ANCIENT GREEK WORD ORDER AND THE
LEHMANN HYPOTHESIS

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The development of modern word order typology received a major stimulus from the publication in 1963 of a pioneering article by Greenberg entitled 'Some universals of grammar with particular reference to the order of meaningful elements'. Perhaps the most important result to emerge from this study was that languages could be classified into two main types according to their placement of the direct object before or after the verb.   Languages with preposed objects were found to favour in their syntax the placement of modifiers before their heads whereas those with postposed objects favoured the placement of modifiers after their heads.[1]   Greenberg himself did not state the typology in such an uncompromising form and subsequent reservations had to be made, particularly with regard to the placement of adjectives which did not always appear on the 'right' side of their noun.   But on the whole the new typology made a substantial contribution to the understanding of word order and syntax, and provided a valuable foundation for further research.

In the field of Indo-European studies the modifer/head typology was taken up and developed by Lehmann (1969;   1973a;   1973b;   1974 etc.) who drew attention to the fact that Indo-European languages such as Greek, Latin, and Sanskrit[2] did not conform well to either the modifier/head (MH) or the head/ modifier (HM) pattern.   On the contrary these languages and others of the same family were ambivalent and had charac- teristics of both types.   What was the explanation?

According to Lehmann the classical and other Indo-European languages do not consistently follow either type because they are in a state of historical transition.   The hypothetical mother language, Proto-Indo-European, was, according to Lehmann, an MH language.   But the attested Indo-European languages are in the process of changing over from MH to HM.[3]

The purpose of this paper is not to reconstruct Proto-Indo-European patterns of word order by the comparative method, but to re-examine the word order of ancient Greek in the light of the Lehmann hypothesis. We will be looking for answers to the following questions: Does the hypothesis describe and explain the Greek data? Do the data support Lehmann's view of the relationship between word order of the parent language and ancient Greek as a daughter language? What are the implications for our understanding of word order in the Greek authors? In considering these questions we will also devote attention to the freedom of Greek word order, particularly where that freedom is due to the indeterminacy to be expected in a transitional model of an historical process. A review of the main syntactic evidence follows.

The first evidence to be considered is the placement of the interrogative and negative.[4] MH languages place the interrogative and sentence negative at the end of the sentence, whereas HM languages put these markers at the front. What is the situation in ancient Greek? In Greek the matter is relatively straightforward. Both interrogative and negative normally come at the front of the sentence, with a few rare exceptions. The same is true of gapping. MH languages gap the verb to the left; HM languages to the right. Again the norm in Greek is gapping to the right, the HM type, but rare cases of gapping to the left do occur, particularly in verse. In general the evidence of these three features suggests, in accordance with the hypothesis, that the HM patterns are productive whereas the corresponding MH patterns are vestigial, traces of earlier syntactic forms.

To carry the argument further it will be useful to present some statistics. For this purpose 31 dependency constructions have been selected from samples of text taken from Homer, *Iliad* I & II (recorded 8th century B.C.), Herodotus, *Histories* I (5th century B.C.), and Matthew, *Gospel* (1st century A.D.).[5] Together these texts provide a chronological perspective of some 800 years.

The basic statistics for each phrase type are presented in tables I, III, V and VI. The modifiers are listed in the left margin of each table followed by the figures for Homer, Herodotus, and Matthew in that order. For each modifier in each author we give the frequency of preposing, the frequency of postposing, the percentage, in brackets, of the sample postposed, and the associated value of Pearson's X^2 statistic.

Each value of X^2 is calculated on a 2 x 2 table which compares the numbers of preposed and postposed examples with the numbers to be expected if the placement of the modifier is random. The value of X^2 is used to determine whether or not to reject the null hypothesis that the placement of the modifier is indeterminate or due to chance.

In this study the null hypothesis will be rejected at the 5% level which corresponds to a X^2 of 3.84. Rejection of the null hypothesis entails a decision that the modifier normally precedes or follows its head as suggested by the percentages. When the figures are too low to calculate a valid X^2, i.e. when the sample size falls below ten, a bp. or binomial probability is provided.

To facilitate the reading of the results, each statistic is marked with a '-' sign (favouring MH), a '+' sign (favouring HM) and an '=' sign (if the distribution is random). The signs are ranged in three columns, one for each author, in the right margin, in the same order as the author statistics.

We can now consider Table I, which has the statistics for the verb phrase.

Of the twelve modifiers listed, two, the noun clause direct object and the infinitive, are HM already in Homer. With these may be contrasted the temporal phrase[6] which remains in preposed position throughout, and the instrumental, which is consistently ambivalent in all three authors. The remaining eight modifiers undergo movement. Five, namely the indirect object, direct object, locative, ablative, and allative, eventually attain the goal of HM placement. Two more, the manner adverbial and the equational complement, shift from MH to ambivalence. Thus the equational complement precedes its verb in Homer, follows its verb in Herodotus, and regresses to indeterminacy in Matthew. The equational subject is also idiosyncratic, being ambivalently used in relation to the equational complement in Homer, then turning against the tide to precede the complement in Herodotus and Matthew.

	Homer	Herodotus	Matthew
HM	2	4	7
MH	5	4	2

Table II
Incidence of MH and HM ordering of verb modifiers

	Homer	Herodotus	Matthew	
Indirect Object	56:17(23.29%) 20.84	129:69(34.85%) 18.18	6.148(96.1%) 130.94	- - +
Direct Object	82:44(34.92%) 11.46	270:280(50.91%) 0.18	31:96(75.59%) 33.27	- - +
Noun Clause Object	1:20(95.24%) 17.19	0:46(100%) 46.0	2:92(97.87%) 86.17	+ + +
Infinitive	5:44(89.8%) 31.04	29:263(90.07%) 187.52	0:101(100%) 101.0	+ + +
Subject to Equational Complement	21:15(41.67%) 1.0	117:29(19.86%) 53.04	101:28(21.71%) 41.31	= - -
Equational Complement to Verb	34:3(8.11%) 25.97	54:78(59.09%) 4.36	66:72(52.17%) 0.26	- + =
Temporal Phrase	75:9(10.71%) 51.86	223:34(13.23%) 138.99	159:22(12.15%) 103.7	- - -
Manner Adverbial	16:2(11.11%) 10.89	84:45(34.88%) 11.79	40:29(42.03%) 1.75	- - =
Locative	25:32(56.14%) 0.86	57:60(51.28%) 0.08	27:99(78.57%) 41.14	= = +
Ablative	8:10(55.56%) 0.22	24:27(52.94%) 0.18	26:66(71.74%) 21.04	= = +
Allative	15:14(48.28%) 0.03	35:121(77.56%) 47.41	7:121(94.53%) 101.53	= + +
Instrumental	10:13(56.52%) 0.39	22:25(53.19%) 0.19	8:5(38.46%) 0.69	= = =

Table I
The Verb Phrase

The picture is complex, but the general trend for the verb phrase is summarised in Table II, which shows that from Homer to Matthew the number of postposed modifiers increases as the number of preposed modifiers falls.

	Homer	Herodotus	Matthew	
Relative Clause	3:38(92.68%) 29.88	20:224(91.8%) 170.56	0:47(100%) 47.0	+ + +
Demonstrative Adjective	13:6(31.58%) 2.58	77:85(52.47%) 0.4	23:79(77.45%) 30.75	= = +
Adjective of Quality	134:86(39.09%) 10.47	95:133(58.33%) 6.33	27:61(69.32%) 13.14	- + +
Quantifier	12:2(14.29%) 7.14	33:82(71.3%) 20.88	13:29(69.05%) 6.1	- + +
Pâs, 'all'	9:9(50%) 0.0	54:27(33.33%) 40.5	90:10(10%) 64.0	= - -
Numeral	44:10(18.52%) 21.41	101:43(29.86%) 23.36	90:20(18.18%) 44.55	- - -
Pronominal Adjective	22:8(26.67%) 6.53	3:7(70%) 1.6	0:5(100%) bp. 0.03	- = +
Common Noun in Apposition	22:13(37.14%) 2.31	17:62(78.48%) 25.63	4:41(91.11%) 30.42	= + +
Genitive of Common Nouns	4:37(90.24%) 27.23	101:137(57.56%) 5.45	3:306(99.03%) 297.12	+ + +
Genitive of Proper Names	49:46(48.42%) 0.1	65:19(22.62%) 25.19	2:20(90.91%) 14.73	= - +
Ethnic Genitive	8:56(87.5%) 36.0	65:17(20.73%) 41.0	0:12(100%) 12.0	+ - +

Table III
The Noun Phrase

Next the noun phrase statistics (Table III). Of the
11 modifiers of nouns listed, one, the relative clause, follows
the HM pattern throughout. (Cf. the infinitive in the VP.)?
Similarly advanced is the genitive of the common noun, which
also favours the postposed position in all three authors.
With the genitive of the common noun we may contrast the ethnic
genitive, which appears as HM in Homer, regresses to MH in
Herodotus, then reappears in postposed position in Matthew.
Also unorthodox is the genitive of proper names which moves
from ambivalent to MH to HM. Perhaps Herodotus is conservative
in his placement of genitives. Nevertheless the most reactionary
modifier in the noun phrase is the numeral, which remains
preposed in all three authors. The last modifier which does
not advance towards HM placement is the adjectival $p\hat{a}s$ 'all',
which is ambivalent in Homer but firmly preposed in Herodotus
and Matthew. The more progressive quantifier, demonstrative,
adjective of quality, and pronominal adjective (rare in Matthew
who prefers to use the genitive of the pronoun) all eventually
attain HM position. The last of these, the pronominal adjec-
tive, only occurs five times (all postposed) in Matthew and
is accordingly assigned a binomial probability of 0.03 which
lies within the 5% limit and is therefore significant.

	Homer	Herodotus	Matthew
HM	3	5	9
MH	4	4	2

Table IV
Incidence of MH and HM ordering of noun modifiers

Last to be mentioned is the placement of the common noun
in apposition to the proper noun. This modifier is ambivalent
in Homer but clearly postposed in Herodotus and Matthew.
The overall trend of Table III is summarised in Table IV.
Again the HM pattern rises as the MH pattern falls.

Table V has the statistics for the adjectival phrase.
Due to the rarity of modifiers with the adjective only five
are given. Of these the partitive genitive with the sub-
stantivised adjective consistently prefers HM position in
all three authors. The next two modifiers, the genitive
of standard with the comparative and superlative, and the
dative of similarity with adjectives meaning 'like to', are
indeterminate in Homer and Herodotus but attain HM placement
in Matthew. The progress of the last two modifiers, the
accusative or dative of 'reference' or 'respect', and the
intensifying adverb is obscured by the scarcity of examples

	Homer	Herodotus	Matthew	
Genitive of Standard	9:17(65.38%) 2.46	45:42(48.28%) 0.1	1:14(93.33%) 11.27	= = +
Partitive Genitive to Adjectival	2:20(90.91%) 14.73	20:79(79.8%) 35.16	1:12(92.31%) 9.31	+ + +
Dative of Similarity	13:6(31.58%) 2.58	7:14(66.66%) 2.33	0:5(100%) bp. 0.03	= = +
Accusative or Dative of Reference	12:3(20%) 5.4	18:8(30.77%) 3.85	1:3(75%) bp. 0.25	- -[=]
Intensifying Adverb	26:0(0%) 26	16:4(20%) 7.2	0:1(100%) bp. 0.5	- -[=]

Table V
The Adjective Phrase

in Matthew. Both these modifiers are normally preposed in Homer and Herodotus. In Matthew the binomial probabilities of 0.25 and 0.5 are not significant. Indeterminacy symbols in square brackets are assigned by default.

	Homer	Herodotus	Matthew	
Caseword to Preposition	19:130(87.25%) 82.69	35:1520(97.75%) 1418.15	0:1426(100%) 1426	+ + +
Caseword to Adverb	12:11(47.83%) 0.04	4:31(88.57%) 20.83	0:48(100%) 48	= + +
Adverbial Intensifier to Adverb	6:0(0%) bp. 0.02			

Table VI
The Adverb Phrase

The figures for the adverb phrase are given in Table VI. The most common type of adverb phrase is the phrase with the preposition, which is a bound adverb. Here the caseword strongly prefers the postposed position, moving up from 87.25% in Homer to 97.75% in Herodotus and 100% in Matthew. Free adverbs may also take an inflected caseword, usually in the

genitive.　The caseword's position in this construction is indeterminate in Homer, but Herodotus shows 88.57% postposed, Matthew 100%.　The third and last modifier in Table VI is the intensifying adverb.　In Homer the intensifier precedes its adverbial head with a significant bp. of 0.02.　Comparable data from Herodotus and Matthew are lacking.　The trend for the adjective phrase and adverb phrase is shown in Table VII.　Once again the HM patterns rise as the MH patterns fall.

	Homer	Herodotus	Matthew
HM	2	3	5
MH	3	2	0

Table VII
Incidence of MH and HM ordering of
adjective and adverb modifiers

One phrase type remains which has not been dealt with. This is the exclamation phrase.　Most often exclamations stand alone, but they may take a dative of the person at whom the exclamation is directed.　Statistics for this phrase type are not given because there were no examples in Homer and Herodotus, and few in Matthew, e.g. *ouaì humîn*, 'woe to you';　(cf. Latin *vae victis*, 'woe to the conquered').

Before stating the general conclusions it will be useful to compare the overall MH and HM trends with the trend for the indeterminates.　These are tabulated in Table VIII.

	Homer	Herodotus	Matthew
MHM	12 38.71%	8 25.81%	4 12.9%
HM	7 22.58%	12 38.71%	21 67.74%
MH	12 38.71%	10 32.26%	4 12.9%

Table VIII
Summary of trends in modifier placement

If we take Homer first it will be seen that although the MH patterns (38.71%) are more numerous than the HMs, the indeterminates (38.71%) are just as numerous as the MHs.

So Homer's Greek can be described with equal validity as MH or as indeterminate in its surface structure.

In Herodotus the HM patterns predominate at 38.71% followed closely by the surviving MHs at 32.26%. The indeterminates have by now been relegated to third place (25.81%).

Finally Matthew. Here we have strong HM syntax (67.74%) with indeterminates and MHs both reduced to 12.9%.

The conclusions can now be stated:

(1) In general the data and statistics, with a few minor inconsistencies, support the Lehmann hypothesis. As we move from Homer to Herodotus to Matthew there is a steady change away from MH and towards HM patterns in the syntax. This applies to all the phrase types for which statistics were given.

(2) It is also clear that while modifier placement is relatively free in ancient Greek there is a trend towards reducing this flexibility and imposing stronger restrictions. By the time of Matthew much of the freedom is gone.

In an Indo-European context conclusion (1) is the more important. Thus if the gradient of the head/modifier statistics is projected backward in time it 'predicts' that prehistoric Greek and the Indo-European protolanguage conformed more closely to the MH type than does Homeric Greek.

As evidence regarding Proto-Indo-European conclusion (2) is more problematic. If the statistics for indeterminacy were projected back into the past they would suggest language states of increasingly greater randomness in head/modifier placement than Homeric Greek. But this contradicts the implications of conclusion (1). It is more plausible to suppose that a level of maximal indeterminacy was reached at some time prior to Homer, when some of the seven modifiers given as postposed in the Homeric column of Table VIII were still at the transitional stage. It is probable that at least two of these, namely the infinitive and the caseword with the preposition were already in HM position before the Mycenaean period, i.e. before c.1500 B.C. The degree of indeterminacy could then be expected to decrease as we follow prehistoric Greek back towards the parent language (c.3000 B.C.). Presumably the interrogative and negative were already fronted

during the protoperiod. It is probable that the 'shift' of these markers may have been precipitated by movement of the sentence accent to the front of the sentence during the protoperiod. If this is so Proto-Indo-European was already beginning to change its typology and was not a fully consistent example of the MH language type. The changeover may have already been inevitable.[8]

It remains to consider the significance of the conclusions for the understanding of the word order of Greek during the historical period.

Due to the typological changeover, the three authors studied represent different systems as far as the head/modifier placement is concerned. Homer is weakly MH, Matthew is relatively firm HM and Herodotus is best described as transitional. It follows that in each author different rules of word order apply.

But this is an oversimplification. What the three authors have in common is that practically all[9] their head/modifier sequences are reversible. So in a sense they are all transitional.

Where there is a rule, the sequences prescribed by the rule can be inverted for stylistic effect in order to produce markedness. But where there is indeterminacy both the alternative orders are equally unmarked. Freedom of this kind lent itself to the development of rhetorical figures as seen above all in the prose of Gorgias, the avoidance of hiatus (final-initial vowel junction) as practised by Isocrates, subtleties of prose rhythm (particularly at the end of the sentence) and so on. The attention paid to such matters by the classical authors is encapsulated in an anecdote reported by Euphorion and Panaetius who mention that among the writings of Plato a manuscript was found in which he had jotted down the words of the first sentence of his *Republic* in various different orders, as he searched for the ideal sequence with which to begin his major work.

It may be well to mention, in conclusion, that the flexibility of ancient Greek word order was due not only to head/modifier reversibility, but also the language's potential for universal modifier float. Together these two features provided ancient Greek with a grammatical flexibility of word order which exceeds that of any other Indo-European language.

NOTES

[1]An attempt to explain the origin of the modifier/head typology can be found in Vennemann (1973 and 1974).

[2]Staal (1967) used the freedom of word order in Sanskrit to support an argument that the base structures of natural languages are not sequenced but consist of unordered sets.

[3]The Lehmann hypothesis has not been without its critics, particularly among students of Germanic. Werth (1970), Friedrich (1975) and Dik (1980) all stressed the importance of verb-second patterns in main clauses in Germanic. Hirt (1937) recognised verb-initial, verb-second and verb-final patterns as all equally valid in Proto-Indo-European. The view that the protolanguage was basically verb-final goes back to Delbrück (1893-1900). Cf. Behagel (1932:5).

Miller (1975) looked for evidence that Proto-Indo-European was 'VSO, SOV, SVO or all three'. Verb-initial and verb-second patterns imply placement of the direct object after the verb, i.e. the HM type. So Miller's hypothetical VSO (cf. Berman [1974]) → SOV → SVO involves two reversals of modifier/head typology. Dik's V1 → V2 → V2s (strong V2) → V3 for main clauses in Germanic is more economical. But the possibility should also be considered that the Indo-European languages are undergoing drift from SOV (formal) to SVO (informal) to VSO (emotional). In this case languages of the Celtic group would be the most advanced in their word order for subject verb and object.

[4]Moorhouse (1959:chapter IV:69f.) argues that the sentence negatives were originally placed at the front of the Greek sentence. Historically there is a trend towards placement immediately before the verb. This applies more strongly to *ou* than to the modal negative *mē*. Thomson (1939) provides a treatment of sentence final placement of the interrogative which he considers to be stylistically marked. Gapping is treated by Ross (1970) and Maling (1972).

[5]Homer's epics, the *Iliad* and *Odyssey*, were probably recorded in writing in the eighth century B.C., but they contain oral material from a tradition of great antiquity. The earliest documented form of Greek is that of the clay tablets in Linear B script (c.1450 B.C.) from Knossos and Pylos. When translated by Ventris and Chadwick (1956) the tablets turned out to be in an early form of Greek. Since these documents

are records from the palace archives the range of syntax is
very limited. According to Vilborg (1960) the word order
of the tablets prefers: verb + object, verb + infinitive,
adjective + noun (except for patronymics), genitive + noun
(except for patronymics), caseword + preposition.

The *Histories* of Herodotus and the *Gospel* of Matthew
are also oral in style, Herodotus somewhat less so than Matthew.

[6] The temporal phrase tends to come at the front of the sentence
to indicate stages in the narrative. In this role it is
a 'relator'. For the concept of relators see Dover (1960:21).

[7] The strong postposition of relative clauses and infinitives
may be open to explanation in terms of Dik's concept of 'tail'
as a pragmatic function which introduces an 'afterthought'
and stands after the predication (Dik 1980:16). Both rela-
tive clauses and infinitives may be cases of tail functions
being absorbed into the sentence proper by grammaticalisation.

The placement of the relative is discussed in Monteil
(1963:33), Friedrich (1975:19), and Kuno (1974). For the
infinitive see Miller (1974) and Jeffers (1975).

[8] Aitchison (1979) surveys the word order of a few key construc-
tions in Greek from Proto-Indo-European to the present day.
Her intermediate points of reference are Homer and Linear B.
In such a long period of time development is not consistently
unidirectional, but involves some reversal. This can be
seen inter alia in Byzantine Greek which is archaising and
classicising. Noteworthy also is the modern Greek placement
of adjectives before the noun whereas our statistics show
postnominal adjectivals well established as the norm in
Herodotus and Matthew.

As far as Homer is concerned our results confirm those
of Aitchison who found that clause constituents (infinitives,
relative clauses, noun clause objects) played a leading role
in the changeover from MH to HM; likewise the prepositional
phrase. Aitchison does not discuss indeterminate placement
and does not use statistical tests.

Aitchison attributes the typological changeover to 'right-
wards operations' in complex sentences.

[9] The definite article is never NP final but can occur after
its head noun if followed by a qualifying adjective. This
combination may be treated as an apposition in which the second

noun (after the article + adjective/genitive group) is deleted. In NPs consisting of a noun and definite article only the article must precede its noun.

Examples:

    Herodotus I, 12, 2 *Arkhílokhos ho Pários*, "Archilochus the Parian"

    Herodotus I, 14, 2 *Mídēn tòn Gordíeō*, "Midas the (son) of Gordias"

In Greek the definite article is a relatively new phenomenon: it is post-Homeric.

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