Verbal co-compounds and subcompounds in Greek*

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1 Verbal compounds

Nicholas and Joseph (this volume) identify a class of previously unnoticed compounds of the form V+V in modern Greek, and establish some significant descriptive generalizations about them. They argue that V+V compounds are true morphological compound words, the verbal analogs of nominal *dvandva* compounds, and not syntactic phrases or verb clusters. The existence of such compounds in Greek is interesting because true *dvandva* compounds in most languages (including all other Indo-European languages, it seems) are restricted to the nominal domain. N&J present historical data which suggests that the first attested examples of verbal dvandvas come from post-classical nominal dvandvas by back-formation plus reanalysis.

Taking their analysis a few steps further, I propose that N&J's generalizations, along with a number of other generalizations about Greek verbal compounds to be proposed here, follow from general morphological principles, plus constraints on Greek word formation independently established by compound nouns and adjectives.

My synchronic analysis also sheds some light on the historical question of how and why verbal compounds arose in Greek. In the Indo-European morphological system inherited by Classical Greek, verbs entered primary derivation as roots, and inflection as tense/aspect stems. Neither category could be compounded. The crucial innovation of later Greek was the rise of a new category, the VERBAL STEM, which became the basis not only of verbal dvandva compounds, but of two other new types of verbal compounds, as well as of a new class of secondary deverbal derivatives, all of which enter the language hand in hand in post-classical Greek. *Mutatis mutandis*, the new types of verbal compounds have the same semantic and morphological properties as their previously existing nominal counterparts.

I support my morphological treatment of modern Greek V+V compounds with two classes of data. The first includes the corpus of verbal compounds collected by N&J from various sources, plus a few more which I have gleaned from Babiniotis' dictionary. The second class of data consists of speakers' judgments about nonce V+V compounds, identified below with an asterisk after them (an asterisk before a word marks unacceptability as usual). Most of these words were constructed specifically to test various hypotheses about the formation of V+V compounds. This is a legitimate method because, insofar as V+V compounds enjoy a measure of productivity, it should in principle be possible to judge their well-formedness as potential words even if they are not in actual use. Indeed, some speakers proved quite comfortable with assessing the acceptability of unfamiliar made-up words and offered crisp judgments about them, while others tended to draw the line between existing and non-existing words. The intuitions of the former group turned out to

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conform to clear-cut generalizations, including some that neither they nor I were aware of at the time. Therefore the nonce-word data is of considerable interest, though it should naturally be used with due caution.

The starting point for any grammatical analysis of compounds must be the insight, originating in Pāṇini's grammar of Sanskrit, that the morphological structure of a compound is determined by the relation between its constituents. It implies that, at the top level, compounds can be classified into three types depending on the head-dependent relations between their members:

(1) 1. Compounds with one head: determinative compounds ("subcompounds"),
2. Compounds with two or more heads : *dvandvas* ("co-compounds"),
3. Compounds where neither member is the head: *bahuvrīhis* (externally headed compounds), functionally corresponding to relative clauses.

In Sanskrit and most other Indo-European languages, the latter two types (insofar as they exist in the language) form clear-cut classes with distinctive morphological and semantic properties. Determinative compounds, though, tend to be more heterogeneous; in most languages (including English) they fall into several, partly cross-classifying subtypes depending on what word class the head belongs to, and whether it is the left or right member of the compound.

The Pāṇinian approach provides the key to the compounds of Greek as well.[1] It is immediately apparent that verbal compounds have two main interpretations: co-ordination (parataxis) and subordination (hypotaxis). The prediction is that co-ordinating and subordinating V+V compounds — CO-COMPOUNDS and SUBCOMPOUNDS, as they are often referred to in the nominal domain — are structurally distinct formations. This turns out to be the case. A series of diagnostics identify co-ordinating V+V compounds as true *dvandvas*, the verbal analogs of nominal co-compounds such as *papuδo-jajaδes* 'grandparents' ('grandfather+grandmother-PL'). Subordinating V+V compounds, on the other hand, are not *dvandvas*, but determinative compounds — the verbal analogs of such nominal compounds as *palio-filos* 'old friend', 'buddy', *kalo-kamomenos* 'well-made', *mikro-pramata* 'odds and ends' ('little things').[2] This bifurcation not only makes sense of the distribution and formal properties of V+V compounds, but on the diachronic plane reveals the rise of V+V compounds (of both types) to be part of a larger set of morphological changes.

Proceeding deductively, we can derive a number of predictions about verbal co-compounds versus subcompounds from the known properties of their nominal counterparts.

(2)

co-compounds	*subcompounds*
1. order fixed by *dvandva* constraints	head-final
2. can have more than two members	binary
3. V_1 and V_2 have parallel argument structure	V_1 and V_2 may differ in transitivity
4. pluractional, can denote multiple events	denote a single event
5. prefixed adverb can scope over one member	scopes over whole compound
6. unique to Greek (within I.-E.)	also in English and elsewhere

In the next section I show how these predictions are arrived at, examine the relevant data on co-compounds and subcompounds, and conclude that the predictions are confirmed.

[1] Including their accentuation, not dealt with here, but see Kiparsky 2003 for ancient Greek.

[2] These correspond to Pāṇini's *karmadhārayas*, a subtype of the *tatpuruṣa* type of determinative compound in which the relation between the members is attributive.

2 Morphology

2.1 Order

The order of members in Greek co-compounds is determined by constraints familiar from Sanskrit N+N *dvandva* compounds (Pān̤ini, Wackernagel 1957) and English irreversible binomials (Benor and Levy 2006). Both semantics and phonology play a role. The expectation is that V+V compounds should obey the same regularities as the corresponding N+N compounds.

The most important semantic constraint on the order of elements on co-compounds is ICONICITY, which requires elements in a co-compound to be arranged in the "natural order" of their denotata. In the nominal domain this natural order receives a number of different concrete interpretations (importance, size, prototypicality, etc.) so that in this case iconicity really resolves into a family of constraints. But in the verbal domain, the natural order seems to boil down to the normal temporal sequence of the events denoted by the compound.[3]

(3) ICONICITY

beno-vjeni 'goes in and out', *skarfalo-kateveni* 'climbs up and down' (*skarfal-on-i* 'climbs', for the truncation of *-on-* in the compound see below), *kataδio-anaδiete** 'dives down and resurfaces'. Cf. English *in and out, up and down*.

The most important phonological constraint arranges the constituents of a co-compound in order of increasing length:

(4) SHORTEST FIRST

*xtipo-xaiδevi** 'beats and caresses', *trexo-perpatai** 'runs and walks', *peto-perpatai** 'flies and walks', *ɣrafo-δiavazi** 'writes and reads', *xezo-katurai** 'shits and pisses', *xezo-ksernovolai** 'shits and vomits', *vixo-ftarnizete** 'coughs and sneezes'.

Interestingly, the ranking of these two constrains seems to be the same in all three languages. Semantics trumps phonology in Greek, as in Sanskrit (Wackernagel 1957:165) and in English (Benor and Levy 2006: 271).

(5) *skarfalo-piδai** 'climbs up and jumps off (e.g. a wall)', *anavo-svini* 'turns on and off', *pijeno-ferni* 'brings and fetches back'.

But what happens when neither semantics nor phonology decide? Then the order is either fixed lexically, or there is variation. This again matches the Sanskrit facts (Wackernagel 1957:167).

(6) 1. *katiko-edrevi* 'resides and is based (in)'

2. *troɣo-pini*, or *pino-troi** 'eats and drinks', *prosjio-apojionete** 'lands and takes off' (preferred to *apojio-prosjionete** — in either case, with truncation of the first member, on which see the next subsection)

[3]For clarity, I mark compound boundaries with - (not written in Greek) and cite verbs in the third person singular, which avoids potential confusion of the usual 1.Sg. citation form's ending *-o* with the stem vowel *-o*.

The only case I found that is not covered by these rules is *ɣδino-dinete** 'undresses and dresses' (*dino-ɣδinete** 'dresses and undresses' was also accepted). The two orders tie on phonology and iconicity predicts the former.

As for subcompounds, the situation is very simple. Their order in the nominal domain is rigidly head-final in Greek. The first member always modifies the second. And this rule extends without exception to verbal subcompounds as well:

(7) *xasko-jelai* 'guffaws, laughs with wide-open mouth', *tsibo-loɣai* 'nibbles, snacks' ('pinch-picks'), *tsibo-filai* 'pecks' ('pinch-kisses'), *xarokopo-troi* 'feasts' ('celebrate-eats'), *tremo-fengi* 'flickers' ('tremble-shines').

2.2 The first member

In Greek nominal compounds, of both the subcompound and co-compound type, the first member is as a rule stripped of all its inflectional features. The first member must be a bare stem unspecified for any functional features.

(8) 1. No gender:
kutso-δulia 'menial work', *meɣalo-iδeatis* 'adherent of the *Megali Idea*', 'Greek irredentist', *i ɣalano-lefki* 'the blue-and white (Greek flag)', *mikro-posotita* 'small quantity'.
2. No number:
mikro-pramata 'odds and ends', *papuδo-jajaδes* 'grandparents', *jinekopeda* 'women and children', *xristo-panajies* 'oaths involving sacred names', *skato-nera* 'shit-water'.

The same generalization extends rigorously to verbal compounds as well.

(9) 1. No Person.
2. No Voice, including deponents:
*ksexno-θimate** 'forgets and remembers' (not **θimo-ksexnai*, cf. *ksexnai* 'forgets', *θimate* 'remembers'), **niazo-parameli* 'takes care of and neglects' (*niazete* 'takes care of, minds')
3. No (perfective) Aspect, hence invariant stem in first member:
anevokatevene 'he was going up and down (imperfective), *anevokatevike* 'he went up and down (perfective), **anevikokatevike*.

Interestingly, this constraint seems to be undominated and unviolated. That it outranks ICONICITY and SHORTEST FIRST is illustrated by the following example, where it trumps both.

(10) *piɣeno-erxete, *erxo-piɣeni* 'goes and comes' (*piɣeni* 'goes', *erxete* 'comes', a deponent verb); *pijeno-irθe, *piɣo-irθe* 'went and came'.

Suffixed first members (*-ev-o-, -en-o-, -on-o-, -n-o-, -iz-o-, -az-o-*) are prohibited in compounds. They are avoided by three means.

(11) 1. By ordering the conjuncts if possible (sometimes even against both length and iconicity):
aniɣo-sfalni, aniɣo-klini ‘opens and shuts’, *perpato-jirevi* ‘walks and searches’, *lino-δeni* ‘unties and ties’, *vrisko-xani** ‘finds and loses’, *xtipo-xaidevi** ‘beats and caresses’.

2. Otherwise by truncation of the first member’s suffix if it is syllabic:
anevo-kateveni ‘goes up and down’ (*an-ev-en-i* ‘goes up’, *kat-ev-en-i* ‘goes down’), *anevo-katevazi* ‘brings up and down’ (*an-ev-az-i*, *kat-ev-az-i*), NB: nominal derivative *anevokatevazma* ‘fluctuation, going up and down’ (additional evidence for lexical status of the verb), *avkso-mioni, avkso-mio* ‘increases and decreases, fluctuates’ (*avks-an-i, mi-on-i*), *alono-θerizi* ‘reaps and threshes’ (counter-iconic order!, *alon-iz-i* ‘threshes’), *kliδ-ambaroni, kliδo-mandaloni* ‘locks and bolts’ (*kliδ-on-i* ‘locks’).

3. Otherwise the compound is ungrammatical:
**fortono-ksefortoni, *forto-ksefortoni* ‘loads and unloads’.

Notice that the truncation must be morphological rather than phonological, since it cannot apply to non-suffixal elements such as the *-n-* in *lin-o-*.

2.3 Relations between the members

Since co-ordination is a relation between two or more elements, nominal co-compounds can have two or more co-ordinated members.

(12) *kutalo-maxero-piruna* ‘spoons, knives, and forks’, *kokkino-ɣalano-lefki** ‘the red-blue-and-white (flag) (the Tricolor)’, *mavro-prasino-kokinos sinaspismos** ‘black-green-red (conservative-green-socialist) coalition’.

This predicts the possibility of multiple verbal co-compounds. Some speakers (but not all) do accept examples such as the following.

(13) *pino-traɣuδo-xorevi** ‘drinks and sings and dances’, *xezo-katuro-ksernovolai** ‘shits and pisses and vomits’

On the other hand, since government is a relation between two elements, a head and a dependent, subcompounds have exactly two members. This holds without exception for V+V subcompounds as well.

Another difference between subbcompounds and co-compounds is the following. The members of a subcompound are not in a relationship of parallelism, so they may in principle differ in properties such as transitivity. A possible example is *perpato-jirevi* ‘searches while walking’. On the other hand, the members of a co-compound must be parallel, which includes having parallel argument structure.

3 Semantics

3.1 Aspectual interpretation

What is the semantic interpretation of the ‘and’ relation between the members of a co-compound? It seems to be basically similar to the ‘and’ relation in conjoined verbs. When the conjuncts denote activities that are incompatible (cannot be carried out at the same time), the compound denotes their (normally repeated) alternation.

(14) *anevo-kateveni* ‘goes up and down alternately/repeatedly’, *liso-δeni, lino-δeni** ‘unties and ties alternately/repeatedly’, *ɣrafo-δiavazi** ‘writes and reads alternately/ repeatedly’.

But when the conjuncts denote compatible activities, the compound normally denotes the joint activity over some period.

(15) *katiko-eδrevi** ‘resides and is based (in)’, *traɣuδoxoropiδai** ‘sings and jumps’, *xezo-ksernovolai** ‘shits and vomits’, *jelo-klei* ‘laughs and cries’, ‘laughs through tears’.

Cross-linguistically, the iterative/durative semantics of the latter class is characteristic of pluractional verbs.

(16) Finnish *aja-n* ‘drive’, *aj-ele-n* ‘drive along’ (durative), *hyppää-n* ‘jump’ (possibly once), *hypp-ele-n* ‘jump about’ (iterative)

For subcompounds, the generalization is simple: denote single events. This follows from the fact that they have only one verbal head, the second member, which the first member modifies without denoting an independent event of its own.

3.2 Scope of prefixed adverbs

What is the scope of prefixed manner adverbs like *kutso-* ‘sort of’, *siɣo-* ‘slowly’ in verbal co-compounds? Theoretically, one should expect them to be able to take scope either over the whole compound, or over its first member, but not over its second member. In the case where the actions are incompatible and interpreted as taking place alternately, this would give rise to two different interpretations. Not surprisingly, judgments on this point are especially delicate and speakers are often uncertain.

(17)
1. *siɣo-peto-perpatai** (1) ‘(alternately) flies slowly and walks’, or (2) ‘(alternately) slowly flies and walks’.
2. *koutso-anavo-svine** (1) ‘(alternately) sort of turned the light on, and turned it off’, (2) ‘(alternately) sort of turned the light on and off’.

For the case of compatible actions, interpreted as concurrent, the adverbs seem to take scope over both members.[4]

(18) *troɣo-pini* ‘eats and drinks’ (concurrently); *kutso-troɣo-pini** ‘sort of eats-and-drinks’, not ‘sort-of-eats and drinks’.

4 Why did Greek develop V+V compounds?

N&J propose that V+V *dvandvas* originated from Hellenistic nominal dvandvas by back-formation followed by reanalysis, according to a scenario something like this.

(19)
- Original N+N co-compound: *afkso*$_N$*-mío-sis*$_N$ ‘rise and fall’ (of tide)
- Back-formation to N+V compound: *afkso*$_N$*-mió-*$_V$ ‘to rise and fall’

[4]Some speakers get these adverbs in internal position, with narrow scope.

- Reanalysis to V+V co-compound: *afkso*$_V$*-mió-*$_V$ ‘to rise and fall’

Any evidence for the intermediate stage in this trajectory would have to be indirect, of course.

Why might such a reanalysis have happened? I believe that reanalysis never happens out of the blue for no particular reason. A new analysis can only gain ground when some other change either obliterates the evidence for the old one, or makes the new one preferable (simpler or more regular).

The first case can be excluded. In Indo-European, and Classical Greek, verbs entered morphology in only two ways: (1) as roots, taking primary suffixes, and (2) as tense/aspect stems, inputs to inflection. Neither roots nor stems specified for tense/aspect could be compounded, for compounding is a morphological operation that applies to stems only. The positive evidence that compounds were formed from stems, and not from roots and tense-aspect stems remained robust. So we should look for some change with the second type of effect, that is, a change which made verbal stems available for compounding, so that V+V compounds fit into the pattern of Greek morphology.

Given the importance of the distinction between verbal co-compounds and subcompounds it is a significant fact that only V+V co-compounds (true verbal *dvandvas*) are unique to Greek. V+V subcompounds occur in several Indo-European languages, including English.

(20) 1. English *freeze-dry, stir-fry, switch-hit, drop-forge, drop-kick* (Wald & Besserman 2003), *playfight, kickbox, drip-dry, test-drive, spray-paint, jump-start*. These V+V subcompounds denote *single events*.

2. Swedish *gap-skratta* (*gapa* ‘gape’, *skratta* ‘laugh’) = *xasko-jelai* ‘guffaws’.

These languages confirms the generalization that where V+V compounds exist, their types and range of interpretation parallels that of N+N compounds.

(21) 1. English, Swedish: subcompounds only, N+N and V+V.

2. Greek: subcompounds and co-compounds, N+N and V+V.

Next, we observe in postclassical Greek the rise of other new types of compounds which become increasingly productive in time. Most interestingly, these include determinative N+V compounds (verbal *tatpuruṣas*). Except for the early example *euripidaristofanizo* ‘to Aristophanize (i.e. to lampoon) Euripides’ (Kratinos), these are, avoided in classical Greek (a prohibition inherited from Indo-European). I conjecture that the rise of V+V compounds and the rise of N+V compounds are causally connected and part of the same change. Moreover, certain new types of deverbal derivation may belong in the same complex. E.g. in *kleiδ-o-menos* ‘locked’, *kleiδ-o-* is neither a root nor a tense/aspect stem, but a derivational stem. (Contrast Classical *kleis-menos*).

In post-classical Greek, it seems that roots and tense-aspect stems tended to become morphologically confounded, and the result was a new type of non-tensed derivational stem, which could feed secondary derivation and compounding. If so, the rise of V+V compounds can be seen as a special case of a single, general innovation in Greek morphology: V acquired a derivational stem, and thus became available to compounding and secondary derivation.

The resulting types of compounds, and their properties, are predictable. In fact, *dvandvas* (co-compounds) and *karmadhārayas* (head-modifier subcompounds) are the *only* possible types of V+V compounds. Other compounds can only be nominal. Exocentric compounds (*bahuvrīhis*,

"attributive compounds"), such as *mikro-psixos* 'small-minded', *redcoat*, can't be V+V because verbs are not relativizable. And governing compounds (*tatpuruṣas*), such as *sfigmo-metro* 'measure the pulse', *stage-manage*, can't be V+V because V can't be assigned a Th-role. Thus, the new category of verbal stem gave rise to exactly those new formations which were generated by the existing morphological system.

In conclusion: compounds and secondary derivatives are made by combining stems, and since verbs lacked stems, they could not originally form compounds or secondary derivatives. The introduction of the new category of non-tensed verbal stem allows the formation of three new types of compounds: N+V subcompounds, V+V subcompounds (verbal *karmadhārayas*), and V+V cocompounds (verbal *dvandvas*, e.g. *kliδo-mandaloni* 'locks and bolts'), as well as secondary derivatives. The new verbal compounds have the same semantic and morphological properties as their previously existing nominal counterparts.

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