aktivisti apo.
    c. o   Janis parafuskose to baloni   ce   eskase
       the John over-inflated the balloon and burst
       'John over-inflated the balloon and it burst'
    d. *o Janis fuskose to baloni para ce eskase

(9) a. efiγa   apo   tin poli
      leave.PAST.1.SG from the town
      'I left the town'
    b. to   spiti   xtipiθike apo ton   ceravno
      the house was hit   by   the   thunder
    c. o Janis   ine kaliteros fititis   apo   tin   aðerfi tu
      the John is   better   student than the   sister his
      'John is a better student than his sister'
    d. para liγo   ce   θa jinotan   proθipurγos
      for little   and he   would have become   prime minister
      'He almost became prime minister'
    e. para to   ðjavazma tu   ðen   perase tis eksetasis
      in spite of study   his, didn't   pass   the exams
      'In spite of his study, he didn't pass the exams'
    f. ine   çirotero na les   ti   γnomi su   para na min ti les
      is   worse   to say the opinion your   than to not it say
      'It is worse to say your opinion than not to say it'

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[10]The preverbs of Ancient Greek were the following: αμφι /amphi/, ανα /ana/, αντι /anti/, απο /apo/, δια /dia/, εις /eis/, εν /en/, εκ /ek/, επι /epi/, κατα /kata/, μετα /meta/, παρα /para/, περι /peri/, προ /pro/, προς /pros/, συν /syn/, υπερ /hyper/, υπο /ypo/ (see Humbert 1974).
[11]However, as mentioned by Smirniotopoulos (1992: 73), in one adverbial phrase, *para poli* 'very much/many', *para* occurs in isolation and can be repeated for emphatic reasons (*para para poli* 'very very much/many').

As seen by the examples of (7a,b), the bound form of *apo* may reverse the event or intensify the meaning of the verb. Under these two meanings, it is semantically close to *kse* (see [1]). However, *kse* and *apo* are not synonymous, since it is generally the case that only *apo*, but not *kse*, focuses on the final stage of the change of the event. For instance, while both *apo* and *kse* provide an intensive character to the meaning of the verb, only the verb with *apo* expresses a completion of the event.

(10)a. apojimnono < apo jimnono   b. ksejimnono < kse jimnono
     to strip   to undress   to divest   to undress

The same nuance of completion is also present in the use of bound *apo* with the function of reversing the event, as the examples in (11) illustrate:

(11)a. apokolo   < apo kolo   b. ksekolo   <   kse kolo
      to detach   to glue/attach   to unglue/unstick   to glue/attach

It is under the reversative meaning that the original prepositional use of moving away from a departure point is still present in *apo*. As an illustration, compare, for instance (7a) and (9a). The idea of moving away from a departure point constitutes another semantic difference between *apo* and *kse*, since the latter is deprived of this notion.[12]

With respect to the bound form of *para*, it should be noticed that, in the example of (7d), *para* denotes the idea of proximity, or parallelism, to the notion expressed by the verb. This is the ancient use of *para* that is also found in its phrasal appearance as a free form (see [9d,e]). In recent times, however, the bound *para* has also developed the meaning of an excessive realization of the event, as shown by the example in (7c) (see Triantaphyllides 1991).

The striking fact about the members of this class of preverbs is that they still possess some of their original Ancient Greek properties, but have developed some additional features that can be traced back to late Medieval Greek. The preverb *para* has assumed a new meaning of overdoing the event, while for the bound *apo*, the reversative meaning that was rarely found in Ancient Greek has become very productive in the language today. The Ancient Greek origin allows *para* and *apo* to be preposed to verbs marked (12c) and non-marked (12a) as [learned], as opposed to the relatively new, medieval *kse* (see above), which is preposed to verbs that are not marked as [learned].[13] Moreover, the fact that *apo* has undergone fewer changes, as compared to *para* (*apo* did not develop any completely different meaning in Modern Greek), explains why this preverb does not attach to new forms of ancient verbs (12b):

(12)   Verb   kse   apo   para
   a. treleno   ksetreleno   apotreleno   paratreleno
      to madden to drive sb. mad to drive sb. completely mad to over-drive sb. mad
   b. ðino   kseðino   *apoðino   paraðino
      to give   to relax   to over-give/deliver

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[12] The preverb *apo,* as observed by Efthimiou (2002), is extensively used in formations of scientific sub-languages, or in translating terms from French and English, and corresponds to the prefixes *dé* (*décomposer*) and *de* (*decompose*) respectively.

[13] Verbs characterized as [learned] are those that come from Ancient Greek, or constitute formations of the so-called 'katharevousa', an artificial, ancient-looking form of language that was developed for political reasons by a group of literary people in the XIXth century.

c.	ðiðo[14] to give	*kseðiðo	apoðiðo to attribute	paraðiðo to deliver

It is worth stressing that verbs with *apo* and *para* do not have any grammatical phrase-level counterparts (8b,d). Linguists who have addressed the issue of how these structures are derived, for example, Philippaki-Warburton (1970), Malikouti-Drachman & Drachman (1992), Smyrniotopoulos & Joseph (1997, 1998), and Ralli (2002b) agree that they are the product of lexical/morphological rules. Particularly, Smyrniotopoulos & Joseph (1998: 451-454) have shown that these structures do not fulfill the criteria for postulating the use of syntactic operations.

First, the combination of a class II preverb with a verb is not fully productive and shows a significant number of arbitrary exceptions. For instance, *apo* is generally combined with all kinds of verbs, that is, verbs expressing a state (*apocimame* 'to fall asleep' < *apo+cimame* 'to sleep'), an activity (*apoɣrafo* 'to finish writing, to conduct a census' < *apo+ɣrafo* 'to write'), an achievement (*apofevɣo* 'to avoid' < *apo+fevɣo* 'to leave'), and an accomplishment (*apovutirono* 'to skim' < *apo+vutirono* 'to butter'). However, there are gaps such as **apostolizo (< apo+stolizo* 'to decorate') and **apoðulevo (< apo+ðulevo* 'to work'). As far as *para* is concerned, it is combined with verbs of state (*paracimame* 'to over-sleep' < *para+cimame* 'to sleep'), activity (*paraxorevo* 'to over-dance' < *para+xorevo* 'to dance'), and accomplishment (*paravafo* 'to over-paint' < *para+vafo* 'to paint'), while it avoids verbs of achievement. However, in cases with a highly lexicalized meaning, it also appears with verbs of achievement (*paravjeno* 'to compete' < *para+vjeno* 'to go out').

Second, the meaning of the structure is not always compositional. For example, *apofevɣo* 'to avoid', *apoperno* 'to snub, to scold', *paravlepo* 'to ignore', and *paravjeno* 'to compete' have developed unpredictable meanings as compared to the verb bases, that is, *fevɣo* 'to leave', *perno* 'to take', *vlepo* 'to see', and *vjeno* 'to go out' respectively. Crucially, non-compositionality may occur only with respect to one part of the meaning of the two preverbs, that is, it may affect intensive *apo* and the idea of parallelism or proximity expressed by *para*. Generally, the reversative *apo* and the excessive *para* do not undergo the formation of semantically opaque structures.

With respect to prefixes, Di Sciullo (1997, 1999) makes a distinction into internal and external ones, mainly according to the semantic changes that they bring to the base. Internal prefixes are those which affect the meaning of the verb, for instance, they may change the internal aspectual structure of the event denoted by the verb. The French prefix *a-* (e.g., *apporter* 'to carry' < *a+porter* 'to bring') can be an example of this category: it provides an endpoint to an unbounded event, and thus, it changes an activity onto an achievement. Compare the following sentences as an illustration to this observation (Di Sciullo 1999: 43):

(13)a. Il l'a porté pendant une heure / *en une heure
    'He carried it for an hour'/*in an hour
   b. Il l'a apporté *pendant une heure/en heure
    'He brought it *for an hour/in an hour'

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[14] *ðiðo* derives from the Ancient Greek verb *δίδωμι* /dido:mi/, after the loss of the ancient ending –*μι* /mi/. *ðino* is the commonly used form in Modern Greek.

Contrastingly, external prefixes, like the French prefix *re-* (e.g., *retrouver* 'to find again< *re+find* 'to find'), may not affect the internal aspectual structure of the event:

(14) Il l'a retrouvé en une heure/*pendant une heure
     'He found it in an hour'/*for an hour again

In accordance with Di Sciullo's distinction, we may claim that *apo* and *para* have a dual character. They behave like internal preverbs when they affect the meaning of the base (intensive *apo* and *para* with the meaning of parallelism or proximity); they are external when they bring only external specifications to it (reversative *apo* and excessive *para*). The same conclusion can be reached for *kse*, which is internal when it functions as intensive, and has an external character under the reversative meaning (see 1.1).

Third, *apo* and *para* formations show a form irregularity on both phonological and structural grounds. It should be noticed that when a preverb is attached to a verb beginning with a vowel, a vowel deletion occurs at the morpheme boundary between the two. As the following examples illustrate, this vowel deletion is not obligatory for all occurrences though.

(15)   Verb   apo   para
   a. /exo/   /apexo/, */apoexo/   /parexo/, */paraexo/
        to have   to be off   to provide
                                                      */parexo/, /paraexo/
                                                       to over-have
   b. /asfalizo   /apasfalizo/, */apoasfalizo/   /parasfalizo/, /paraasfalizo/
        to secure/ensure   to non-ensure   to over-ensure

In (15), a vowel deletion always occurs to both occurrences of *apo*, that is, when *apo* functions as an internal as well as an external preverb. However, as opposed to *apo* structures, the *para* formations are subject to an optional vowel deletion when *para* has the meaning of overdoing the event, that is, when *para* is external. It is noteworthy that only *para* displays a dual character with respect to the phonological form of the structures into which it participates. Thus, form changes triggered by the presence of class II preverbs do not match the semantic changes brought to the base, in that a semantically-based division into internal and external preverbs does not have a one-to-one correspondence with phonological behavior. Since an obligatory vowel deletion occurs at the boundary between all occurrences of *apo* and the base, as well as between internal *para* (under the meaning of proximity or parallelism) and the base, *apo* and internal *para* seem to be closer to the verb root. On the basis that no obligatory vowel deletion occurs when *para* is external, that is, when it expresses an excessive realization of the event, we may suppose that it has a more loose structural relation with the verbal base.[15]

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[15]This loose relation with the base is also confirmed by stress. As observed by Drachman & Malikouti-Drachman (1994) and Malikouti-Drachman (1996), in imperative forms of [para verb] clusters, a stress shift applies to the so-called 'internal' *para*, while the external *para* (i.e., excessive *para*) does not trigger any change to the stress of the root verb:
 (iii)a. /pará-γrafe/   vs.   /para-γráfe/
           'ignore, cross-out'   'write excessively'

As seen in 1.1 ([5a,b]), an obligatory vowel deletion is also attested in the *kse* structures that is, in structures where the prefix intensifies (internal *kse*) or reverses the event (external *kse*). Like *apo*, the semantically-based distinction into internal and external *kse* does not match the phonological behavior of the prefix since all *kse* derivatives undergo obligatory vowel deletion in the appropriate context. Given the striking similarities between *apo* and *kse*, and the fact that *kse* is a prefix, we may, thus, conclude that *apo* is also a prefix. This conclusion is in accordance with the criteria examined above which advocate the idea that the *apo* structures are not the product of syntax. The question that arises at this point is whether *para* is a prefix. There is little doubt that internal *para* behaves like a prefix, that is, like *apo* and *kse,* since its derivatives are not without any complications, on semantic, structural and phonological grounds (e.g., lack of productivity, non-compositionality and form irregularity). The question is open with respect to external *para* which, compared to *apo* and internal *para,* displays semantic, structural and phonological regularities and does not affect the inherent properties of the verb. It should be noticed that if we accept two different homophonous *para*, a prefix and a non-prefix', there are cases where it is not clear which *para* is involved. For instance, the verb *paraδino* (< *para+δino* 'to give') is ambiguous with respect to its meaning. It means 'to deliver', when we deal with the internal use of *para*, or 'to over-give' if external *para* is involved. As shown by Ralli (2002b), there is only one prefix *para*, which is polysemous in nature, in the same way that *kse* and *apo* are also polysemous single units, the last two being semantically coherent in their various uses. If we consider that there is a single *para*, we may tentatively suppose that *para-* expresses the basic idea of proximity or parallelism to the meaning of the verb, and when this notion of proximity or parallelism is pushed to an exaggeration, it may trigger an excessive realization of the verbal properties (see Ralli [2002b] for more details on this interpretation).

It is worth adding that Lieber and Baayen (1994) claim that there is a connection between the semantics of polysemous preverbs and their productivity, suggesting that an item which is not very productive may gather strength in some well-defined subset of its formations, and reemerge as highly productive there. In fact, the original *para* (meaning of proximity or parallelism) becomes extremely productive with the recent new meaning of the excessive realization of the notional properties of the verb. Moreover, according to Lieber and Baayen (1994:70), the more determined the semantic representation of a lexical item is, the more productive the item can be. As already seen, the external variant of *para* is much more productive than its internal variant, in that the latter is less determinate in meaning and its semantic contribution to the verb base is subject to several restrictions.

1.3 Class III preverbs: adverbial free forms

Items with an adverbial function, such as *ksana* 'again', and *poli* 'much, a lot', can be used as first constituents in composite words ([16a], [17a]). Unlike class I and class II elements, these adverbs have a free-word source that is related to them synchronically. They are separable from the base and carry a primary stress without any significant change to their meaning ([16b], [17b]). The preverb *ksana* is used to express repetition, while *poli* denotes a non-delimited quantity.

(16)a. ksanavafo <   ksana vafo   vs. b. vafo   to   spiti ksana
          repaint   re   paint   paint.1SG   the   house again

(17)a. policimame < poli cimame   vs. b. ton teftteo cero cimame   poli

sleep a lot   a lot sleep   the last   time sleep.1.SG a lot

According to Mendes-Dosuna (1997), *ksana* has been formed from the combination of the Ancient Greek prepositions *εκ* /ek/ (*eks* prevocalically) and *ava* /ana/ (*eks* + *ana* > *eksana* > *ksana*). On the other hand, the adverb *poli* has an Ancient Greek origin (*πολυ* /poly/), but its use as preverb is of more recent times. For instance, in ancient texts, there are few attested occurrences of complex verbs with *πολυ* as their first constituent, all of them derive from nominal compounds, and most of them are of the post-classical period (e.g., *πολυπραγμονέω* /polypragmoneo:/ 'to deal with a lot of things' < *πολυπράγμων* /polypragmo:n/ 'who deals with a lot of things').

Ksana combines freely with verbs in all contexts, and does not trigger any change of the meaning, the aspectual structure or the valency of the root verb. In word complexes, *ksana* behaves semantically like an external preverb. Contrastively, *poli* may appear with all kinds of verbs, but composite verbs with *poli* are mostly used in the negative form, where *poli* assigns to the verb meaning the value of 'not exactly', 'not particularly, 'almost'. In fact, as seen in (18) below, in verb complexes, *poli* has a slightly different meaning from the one that it has in isolation. Moreover, in the absence of negation, the structure is rather ill formed or dubious (19), depending on the speaker:

(18)a. ðen ton aɣapo   poli   b. ðen ton poliaɣapo
     not him love.1.SG a lot   not him much-love.1.SG
     'I don't love him very much'   'I don't love him particularly'

(19) */?? ton   poliaɣapo
       him much-love.1.SG

As opposed to the restricted [*poli* verb] structure, *poli* may freely modify a verb in syntactic constructions, as the examples in (20) illustrate:

(20)a. θelo   poli afto to taksiði   b. mu aresi   poli   afto to kapelo
     want.1.SG much this the trip   me like.3.SG   much this the hat
     'I want this trip very much'   'I like this hat very much'

As Delveroudi and Vassilaki (1999: 150-152) have proposed, this special use of *poli* is due to its general character to denote an undetermined, or a non-delimited, quantity, and, as such, cannot be combined with events expressing a distinction in time and space. They claim that the presence of negation plays the role of an operator of delimitation of the predicate. Thus, it creates the right environment for the adjunction of *poli*. Since *poli* may also affect the internal aspectual structure of the verb it is combined with, it could be considered to belong to the range of internal preverbs:

(21)a. ɣrafo ena ɣrama kaθe   proi
      I write a   letter every morning
  b. *ðen   poliɣrafo   ena ɣrama kaθe proi
     I don't particularly write a   letter every morning

Finally, as opposed to *ksana, poli* may participate in structures where the second verbal element does not appear as an actual word. In this respect, *poli* displays a similar behavior with preverbs like *kse, apo* and the internal variant of *para* (see 1.1 and 1.2):

(22)a. polivolo   <   poli   *volo   (< -vol-)[16]
      to machine-gun
    b. poliloγo   <   poli   *loγo   (< -loγ-)
      to rattle on, chatter

      A basic question that arises with respect to the members of class III preverbs is whether their combination with verbs is morphological, as has been proposed by Philippaki-Warburton (1970), Ralli (1988, 1992, 2002b), Malikouti-Drachman & Drachman (1989), Smirniotopoulos (1992), Xydopoulos (1996), Kakouriotes et al. (1997), and Smirniotopoulos & Joseph (1997, 1998), or results from a syntactic process. A syntactic approach would require the [adverb verb] composite to be formed in syntax by a process such as incorporation (see Baker 1988), or verb raising (surface-structure adjunction).[17] In fact, an incorporation analysis has been postulated by Rivero (1992) who justifies her proposal by claiming that the adverbs belong to the argument structure of the verb and are analyzed as VP-internal. Rivero's incorporation account of [adverb verb] composites has been questioned by Drachman & Malikouti-Drachman (1994) and Kakouriotes et al. (1997).[18] In particular, Kakouriotes et al. argue that Rivero offers no sufficient and independent evidence for distinguishing between adverbs that incorporate, such as *ksana*, and other similar adverbs that fail to incorporate (e.g., *pali* 'again' vs. *paliγrafo* 'to write again'). In the same vein, Smirniotopoulos & Joseph (1997: 120) note that although the [*ksana* verb] formations are very productive, they do not fully respond to the following predictions that usually should hold in case of a syntactic incorporation account:

a)   For every phrasal combination of verb + adverb, there exists a corresponding composite. The dubious acceptability of the verb ??*ksanaperijelo* 'to re-mock' (< *ksana+perijelo* 'to mock'), as opposed to the perfectly acceptable phrasal form *ton perijelasan ksana* 'they mocked him again', constitutes a counter example to this prediction (Smirniotopoulos & Joseph 1998:456).

b)   If there is no phrasal combination, there is no corresponding composite, and every composite has a phrasal counterpart. It should be noticed that for the composite *ksananjono* 'to rejuvenate, to become young again', mentioned by Mendez-Dosuna (1997), there is no independent phrase *njono ksana* or independent verb *njono.*

c)   Every composite is compositional in meaning, and shows no idiosyncratic meaning differences from its phrasal source. However, there are [*ksana* verb] composites that develop a non-predictable meaning and a non-predictable syntactic behavior that are not determined compositionally from the combination of *ksana* with the verb. Consider the following examples provided by Ralli (2002b), as an illustration to this last observation.

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[16] The examples under (22) could also be considered as parasynthetic constructions, although they differ from the ones seen in (6), in that there is no derivational suffix overtly realized between the basis and the inflectional affix –*o*. Verbs like *polivolo* and *poliloγo* have developed a non-compositional meaning that is different from the meaning of the root verb: *vol-* and *loγ-* historically come from the roots of the verbs βάλλω /ballo:/ and λέγω /lego:/ which mean 'to throw' and 'to tell' respectively. The non-compositional meaning of *polivolo* and *poliloγo* may also serve as an indication of the less productive character of *poli* compared to *ksana*.

[17] As Booij (1991: 53-59) correctly points out for similar structures in Dutch, a deep-structure adjunction should be excluded because it would require that the verb is optionally or obligatorily subcategorized for *ksana or poli.*

[18] It should be noticed that although Drachman & Malikouti-Drachman (1994) reject an incorporation account of these structures, they propose that they constitute compound formations derived in syntax, in accordance with Borer's (1990) parallel model of morphology.

(23)a. ðen   prosekse   ce   ksanacilise
        wasn't careful.3.SG and relapsed
        'S/he wasn't careful and relapsed'
   b. *ðen prosekse ke cilise ksana
   c. ðen prosekse   ce cilise   ksana sto   vurko
        wasn't careful.3.SG and rolled   again in the mud
        'S/he wasn't careful and rolled   again in the mud'

In addition, there are also verbs that do not clearly accept *ksana* in the preverbal position, while they accept *ksana* as a separable modifier in the same context:

(24)a. Ise   ksana stin   iðja ðulja?
        are.2.SG again in the same job?
        'Are you again in the same job?'
   b. ??Ksanaise   stin iðja ðulja?
        re-are.2.SG   in the same job?

This investigation makes clear that no adverb appears to occur freely in [adverb verb] complex words without some complications, either semantic or structural. According to Smirniotopoulos & Joseph (1998: 478), no other adverb participating in the verb composites is as 'mobile' as *ksana*. If the [*ksana* verb] combinations display such irregularities as the ones mentioned above, there is no reason why the other [adverb verb] combinations should be treated syntactically. In fact, a non-syntactic account could also handle the fact that all [adverb verb] structures are phonological words, in that they bear a single stress whereas both the adverb and the verb are stressed when used separately.

We have already seen (1.1 and 1.2) that there is a prefixation process involving a preposed bound form and a verb. We could, thus, assume a unified non-syntactic treatment of all [preverb verb] structures, and consider *ksana* and *poli* as prefixes. That is, we could assign them the same status as the one assigned to class I and class II elements that have been previously examined.[19] It should be noticed, however, that there are basic differences between class III elements and those of the other two classes: on the one hand, class I and class II items have no specific grammatical category, or no well-delimited lexical meaning, when used as preposed elements to verbs. In many instances, their meaning is defined by their occurrence in specific words. On the other hand, class III items possess a particular grammatical category (adverbs) and have more or less the same lexical meaning as the corresponding words, when used independently.[20] Instead of analyzing them as prefixes (where a prefix is usually a functional element, and has a close relation with the base, no particular lexical meaning, and no independent word status), we could consider them as lexemes since lexemes have a particular meaning and, may be realized as independent words or stems.

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[19]In fact, Philippaki-Warburton (1970), Smirniotopoulos (1992), and Malikouti-Drachman (1996) have proposed a prefixal treatment to *ksana*.
[20] It may not be the case for *poli* when used in a prenominal position, where it constitutes a translation of the Latinate prefix *multi*:
(iv) polikatastima   <   poli katastima
     department store   multi store
     Gianoulopoulou (2000) has shown that this *poli* is different from the adverb that is examined in this paper. Thus, I suggest that the two items are homonymous.

As such, they participate in compound formations. That is, I would like to propose that the [adverb verb] formations are not derivatives but compounds.[21] In these compounds, the adverbial constituent is a word-level unit since it may appear independently in syntactic constructions. This word-level status of *poli* and *ksana* does not allow the insertion of a linking vowel *–o-* that is typical of Greek compounds whose first constituent is a stem (see Ralli 1992). For instance, in another compound involving an adverb and a verb, like *kalotroo* 'to eat well', an *–o-* ensures the transition between the stem *kal-* 'well' and the word *troo* 'eat'.

Generally, the structural relation between a prefix and the base is more bound than the one involving the two members of a compound. Moreover, in the latter, the combination of the compound members is less restricted than the attachment of a prefix to a particular base. In fact, [adverb verb] complex words are productively formed, and are not subject to particular selectional restrictions, as opposed to the prefixation structures treated so far, where a prefix may select a particular type of verb to combine with (e.g., *apo* does not select verbs that are used in a secular context).

Crucially, there are cases though where the distinction between a prefixed structure and a compound one is blurred, to some extent, since some independent words may behave as prefixes and some prefixes may display a rather loose relation with the base. For example, we have seen that the meaning of *poli* that is preposed to words is not exactly the same as the meaning denoted in phrasal constructions. That is why there are proposals to consider *poli* as an item situated in between an affix and a lexeme (see Giannoulopoulou 2000). In addition, we have also observed several similarities between the structures with *ksana* and the structures involving external *para* (*para* expressing an excessive realization of the event), in that these structures are productive and semantically compositional. The similarity of the two constructions is further supported by phonology, since, in the [*ksana* verb] formations, the rule of vowel deletion applies in the same way as in the [*para* verb] ones, that is, optionally:

(25) Verb   para-   ksana
      /aniɣo/ /paraniɣo/, /paraaniɣo/ /ksananiɣo/, /ksanaaniɣo/
      to open to over-open   to re-open

Therefore, a division of preverbs according to their separability, that is a division into bound and non-bound elements, a semantically-motivated distinction into external and internal preverbs, as well as a distinction in prefixes and non-prefixes according to their participation into word-formation processes, such as prefixation and compounding, are not sufficient to account for the differences or the similarities between preverbs. What we need is a unified analysis that could accommodate the peculiarities of the data considered so far, and make predictions for similar units.

2. Co-occurrence and ordering of preverbs

In this section, I deal with accumulation and the particular ordering of preverbs in [preverb verb] combinations.[22] It is worth investigating whether the position and the

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[21]The [*ksana* verb] combinations have been previously analyzed as compounds by Ralli (1988), Malikouti-Drachman & Drachman (1989), and Drachman & Malikouti-Drachman (1994). A compounding process, has also been proposed by Smirniotopoulos (1992) for the [*poli* verb] formations.

[22]According to Kuryłowicz (1964:174), accumulation of preverbs, though theoretically possible, is not a favored procedure in Ancient Greek. A small research among native speakers has revealed that Modern Greek could allow up to three preverbs at the left-hand edge. Thus, the language has developed a more morphologically complex form concerning prefixation and compounding.

general order of preverbs, with respect to the base, are in accordance with their classification of prefixes and words/lexemes, internal and external preverbs, as well as with the overall semantic, structural and phonological properties that have been examined in the previous sections.[23]

As expected, very productive preverbs may co-occur and appear in different orders, since they do not impose any specific selectional restrictions to the base. In fact, this is usually attested with occurrences containing the external variant of *para, ksana* and *poli.*

(26) Verb   para   poli   ksana
    a. fuskono   parafuskono   (ðen)polifuskono   ksanafuskono
       to inflate   to over-inflate   to particularly inflate   to re-inflate
    b.   paraksanafuskono   ?? (ðen)poliparafuskono   ksanaparafuskono
            to over-re-inflate   to particularly over-inflate to re-over-inflate
    c.   (ðen)parapolifuskono   ?? (ðen)poliksanafuskono   (ðen)ksanapolifuskono
            to over-inflate particularly   to particularly re-inflate   to re-inflate particularly

However, when *para* behaves as an internal prefix, the ordering between the preverbs shows *para* to be closer to the verb, while *poli* or *ksana* are added outside the cluster [*para* verb]:

(27) Verb   para   poli   ksana
    a. cino   paracino   (ðen)poliparacino   ksanaparacino
       to move   to instigate   to particularly instigate   to re-instigate
    b.   *(ðen)parapolicino
    c.   *paraksanacino

In (27), the difference in the order matches the different properties of the three preverbs. As seen in section 2, *para* is a prefix, as opposed to *ksana* and *poli* that are words (i.e., specific forms of lexemes). As such, *para* is expected to be closer to the base, although it may have some properties that resemble to those of the words *ksana* and *poli*. However, the similar behavior of *para*, *ksana* and *poli* that is displayed in (26) shows that the division between prefixation, on the one hand, and compounding, on the other, is not a radical one with respect to the order between preverbs as word constituents.

The prefixal character of *para* is further proved by the fact that *para* is mutually exclusive with the other prefixes, that is, *apo* and *kse*, in their internal use, when *para* also functions as an internal preverb:

(28) a. Verb   int. kse   int. apo   int. para
          cino   ksecino   paracino
          to move   to start-up, to move-off   to instigate
    b.   *kseparacino   *paraksecino
    c. vlepo   apovlepo   paravlepo
       to see   to aim   to overlook
    d.   *apoparavlepo   *parapovlepo

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[23]All data appearing in this section follows from a questionnaire submitted to native speakers, most of which were third and fourth year students at the Dept. of Philology of the University of Patras.

As far as the co-occurrence between the external variant of *para* and verbs containing the external variants of *kse* or *apo* is concerned, it is crucial to note that *para* always appears at the left-hand edge of the formations, while the last two are mutually exclusive:

(29) Verb   ext. kse   ext. apo   ext. para
    a. kolo   ksekolo   apokolo   parakolo
      to glue/attach   to unglue   to detach   to over-glue
                *kseapokolo   *apoksekolo   paraksekolo
                *kseparakolo   *apoparakolo   paraapokolo

Generally, the distinct structural behavior between external *para* and the other two prefixes is in accordance with the properties that make it different (see 1.2), that is, its extreme productivity and the reluctance to undergo phonological changes.

While the peculiar behavior of *para* seems to blur the distinction between prefixes and lexemes (adverbs), the other members of the first two classes of preverbs conform to that division, in that they cannot appear in the position of the adverbs. In (30) below, *kse* and *apo* are directly attached to the verb root while *poli* and *ksana* may appear at the periphery.

(30) Verb   kse   apo   ksana   (ðen/min) poli
a. fuskono   ksefuskono   ksanafuskono   polifuskono
  to inflate to deflate   to re-inflate   to particularly inflate
      *kseksanafuskono   ksanaksefuskono   poliksefuskono
                        to re-deflate   to particularly deflate
      *ksepolifuskono
b. vutirono   apovutirono   ksanavutirono   polivutirono
  to butter   to skim   to re-butter   to particularly butter
                *apoksanavutirono ksanaapovutirono poliapovutirono
                          to re-skim   to particularly skim
                *apopolivutirono

In addition, it is worth mentioning that differences in the ordering are also found among members of the third class of preverbs, that is, among adverbs participating in compounding. As shown in (31), co-occurrence between *ksana* and *poli* is legitimate only when the linear order allows *ksana* to be at the periphery. Word formations with *poli* at the left-hand edge are not equally accepted by speakers:

(31) Verb   ksana   (ðen/min) poli
    a. fuskono   ksanafuskono   polifuskono
      to inflate   to re-inflate   to particularly inflate
        (ðen/min)ksanapolifuskono   ??poliksanafuskono
          to re-inflate particularly   to particularly re-inflate

These differences conform to the fact that *poli* is submitted to a number of restrictions in its combining with a verb base, while *ksana* is almost free of any kind of restrictions. In the same way, although the external variant of *para* freely alternates with *ksana*, as the examples in (26) have shown, speakers are reluctant to accept a free alternation with *poli* and prefer an ordering between the two according to which *para* precedes *poli*.
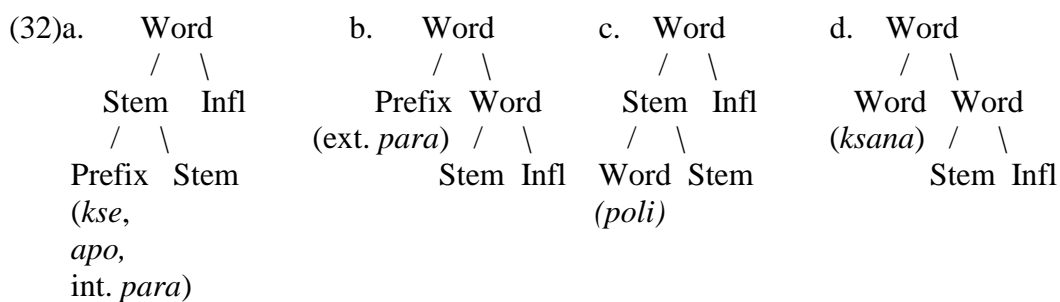
3. The morphological analysis

As seen above, class I and class II items behave like prefixes, while class III ones are word units, that is, actual forms of lexemes since they appear independently in syntactic formations. As such, *kse*, *apo* and *para* participate in the derivational process of prefixation, while *poli* and *ksana* take part in compounding. Structural evidence concerning the particular ordering between preverbs in [preverb verb] combinations has shown that the relation between the base and *kse, apo* and the internal variant of *para* is more bound than the one involving *poli*, *ksana* and the external variant of *para*. The same conclusion is reached by phonological evidence since the latter are not subject to an obligatory vowel deletion in the appropriate context.[24]

Given that Greek word formation is right-headed, the preverbs are not heads of their structures. In fact, we have seen that no category change is involved in the word formations where preverbs participate.

In the following paragraphs, we will see how morphology accounts for the relevant structural, phonological and semantic differences and similarities between the members of the three classes of preverbs. In this morphological analysis, all formations under consideration, compounds and prefixed forms, are produced by morphological operations and have the properties that we typically find in morphology: single stress, gaps and idiosyncrasies of various sorts, possibility of non-compositionality, etc. The basic assumptions of this approach are the following (see Ralli 1999, 2002a for more details):

a) Morphology is a grammatical module[25] generating morphological expressions in the computational space of the faculty of language.

b) In an inflectionally rich language, a lexicon feeds both morphology and syntax, where entries may be words (X^0), but also units smaller than words (i.e., stems).

c) Morphology is responsible for constructing binary well-formed structures in a sequence of steps, relating heads and non-heads.

Within the spirit of these assumptions, I would like to propose that prefixed and compound words involving the addition of class I, class II and class III items have the structures of (32), where the basic morphological categories are those of word, stem, prefix, and inflectional suffix.

(32)a. Word   b. Word   c. Word   d. Word
        / \   / \   / \   / \
     Stem Infl   Prefix Word   Stem Infl   Word Word
     / \   (ext. *para*) / \   / \   (*ksana*) / \
  Prefix Stem   Stem Infl Word Stem   Stem Infl
  (*kse*,   (*poli*)
  apo,
  int. *para*)

Examples: *paracino* 'to instigate', *parakano* 'to overdo', *policimame* 'to sleep a lot', *ksanakano* 'to re-do'.

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[24]Assuming that a structural entity maps onto a phonological entity (e.g., mapping between a structural and a phonological word), we could claim that the domain of obligatory vowel deletion takes place at the stem level, that is, below the phonological-word level. In Greek, a prefix and a stem do not form a word since the structure needs an inflectional affix to become a word (see Introduction).

[25]About morphology seen as an autonomous level of grammar, see also Aronoff (1994:63) who claims that morphology is not entirely reducible to another level, and follows principles of its own, in addition to other principles that may apply to other levels as well.

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(33)a.   paracino      b.   parakano    c.   policimame    d.   ksanakano
         /    \             /    \           /    \              /    \
      paracin  o         para  kano      policima  me        ksana  kano
       /   \                   /   \      /    \                    /   \
    para   cin               kan   o    poli  cima              kan    o
```

The structures above are generally motivated on further empirical grounds, that is, on the basis of morphological data taken from Greek. For instance, it is important to note that Greek verbal and nominal categories are generally analyzed into a stem and an inflectional affix. As proposed by Ralli (1988), inflection and derivational suffixation are stem-based, that is, they involve the combination of a stem and a suffix. Prefixation and compounding, however, display two kinds of structures, both of them equally productive, that is stem-based (32a,c) and word-based structures (32b,d), where the head may be a stem or a word respectively.[26]

In (32a, 33a), a prefix is added to a stem to build a prefixed stem that becomes a word after the addition of the appropriate inflectional suffix. I claim that this is the case of all *kse* and *apo* prefixation (internal and external) and the less productive part of *para* prefixation, the one involving the internal variant of *para*. In (32b, 33b) and (32d, 33d), a prefix (*para*), or a word (*ksana*), are added to another word to form a prefixed or a compound word respectively. These structures generate the *ksana* compounds or the very productive external-*para* formations. In (32c, 33c), a word (*poli*) is added to a stem to produce another stem. The latter becomes a word with the appropriate inflectional suffix. Although not very common, this structure is not unknown among Greek compounds. For instance, it constitutes the patterning for nouns containing an adjectivized adverb and a noun (see, for example, *eksoporta* 'outer door' < *ekso* 'out' + *porta* 'door', cf. Ralli to appear).

The structures of (32) are based on the idea of having different sites of morphological combinations, that is, combination with a stem and combination with a word, and that these sites may interpret some properties of word constituents that, at first sight, seem peculiar.[27] I would like to propose that the use of different sites in the representation of [preverb verb] combinations may take into consideration differences and similarities between preverbs that cannot be sufficiently accounted for by general distinctions such as prefixes vs. non-prefixes, and internal vs. external preverbs. In sections 1.2, and 2, we have seen, for instance, that while *para* is a prefix, and shares properties with the other prefixes examined above, in some contexts (that is, in its use as an external prefix), *para* displays a character that is found in adverbial words like *ksana*. This peculiar behavior is taken into consideration by postulating two possible sites for the combination of *para* with the verb base, according to its particular meaning and structural characteristics. The postulation of two combination sites does not apply to *kse* and *apo*, which, independently of their internal or external character, display a considerable closeness to the verb base and, as such, are adjoined to stems. Moreover, while *poli* is an adverbial word participating in compound formations, its attachment to

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[26] See also Malikouti-Drachman & Drachman (1989), Drachman & Malikouti-Drachman (1994), Malikouti-Drachman (1997), Ralli (1992, 2002b) and Nespor & Ralli (1996) for a detailed analysis of word-based and stem-based structures with respect to Greek compounding.

[27] It should be noticed that a similar idea is found in Di Sciullo's (1997, 1999) work, where she uses different sites in syntactic configurations in order to explain the distinct grammatical behavior of word constituents. Di Sciullo translates the distinction between internal and external prefixes into a difference between adjunction to V (internal prefixes) and adjunction to VP (external ones).

stems, but not to words, illustrates the fact that it shares properties with prefixes which make it different from another adverb, such as *ksana.*

In word structures containing an accumulation of preverbs, the difference in combination sites predicts that a prefix which attaches to words must precede a prefix that is adjoined to stems. Data exposed in section 2 show that this is exactly the case with the preverbs under consideration. When co-occurring, the external variant of *para* linearly precedes the external variants of *kse* and *apo* (29). It further predicts that a prefix, which is preposed to words, linearly precedes a word that is adjoined to stems. For example, we have seen that external *para* is situated at the left periphery of compound words having the adverb *poli* as their first constituent (see [26]).

Moreover, the possibility to combine with stems allows us to account for the formation of lexical structures that are bound. We saw in 1.1, 1.2 and 1.3 that *kse, apo*, the internal variant of *para*, and *poli* may participate in derivational processes where both the head (the second constituent) and the output of the derived construction (the structure without the inflectional suffix) are bound. As opposed to that, structures containing external *para* and *ksana* do not allow similar formations. The two preverbs are adjoined to free bases, that is, to words, which belong to the range of actual, or possible words of the language.

Crucially, the adoption of different combination sites in morphology accounts for the distinct characteristics of the morphological categories of stem and word. Combination with a stem means that there is a closer relation between a constituent and its stem base than the relation that exists between a constituent and a word base. In fact, a stem is a piece of morphological structure, as opposed to a word that may also be used by syntax. As far as preverbs are concerned, we have seen in section 1.1 that *kse,* which is adjoined to stems, is very close to the base, in that it is the cause for several changes, semantic, structural and phonological. In this respect, it differs from a constituent that attaches to words, like *ksana* (section 1.3), which occurs more or less freely with verbs.

Finally, it is important to notice that, for preverbs, the difference in the combination with a stem or a word also accounts for the fact that phonological changes are compulsory within the clusters involving preverbs that are adjoined to stems. As already seen (sections 1.1 and 1.2), in a stem-based structure involving all instances of *kse, apo* and the internal variant of *para*, an obligatory vowel deletion occurs if the verbal base begins with a vowel. In accordance with Nespor and Ralli (1996), I suggest that a unitary principle governs the mapping of morphological structures onto phonological domains.[28] I would like to propose that the phonological domain of obligatory vowel deletion occurs at the stem level, that is, below the level of phonological word. Thus, word-based formations (32b,d), whose second member is already a phonological word (that is, a word with its stress), are not subject to obligatory vowel deletion. A similar suggestion according to which the loss of vowel in [pre-verbal verb] complexes may be related to morphological structure has been previously made by Malikouti-Drachman & Drachman (1992) who have distinguished word-level pre-verbal elements (e.g., *ksana*) from non-word level ones (e.g., *apo*) on the basis of the application, or non-application, of phenomena such as vowel deletion.

4. Summary

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[28]Nespor & Ralli (1996) adopt this principle for the mapping of Greek compound structures onto phonological word or phonological phrase, depending on the case.

In this paper, five productive Greek preverbs have been examined, namely *kse, apo, para, ksana,* and *poli.* On the basis of their semantic interpretation, structural characteristics and phonological behavior in the structures they are part of, it was shown that they may be classified into two categories:

a) Prefixes and non-prefixes (words), depending on the ability to appear as bound or independent elements in words and sentences respectively, and according to form and semantic irregularities that appear when a preverb is combined with a verbal base. While there is no doubt about the prefixal status of *kse, apo* and *para, ksana* and *poli* are rather words, since they can be separated from the verbal base without any significant change to the meaning of the sentence they are part of. It was claimed that *ksana* and *poli* actively participate in compound word-formations, while *kse, apo* and *para* are handled as cases of derivational prefixation.

b) Internal and external preverbs, according to the semantic specifications that they bring to the verbal base, that is with respect to the root meaning, the aspectual structure or the valency of the verb. *Kse, apo* and *para* display a dual character, since they can assume an internal or an external role, *poli* has only an internal role, while *ksana* is used only as an external preverb.

It was shown, however, that this classification does not take into consideration all differences and similarities between the five preverbs and that there are properties that cut across these categories. In order to account for the general behavior of the preverbs, it was proposed that the combination of each preverb with a verbal base may occur at different sites within morphology. *Kse, apo* and internal *poli,* which appear to be closer to the base, are added to stems. *ksana* with a loose relation to the base is attached to words, while *para* can be both adjoined to stems or to words, depending on the case.

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