# Greek word order: towards a new approach<sup>\*</sup>

## DIMITRA IRINI TZANIDAKI

#### 1 Introduction and data

In this paper I shall examine Greek word order variation, with particular emphasis on main declarative clauses containing a transitive verb. As is well-known, Modern Greek, in contrast to English, exhibits a great flexibility with respect to word order. A system of rich nominal inflection allows syntactic relations among clausal elements to be identified without being placed in fixed positions<sup>1</sup>. Thus, for example, a simple declarative clause consisting of a verb and its nominal subject and object can be rendered in all six logically possible combinations, as illustrated in (1) below:

(1)	(a)	latrevi ton iperealismo i Antigoni	VOS			
		adore-3s [the surrealism]acc [the Antigoni]nom				
		'Antigone adores Surrealism'.				
	(b)	latrevi i Antigoni ton iperealismo	VSO			
(c)		i Antigoni latrevi ton iperealismo	SVO			
	(d)	ton iperrealismo latrevi i Antigoni	OVS			
	(e)	(e) i Antigoni ton iperealismo latrevi				
	(f)	ton iperealismo i Antigoni latrevi	OSV			

(1a-f) are truth-conditionally but not pragmatically equivalent (Tzanidaki 1993, 1994).

Not all the orders shown above are regarded as being equally common or 'natural'. Thus, traditional grammarians (Tzartzanos 1963, Tsompanakis 1994) take SVO to be the least marked order. Typologically, Greek is also classified as predominantly SVO (Greenberg 1963, Lightfoot 1981, Tomlin 1986, Mackridge 1985).

There are a number of formal accounts for the flexibility illustrated in (1), the majority of which are syntactic and have been put forward within Government and

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<sup>&</sup>lt;sup>1</sup>Flexibility in constituent ordering is also found in Noun Phrases as well as clauses.

Binding Theory (GB) (Chomsky 1981)<sup>2</sup>. These accounts range from the strictly configurational (Drachman 1985, Tsimpli 1990, Agouraki 1993) to more 'flat' ones (Catsimali 1990, Horrocks 1994). Philippaki (1987) has also offered an account to which I shall briefly return later.

However, as far as I am aware, no explanation has been given for the following questions: (a) why is it that certain orders can be described, at least in a pretheoretical sense, as more 'common' or 'usual'? This is reflected not only in native speakers' judgements, but also in available statistical evidence (Laskaratou 1984, 1989, Tzanidaki in prep.); (b) Why is it that the less usual of the orders do occur at all ? In what follows I will attempt to give an answer to (a) above, and rather indirectly touch upon question (b).

This paper is organised as follows: section 2 outlines a theory of Dependency syntax and its implications for Greek clause structure and word order. In section 3, I propose that the concept of grammatical preference, in the spirit of Jackendoff (1988), offers a new, plausible way of examining linear order. The suggested analysis, although by no means exhaustive, is argued to enjoy support from independent psycholinguistic and empirical evidence.

## 2 Hudson 1990 and word order

#### 2.1 Background

Word-Grammar (WG) (Hudson 1984, 1990) belongs to the family of Dependency Grammars (Tesnière 1953, 1959, Mel'čuk 1988). Hudson's Dependency theory, in particular, is a theory of language which seeks to express linguistic knowledge in terms of relationships holding between individual words. Dependency arrows rather than phrase-structure trees are employed to represent these relationships. In any dependency relation one word is the **head** and the other is the **dependent**. This inequality in the dependency relation is represented by the direction of the arrow. Thus, A in (2) below is the head of B and B is the dependent of A:

$$\begin{array}{ccc} (2) & & & \\ & & A & B \end{array}$$

Head and dependent are the two general primitive syntactic functions a word may

<sup>&</sup>lt;sup>2</sup>Philippaki (1985), however, handles Greek word order variation by employing the Praguian notion of Functional Sentence Perspective (Firbas 1964). Laskaratou (1984, 1989) has offered an account in terms of Dik's Functional Grammar (Dik 1980) and Horrocks (1983) has proposed a GPSG analysis.

assume in its relationship to another word. Various relations such as subject, object, adjunct, etc. may be distinguished as subfunctions of the general head-dependent relation. These relational categories are represented in the syntactic structure by means of labelling on the dependency arrow as seen in (3) below:

(3) <---s----> Euripides wrote Electra

Thus, the noun 'Euripides' in (3) is the subject of the verb 'wrote' and 'Electra' is its object. To the extent that dependencies are basic, the grammatical relations (GRs henceforwards) encoded by them are also basic. This **relationist** view of WG is also shared by other theoretical frameworks such as Relational Grammar (Perlmutter 1980) and Lexical-Functional Grammar (Bresnan 1982).

In WG, as pointed out before, grammatical description refers only to lexical items. This entails: (a) there is no recognition of sub-lexical units such as, say, the inflectional head I of GB; (b) empty categories are also not recognized; (c) there is, similarly, no recognition of super-lexical elements, such as phrases, as primitive entities, though phrases may arise as a by-product of inter-word dependencies: in a dependency structure the head-word may be considered as the **root** of a 'phrase' containing all its dependents..

## 2.2 Dependency and word order

One of the cardinal features of Hudson's model is that it belongs to the so-called ID/LP type of grammars (cf. The ID/LP principle of GPSG (Gazdar and Pullum 1982, Gazdar et al. 1985, Hudson 1976, Dik 1978)). This means that the word-order or linear precedence (LP) rules are distinguished from rules which structure elements in permitted combinations, i.e. immediate dominance (ID) relations<sup>3</sup>. As Hudson (1990) points out, the main advantage of the ID/LP format is that cross-constructional generalisations concerning word order can be stated<sup>4</sup>.

In Hudson's Word-Grammar (Hudson 1990) two types of LP rules are said to govern word-word relations. One rule regulates the directionality of a single dependent in relation to its head. The other deals with the arrangement of two dependents in relation to each other. The former rule is known as **head-dependent** 

<sup>&</sup>lt;sup>3</sup>Horrocks (1987) discusses some of the problems that conventional PS grammars have from conflating ID and LP facts.

<sup>&</sup>lt;sup>4</sup>Parenthetically, Horrocks (1983, 1984) also exploits the ID/LP format in his GPSG-based account of Greek word order phenomena.

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**ordering** whereas the latter is referred to as **dependent-dependent ordering**. The directionality of both types of ordering in a particular language is defined by virtue of a **proposition**. A proposition is a formal unit which expresses various types of information about a word or a word-word relation. The repository of these propositions is the lexicon/grammar (no formal distinction is assumed between lexical and grammatical knowledge in Word-Grammar). To take an example from English word order, consider again the example in (2) above, repeated in (4) below:

(4) <----s-----> Euripides wrote Electra

In (4), the dependency structure is projected by means of two propositions, which define subject as an instance of **predependent** in English, that is as preceding the verbal head (predependent itself being an instance of the dependent relation). WG extensively uses so-called **'isa'** or **inheritance hierarchies**, also employed by Artificial Intelligence and other theories (cf. Flickinger 1987, Gazdar et al. 1987). Thus, for example, just as "predependent isa dependent", so "verb isa word", which means that verb is an instance of word, whose properties it inherits. The grammatical propositions generating the structure of (4) above are shown in (5) below, with italics representing the concept's name to which 'it' refers, following the standard WG notational convention:

(5) p1: position of dependent of *word* =after itp2: position of predependent of *word* =before it

The WG treatment of word-order outlined above is **monostratal** and non-derivational, that is, sentential structure is expressed by reference to a single level of syntactic representation. Extraction serves as an example. Consider an example of 'object extraction', shown in (6) below:

(6) <-----o-----<--s-----Electra Euripides wrote

(6) is the 'topicalized' version of (4) above. As can be seen, the noun 'Electra' can be sinultaneously read off the structure as the object of the verb and also its extractee. In such structures the theory makes available an extra dependency relation, called **the visitor relation**, which holds between the extracted element and the verb. The 'visitor' link is represented below the line so as to be separate from the ordinary dependencies. This 'visitor' relation corresponds to the [spec, CP] position in

constituency-based theories, or to the 'topic' or 'theme' of Functional Grammar (Dik 1978, Halliday 1985), Systemic Grammar, and Daughter Dependency Grammar (Hudson 1976).

The dependency structure in (6) is generated by the same propositions given in (5) for the non-extracted version, except that p1 in (5) is replaced by the overriding proposition relating to 'extracted' objects, seen in (7) below:

(7) p3: NOT: position of dependent of *word*=after it

Thus, the default linearization of object-dependents (after the verb) is overriden by the special word-order requirements which arise in extracted constructions such as (6). Overriding is quite a crucial concept in WG, and is based on the assumed **prototypist** character of linguistic categories. Related to overidding in this theory is the concept of **Default Inheritance**<sup>5</sup>, a logical relation holding between **instances** and **models**, by virtue of which general properties of the models are particularized in their instances, the principle being that more specific instances have priority over more general ones. Overriding comes into effect, therefore, where the properties of more specific instances cancel those of the models, which apply by default. Thus, in (7) above, the general property of objects is postdependence. However, an extracted object is a more specific instance of object. Hence its word-order requirement takes precedence over that of the general entry 'object'.

# 2.3 Dependency and Greek clause structure

**2.3.0** After this introduction to the basic tenets of the dependency component of WG let us turn to the Greek clause and examine how a dependency-based account could be formulated to account for it. Since Greek is well-known for its morphological richness, displaying both head- and dependent-marking, I start with a morphosyntactic description of the Greek clause, looking at the relation between morphosyntax and word order flexibility.

**2.3.1 Verbal morphology and full NPs: some preliminary remarks.** The question of flexibility displayed by the subject and object nominals in the Greek clause appears to bound up with a related, but separate question. That is, whether full nominals occur in a clause by default, and, if not, what triggers their appearance.

In relation to the latter point, there seems to be a general consensus in the literature on language typology (Payne 1992a, b) that in so-called free word order languages

<sup>&</sup>lt;sup>5</sup>This concept is also common to a number of theories, including HPSG (Pollard and Sag 1987) and Cognitive Grammar (Langacker 1987), where it is called **schematicity**.

both the appearance and the position of nominal elements are pragmatically triggered. This is so since these languages tend to code their arguments via rich verbal agreement or bound pronouns<sup>6</sup>. For example, Hale (1992) reports that in Walpiri and Papago, sentences containing both arguments overtly expressed are very infrequent, since typically one or even both of them would be recoverable from the previous discourse. Mithun (1987) has stated something similar in her study of Coos and Cayuga, two North-American languages, and also Ngandi, a North-Australian language. In addition, Swartz (1987) following Mithun has analysed overt nominals in Walpiri as non-arguments. According to this view, arguments are actually expressed by the pronominal morphology in the verb and/or auxiliary system, and overt NPs are taken to be adjuncts, construed with the actual pronominal arguments in some way similar to that in which a dislocated noun is linked to a resumptive pronoun in languages like English and French.

The immediate implication of the view outlined above is that, whereas in fixed word-order languages rearrangement of clausal elements is marked (cf. L- and R-dislocation, Y-movement (Givon 1990), etc.), in flexible word order languages the very occurrence of full nominals, let alone their order, is a marked option. In Swartz's words: "...given that the primary case relations are between the verb and the pronominal affixes, and given that the major constituent noun phrases serving as subject, object, and indirect object are relatively rare, every occurrence, and the subsequent positioning, of such noun phrases represents a marked phenomenon determined by the pragmatic requirements of the surrounding discourse" (ibid: 42-43). Such pragmatic requirements might be the introduction of a new referent in the discourse, resolution of potential reference ambiguity due to competing referents, switch reference, emphasis upon a referent, contrast, and so on (see Tzanidaki in prep.).

In fact this idea of employing verbal morphology by default, and using full NPs under certain pragmatic conditions has been explored by Givón (1983, 1988), independently of a language's word order type. According to Givon, what governs whether or not a full nominal expression is employed in a language is the concept of **referential accessibility**. This refers to the degree of ease with which referents can be identified in a discourse setting, the basic idea being that easily accessible referents are minimally encoded while less accessible referents tend to require fuller encoding. This rather iconic claim suggests that the referential accessibility of an NP stands in inverse proportion to the phonological size of the grammatical device which encodes

<sup>&</sup>lt;sup>6</sup>This differentiation has given rise to the distinction between configurational and nonconfigurational languages (Hale 1982, 1983). According to Bresnan (1982: 298 quoted in Siewierska 1988: 198) unlike configurational languages, in non-configurational languages case and inflexion of unordered constituents mark their GRs. Chomsky (1981) recognized the distinction in question though his later Principles and Parameters theory (Chomsky and Lasnik 1991) has refuted it.

it. This claim has been substantiated on the basis of textual studies of languages as diverse as English, Biblical Hebrew, Polish, Japanese, Amharic, Ute, Spanish, Hausa, Chamorro (see Givon 1983 for references), and it is known as *the code-quantity scale* the lower point of which is zero anaphora for most accessible/predictable referents, the upper point being restrictively-modified definite nouns encoding the least accessible/predictable referents (see Givon 1988: 249). According to Givon, the iconicity underlying this scale may well be motivated by a psychological, motor-behavior principle: "Expend only as much energy on a task as is required for its performance" (Givon 1983: 18).

**2.3.2 Greek clause and full NPs.** Following the discussion above, it appears that at least in flexible word order languages, full expression of one or both arguments is typically infrequent, given that the office of these arguments is filled by verbal morphology. Statistical data from my spoken corpus seem to corroborate this point further in relation to Greek. Consider the table in (8) below:

orders	total	% relative to total 437
with neither full S nor O	243	56
with full S and O	35	8
with full O	143	33
with full S	16	4

(8) above shows the statistical frequency of orders with full subject and/or object nominal arguments. Note that only 8% of the 437 matrix declarative sentences displayed full subject and object nominals. The variety of sources from which these 437 clauses have been taken is important, since as pointed out in the previous section, certain pragmatic environments favour or require the introduction of full nominals in the discourse. Thus, 158 of the 437 sentences in (8) are extracted from a novel, 171 from a phone conversation and 108 from a recorded 3-person conversation. In all three sources, discourse between the communicators is characterized by a high degree of intimacy and familiarity. That is, communication relies heavily on mutually shared background context and, therefore, it need not be that explicit. However, the proportion of sentences containing full NPs rises considerably when one examines another type of discourse. Consider the table in (9) below:

(8)

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orders	total	% relative to total 136
with neither full S nor O	12	9
with full S and O	69	51
with full O	48	35
with full S	7	5

The clauses of the table in (9) have been taken from a news bulletin and a live talk show. As can be seen, more than 50% of the clauses contain full subject and object arguments. This increase may be accounted for if one considers the different pragmatic demands underlying this type of discourse. Thus, a news bulletin is naturally full of events and participants which are 'new' and often assume no degree of familiarity on the part of the hearers. The majority of information, therefore, has to be fully spelled out, and the degree of overall explicitness rises considerably.

In passing, note that the number of full objects in both sources, shown in tables (8) and (9) above, is far higher than the number of full subjects. This seems to corroborate the typologically and functionally acknowledged strong correlation of object and focushood on the one hand, and subject and topichood on the other hand. Thus, if objects tend to encode focal information, i.e. information which carries the effects and the main point of the utterance, then their increased full presence in a clause can be naturally explained. By contrast, the highly topical nature of subjects tends to render their full presence redundant, especially in discourse frames with high degrees of familiarity and intimacy<sup>7</sup>.

**2.3.3 Greek clause structure**. These observations concerning the verbal encoding of subject and object arguments, along with the discourse sensitivity of their full appearance in clauses have been incorporated into Philippaki's approach to Greek clause structure (Philippaki 1987). This proposal, however, also includes some rather radical modifications of standard GB theory, which I do not have the space to go into here.

Word-Grammar offers a neat straightforward way of expressing the insights outlined in the previous section. Firstly, assume that (10a) below represents the grammatical structure of a simple declarative clause in MG containing a transitive verb and an object clitic. An example is given in (10b):

<sup>&</sup>lt;sup>7</sup>The point made here seems to be further corroborated by cross-linguistic facts concerning languages which employ morphological topic and focus markers. As Kiss (1995) reports, focus markers occur far more frequently than topic markers.

(10) (a) <-----  
$$[cl_0+V_s]$$

The clause here minimally consists of a verbal compound (containing a subject suffix) and an object clitic which depends on the verb. The main verb, in Dependency Grammar, is the 'root' of the clause, i.e. the most central element, and the only one which itself depends on nothing else. The representation in (10a) shall be known as the **minimal clause structure hypothesis.** 

The main claim, following (10a), is, therefore, that the subject suffix and object clitic bear the grammatical functions of subject and object respectively. Thus, any other nominal expression which can be construed with them is merely an adjunct, an insight also shared by other approaches (Philippaki 1987, Kreps 1992, Catsimali 1990, Tsimpli 1990).

Note that the representation in (10a) assumes an account of cliticization and intraword dependencies such as that presented in Hudson (1984). According to this account, pronominal clitics are attached to their host by a morphological process, the output being a word, i.e. a morphological and phonological unit. This is of course a lexical account of cliticization which does not prevent the clitic, as well as the subject agreement suffix in (10a) above from having some syntactic properties. For example, in the hypothesized representation the object clitic and the subject affix satisfy the predicate's valency. A question arises here as to the extent to which these two object and subject markers have an identical morphological status. Namely, are they both clitics, are they both inflections, or are they different? Examining the issue would of course require setting criteria for clitic-hood and affixhood. Such criteria are not uncontroversially available, and a full discussion of the issue would be beyond the scope of my discussion here. As Zwicky (1994) points out 'clitic' is something of an 'umbrella' term for words with several word- or affix-like properties, and both the definition and various criteria of clitic-hood are by no means straightforward. However, I will confine myself to saying that both object clitics and subject suffixes, such as in (10a) above, share a number of syntactic, semantic and morphological properties such as inability to be modified, coordinated, stylistically scrambled, stressed, etc. It is due to these shared properties that both clitics and suffixes stand in clear contrast with undoubted words. One difference, however, between the object clitic and the subject suffix is that whereas the latter's occurrence is obligatory in all finite clauses (12 below), the presence of object clitics is optional under certain circumstances, as seen in (11) below:

- (11) (a) idha TON PETRO saw-1s [the Peter]acc
  'I saw Peter', 'It was Peter that I saw'.
  (b) TON PETRO idha
- (12) (a) \*irth o Petros came [the Peter]nom 'Peter came'
  - (b) \*o Petros irth

Note that in (11a and b) the object role is borne by the accusative NP, shown in capital letters. I shall return to this issue in section 3 below.

## 2.4 The Minimal Clause Structure Hypothesis (MCSH) and clitic constructions

The proposed clause structure in (10a) above contains an object clitic the referent of which would have to have been **activated** in the immediately preceding discourse<sup>8</sup> (Chafe 1987). Below I shall propose that this active status of the clitic's referent may be involved in the explanation of certain rather well-known properties of so-called clitic constructions. Before looking at this issue, however, I should say a bit more about the theory of activation proposed by Chafe. According to him, concepts which are expressed by nouns (as well as verbs, adjectives, etc.) may be in any one of the following states of activation at a particular time, that is active, semi-active and inactive: active concepts are part of the communicators' centre of attention. Semiactive concepts represent accessible information in the sense that they are peripherally in the person's consiousness. Finally, inactive concepts form part of the person's long-term memory; they are neither centrally nor peripherally active. Chafe demostrates further how these three activation modes constrain the linguistic form of utterances, and especially the way in which the utterance's content is 'packaged', the claim being that the activation state of a concept in a sentence bears on the way it is linguistically encoded and linearized. Thus, for example, if a speaker assumes that a concept is already activated in the addressee's mind, then he will probably express it by assigning it weak stress and pronominal form. Also for reasons related to the limited capacity of the addressee's short-term memory only one concept can be active at a time 'one new concept at a time constraint', ibid: 32).

In the outlined account, then, the referents of object clitics belong to the active type of concepts. Hence the clitic's pronominal form and lack of stress. This, intuitively

<sup>&</sup>lt;sup>8</sup>The situation parallels that observed in Albanian (Newmark, Hubbard, Prifti 1982). Albanian, like Greek, also displays rich morphology and a remarkable degree of word order flexibility.

at least, seems to constrain the range of nominals which could be construed as coreferential with these clitics. Specifically, focally stressed nominals, whose referents are inactive at the time of their occurrence, should not be coreferential with clitics. As is well-known, the coreference of clitics with focally stressed nominals results in ungrammaticality (Philippaki 1985, Tsimpli 1990, Agouraki 1993). This is illustrated in (13) below:

- (13) (a) \*to<sub>i</sub> ida [TO ERGO]<sub>i</sub> it-cl saw-1s [the film]acc '\*It is the film that I saw it.'
  - (b) to<sub>i</sub> ida [to ergo]<sub>i</sub> it-cl saw-1s [the film]acc 'As for the film, I saw it.'

Thus, the coreferentiality of the clitic 'to' and the focally stressed nominal 'to ergo' in (13a) above is inadmissible because it would give rise to a contradiction. That is, the very nature of the clitic implies that the concept it expresses is already active in the hearer's attention. On the other hand, the focally stressed nominal draws the addressee's attention to a new, unfamiliar, or as yet not-active referent (Gundel 1985). A similar pattern holds in English, as seen in the ungrammaticality/ grammaticality of the English glosses in (13a, b) above.

Similarly, in (14) below the coreferential reading of the clitic with the Wh-word also results in ungrammaticality. The parallelism between focused and Wh-words is well-known, since a focused word often constitutes the answer to a Wh-question:

- (14) (a) \*PJO<sub>i</sub> to<sub>i</sub> ides WHICH-acc it-cl saw-2s '\*Which did you see it.'
  - (b)  $*to_i ides PJO_i$

The oddness of the construction in (14) may arise once again from the coreferentiality of the active referent of the clitic and the as yet inactive referent of the interrogative pronoun.

A similar line of explanation may be invoked for the so-called 'definiteness condition' on constructions involving clitics coreferential with NPs. Consider (15) below:

(15)	(a)	*to <sub>i</sub> ida	[ena ergo] <sub>i</sub>
		it-cl saw-1s	[a film]acc

'\*It is a film that I saw it.'

- (b) \*to<sub>i</sub> ida ergo<sub>i</sub> it-cl saw-1s film-acc '\*It is film that I saw it.'
- (c) to<sub>i</sub> ida [to ergo]<sub>i</sub> it-cl saw-1s [the film]acc 'As for the film, I saw it.'

In (15a, b), the coreferentiality of the clitic with a non-definite NP results in ungrammaticality. The referent of the clitic will be, as already pointed out, active, whereas that of the indefinite noun won't be. Again, it seems that a similar situation obtains in English, as the ungrammaticality/grammaticality of the English glosses suggests. No problem arises, however, in (15c), where both the clitic and the coreferential noun refer to the same active (definite) referent.

Givón (1990) attributes the oddness of data such as (13a), (14) and (15a, b) above to a 'functional conflict' which he illustrates by means of a computer-language parallelism. According to him, the coreference of a clitic with either a stressed or a non-definite noun imposes on the addressee the impossible task of 'retrieving an existing file' and 'creating a new one' at the same time. This clash results in a socalled 'info-overload' in computer jargon.

Much, of course, remains to be said concerning this preliminary line of explanation suggested above, but I hope that it has been shown how the cognitive (active/inactive) status of linguistic elements such as clitics and certain types of nominals may bear on the way they are construed.

#### 3 Greek word order and preferences

#### 3.1 The order of subject and object NPs

Turning now to the positional variation of subject and object nominals, as we saw in the introduction, a declarative clause containing a full nominal subject and object may be rendered in all six logically possible combinations. Moreover, available Greek corpora show that even the more marked of the six orders occur with sufficient frequency to indicate that they are grammatical and thus should not be attributed to performance factors. Recall, from the discussion in 2.2, that in WG, word order is handled by two rules. The first concerns head-dependent ordering, the second concerns dependent-dependent ordering. Does, then, the apparent flexibility in word order mean that both head-dependent and dependent-dependent ordering is totally free in Greek? To answer this question, I shall look at subject and object nominals separately.

Let us first consider nominal subjects. Following the hypothesis formulated above in 2.3.2, these are merely adjuncts. Moreover, both their order in relation to the verb and in relation to an object dependent NP is grammatically free. This does not mean, however, that the functions of pre- and postverbal subjects are necessarily identical. What I am saying is that all the grammar needs to say about nominal subjects in Greek is that they are free to occur in either head-dependent order, i.e.VS, SV and also in either dependent-dependent order, i.e. SO, OS.

As far as nominal objects are concerned, the situation is rather more complex. To see why one needs first to look at some typological facts concerning the VO order. In typological studies of word order the object's placement in relation to its verbal head is taken to be the key criterion for setting the default head parameter in a language (cf. Lehmann 1973, Vennemann 1973, Siewierska1988). Thus Lehnmann (1973), who modifies Greenberg's (1966) work, formulates his universals solely on the basis of the VO/OV parameter, having found the subject's position to be of little interest to typology. Hence it is not strange that even SVO languages (e.g English) are often classified as head-initial together with VSO and VOS ones (see Siewierska 1988).

Greek has also been typologically classified as a head-first language. Further justification for this classification comes from the existence of prepositions rather than postpositions, the preferred Noun-Genitive sequence, the relative order of matrix and subordinate clauses, the order Noun-relative clause and the position of negatives before the verb (Lehmann 1973).

Moreover, from the statistical predominance of VO orders (Laskaratou 1984, 1989 and my own spoken corpus), Greek can be said to be unmarkedly a head-first language. Thus, in Laskaratou's corpus for instance 85.7% of the sentences containing full object NPs displayed orders where the verb preceded its object. Similarly, in my own spoken corpus 86% of the sentences containing object nouns display VO order.

It seems valid to assume that the observed variational frequencies are indicative of overall tendencies in language (cf. Siewierska 1993). Furthermore, following Givon (1992), while word order statistics per se are not explanatory of anything, they might shed light on the study of the mind that produces them. If that is so then, we need some sort of a principled explanation for the frequency of VO order. In what follows, I shall sketch the rough lines of a potential explanation by introducing and exploring a preference-based system of grammatical linearization principles.

## 3.2 The preference principles hypothesis

**3.2.1 Jackendoff (1988).** I suggest that the concept of **preference**, in particular in the spirit of Jackendoff (1988), may provide us with the necessary means for expressing the predominance of VO orders vis-à-vis OV ones.

Jackendoff (1988) is the first, as far as I know, to formalize and explicitly refer to preference rules, as a means of working out a more comprehensive account of lexical semantics. The rules in question were initially employed in Lehrdal and Jackendoff (1982) to account for the most common grouping structures of musical signals, an unresolved issue in the theory of musical cognition. They hypothesize that listeners impose on a musical string a structure that encompasses the highest degree of overall preference.

The concept of preference was subsequently introduced into lexical semantics as a solution to problems associated with the traditional theory of necessary and sufficient conditions defining word-meanings. As Jackendoff points out, preference rule systems seem to be operational in a variety of areas such as visual experience, language, perception, communication, etc. However, the notion of preference has not acquired any great theoretical status, the reason being that current preconditions on how a formal theory should be renders the sort of computation performed by a preference rule rather alien<sup>9</sup>.

Returning to Greek word order, I think that, ceteris paribus, the insight of preferential ranking of choices outlined above could be adopted in the theory of word order variation enriching it with the expressive power needed to capture the preference/dispreference of some word orders. More specifically, one could plausibly hypothesize that preferences underly the word orders discussed here, the main prediction being that orders exhibiting the highest degree of overall preference should be more favoured.

A preference-based system would bring the following potential advantages to an

<sup>&</sup>lt;sup>9</sup>In Jackendoff's words: "Formal logic, generative grammar, and computer science all have their roots in the theory of mathematical proof, in which there is no room for graded judgements, and in which conflict between inferences can be resolved only by throwing the derivation out."

account of word order phenomena:

- (i) flexibility, i.e. it does not establish inflexible decisions about structures;
- (ii) relativity, i.e. it provides a relative degree of preferences among a set of logically possible ones;
- (iii) scalarity, i.e. the more preferences a structure satisfies the more preferred it is;
- (iv) cancelation, i.e. it may be overridden under the influence of other competing forces.

3.2.2 VO/OV orders and the the head-first principle. I shall assume that the object's placement in relation to its head is the criterial factor for setting the default head parameter in Greek. Apart from the typological evidence, outlined in section 3, there is an additional reason for assigning objects this criterial role. As we saw in section 2.3.2, subjects are always encoded in the verbal suffix, and any nominal construable with this suffix is merely an adjunct. Similarly, it has already been pointed out that objects can be encoded by clitics, in which case the NPs construable with these clitics are adjuncts. We also saw, however, that these object clitics do not always occur, notably in cases where a full direct object noun is present bearing some sort of focal status to be defined later on. In such cases, it is the accusative nominal that is assigned the object role. Hence it cannot be an adjunct. Bearing in mind that the order of adjuncts is largely irrelevant syntactically in most languages, it follows that the position of objects may be more criterial in the clause structure, since only object nouns have the potential to function as proper arguments. Taking this for granted, I suggest the following preference principle (PP) underlying Greek word order, shown in (16) below:

(16) **PP 1**: in Greek declarative clauses containing a verb and its nominal object, the verb preferably precedes its object (schematically v-->o).

According to the PP proposed here the default value for a transitive verb's position is to precede its nominal object. I take this principle to be part of the grammar of Greek, namely it is a language-specific grammatical principle which, however, as its name suggests, has a strong preferential flavour. That is to say, it does not impose a strict grammatical condition, the violation of which would result in ungrammaticality. Instead, it imposes a strong preference for VO order which may, however, be overriden under certain circumstances. As such then, this PP strongly reeinforces the thesis that "...the word-order patterns occurring in languages are best viewed not in terms of dichotomous grammaticality judgements, but in terms of a series of choices defining a preferential ranking among the set of word-order possibilities available in a given language." (Siewierska 1994: 4999).

Moreover, I take this v-->o principle to be operational in Greek word-order, I do not preclude that it may be operational in other languages with similar word-order

flexibility. Siewierska (1993: 159), for example, offers some data from Polish wordorder. According to these data, Polish, which also allows all six orders, displays VO order in nearly 90% of sentences containing subject and object nominals. Moreover, according to Tomlin (1986) more than 53% of the world's languages exhibit VO linearization. If that is so then, and if other studies of word-order in other languages show similar patterns, then it may be that the principle I am proposing may form part of a universally available repertory of linearization principles, not of course as a universal absolute. The interaction or conflict of this PP with other principles may shape individual grammars (see Tomlin 1986). In fact, as I shall argue later on, there may be some good evidence to suggest that the proposed grammatical principle is processing-motivated. Before coming to that, however, something should be said about the generation of OV orders, which also exist in Greek, rarer though they may be statistically.

It is well-acknowledged that OV orders are associated with a special focal reading of the object (Philippaki 1985, Tsimpli 1990, 1995, among others). I shall look first at how these orders are generated in the grammar, and then I shall say more about their claimed focal status. Assuming a theory of overriding such as that in Hudson (1990), outlined in 2.2 above, I suggest that OV orders become available to the grammar by means of the overriding proposition in (17) below, with head standing for verb and word standing for object:

(17) NOT: position of the head of *word*=before it

(17) above specifically cancels PP1 in (16), thus yielding the mirror image of the preferred VO order. Two points should, however, be stressed here. Firstly, as we saw in 2.2, overriding comes into effect when particular values of words are not compatible with the values of the models of which these words are instances. This being the case, it has to be shown that some value of preverbal objects is not unifiable with the general default value of nominal objects. To establish that this is so, I shall look at the properties of post- and preverbal objects, and see whether it is right to claim that the latter constitute more specific instances of the former, and thus properties of preverbal objects take precedence over those of postverbal objects. Secondly, I think that the proposed preference principle would be explanatorily more adequate if it could somehow be argued that there may be some independent motivation for it and its overriding. Concerning this second issue, I shall speculate that processing may have a bearing on this matter. In the following section, I examine these issues, looking at post- and preverbal objects first. I should, however, point out that what follows is by no means an exhaustive account. Rather, I present a first approximation of these issues.

3.2.3 Object NPs and focus. As we saw, nominal objects tend to follow their verbs,

though the reverse situation also can obtain. Moreover, as I argued in sections 2.3.2 and 2.4, the actual presence of a full nominal object tends to occur when it assumes a focal role. Cross-linguistically, a similar correlation between objecthood and focushood has been shown to be high (Siewierska 1988, 1991). In what follows, I shall go on to claim that focus bears crucially on the V/O linearization in Greek. Unlike other formal accounts of focus in Greek (Tsimpli 1990, 1995), however, I follow Dik (Dik et al. 1981, Dik 1989) in assuming that focus is far from being a unitary concept. According to Dik et al., there is a binary distinction, depending on whether focus merely introduces something new, or whether the entity identified as focus expresses exclusion with respect to some closed set of alternative entities, with which it enters to a contrastive relation. The first type of focus he calls **newfoc**, whereas the second type is referred to as **confoc.** The former is also termed 'wide or new focus', and the latter 'narrow or identificational focus' (Kiss 1995)<sup>10</sup>.

Apart from this semantic criterion as to the absence/presence of contrast in the two types of foci presented above, there is also a phonetic one. That is, although both types bear focal stress, contrastive focus is generally said to be associated with strong focal stress. According to Couper-Kuhlen (1986), this strong stress may justify not only a semantic but also a prosodic distinction between new and contrastive focus. In her words: "First, strict semantic contrast can be identified relatively well and is systematically accompanied by a distinctive pitch configuration (which may of course be neutralized in certain contexts, or modified by intonational features realizing other functions). Second, there is a sense in which the absence of contrastive pitch configuration in the presence of clear semantic contrast is a speech error (Couper-Kuhlen 1984). This constitutes the strongest evidence for its linguistic function. Third, even if the pitch configuration typically associated with contrastivity is extended to non-specific contrast or emphasis, a case can still be made for considering these as distinct from new information. Both specific and non-specific contrast make, loosely speaking, additional presuppositions. With specific contrast, the speaker chooses one candidate and simultaneously implies that all the other possible candidates are not the right ones: JOHN ordered the tickets ('it wasn't Tom'). With non-specific contrast, the speaker pressuposes that a particular candidate has a low degree of expectability but chooses that candidate anyway: JOHN ordered the tickets ('of all people', I wasn't expecting him'). Nothing similar is presupposed or implied with new information. In

<sup>&</sup>lt;sup>10</sup>In fact, an analogous distinction has been proposed within Valduvi's account of information packaging. According to his system, newfoc is equivalent to an ENTER-ADD operator, which instructs the hearer to add the new element of an uttered sentence into his knowledge store. By contrast, confoc is equivalent to an ENTER-SUBSTITUTE operator, which instructs the hearer not only to add information to his knowledge store but also to replace some element in his existing records. Thus, in this view, newfoc (=ENTER-ADD) is perceived to be the most basic aspect of informational sentential structure, since every utterance is expected to **add** something to the hearers' knowledge-store.

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sum, if we recognize that contrast/emphasis are distinct from new information, then it can be argued that there are distinct pitch configurations which correspond to these two broad categories."(p. 137).

Following the above distinction, I want to claim that post- and pre-verbal objects in Greek seem to pattern respectively with this two-way dichotomy between new and contrastive (specific and non-specific) foci. That is, Greek exploits the ordering flexibility between the verb and the object in order to mark these semantically (and prosodically) distinct focal categories. As an illustration, consider the examples in (18) below:

- (18) (a) idha ton Petro saw-1s [the Peter]acc
  - (b) ton Petro idha

Both object nominals in (18) above are instances of foci, as long as focus is taken to be the part of the utterance that states the main point of the utterance and gives rise to its contextual effects. However, in (18a) the object focus is a newfoc (**o-newfoc**), in that it may serve to introduce a new referent, not yet activated in the preceding discourse. According to Dik et al., these new foci can be clearly construed as answers to Wh-questions, following the standard question-test, shown in (19) below:

(19) Pjon idhes;whom-acc saw-2s'whom did you see?'

Thus, when the speaker asks the question in (19) above, his addressee can infer the following presuppositional structure as part of his pragmatic information (ibid: 60):

(20) You saw x; x=?

Thus, the question in (19) can be interpreted as a request to fill in the gap in the structure in (20). According to Dik, this type of focus is "...meant to fill in a gap in the pragmatic information of the addressee" (ibid: 60), and it is in this sense that Dik calls this type of focus **completive**.

On the other hand, the sentence in (18b) above, instead of being completive, is **only** acceptable with a contrastive reading of the object 'ton Petro'. This contrastive reading may either be specific, as in (21a) below, or non-specific as in (21b), in the sense of Couper-Kuhlen quoted above:

- (21) (a) It is not John I saw; it is Peter.
  - (b) I did indeed see Peter (though you didn't expect me to).

The difference, therefore, between VO and OV orders lies on the different instructions these two linguistic forms give to the hearer. Thus, the full meaning of (18a) above containing o-newfoc would be along the lines of the following proposition: 'I hereby state the fact that I saw Peter'. By contrast, the OV order containing the contrastive focused preverbal object (o-confoc) in (18b) would mean something like: 'I hereby state that I saw Peter, thus correcting your assumption that I saw John', or 'I did indeed see Peter despite your assuming that I did not'<sup>11</sup>. Thus word order can be seen to act as an operator, or 'special flag', in the sense that the speaker uses it to instruct the hearer to develop or enrich further the linguistic form of the utterance, and thus to reach the intended meaning.

Evidence for my claim that Greek employs word order to encode these two versions of focus may come from contextualizing sentences containing post- and preverbal objects. If the distinction drawn above is correct, then one would expect that the two types of foci will be appropriate in different discourse contexts. Consider (22) and (23):

- (22) (a) piga sinema tis proales ke tichea idha ton Petro
  - (b) ?piga sinema tis proales ke tichea ton Petro idha
- (23) A: igame sinema tis proales ke idhame ton Aleksi
  - Bi: ton adelpho tu idhame
  - Bii: ?idhame ton adelpho tu

In (22a) the VO order is fine even in an out-of-the blue context, i.e when nothing is presupposed and the speaker merely reports a series of things, among which the fact they went to the cinema, they saw Peter there by chance, etc. By contrast the OV order in (22b) sounds nonsensical in that context. The situation is reversed in (23). Here speaker A has apparently made a mistaken or untrue statement, and Bi's utterance in OV form serves as corrective. A VO order in this context, as in Bii's utterance, would not make any sense, for the issue here is not a mere announcement of the fact that they saw the brother of Aleksis but mainly that it was Aleksi's brother that they saw rather than Aleksis himself.

Having thus offered a distinction between post- and preverbal objects, we can now return to the question what it is that makes preverbal objects more specific instances of postverbal ones. In other words, what licenses the overriding rule in the grammar of Greek word order, given in (17) above, to take effect? For one thing, preverbal foci are a more restricted type of focus in the following sense; as I have shown, both types of foci supply the hearer with a piece of new information, i.e. they both bring the

<sup>&</sup>lt;sup>11</sup>Fuller propositions such as these are the result of an enrichment process (see Sperber & Wilson 1986).

referent of the focused object into the hearer's focus of attention. But whereas this is all there is to say about postverbal (o-newfoc) foci, preverbal foci (o-confoc) are additionally associated with either a strong emphatic or counter-expective reading (21b), or alternatively, with a substitution operation whereby the entity identified as focus substitutes for a falsely presupposed entity (21a) (see also footnote 10). It is this way then that I take postverbal objects to encode the default o-focus in Greek clauses<sup>12</sup>.

#### 3.3 Motivation for the v-->o principle and its overriding

Let us now come to the issue of what, if anything, may be the motivation underlying the grammatical preference principle, schematically depicted as v-->o principle. One way of explaining it would be to view this strong preference for VO orders as a reflex of some processing motivation. In fact, according to Newmeyer (1994), even Chomsky would agree with the idea that needs of communication may influence structure, and that an iconic relation may exist between surface structure order and order of importance. After all, the claim that various linearization choices reflect underlying cognitive principles is pretty uncontroversial, especially in the functional and pragmatic literature. One such principle is the well-known given-before-new principle, or the so-called Information Flow Principle (IFP, Kuno 1978: 54): "In principle, words in a sentence are arranged in such a way that those that represent old, predictable information come first, and those that represent new, unpredictable information last". Though, there are of course cases where the speaker may organize his message in the opposite order, which Givon (1988: 252) would call 'the-attendfirst-to-the most-urgent-task-principle'. According to this latter principle, when the focus is especially important and the topical information highly accessible or predictable, then the most urgent task is the presentation of the informationally important part of the message.

Similar predictions to the given-before-new principle are made by the concept of back- and foregrounding in Relevance Theory (Sperber and Wilson 1986). According to this distinction, backgrounded elements are those which set the context within which foregrounded elements are to be processed. Foregrounded elements are always those which give rise to contextual effects. The main claim of this theory concerning linearization is that placing of backgrounded elements earlier in the sentence facilitates processing, by making available a context to which the foregrounded part is anchored. This arrangement, however, rather than stipulated as a principle in

<sup>&</sup>lt;sup>12</sup>The default postverbal position for o-focus is furthermore in line with typological evidence. Head-first languages unmarkedly place focal material postverbally, whereas head-final languages place it preverbally (see Hyun and Kim 1988 for details and references).

Relevance theory, derives from a more fundamental principle of human cognition and communication, that is the principle of relevance. According to this, rational communication is geared to relevance, i.e. to achieving enough contextual effects for no unjustifiable processing effort. It is due to this principle, then, that backgrounded elements are predicted to come earlier, since this way the utterance will achieve its effect with no wasted processing endeavour. The reverse state of affairs is also predicted, however. Namely, extra processing effort is justified provided that it guarantees extra effects for the hearer.

To the extent, therefore, that objects tend to be overtly instantiated when encoding new information, then the predominance of VO in Greek may just be a reflex of these message management strategies (Hannay 1991), or cognitive principles. If this syllogism is correct then the v-->o PP may be viewed as the default, simply because it complies with the most optimal cost-effect balance in terms of processing. What about OV orders then? As already pointed out, the object here, rather than simply filling a blank in the hearer's information (as new focus does), requires him to carry the more complex operation of removing a mistaken entity and replacing it with another. This being so then, the following reasoning of causation may be speculated to account for the lower frequency displayed by OV orders. According to Ninio (1993), the default head-dependent directionality in a language is earlier acquired and easier to process. This would logically entail that a non-default directionality should be costlier in processing terms. As pointed out above, in Sperber and Wilson's theory increased processing cost is accompanied by more extensive modification of the hearer's cognitive environment. If my argument is correct then one would predict that orders exhibiting an OV sequence, being harder to process, should be richer in effects. In this case the special emphatic or contrastive reading of the object not only fills in a gap in the hearer's knowledge-store, but also instructs him to cancel a previously entertained assumption and replace it with the one expressed by the focal object. Note that a similar reasoning has been suggested by Siewierska (1993) in relation to Polish, a predominantly SVO free word order language. According to her, o-fronting is licensed by stronger pragmatic motivation. The latter compensates for the breaking of the VO semantic bond.

#### 3.4 The order of subject, verb and object: variation and markedness

**3.4.1 Background.** The unmarked head-dependent directionality expressed by the processing-motivated preference principle of grammar discussed above gives rise to the twofold taxonomy of word orders shown in (24) below:

(24) v-->o o<--v VOS OVS

VSO	SOV
SVO	OSV

Nevertheless, even within each group not all orders are felt to be equally usual. For instance, from the first group of orders, while all three are felt to be unmarked in relation to their analogues in the second group, SVO is described as being the least marked, and as the most common and natural. With respect to the second group of orders, OVS is clearly favoured by judgements whereas SOV is usually only accepted with a special intonation contour ('comma intonation' after the subject (Kakuriotis 1979, Philippaki 1985)). OSV, finally, is judged to be very unusual indeed<sup>13</sup>. Available statistics (Laskaratou 1984 and my own spoken corpus) seem to corroborate this point. In Laskaratou's corpus, for example 49.2% of the orders with full subject and object nouns were SVO. After this, however, the next most frequent order was OVS (8.7%).

Again what we need is some sort of principled system which could capture these intuitions and provide us with an explanation for the relative frequency of these orders. In what follows I shall sketch the rough lines of a potential explanation, by employing the already familiar concept of grammatical preference. The preference principle which I claim to be operational in the ordering taxonomies described above is what I call the **non-open dependency principle**. I first present the principle in question and I then provide various types of supporting evidence for it.

**3.4.2 The non-open dependency principle**. As seen above SVO and OVS are, respectively, the most popular members of the VO and OV ordering groups. Note that the dependency structure of these two orders is basically the same:

(25)	<		>	<	<>		
	S	V	Ο	0	V	S	

Both orders belong to what Ninio (1993) refers to as the 'linear type' of construction. That is to say, subjects and objects are immediately adjacent to their head, with no material in between. In contrast the remaining four orders, seen in (26), display non-linear dependencies:

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(26) -----> ----->
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<sup>&</sup>lt;sup>13</sup>Some consider OSV to be ungrammatical in MG (Tsimpli 1990, Agouraki 1993). Rare though it may be, it does, however, occur and, therefore, should be generated by the grammar although a principled explanation should be given for its markedness.



The dependencies in (26) are called **open dependencies** because in each case one dependency must remain pending while the other is being processed. The open dependents are shown in bold. I, therefore, suggest the following PP, shown in (27) below:

(27) **PP 2**: in Greek declarative clauses containing a verb and its nominal subject and object, the verb preferably linearizes in immediate adjacency with its nominal dependents (schematically <-- v-->).

According to the PP proposed here the default value for a transitive verb's position is to be immediately adjacent to its nominal dependents placed on either side of it. A question arises here as to what is the precise nature of the proposed principle. Is it a grammatical principle, or is it a processing principle? I should say that as in the case of the v-->o principle, I also take this PP to be part of the grammar of Greek. I shall argue, however, that the <--v--> PP, no less than the v-->o PP discussed above, is motivated by processing-related factors. That is to say, that both PPs may find themselves within the grammar of Greek as a grammaticalized reflex of processing considerations (Hawkins 1994).

Furthermore, I should stress that although I take the <--v--> PP to be operational in Greek word-order, there is some evidence to suggest that a similar principle is operational in other languages with word-order flexibility. Siewierska (1993), for example, offers some data from Polish according to which, from the six possible orders, SVO and OVS appear to be the most preferred. Thus, SVO appears in 80.4% of the clauses with full subject and object nominals, whereas OVS in only 7.9%. All the other orders appear in less than 6% (ibid: 157). These figures are remarkably similar to the Greek ones. If that is so then, and if other studies of word-order in other languages show similar patterns, then it may be that both PPs examined so far may form part of a universally available repertory of linearization principles. The interaction and/or conflict of these principles with other language-specific facts may shape individual grammars.

Finally, as in the case of the v-->o principle, an overriding proposition, stated in the grammar, will generate the dispreferred patterns, yielding word orders with open dependencies. This overriding, will again have to be motivated by the achievement of effects other than the ones brought about by the preferred patterns, an issue I will

not examine in this paper (see Tzanidaki in prep.).

#### 3.5 Motivation and evidence for the non-open dependency principle

As I suggested above, the <--v--> PP outlined in section 3.4.1 can be shown to be independently motivated. By this I mean that it is not ad hoc, postulated solely in order to account for Greek word order variation, but rather enjoys broader application in the description and functional explanation of cross-linguistic data. For this reason, therefore, it does not unnecessarily proliferate theoretical or technical apparatus.

In particular, a version of the <--v--> principle, though not explicitly referred to as such, has been invoked by Vennemann (1974) to explain the drift from SOV to SVO in a number of languages. In addition, Ninio (1993) accounts for the acquisition of 3-word constructions in English and Hebrew-speaking children by reference to a structural equivalent of this principle.

The proposed principle also enjoys some empirical support. Ninio's research in language acquisition provides us with some relevant psycholinguistic evidence relating to this principle. In her paper 'Predicting the order of acquisition of three-word constructions by the complexity of their dependency structure' (Ninio 1993) she reports the results of a test she conducted in an English-speaking child's first 102 sentences of more than two words. Her hypothesis was that '...the complexity of the dependency structure of different 3- and 4-word constructions predicts the order of their acquisition'. The theoretical framework of her research was Dependency Theory (Hudson 1990, Mel'cuk 1979, 1988).

According to her findings, three-word constructions displaying a linear, uninterrupted dependency structure appear earlier in the children's speech. Recall from the discussion in section 3.1 that linear constructions involve only adjacent dependency pairs as in (28a) below, in contrast to non-linear ones in which one dependency pair is non-adjacent as in (28b and c):

(28)	(a)	D1	Η	D2	D2	Η	D1
		<		>	<		>
	(b)			>			>
			>			>	
		Н	D1	D2	Н	D2	D1
	(c)	<			<		
		<			<		
		D1	D2	Н	D2	D1	Н

According to Ninio's claim, linearity is strongly supported by psycholinguistic evidence and seems to be of crucial importance, '...an inherent competence factor, specifying the subset of the syntactic rule system children are able to construct' (ibid: 25). She takes the dependency relation to be a 'computational command' on the basis of which individuals combinatorily compute the two separate units of the dependency pair. This combinatorial task or synthesising operation is carried out directly, i.e. without having to be stored and recalled from the short term memory, when the two members of the dependency relation by some other intervening element during sentence comprehension results in what she calls **an open dependency** which is harder to process since '...until the second member of the couple is generated, the speaker has to keep in short term memory the fact that such closure is pending' (ibid: 10).

(28a, b and c) above are easily translated to the six orders of our study. Thus, if H=Verb and D1=S (for nominal subject) and D2=O (for nominal object) then the following patterns emerge. SVO and OVS pattern with the linear-type of dependencies as in (28a) above. That means that they impose 'no detour from linear processing into and out of memory storage' and, consequently, in processing terms they are easier.

On the other hand, VOS and VSO pattern with (28b), that is, either the v-->s or the v-->o dependency remains open which, according to Ninio, entails an increased processing cost in the interpretation process on the part of the addressee. Finally, SOV and OSV pattern with (28c) above; either the s<--v or the o<--v dependencies are open which again, following the reasoning above, translates to harder processing effort<sup>14</sup>. Note, however, that the orders patterning with (28b and c) respectively are not totally equivalent despite the fact that they both belong to the non-linear type yielding open dependencies as a result. As already pointed out, VOS and VSO obey the v-->o PP, which sets the default head parameter in Greek, whereas that is not true of SOV and OSV. As Ninio points out, adjacency is just one of the factors having an impact on the processing of three-word sequences. She also takes the predominant directionality of the dependency relation in a particular language to constitute another factor,<sup>15</sup> although for her its effects have yet to be determined.

The non-open dependency PP enjoys some empirical support mainly drawn from Ninio's acquisition data dealt with above as well as from evidence concerning the drift in many languages from SOV to SVO (Vennemann 1974, Givón 1979), which

<sup>&</sup>lt;sup>14</sup>Recall, however, from the discussion in 3.3 that the principle in question operates languagespecifically. As such, it does not make any claim relating to processing difficulty in, say, head-final languages.

<sup>&</sup>lt;sup>15</sup>others being the type of grammatical relations, the number of dependent per head, etc. (ibid: 14).

I shall not go into here. With reference to Greek, it is also worth noting that a similar principle of verb-mediality seems to be favoured in clauses containing intransitive verbs with their nominal subject and an adverbial. Consider, for instance, the examples in (29) and (30) below:

(29)	(a)	O petros	efije	ksafnika	SVAdv
		[the peter]nom	left-3s	suddenly	
	(b)	ksafnika efije o	petros		AdvVS
(30)	(a)	efije ksafnika o	petros		VAdvS
	(b)	efije o petros ks	afnika		VSAdv
	(c)	o petros ksafnik	a efije		SAdvV
	(d)	ksafnika o petro	s efije		AdvSV

Although none of the examples in (29) and (30) is bad, those in (29a, b), where the verb occupies the medial position, sound more natural than those in (30) where the verb occupies a non-medial position. The same has been reported in Polish, a predominantly SVO 'free' word-order language (Jacennik & Dryer 1992).

More generally, abstracting away from the specific principle proposed, I think that the very preferential flavour of both the proposed principles is further empirically supported by some other data from Greek which seem to be more adequately accounted for in terms of **preferences** than by reference to grammatical absolutes. These data are mainly from ordering facts in subjunctive clauses, imperatives, interrogatives, subordinates as well as existential constructions, the placement of adverbials and adverbial participles, the ordering of NPs with genitive modifiers, the placement of prepositional phrases and the particle 'san' (like). These are fully exemplified in Tzanidaki (in prep.).

## 3.6 The preference principles and the criterion of maximal compliance

Having defined the two preference principles, we are now in a position to establish a ranking mechanism which will place each of the six orders found in Greek on a preference hierarchy according to its degree of compliance with the two PPs. The criterion of maximal compliance, formulated in (31) below, serves precisely this function:

(31) **Criterion of maximal compliance:** an order will be more common or 'natural' according to its compliance with the v-->o and the <--v--> principles.

A table showing the feature values each order is assigned after the application of the

above criterion is given in (32) below:

(32)

orders	SVO	VSO	VOS	OVS	SOV	OSV
v>0	+	+	+	-	-	-
<v></v>	+	-	-	+	-	-

As before, the six orders are divided up in two groups according to whether or not they obey the v-->o PP. Desirably, SVO occupies the first position in the first group in that it obeys both the v-->o and the <--v--> PPs. This may thus account for the overwhelming dominance of SVO order in clauses containing both subject and object nominals (see (33) below). Conversely, the value attributed to the two remaining orders of this group accounts for their intuitively and statistically rather low profile; VSO and VOS constitute a subgroup which although they obey the v-->o PP, fail to comply with the <--v--> PP. Thus, while they are predicted to be less common and more marked than SVO, they are also predicted to be more common and less marked than their corresponding orders in the second group, OSV and SOV. In the second group, OVS is the most preferred order in that it complies at least with the <--v--> principle. SOV and OSV on the other hand have a lower degree of preference in complying neither with the head-parameter v-->o nor with the <--v--> PP. These results accord both with native speakers' intuitions (see Tzanidaki in prep. for details) and with statistical evidence. The latter is seen in the table in (33) below which shows the predominance of SVO and OVS orders in my spoken corpus:

(33)

orders	SVO	VSO	VOS	OVS	SOV	OSV
No of clauses	78	2	2	19	1	1
% relative to total 103	76	2	2	18	1	1

## 4 Conclusion/summary

In this paper, I argued for a dependency-based account of Greek clause structure and word order. More specifically, following the rich verbal inflection in Greek, I suggested that the grammatical relations of subject and object are encoded by a subject suffix and object clitic respectively. I thus hypothesized that the verb along with these subject and object morphemes constitute the minimal clause in Greek (the

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Minimal Clause Structure Hypothesis). Following this hypothesis, I speculated on a possible line of explanation for certain properties of clitic constructions such as the inability of clitics to be coreferential with focused NPs, Wh-expressions, and indefinite nominals. Furthermore, I argued that the exhibited patterns in Greek order variation may be accounted for by reference to two grammatical principles, i.e. the v-->o and <--v--> principles, both of which set preferential rather than absolute values, and consequently may be overriden in specific circumstances. Both these PPs were argued to be part of the grammar, but motivated by processing considerations. Although I have proposed these preference principles specifically in order to account for the markedeness associated with certain word orders in Greek, there is some evidence to suggest that they might have a wider application, perhaps as part of a universally available set of linearization principles, especially in the light of recent proposals such as Hawkins (1994). According to Hawkins many cross-linguistic distributional and implicational universals of linear ordering arise from the grammaticalization of processing factors, the claim being that those orderings which involve minimal processing complexity occur more frequently.

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