

DEVELOPING LINGUISTIC METRICS FOR THE ANALYSIS OF ANCIENT GREEK

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DIONYSIUS HALICARNASSUS

- We ought to acknowledge a great debt of gratitude to the age in which we live, my most accomplished Ammaeus, for an improvement in certain fields of serious study, and especially for the considerable revival in the practice of civil oratory. In the epoch preceding our own, the old philosophic Rhetoric was so grossly abused and maltreated that it fell into a decline. From the death of Alexander of Macedon it began to lose its spirit and gradually wither away, and in our generation had reached a state of almost total extinction... Our own age has demonstrated this. Whether at the instance of some god, or by the return of the old order of things in accordance with a natural cycle, or through the human urge that draws many towards the same activities: for whatever reason, the ancient sober Rhetoric has thereby been restored to her former rightful place of honor, while the brainless new Rhetoric has been restrained from enjoying a fame which it does not deserve and from living in luxury on the fruits of another's labors. (Dionysius of Halicarnassus, *On the Ancient Orators*, 1,2)

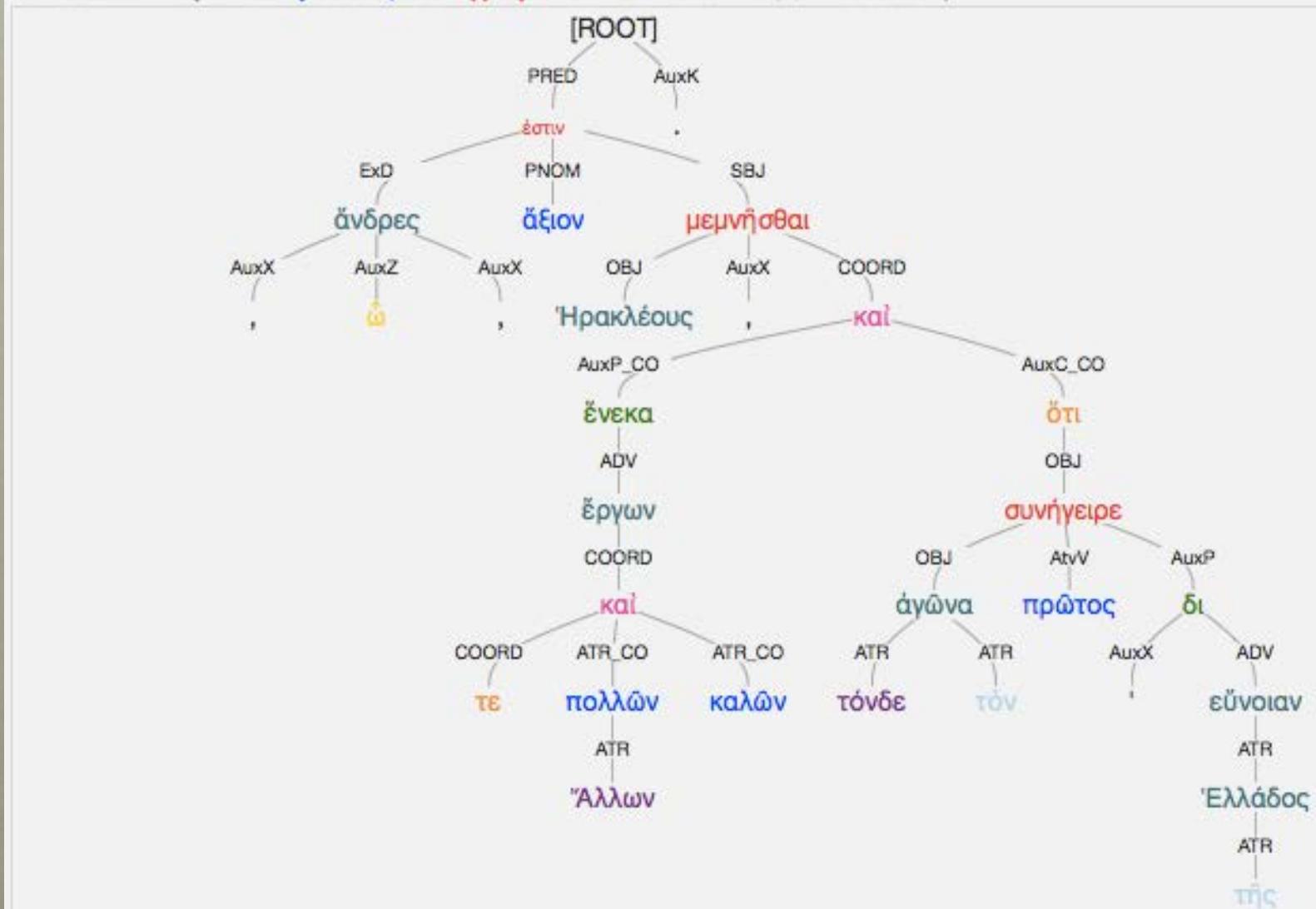
DION. HAL. LYSIAS

His kind of lucidity is therefore another quality which is worthy of imitation. Then there is his ability to combine this lucidity with brevity of expression, two ingredients which are naturally difficult to blend in due proportion. Lysias manages this combination much more successfully than any other writer.
(Dionysius of Halicarnassus, *Lysias* 4)

Purity of language, correct dialect, the presentation of ideas by means of standard, not figurative expressions; Clarity, brevity, concision, terseness, vivid representation...But there is nothing sublime or imposing about the style of Lysias. It certainly does not excite us or move us to wonder, nor does it portray pungency , intensity or fear; (Dionysius of Halicarnassus, *Lysias* 13)

LYSIAS, OLYMPIAKUS 1

"Άλλων τε πολλῶν καὶ καλῶν ἔργων ἔνεκα , ώ ἄνδρες , ἄξιον ἐστιν 'Ηρακλέους μεμνῆσθαι , καὶ ὅτι τόνδε τὸν ἀγῶνα πρῶτος συνήγειρε δι ' εὔνοιαν τῆς Ἑλλάδος .

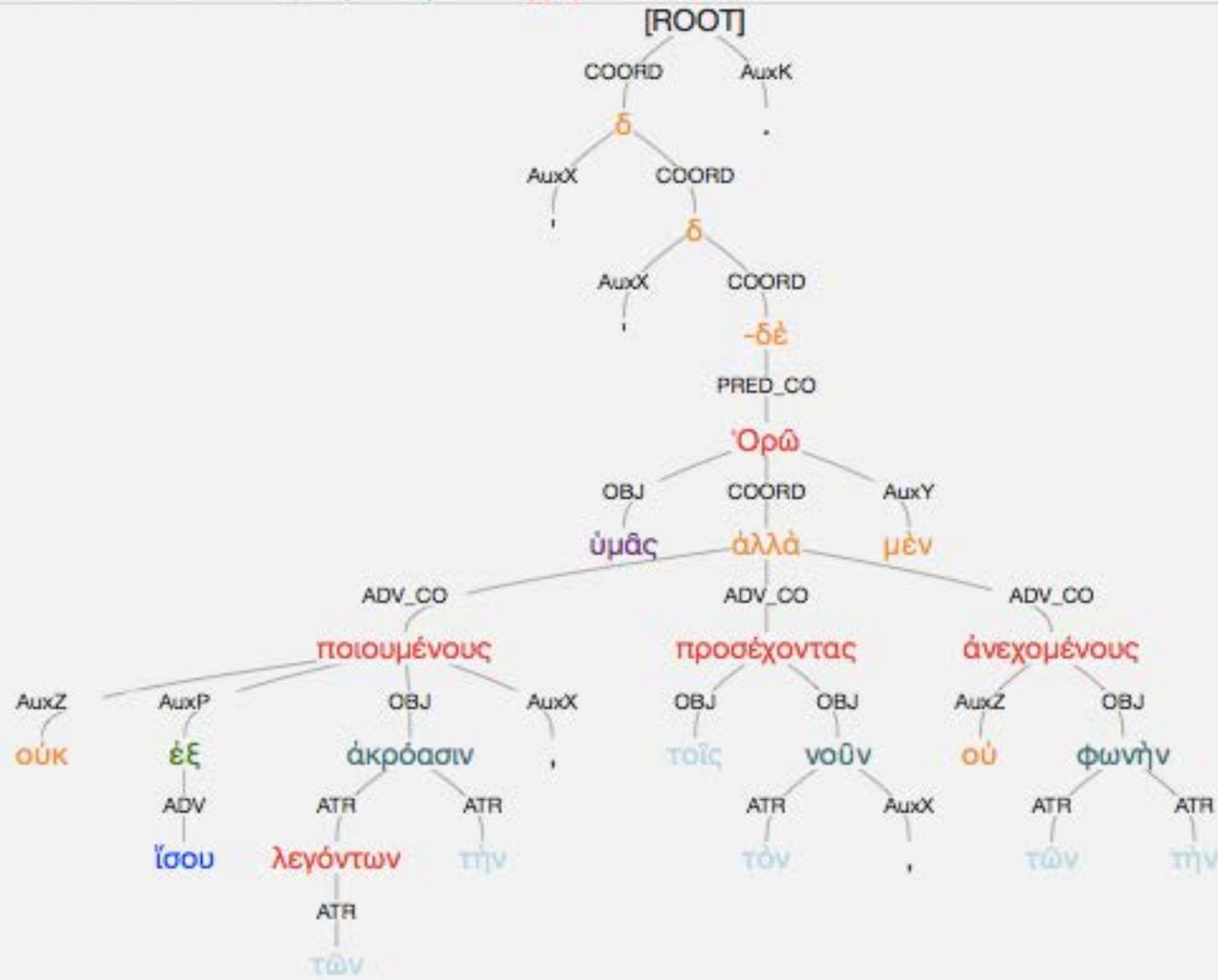


DION. HAL. ISOCRATES

- His style has the following characteristics: it is as pure as that of Lysias; Not a word is used at random; (Dionysius of Halicarnassus, *Isocrates* 2)
- I pronounced both to be masters of lucidity and vividness, but found Lysias the more successful in the concise expression of ideas, and Isocrates the superior at rhetorical amplification...I judged Lysias to be the simpler in sentence-structure and Isocrates the more elaborate; the former more convincing in creating the illusion of truth, the latter the more powerful master of technique. (Dionysius of Halicarnassus, *Isocrates* 11)

ISOCRATES, *PANEGYRICUS* 1

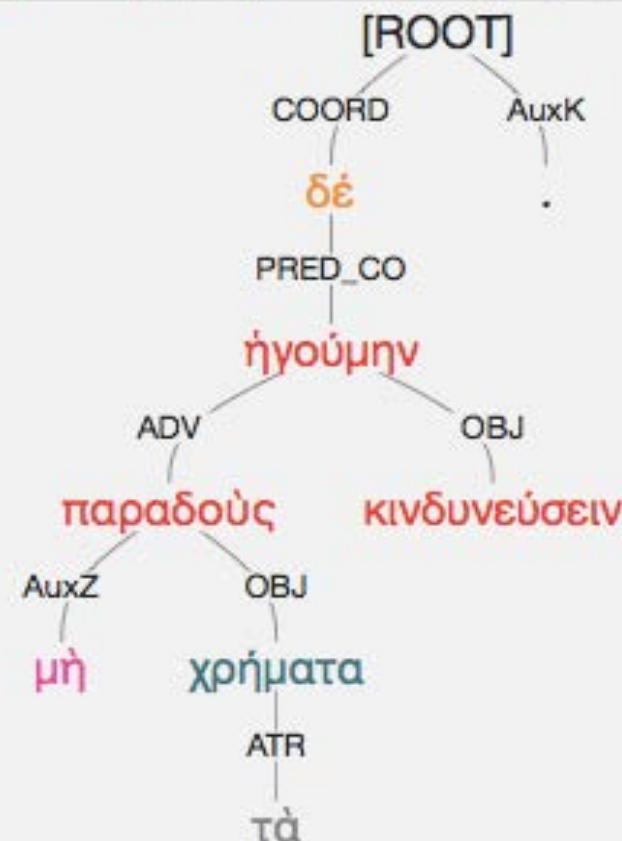
'Ορῶ δ ' ύμᾶς οὐκ ἔξ ἴσου τῶν λεγόντων τὴν ἀκρόασιν ποιουμένους , ἀλλὰ τοῖς μὲν προσέχοντας τὸν νοῦν , τῶν δ ' οὐ -δὲ τὴν φωνὴν ἀνεχομένους .



ήγούμην δέ , εἰ μὲν προείμην τὰ χρήματα , κινδυνεύσειν



ήγούμην δέ μὴ παραδοὺς τὰ χρήματα κινδυνεύσειν



DION. HALICARNASSUS, *ISOCRATES*

- “When he says “I thought that, if I should lose control of all my money, I should run the risk...” it would have been simpler and more natural to say “I thought that in handling over the money I should run the risk...” (Dionysius of Halicarnassus, *Isocrates* 20)

ION. HAL. *DEMOSTHENES*

- In the first place, before rounding off the first idea (or clause if it should be called), a second idea is introduced; then a third is subjoined before the second is complete, and material belonging to the second is tacked on after the third has been completed. (Dionysius, *Demosthenes* 9)
- He cultivates the period as much as possible, not the terse, compact kind, but one which follows a broad and leisurely course like a meandering river, with many curves and inlets. This often produces a tedious and unconvincing effect, robbing the speech of all feeling and life, and makes it more suited to ceremonial than to forensic oratory. (Dionysius of Halicarnassus, *Demosthenes* 4)

DEMOSTHENES, PHILIPPIC 1.1

http://www.per...nk=1&doc=9534

www.perseids.org/tools/arethusa/app/#/perseids?chunk=1&doc=9534

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Εἰ μὲν περὶ καινοῦ τίνος πράγματος προυτίθετ', ὁ ἄνδρες Ἀθηναῖοι, λέγειν, ἐπισχὼν ἀν ἔως οἱ πλειστοι τῶν εἰωθότων γνώμην ἀπεφήναντο, εἰ μὲν ἡρεσκέ τι μοι τῶν ὑπὸ τούτων ὥρθέντων, ἡσυχίαν ἀν ἥγον, εἰ δὲ μὴ ἡρεσκέ, τότ' ἀν καύτος ἐπειρώμην ἢ γιγνώσκω λέγειν · ἐπειδὴ δ' ὑπὲρ ἀν πολλάκις είρηκασιν οὗτοι πρότερον συμβαίνει καὶ νυν ἀκοπεῖν, ἥγομαι καὶ πρώτος ἀναστάς εἰκότως ἀν συγγνώμης τυγχάνειν.

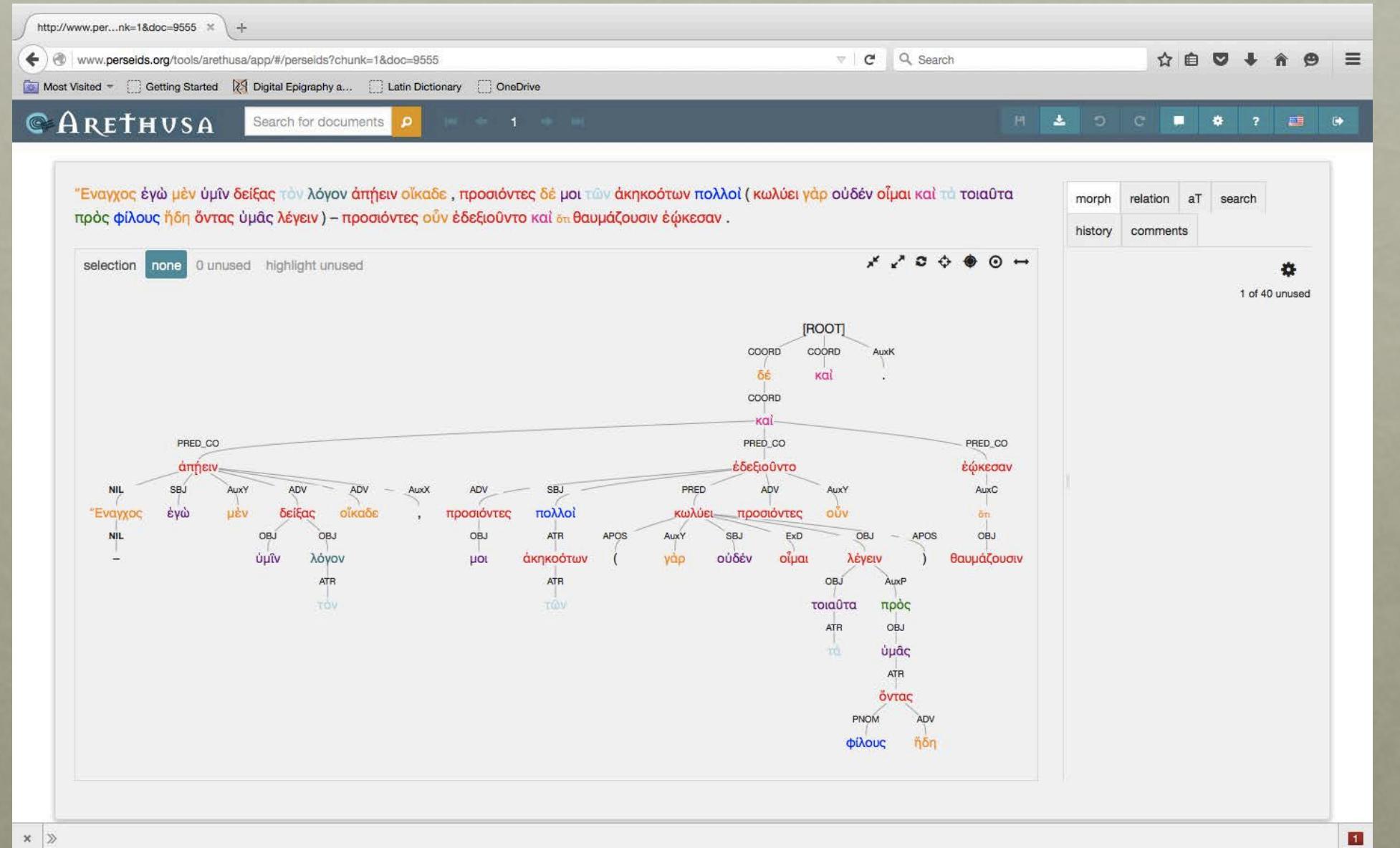
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[ROOT]

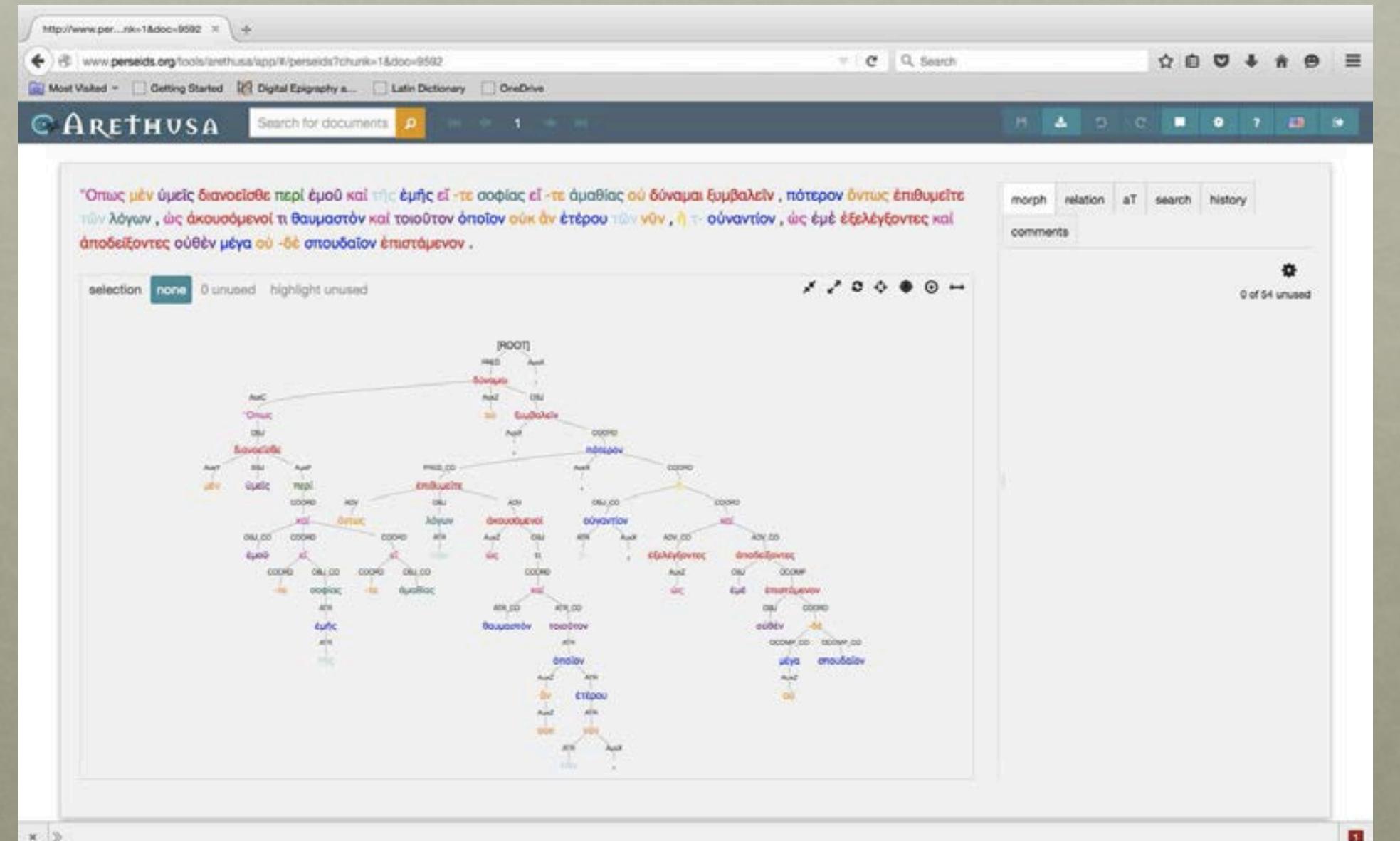
IMPERIAL ORATORS- LUCIAN

- To be honest, however, their praise caused me considerable annoyance, and when they had gone and I was left alone, I reflected as follows: “So this is the only attraction in my writings, that they are unconventional and keep off the beaten track. While good vocabulary, conformity to the ancient canon, penetration of intellect, power of perception, Attic grace, good construction, general competence, perhaps have no place in my work. (Lucian, *Zeuxis* 2)

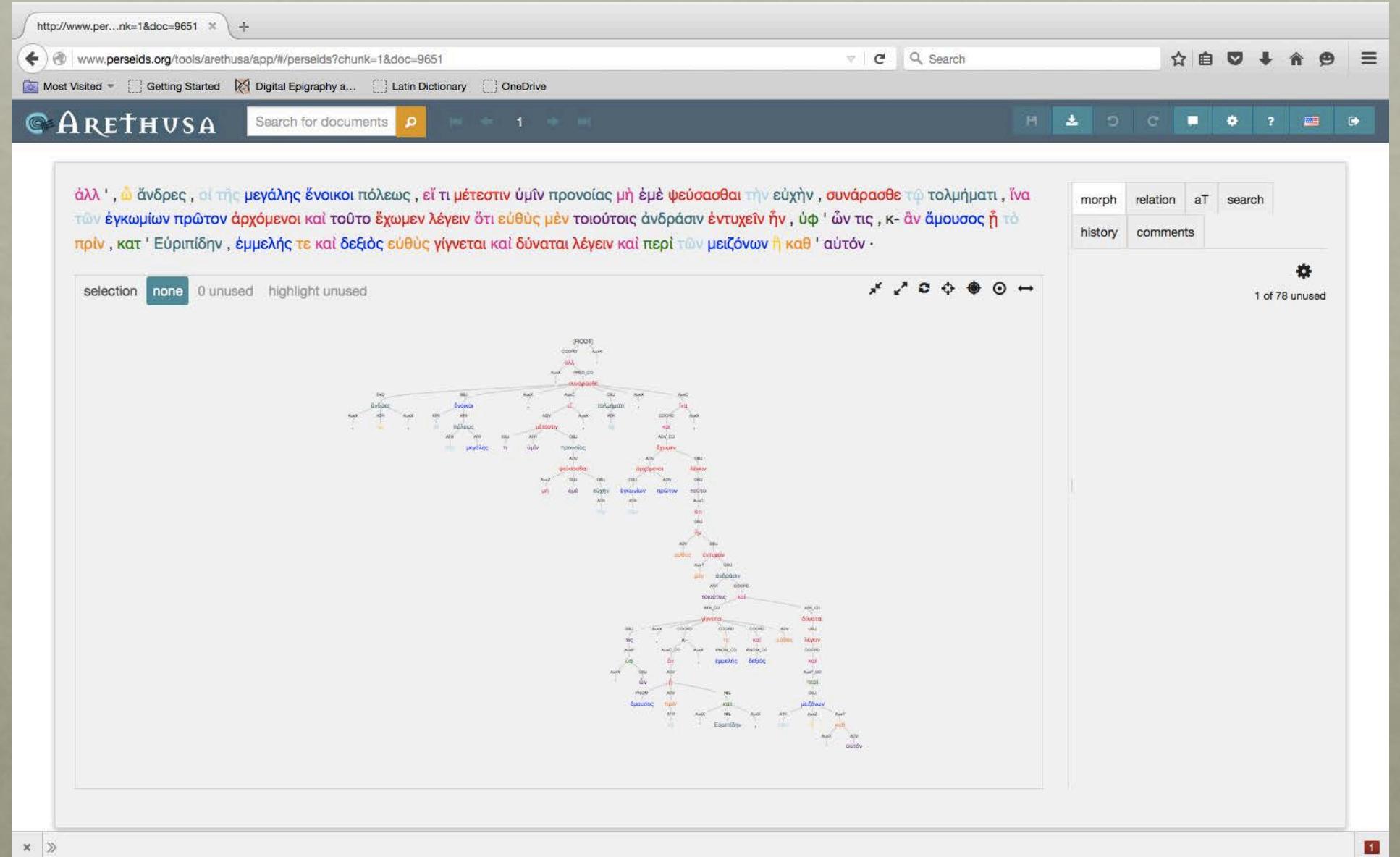
LUCIAN, ZEUXIS 1



DIO, ORATIO 42.1



AELIUS ARISTIDES, *ROME*



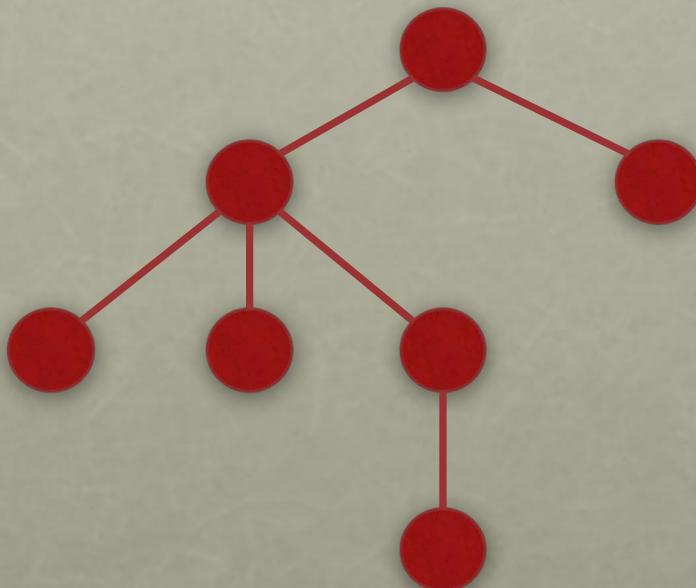
SENTENCE AS A TREE

- $S = \{n_1, n_2, n_3, \dots, n_k\}$
 - where n_i is a tree node ($n_i \in T$)
 - and T denotes the space of tree nodes
- *Each node is a tree on its own*
- *Each node has properties such as:*
 - *children of:* $T \rightarrow \{T^x\}$
 - *isATR:* $T \rightarrow \{0, 1\}$

$$fS = w_1 \mu n_1 + w_2 \mu n_2 + \dots + w_k \mu n_k = i=1 k w_i \mu n_i$$

NODE-BASED METRICS

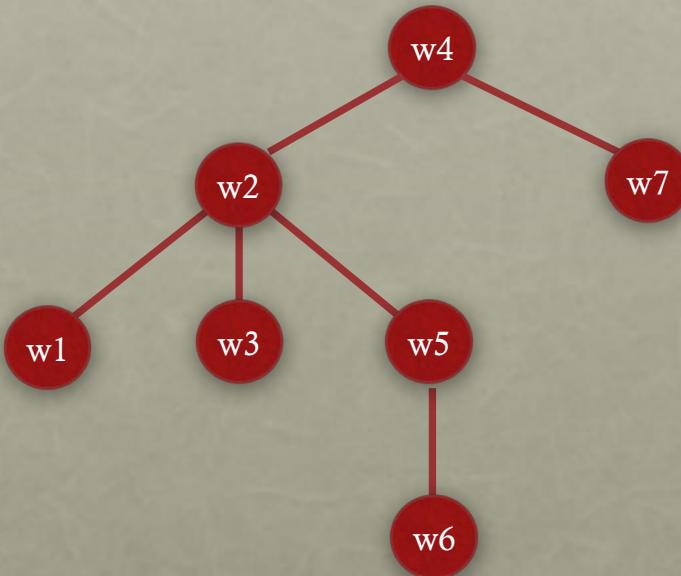
- Let's consider this example syntactically annotated sentence:



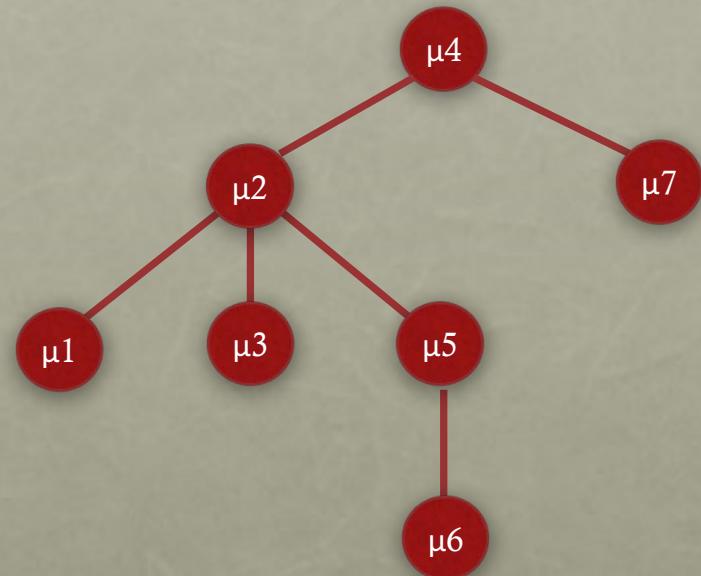
NODE-BASED METRICS

- To calculate a sentence metric we need: w and μ

Weights



Metric Values

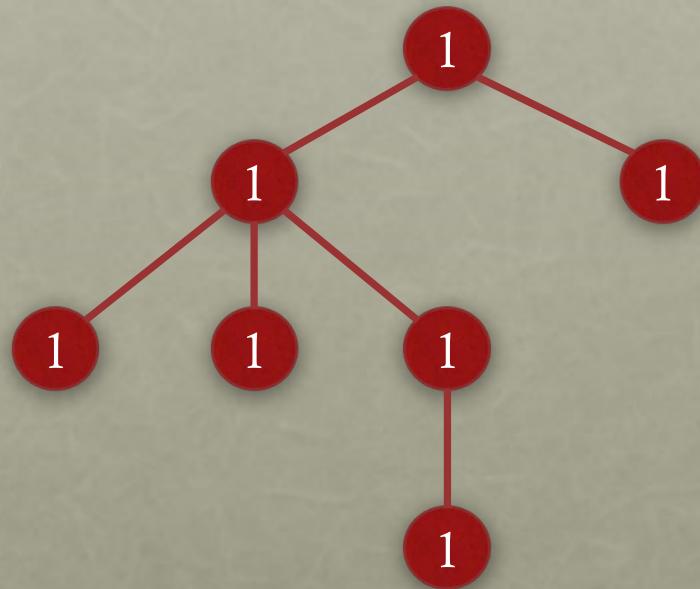


- Result: $w_1 \times \mu_1 + w_2 \times \mu_2 + w_3 \times \mu_3 + w_4 \times \mu_4 + w_5 \times \mu_5 + w_6 \times \mu_6 + w_7 \times \mu_7$

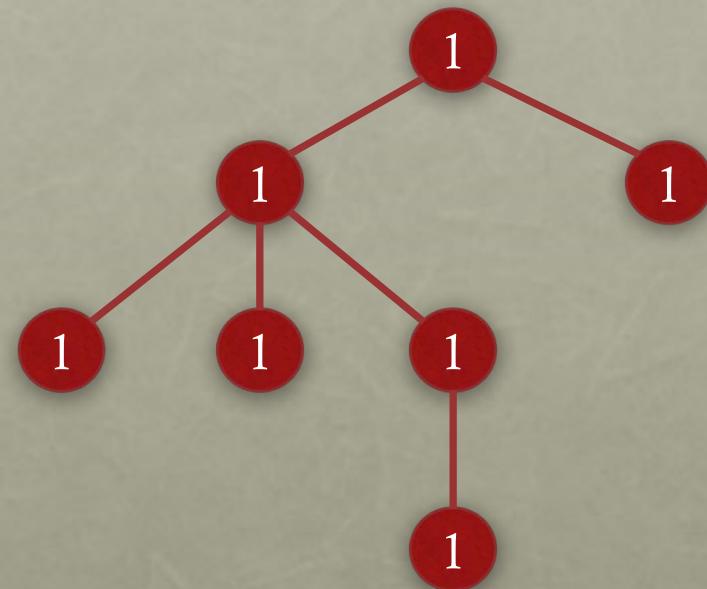
NODE-BASED METRICS

- Metric example: *Number of words*

Weights

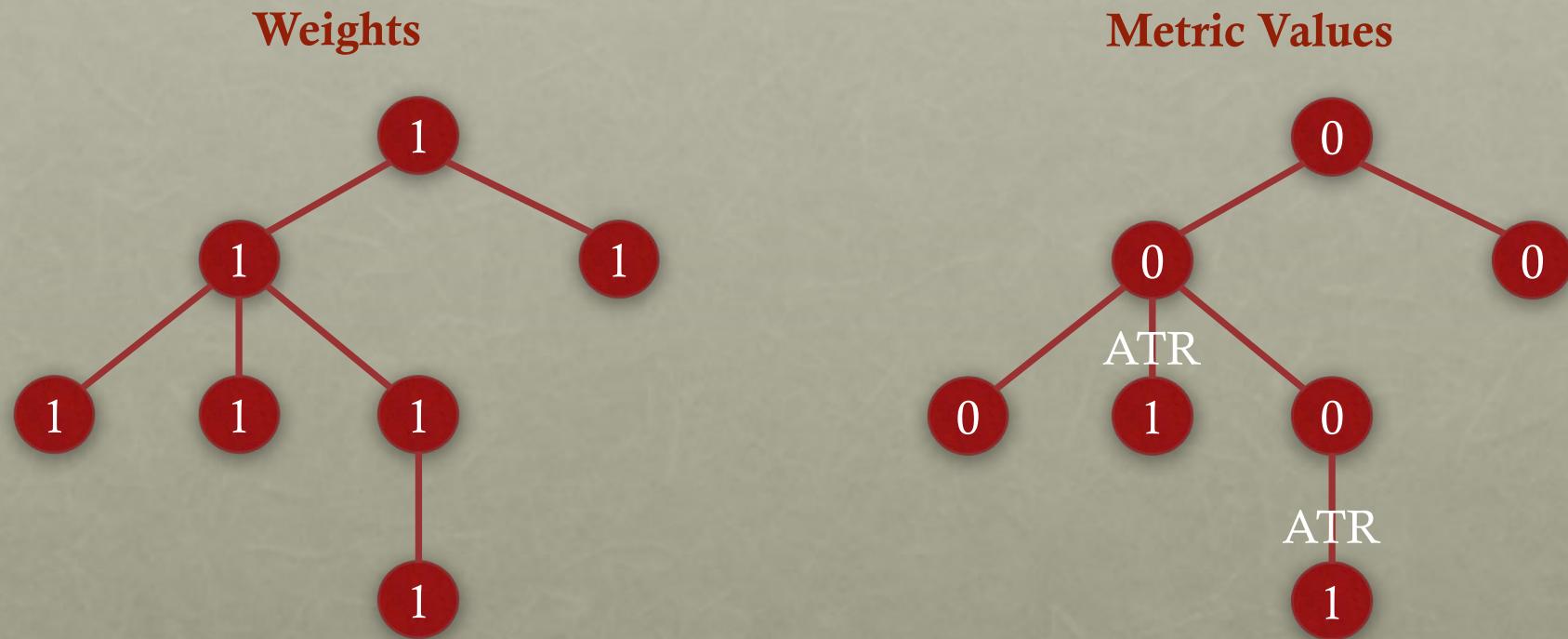


Metric Values



NODE-BASED METRICS

- Metric example: *Number of attributives*



- Result: $1 \times 0 + 1 \times 0 + 1 \times 1 + 1 \times 0 + 1 \times 1 + 1 \times 0 + 1 \times 0 = 2$

NODE-BASED METRICS

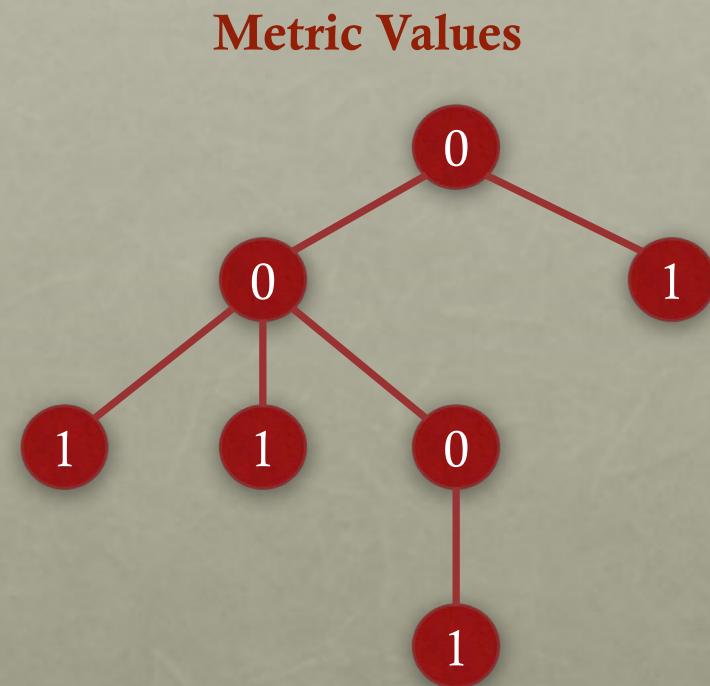
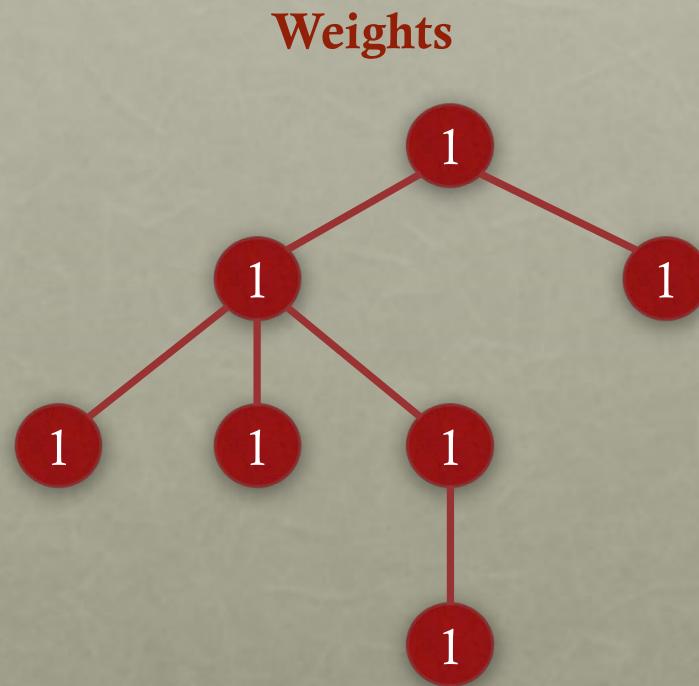
- Metric example: *Percentage of attributives*



- Result: $1/7 \times 0 + 1/7 \times 0 + 1/7 \times 1 + 1/7 \times 0 + 1/7 \times 1 + 1/7 \times 0 + 1/7 \times 0 = 2/7$

NODE-BASED METRICS

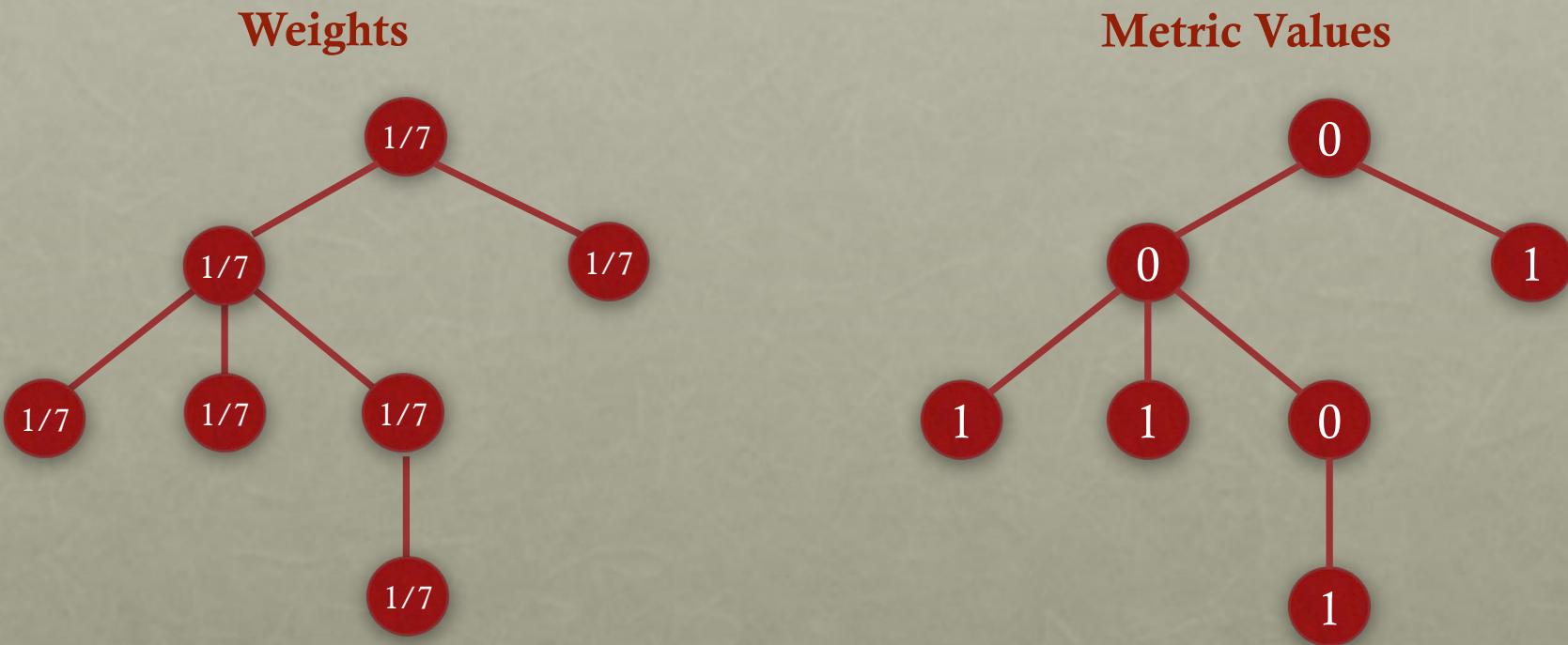
- Metric example: *Number of leaves*



- Result: $1 \times 0 + 1 \times 1 + 1 \times 1 + 1 \times 0 + 1 \times 1 + 1 \times 1 + 1 \times 0 = 4$

NODE-BASED METRICS

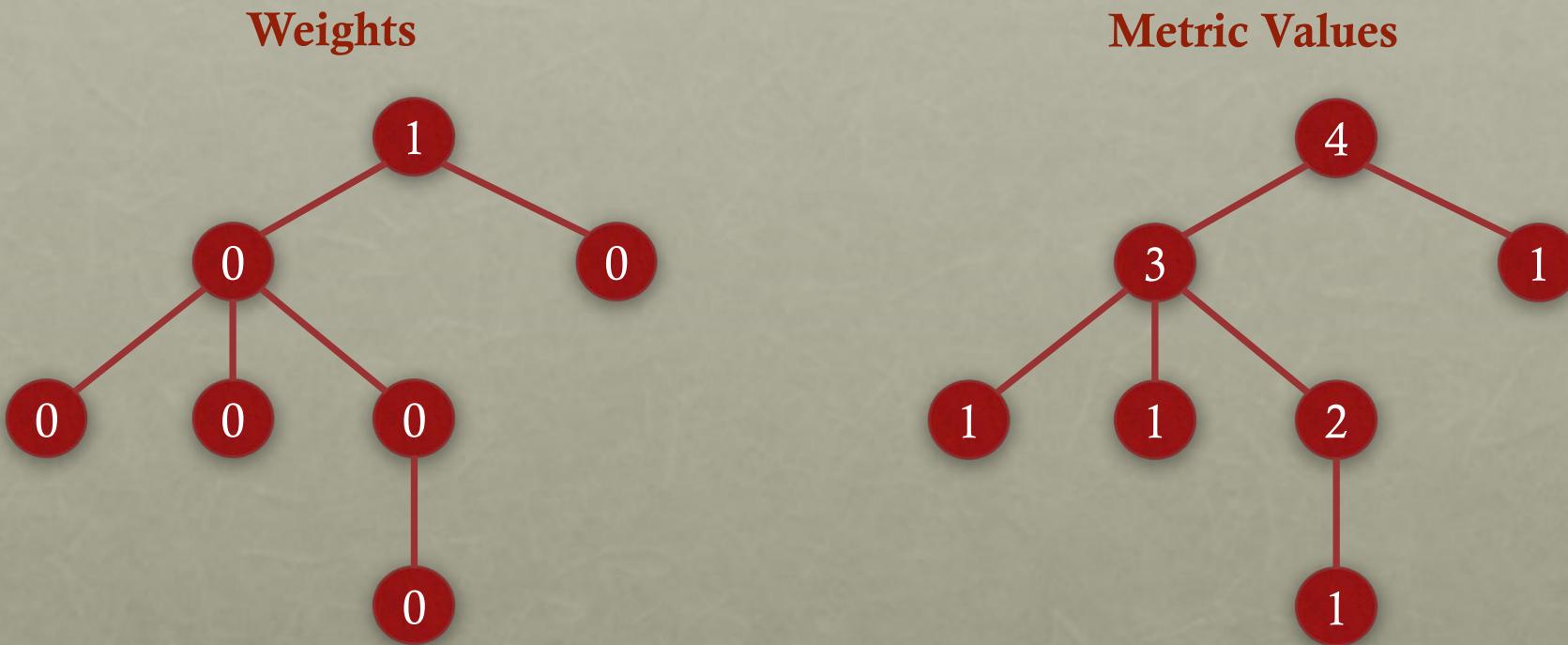
- Metric example: *Percentage of leaves*



- Result: $1/7 \times 0 + 1/7 \times 1 + 1/7 \times 1 + 1/7 \times 0 + 1/7 \times 1 + 1/7 \times 1 + 1/7 \times 0 = 4/7$

RECURSIVE NODE-BASED METRICS

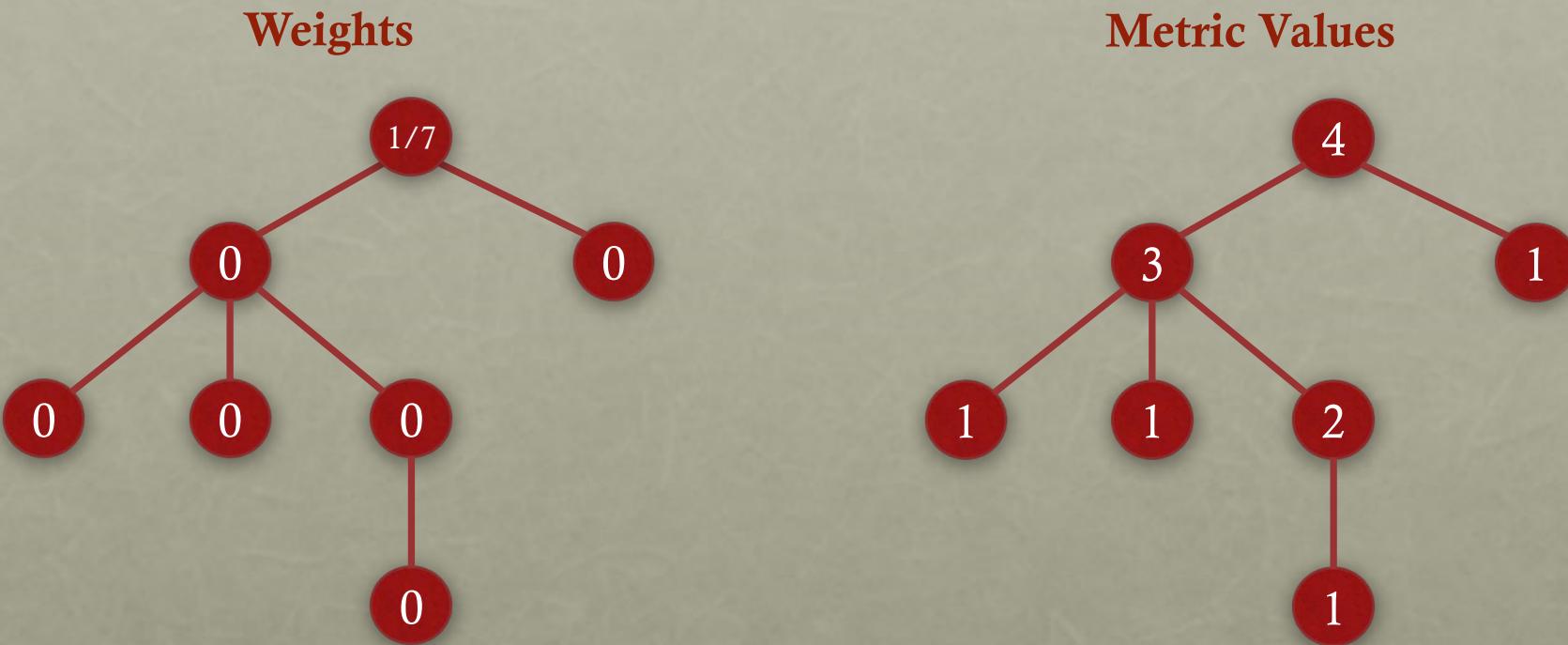
- Metric example: *Height of the tree*



- Result: $1 \times 4 + 0 \times 3 + 0 \times 1 + 0 \times 1 + 0 \times 1 + 0 \times 2 + 0 \times 1 = 4$

RECURSIVE NODE-BASED METRICS

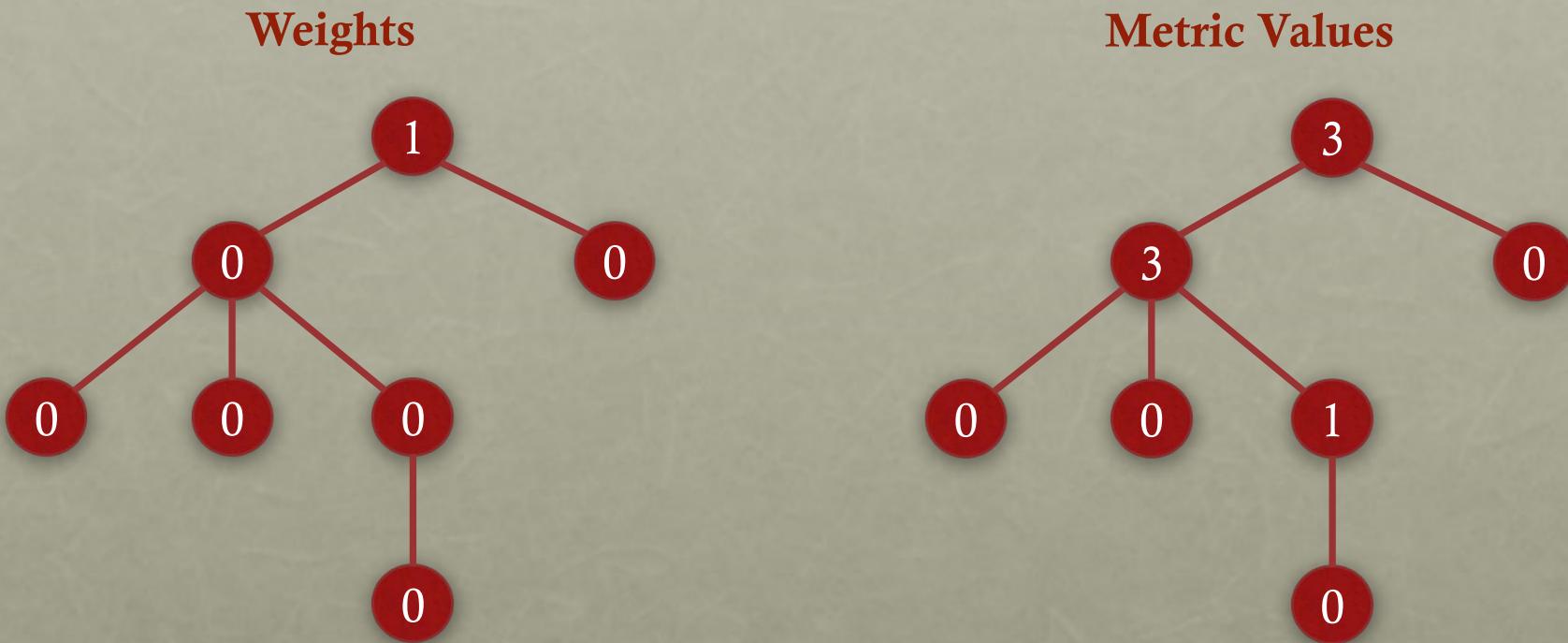
- Metric example: *Height of the tree as percentage of the words*



- Result: $1/7 \times 4 + 0 \times 3 + 0 \times 1 + 0 \times 1 + 0 \times 1 + 0 \times 2 + 0 \times 1 = 4/7$

RECURSIVE NODE-BASED METRICS

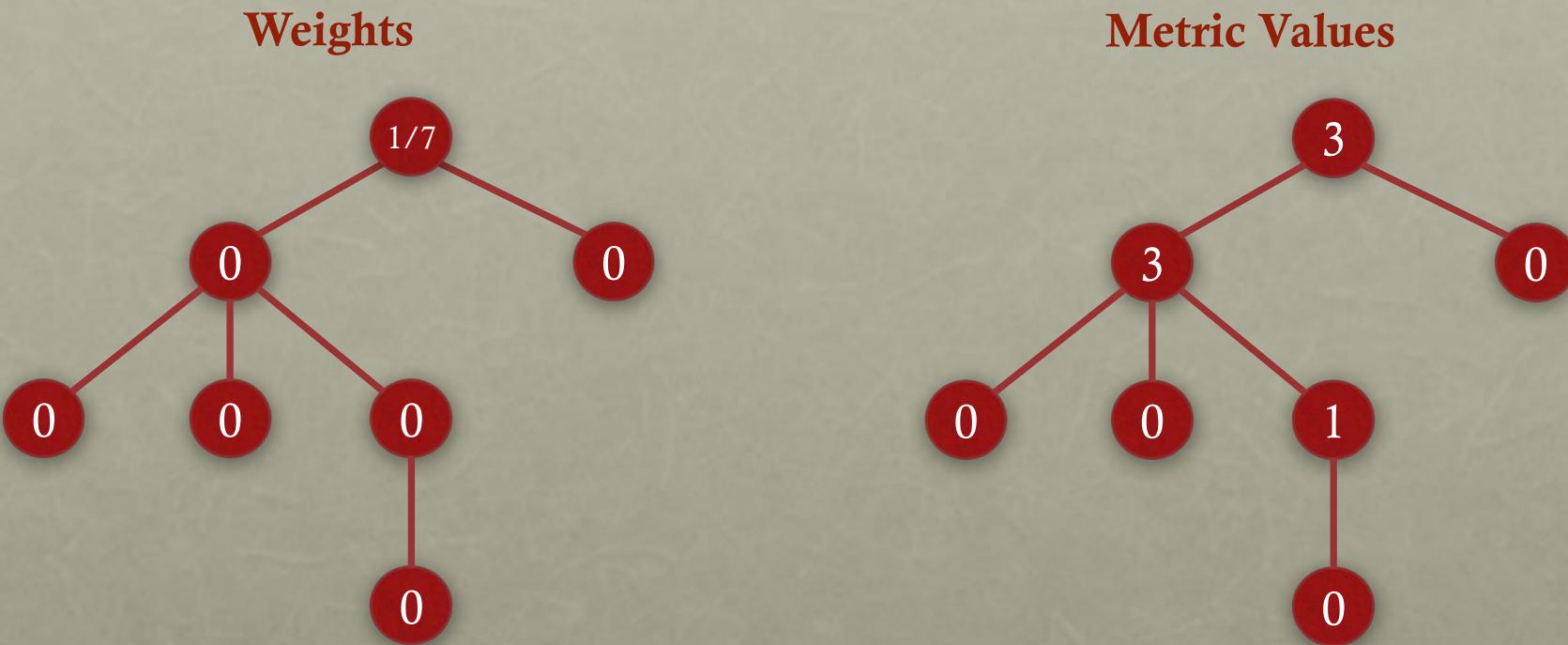
- Metric example: *Size of largest family*



- Result: $1 \times 3 + 0 \times 3 + 0 \times 0 + 0 \times 0 + 0 \times 0 + 0 \times 1 + 0 \times 0 = 3$

RECURSIVE NODE-BASED METRICS

- Metric example: *Size of largest family as percentage of the words*



- Result: $1/7 \times 3 + 0 \times 3 + 0 \times 0 + 0 \times 0 + 0 \times 0 + 0 \times 1 + 0 \times 0 = 3/7$

JAVASCRIPT

```
m=new NodeMetric('Percentage of Verb Attributives');

m.weight=function(n)
{
    return 1/n.getRoot().getNumOfWords();
};

m.metric=function(n)
{
    if(n.getRelation()=='ATR' && n.getPosTag()[0]=='v')
        return 1;
    else return 0;
};
```

METRICS

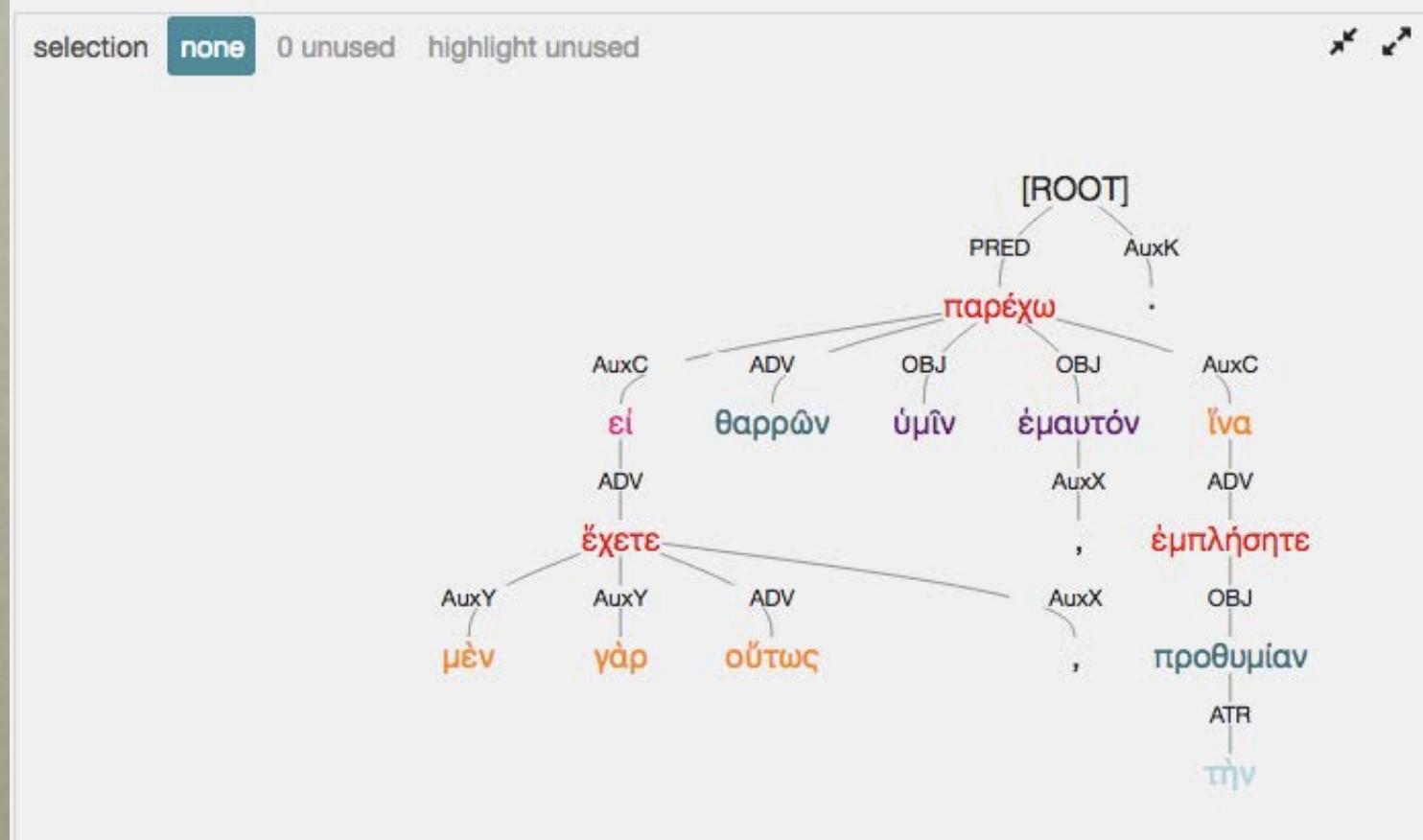
- Height of the tree as percentage of the nodes
- Width of the tree as percentage of the nodes
- Number of leaves as percentage of the nodes
- Number of attributives as percentage of the nodes
- Largest family size as percentage of the nodes
- Verb Attributives as percentage of the nodes
- Percentage of δέ coordinates
- Number of nodes under ATR as percentage of the nodes
- Adjective Attributives as percentage of the nodes

DATA

0.4000	0.3700	0.2000	0.1300	0.2700	0	0.0300	0	0.4000
0.7500	0.2500	0.7500	0.7500	0.2500	0	0	0	0.2500
0.5000	0.3300	0.2800	0.2200	0.0600	0	0	0.1100	0.0600
0.4400	0.1600	0.2400	0.0800	0.1800	0	0.0800	0.0400	0.3500
0.4700	0.2700	0.3300	0.2700	0.0700	0	0	0	0.0700
0.3500	0.3200	0.1800	0.0900	0.1800	0.0300	0.0300	0.0900	0.3400
0.5600	0.4400	0.3300	0.3300	0.1100	0	0	0	0.1100
0.4700	0.2400	0.3100	0.1100	0.3800	0.0500	0.0500	0.1300	0.6500
0.4700	0.1600	0.2400	0.1600	0.2100	0	0	0.0300	0.2100
0.5000	0.1500	0.2500	0.1000	0.1900	0.0600	0.0400	0.0200	0.3300
0.5000	0.4100	0.2700	0.1400	0	0	0	0.0500	0
0.5800	0.2500	0.4200	0.3300	0.2500	0	0	0	0.2500
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0.4600	0.3800	0.3100	0.3100	0.3800	0	0	0	0.6200
0.5000	0.2500	0.2500	0.1400	0.2500	0.0400	0	0.0400	0.3900
0.4400	0.3300	0.4400	0.3300	0.2200	0	0.1100	0	0.3300
0.5000	0.2100	0.3600	0.2900	0.2900	0	0	0	0.4300
0.5800	0.2500	0.4200	0.4200	0.1700	0	0	0	0.1700
0.6000	0.4000	0.6000	0.6000	0	0	0	0.2000	0
0.4400	0.2200	0.2600	0.1500	0.1100	0	0.0400	0	0.1500
0.5800	0.4200	0.4200	0.4200	0	0	0	0.0800	0
0.5500	0.1900	0.2600	0.2600	0.2900	0.0300	0.0600	0.0300	0.6100
0.4800	0.2300	0.1900	0.1900	0.1900	0	0	0	0.1900
0.5300	0.1600	0.3400	0.1600	0.1600	0	0.0300	0.0500	0.1600
0.5000	0.1500	0.1800	0.0600	0.1300	0.0100	0	0.0200	0.2900
0.4800	0.2000	0.4400	0.2000	0.0400	0	0	0.0400	0.0400
0.5500	0.3600	0.4500	0.4500	0.2700	0.0900	0.0900	0	0.2700
0.5500	0.3600	0.3600	0.3600	0.1800	0	0.0900	0	0.1800
0.4300	0.3300	0.2400	0.1400	0.2900	0.1000	0	0	0.6700
0.4900	0.2300	0.1300	0.0900	0.1600	0	0.0100	0	0.1800
0.4200	0.2300	0.1600	0.0800	0.2500	0.0300	0.0200	0.0500	0.6100
0.4300	0.2000	0.2500	0.1200	0.2200	0	0.0200	0.0400	0.3100
0.3500	0.3000	0.2600	0.1300	0.2600	0.0500	0	0	0.3600
0.4400	0.3300	0.4400	0.4400	0.4400	0.2500	0	0	0.7500
0.5300	0.1800	0.2600	0.1100	0.2100	0.0300	0.0300	0	0.2400
0.5700	0.3600	0.3600	0.3600	0.1400	0	0.0700	0	0.1400
0.4400	0.2800	0.3600	0.1200	0.2400	0.0400	0	0.0400	0.3300
0.4700	0.1400	0.2300	0.0600	0.1100	0.0100	0.0500	0.0100	0.3500
0.4700	0.3000	0.1700	0.1700	0.1300	0.0300	0.0300	0	0.5000
0.5300	0.2100	0.4200	0.3200	0.1100	0	0	0.0500	0.1100
0.5500	0.2300	0.2000	0.1100	0.1400	0.0200	0.0200	0.0200	0.5900
0.3600	0.4500	0.2700	0.2700	0.3600	0.1000	0.1000	0	0.6000
0.5000	0.2500	0.2900	0.1400	0.0400	0	0	0.0700	0.0400

EXAMPLE 1

εἰ μὲν γὰρ οὕτως ἔχετε, θαρρῶν ὑμῖν παρέχω ἐμαυτόν, ἵνα ἐμπλήσητε τὴν προθυμίαν.



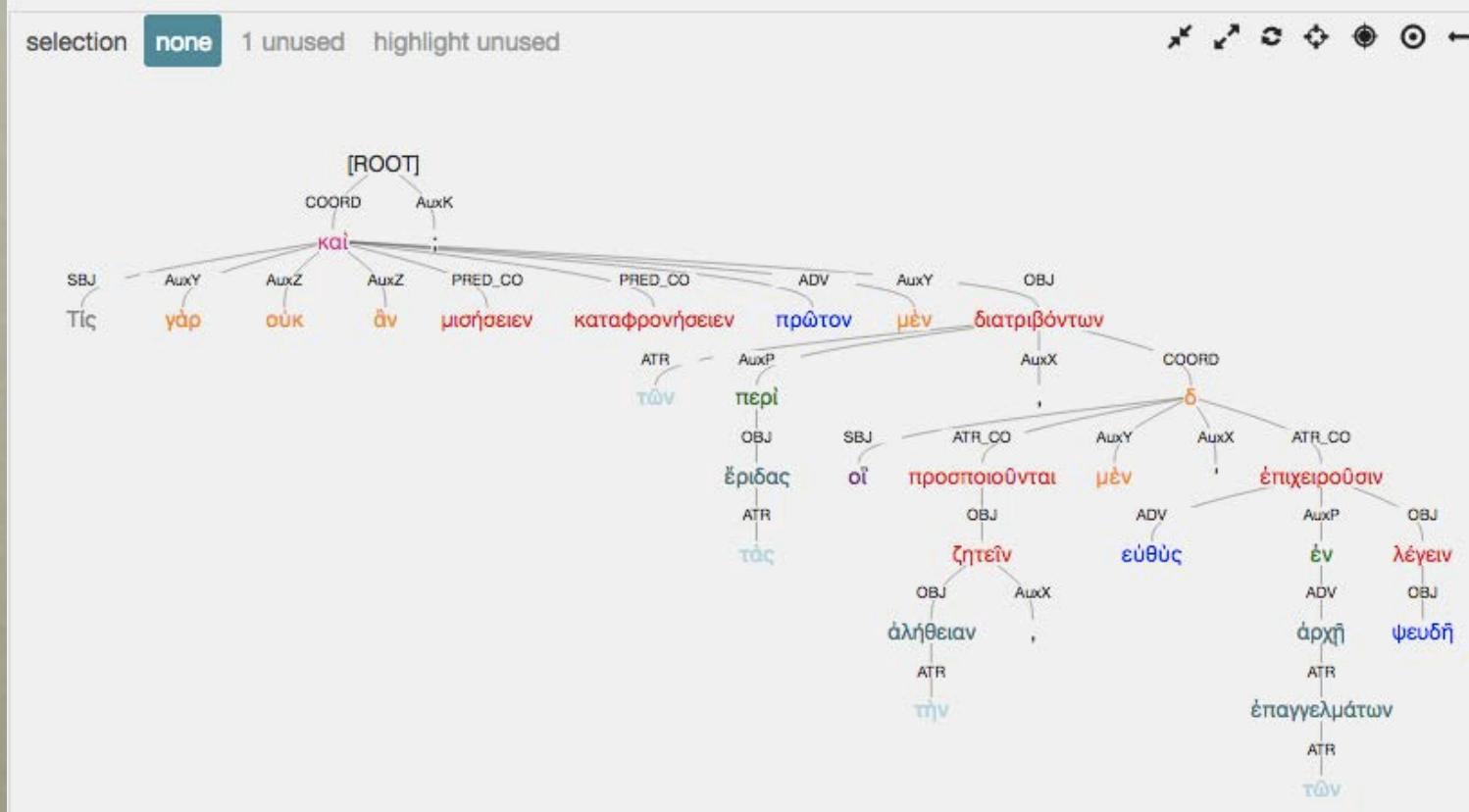
Number of words:

Number of Attributives:

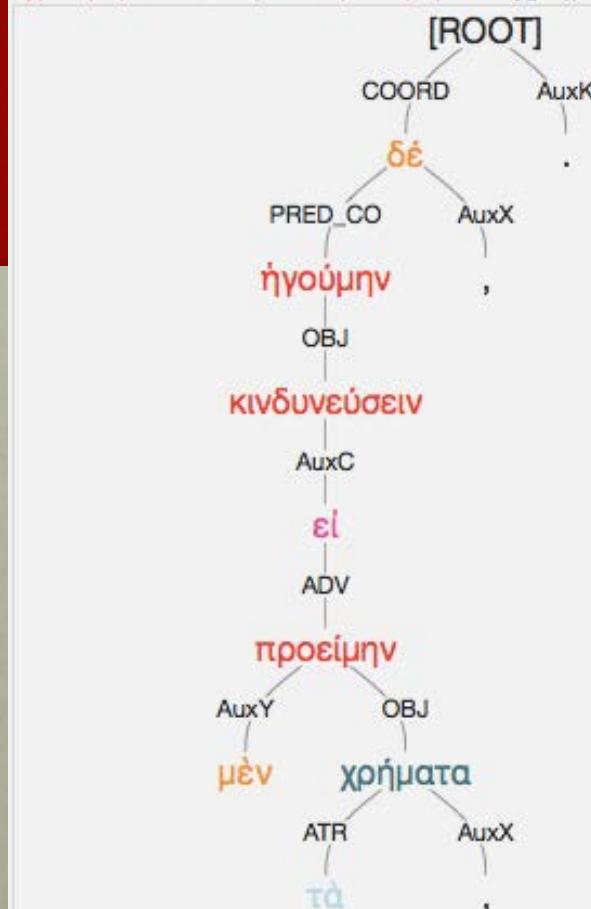
$$1x0+1x0+1x0+1x0+1x0+1x0+1x0+1x0+1x0+1x0+1x0+1x0+1x0+1x0+1x1=1$$

EXAMPLE 2: NUMBER OF LEAVES

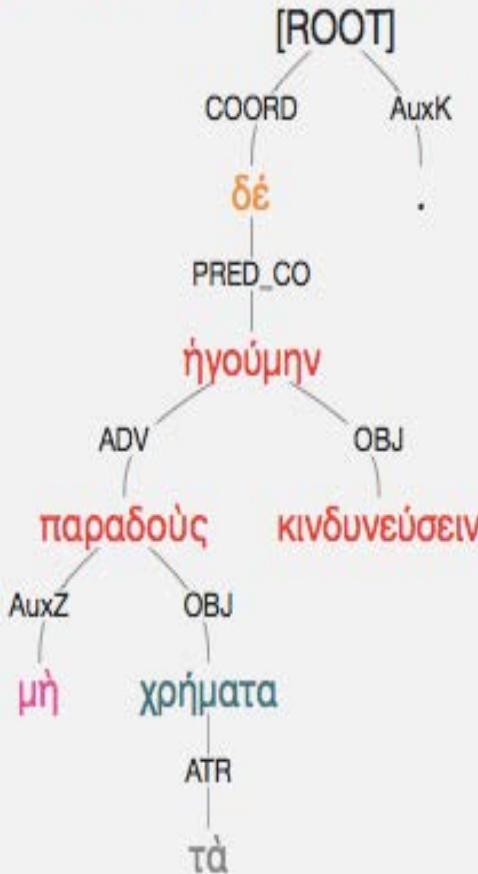
Τίς γάρ οὐκ ἂν μισήσειν ἄμα καὶ καταφρονήσειν πρῶτον μὲν τῶν περὶ τὰς ἔριδας διατριβόντων, οἵ προσποιοῦνται μὲν τὴν ἀλήθειαν ζητεῖν, εύθυνς δέ ἐν ἀρχῇ τῶν ἐπαγγελμάτων ψευδῆ λέγειν ἐπιχειροῦσιν;



ἡγούμην δέ , εἰ μὲν προείμην τὰ χρήματα , κινδυνεύσειν

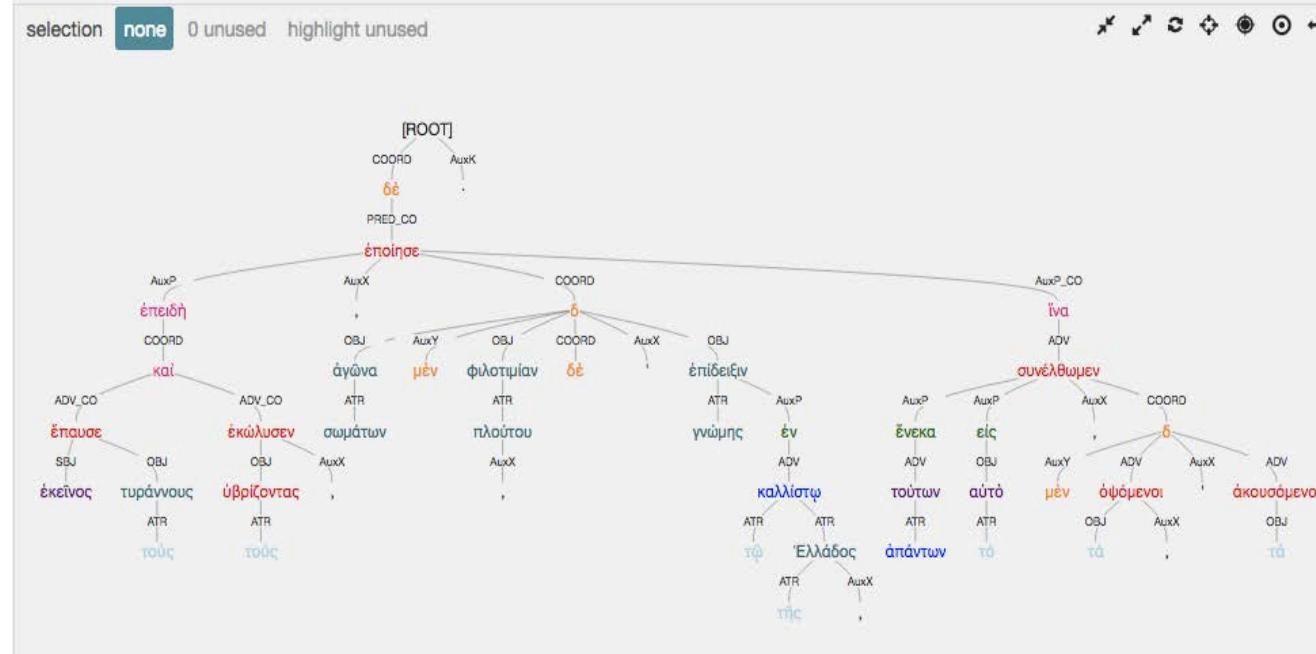


ἡγούμην δέ μὴ παραδούς τὰ χρήματα κινδυνεύσειν



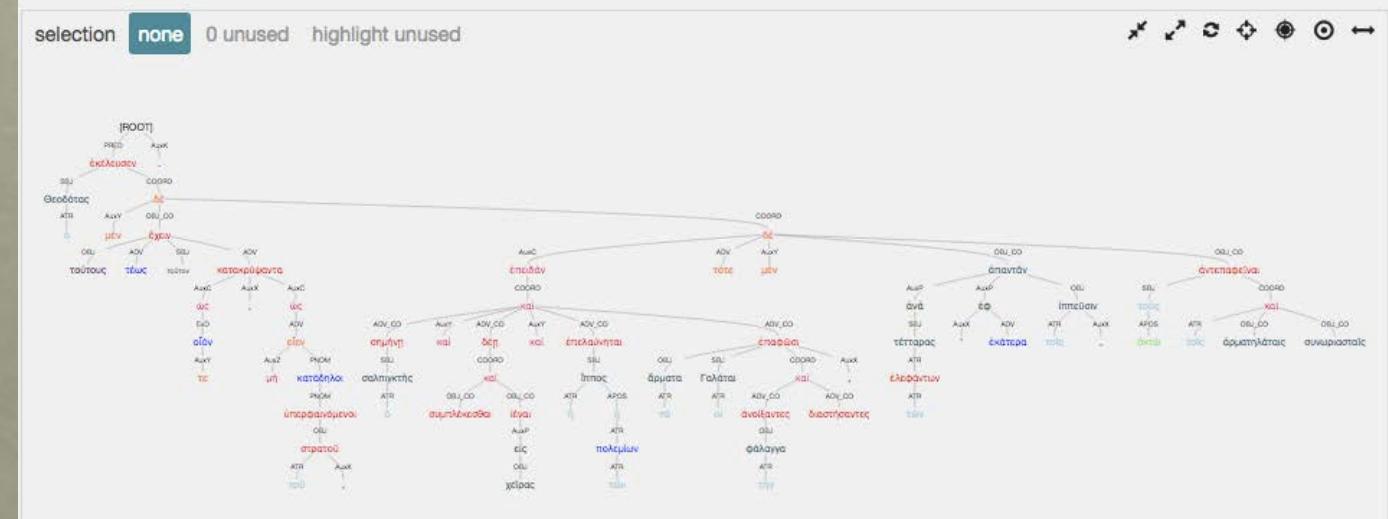
If we run the recursive metric to calculate the height of the tree, then the result is that setting $w_{root}=1$ for the root and $w_{i \neq root}=0$ for the rest of the nodes in the sentence, the Isocratean sentence produces the number 7, while the one by Dionysius gives the number 5.

έπειδή δὲ έκεινος τούς τυράννους ἔπαισε καὶ τούς ύβριζοντας ἐκώλυσεν, ἀγῶνα μὲν σωμάτων ἐποίησε, φιλοτιμίαν δὲ πλούτου γνώμης δὲ ἐπίδειξιν ἐν τῷ καλλίστῳ τῆς Ἑλλάδος, ἵνα τούτων ἀπάντων ἐνεκα εἰς τὸ αὐτὸ συνέλθωμεν, τὰ μὲν ὄψόμενοι, τὰ δὲ ἀκούσομενοι.



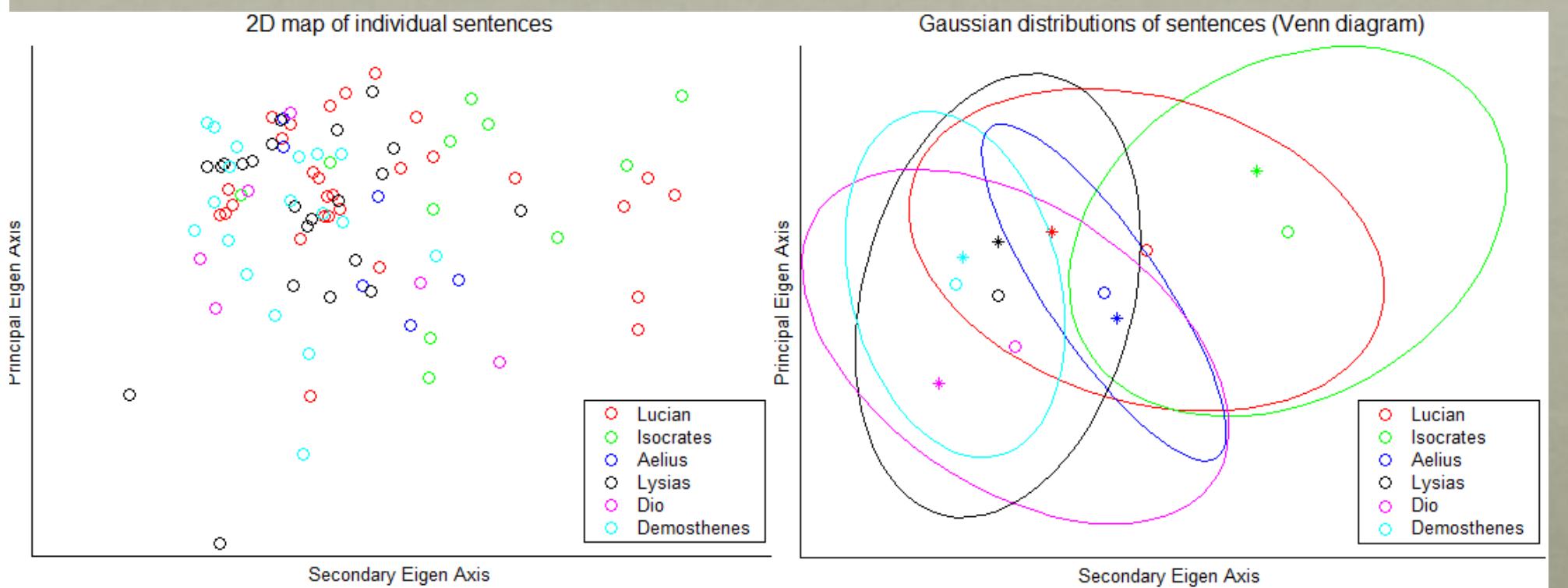
Lysias, Olympiacus

τούτους ἐκέλευσεν ὁ Θεοδότας τέως μὲν ἔχειν ὡς οἰόν τε τοῦτον κατακρύψαντα, ὡς μὴ κατάδηλοι είεν ύπερφαινόμενοι τοῦ στρατοῦ, ἐπειδάν δὲ σημήνῃ ὁ σαλπιγκτῆς καὶ δέη συμπλέκεσθαι καὶ εἰς χεῖρας λέναι καὶ ἡ Ἰππος ἡ τῶν πολεμίων ἐπελαύνηται καὶ τὰ ἄρματα οἱ Γαλάται ἀνοίξαντες τὴν φάλαγγα καὶ διαστήσαντες ἐπαφώσι, τότε ἀνὰ τέτταρας μὲν τῶν ἑλεφάντων ἀπαντᾶν ἐφ' ἐκάτερα τοῖς ἵππεύσιν, τοὺς ὅκτω δὲ ἀντεπαφεῖναι τοῖς ἄρματηλάταις καὶ συνωριασταῖς.

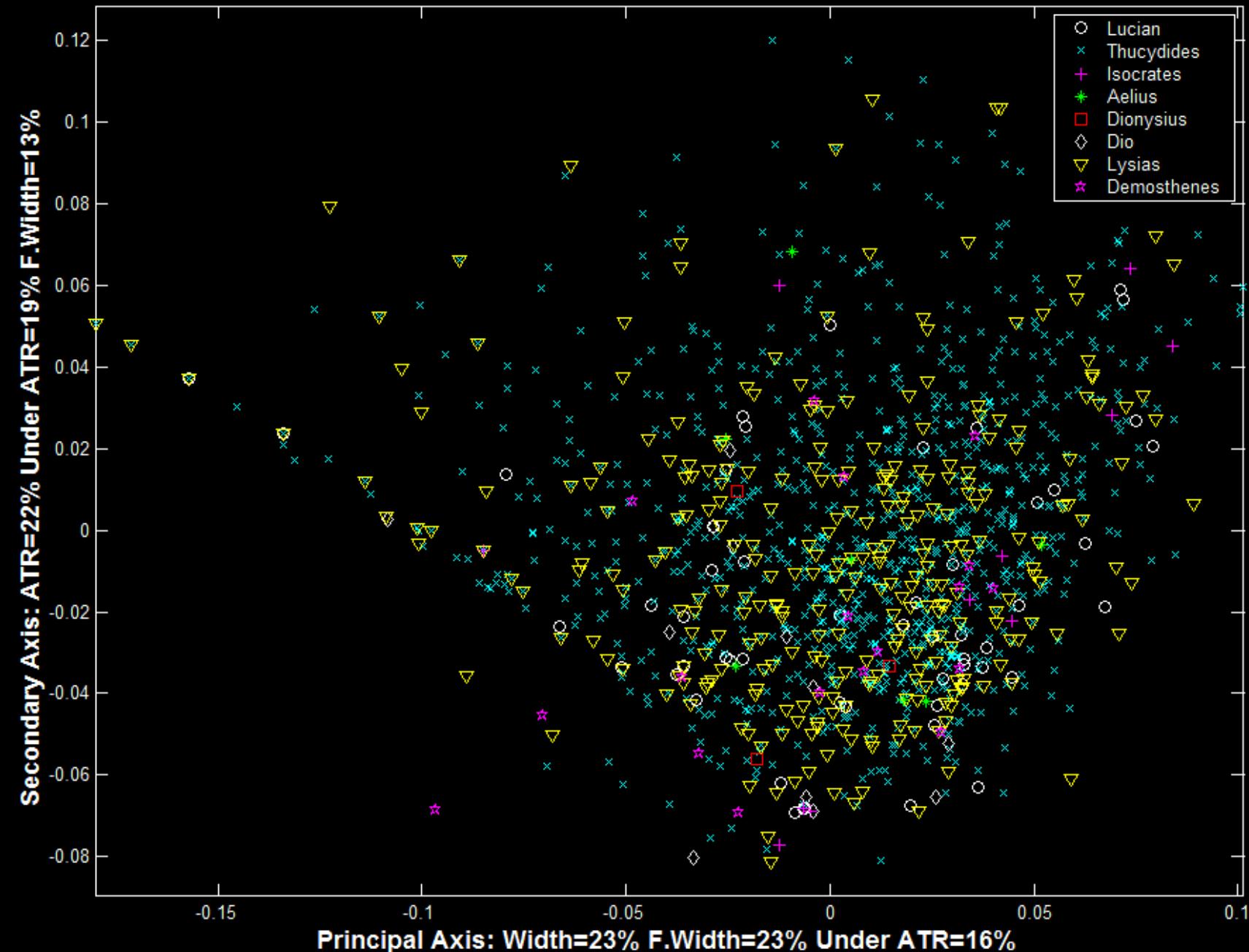


SENTENCE WIDTH

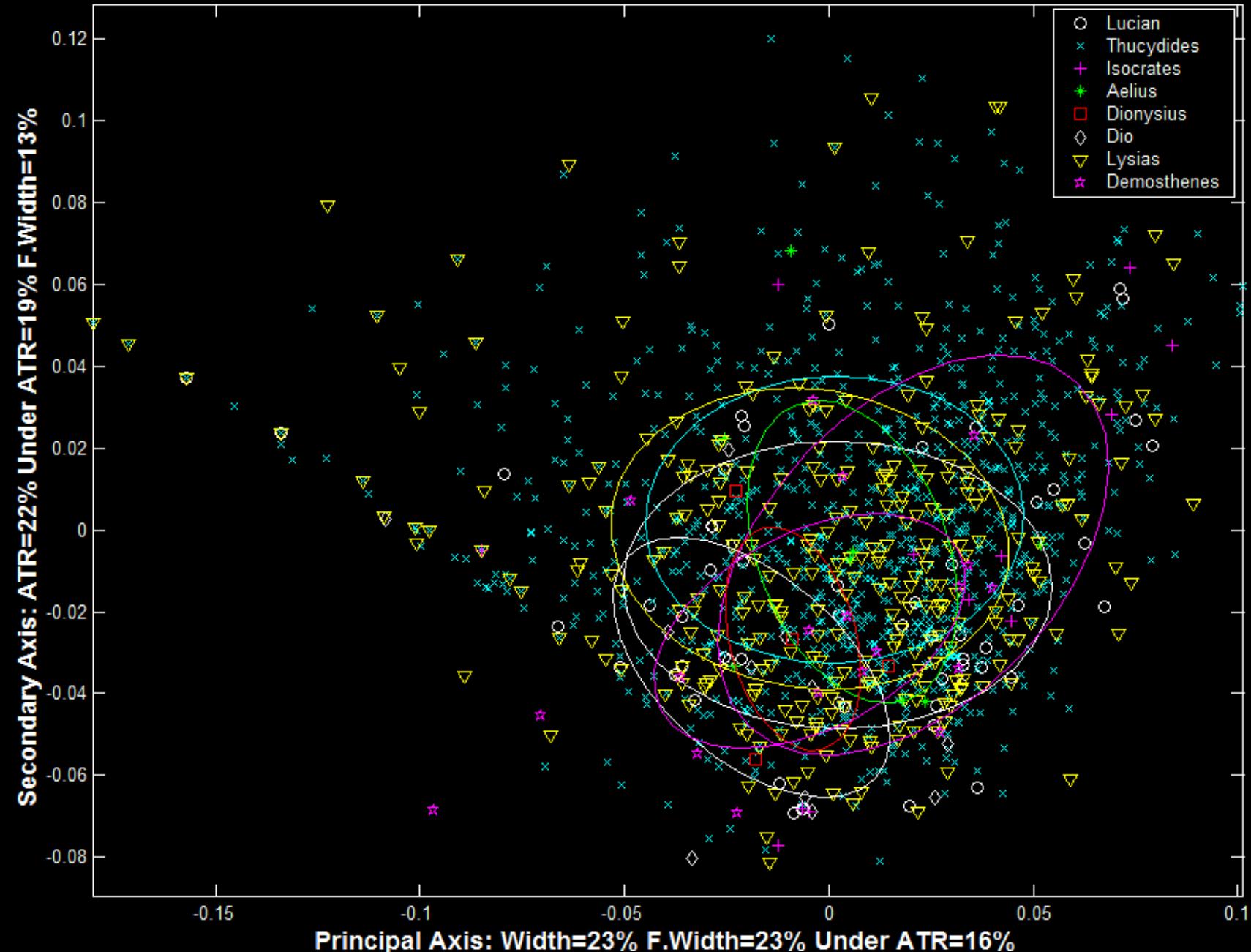
The width of Lysias's sentence is 10, while Lucian's sentence comes significantly ahead with the width being 17. Phrasing this in a stylistic context, this indicates that the latter's constructions are more complicated, with each node governing more dependents.



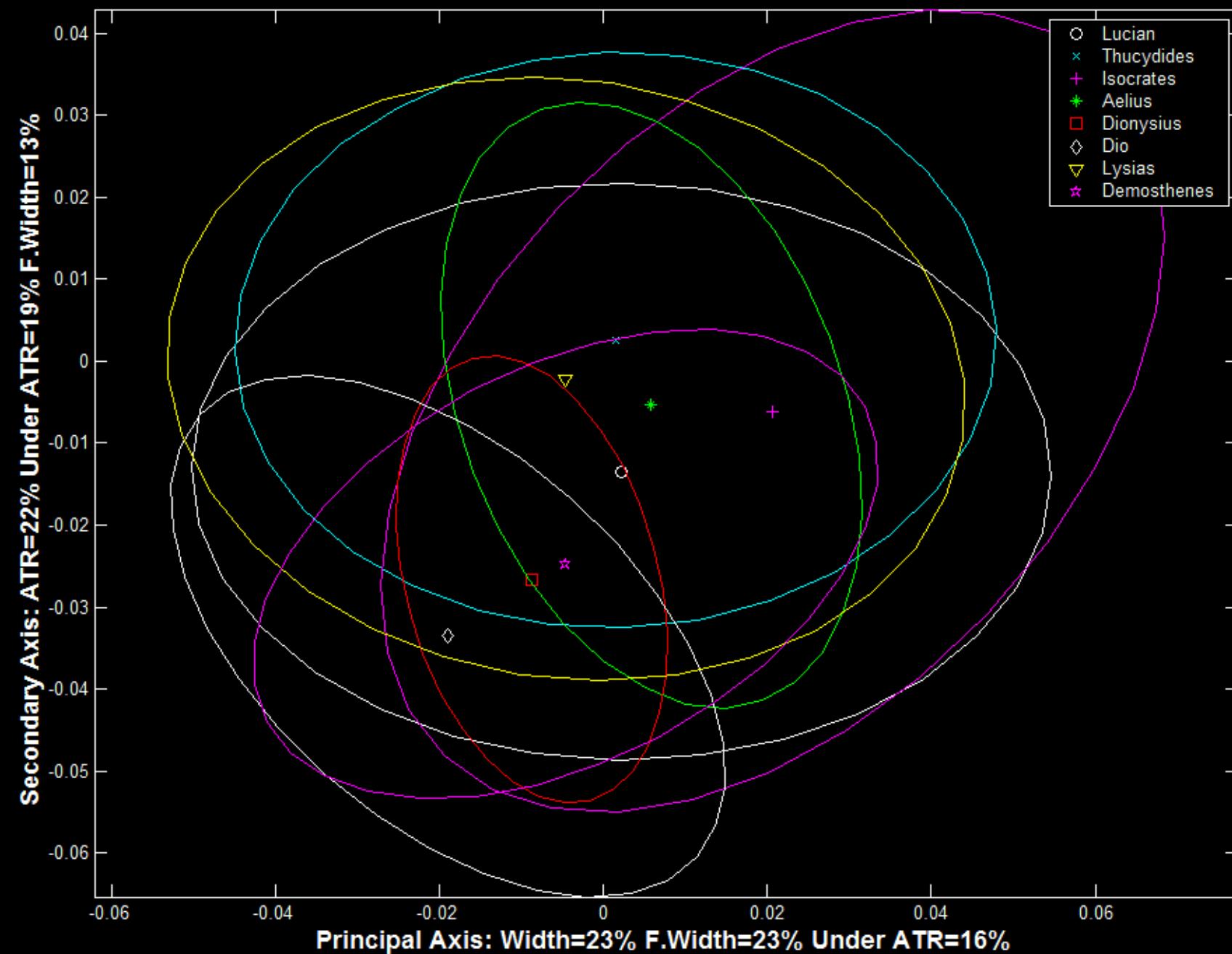
Dominant eigenplane

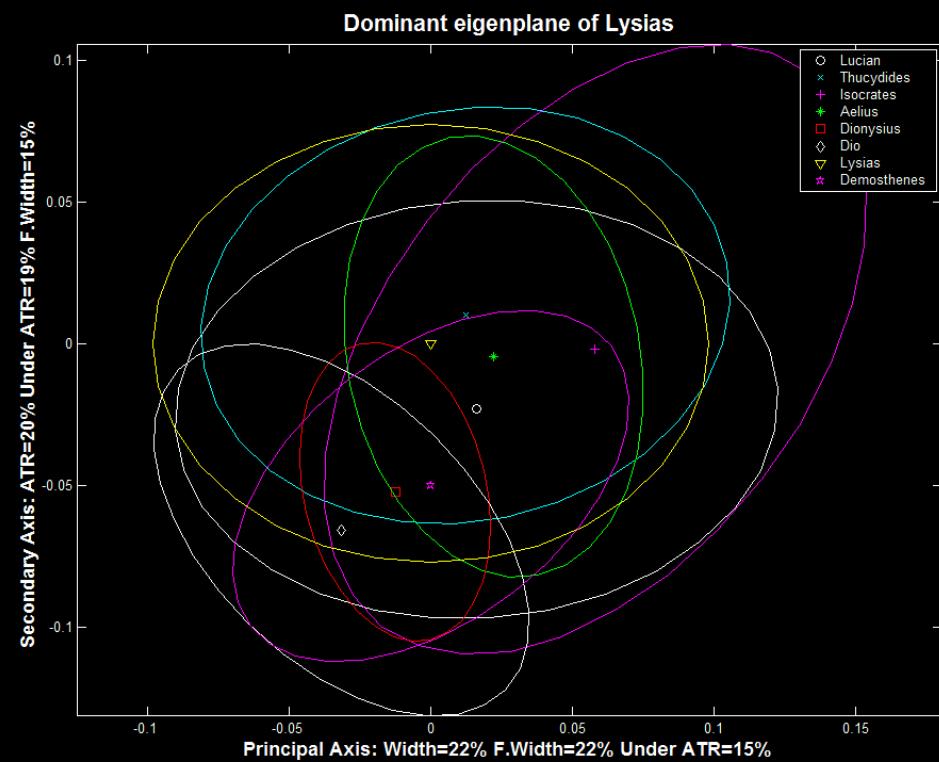
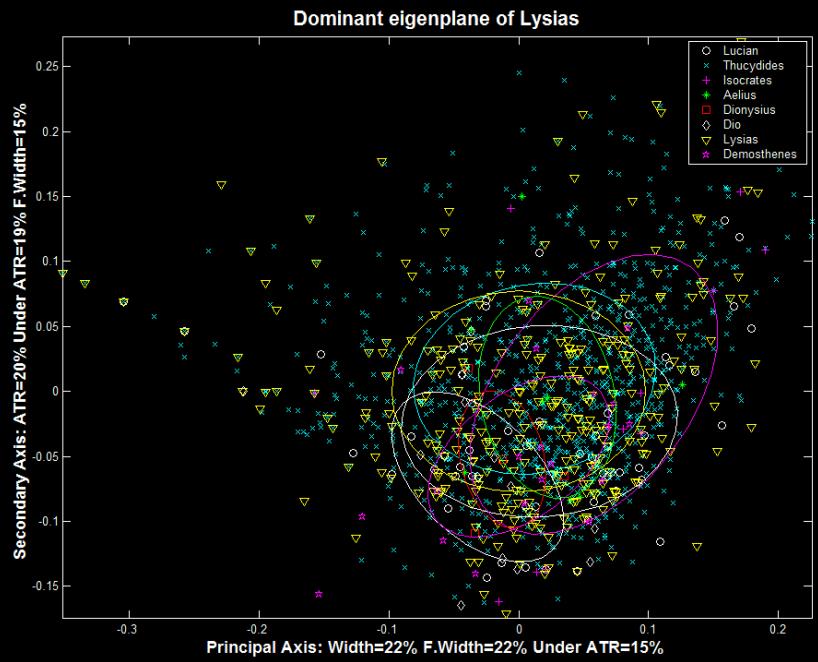
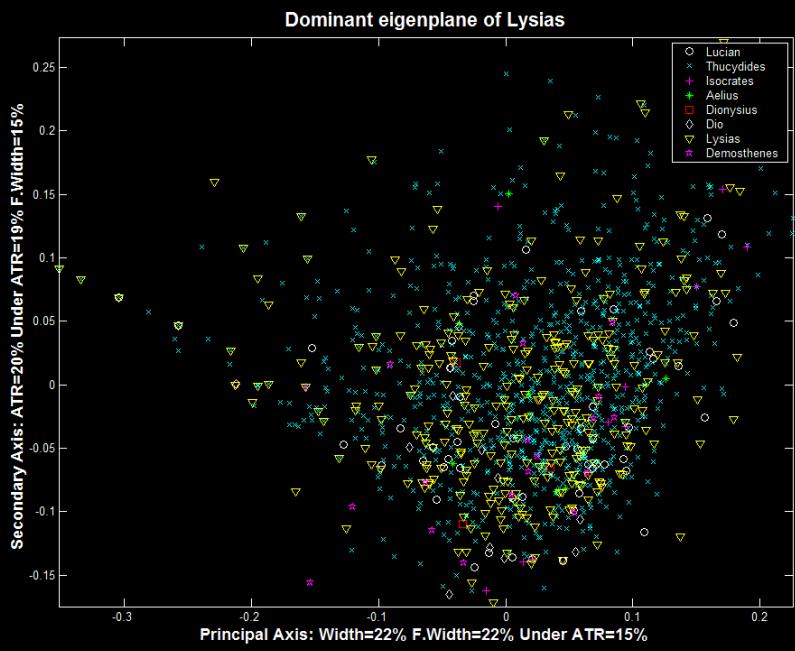


Dominant eigenplane

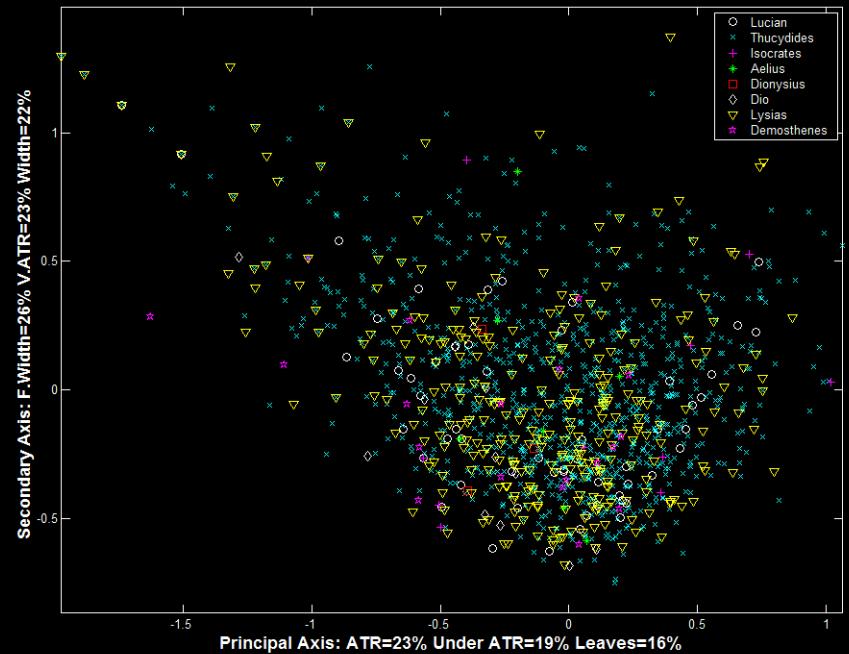


Dominant eigenplane

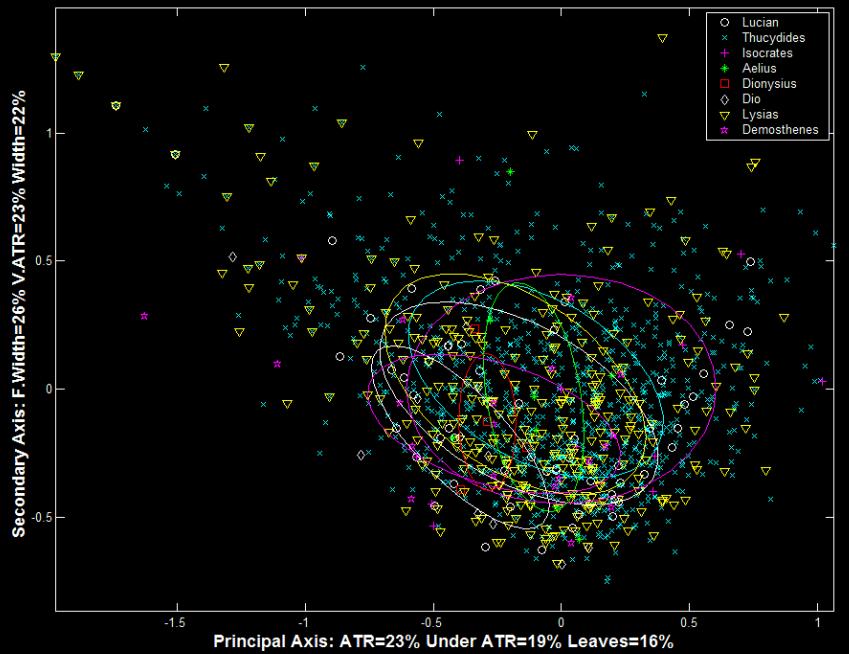




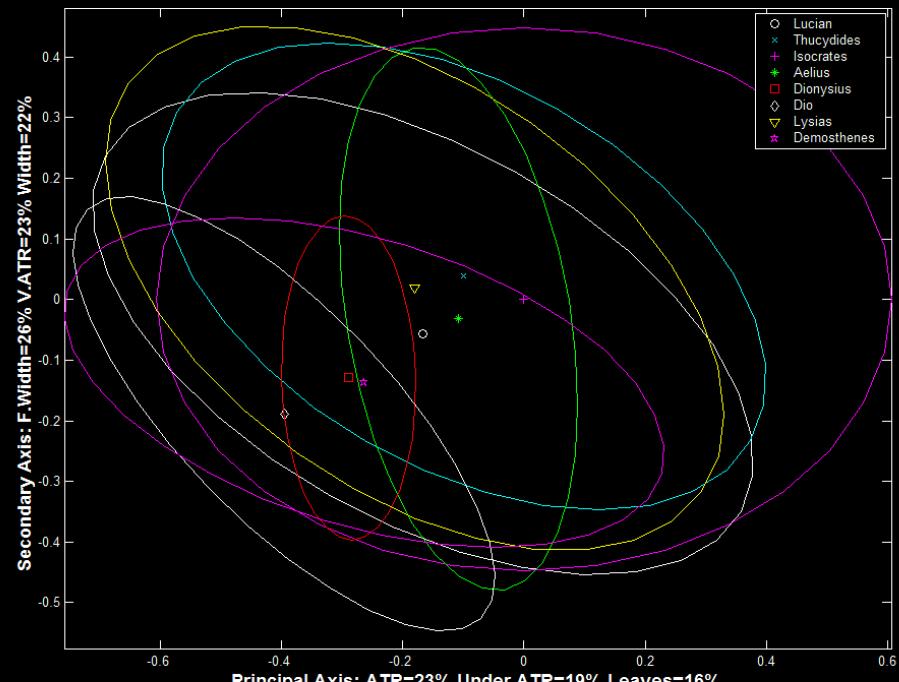
Dominant eigenplane of Isocrates

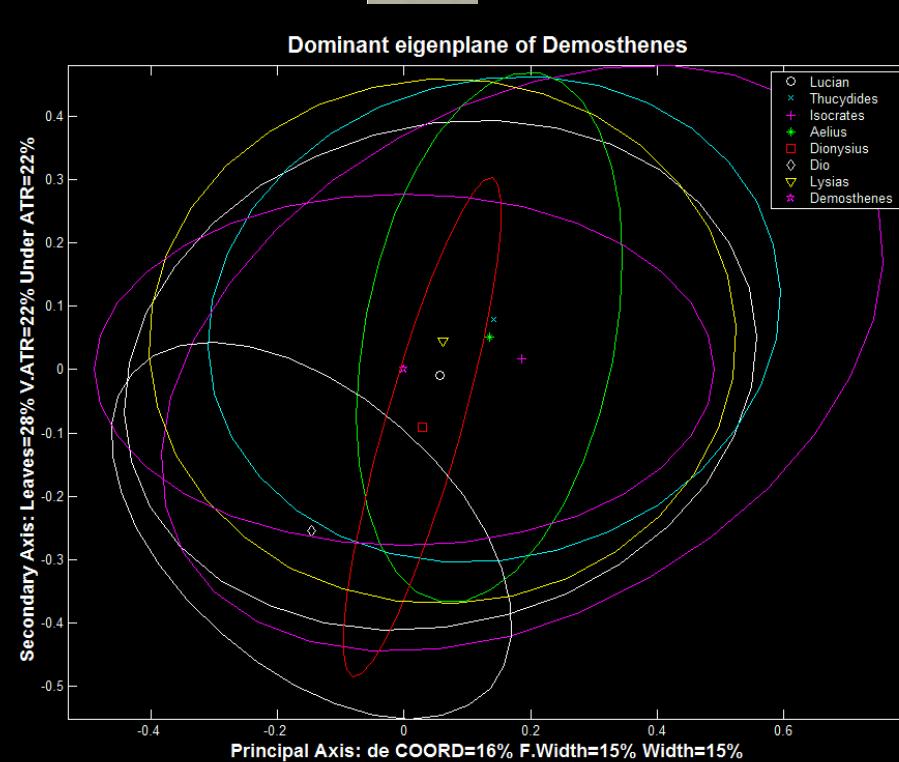
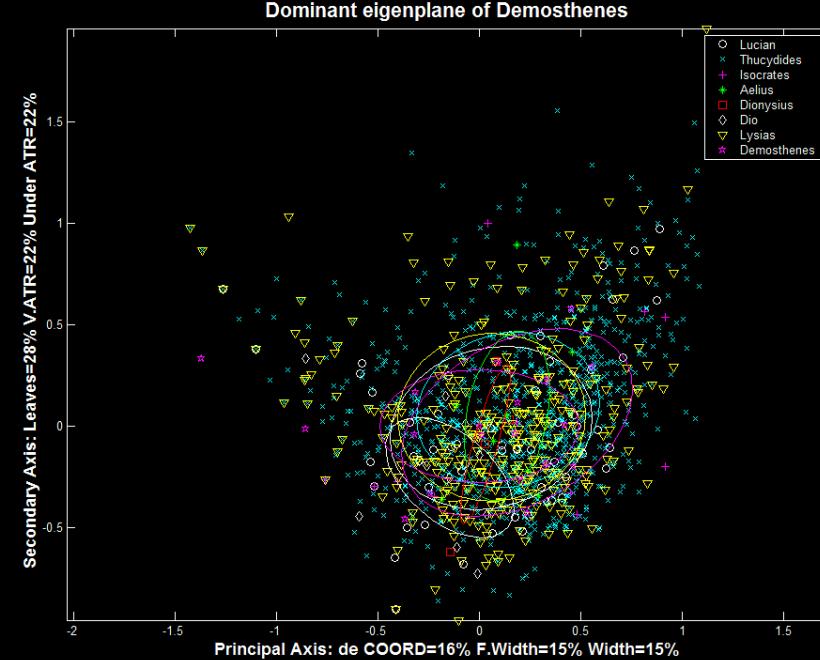
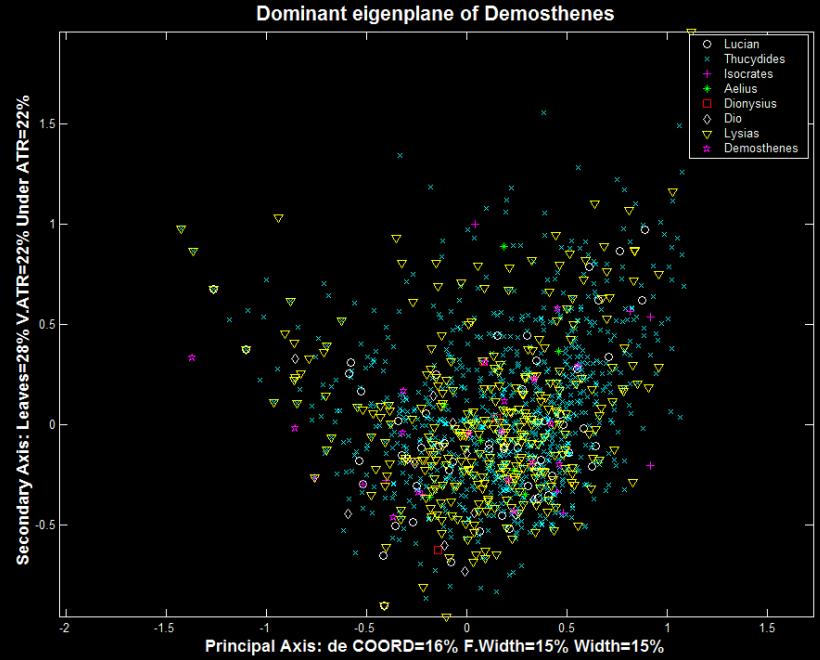


Dominant eigenplane of Isocrates

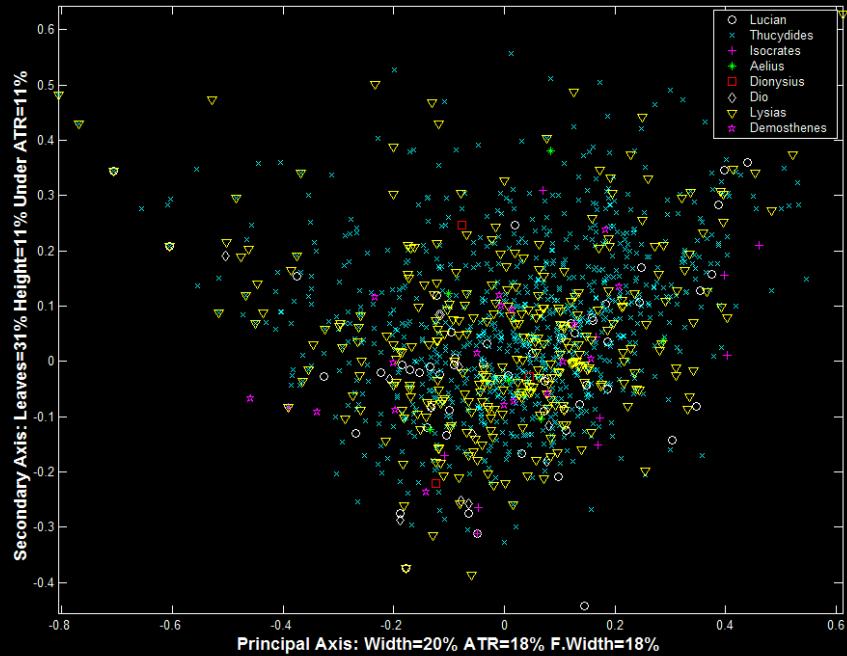


Dominant eigenplane of Isocrates

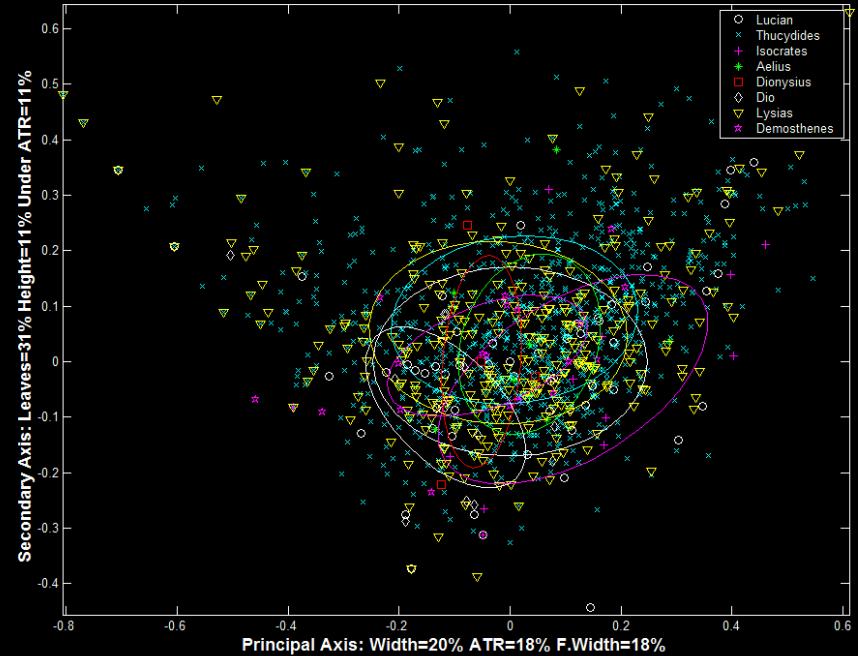




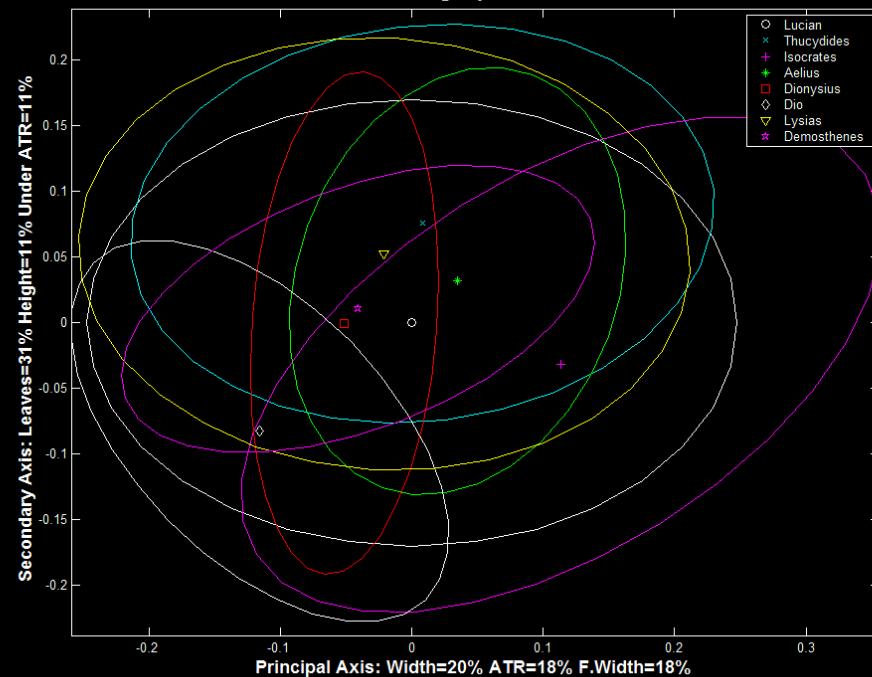
Dominant eigenplane of Lucian

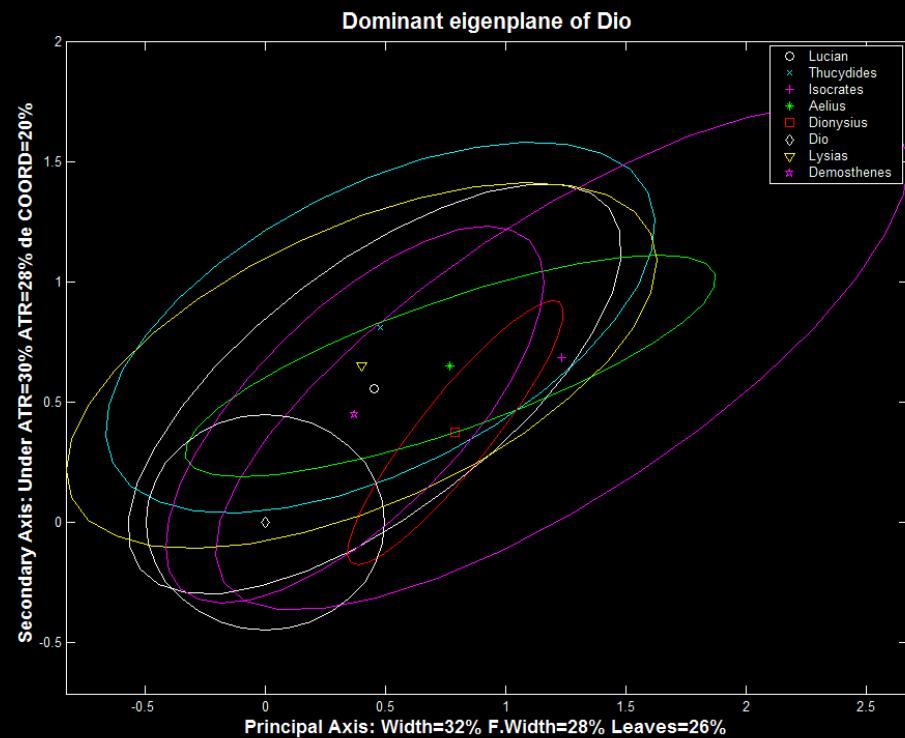
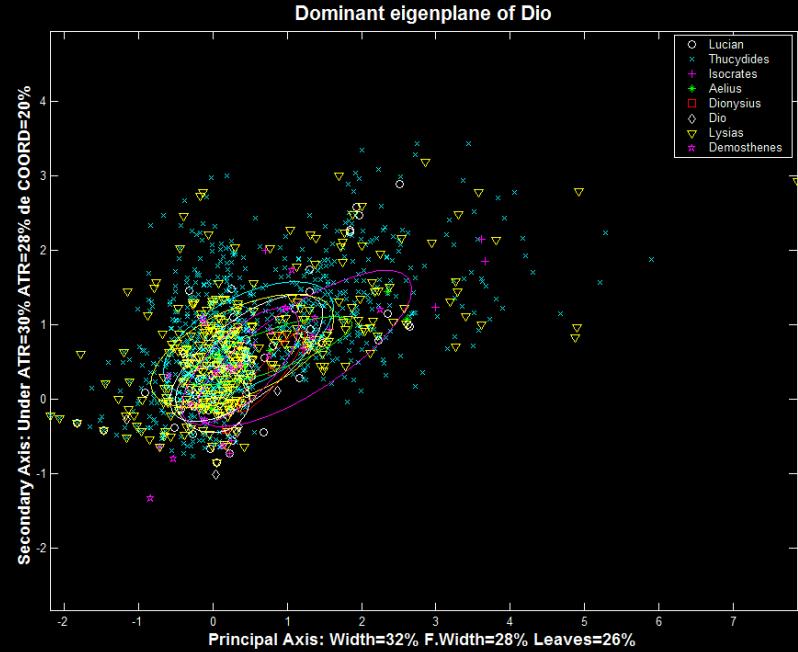
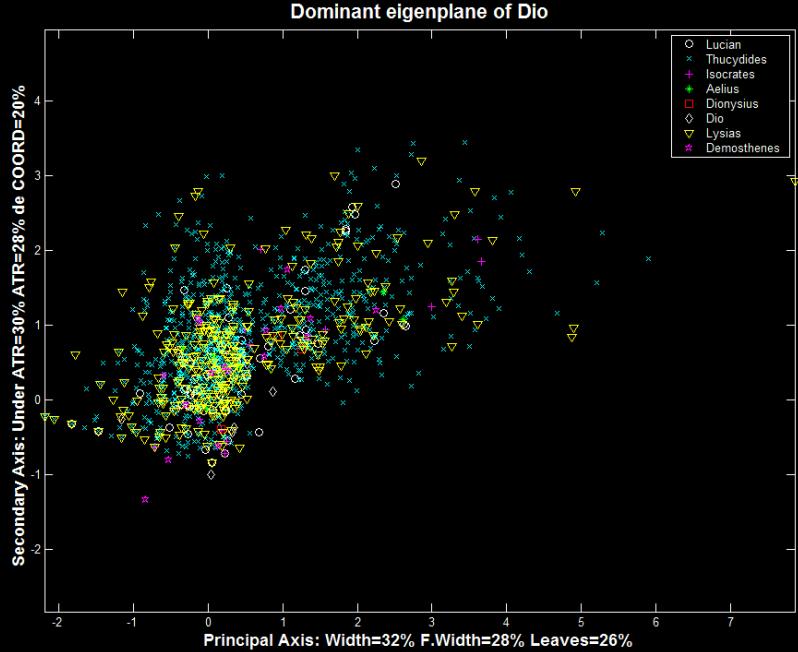


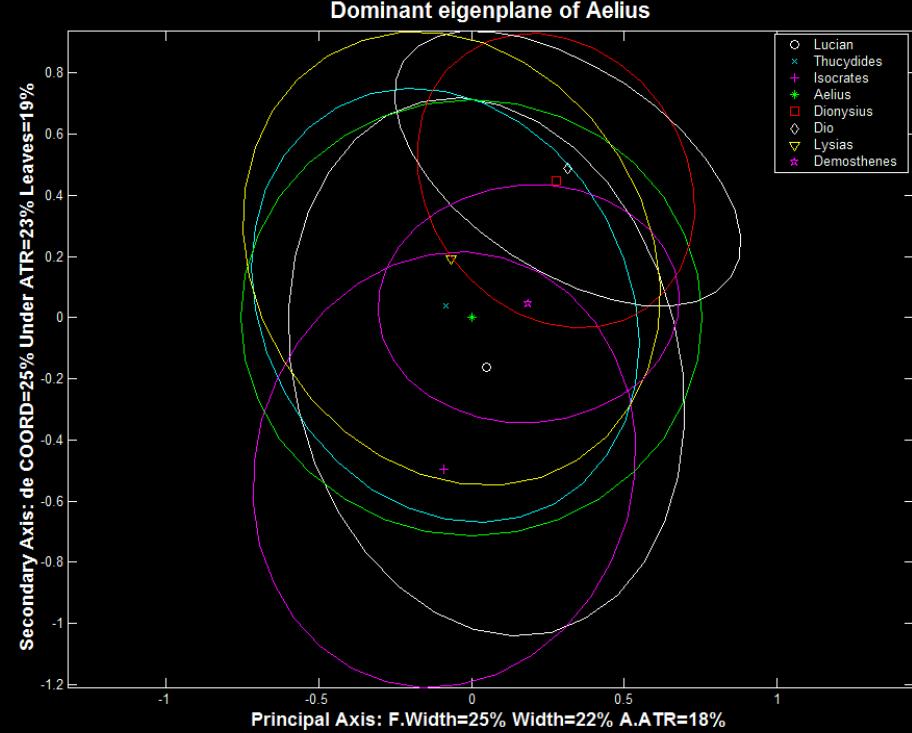
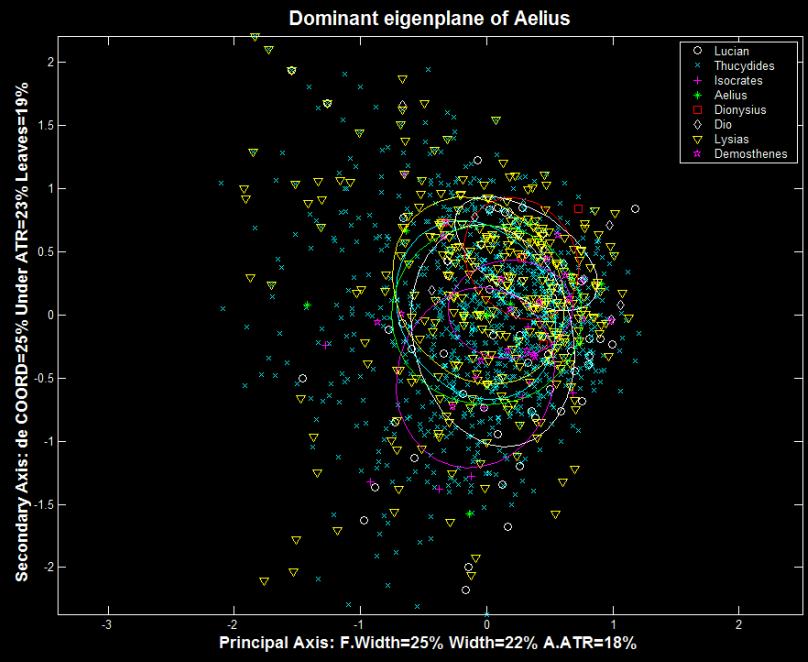
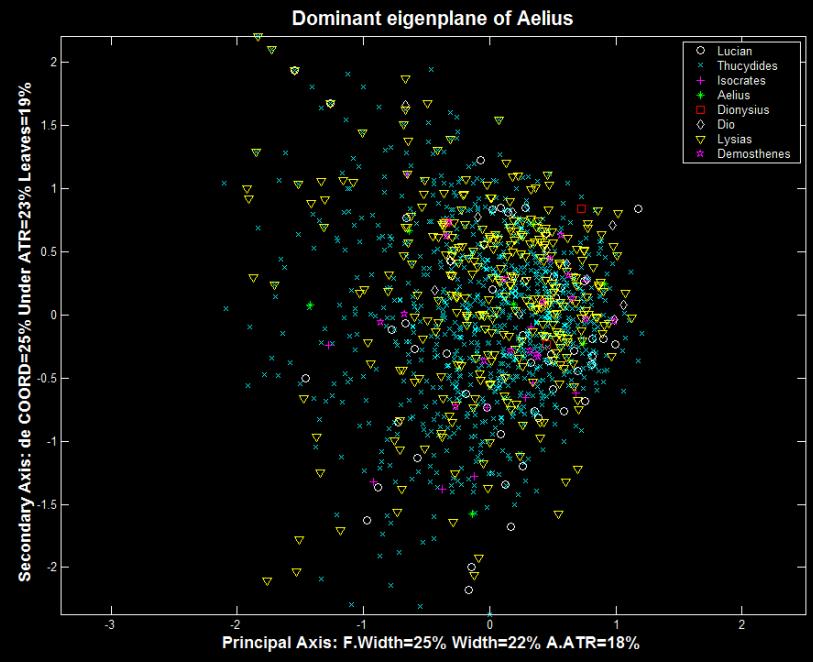
Dominant eigenplane of Lucian



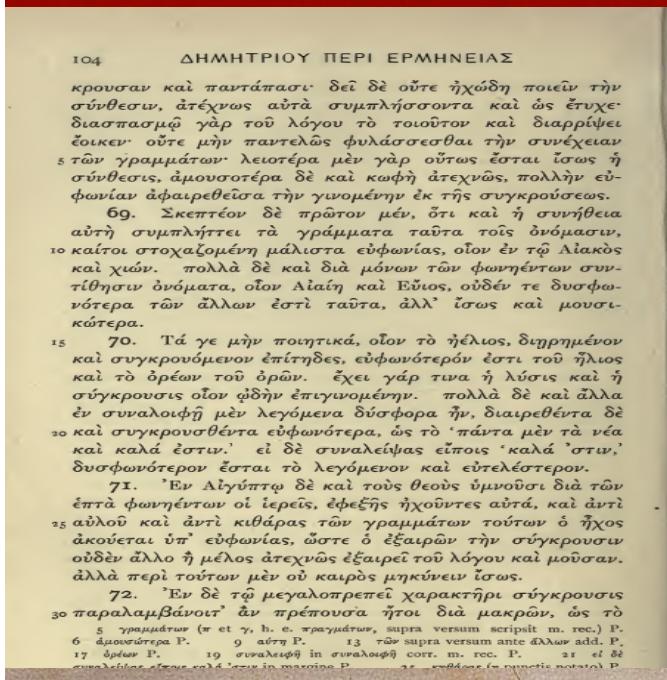
Dominant eigenplane of Lucian







THANK YOU



ΔΗΜΗΤΡΙΟΥ ΠΕΡΙ ΕΡΜΗΝΕΙΑΣ

κρουσαν καὶ παντάπαις δεῖ δὲ οὗτε ἡχώδη ποιεῖν τὴν σύνθεσιν, ἀτέχνως αὐτὰ συμπλήσσοντα καὶ ὡς ἐπιχειρίζεται πασμῷ γάρ τοῦ λόγου τὸ τοιοῦτον καὶ διαρρίψει ἔσκειν οὐτε μῆν παντελῶς φυλάσσεσθαι τὴν συνέχειαν τῶν γραμμάτων· λειτέρᾳ μὲν γάρ οὕτως ἔσται ἵστως ἡ σύνθεσις, ἀμονοστέρα δὲ καὶ κωφὴ ἀτέχνως, πολλὴν εὐφωνίαν ἀφαιρεθεῖσα τὴν γνωμένην ἐκ τῆς συγκρούσεως.

69. Σκεπτέον δὲ πρῶτον μέν, διτὶ καὶ ἡ συνήθεια αὐτὴν συμπλήγεται τὰ γράμματα ταῦτα τοῖς δύομάσιν, ιο καίτοι στοχαζομένη μάλιστα εὐφωνίας, οἷον ἐν τῷ Λακὸς καὶ χώρῃ. πολλὸ δὲ καὶ διὰ μόνον τῶν φωτηγένων συντίθησιν ὄντων, οἷον Αἰανή καὶ Εὔιος, οὐδέν τε δυσφωνίαν τόπον ἄλλων ἔσται ταῦτα, ἀλλ' ἵστως καὶ μονοτίθητα.

70. Τά γε μήν ποιητικά, οἷον τὸ ἡέλιος, διηγημένουν καὶ συγκρουόμενουν ἀπίτηδες, εὐφωνιότερον ἔστι τοῦ ἡέλιος καὶ τὸ ὅρεων τοῦ ὅρων. ἔχει γάρ τινα ἡ λύσις καὶ ἡ σύγκρουσις οἷον φῶλην ἐπιγωμένην. πολλὰ δὲ καὶ ἄλλα ἐν συναλογῇ μὲν λεγόμενα δύστοφα ἦσαν, διαιρεθέντα δὲ τοῦ καὶ συγκρουούσθεντα εὐφωνότερα, ὡς τὸ 'πάντα μὲν τὰ νέα καὶ καλά ἔστων' εἰ δέ συναλείφας εἴποις 'καλά ὅτινα,' δυσφωνότερον ἔσται τὸ λεγόμενον καὶ εὐτελέστερον.

71. 'Ἐν Αἰγύπτῳ δὲ καὶ τοὺς θεοὺς ὑμνοῦσι διὰ τῶν ἐπτὰ φωτηγένων οἱ ιερεῖς, ἐφεξῆς ἥχοντες αὐτά, καὶ ἀντὶ αὐλοῦν καὶ ἀντὶ κιθάρας τῶν γραμμάτων τούτων ὁ ἥχος ἀκούεται ὑπὲρ εὐφωνίας, ὡστε ὁ ἔξαιρων τὴν σύγκρουσιν οὐδὲν ἄλλο ἡ μέλος ἀτέχνων ἔξαιρει τοῦ λόγου καὶ μούσαν, ἄλλα περὶ τούτων μὲν οὐ καρδίς μηκύνει τὸν.

72. 'Ἐν δὲ τῷ μεγαλοπρεπεῖ χαρακτῆρι σύγκρουσις

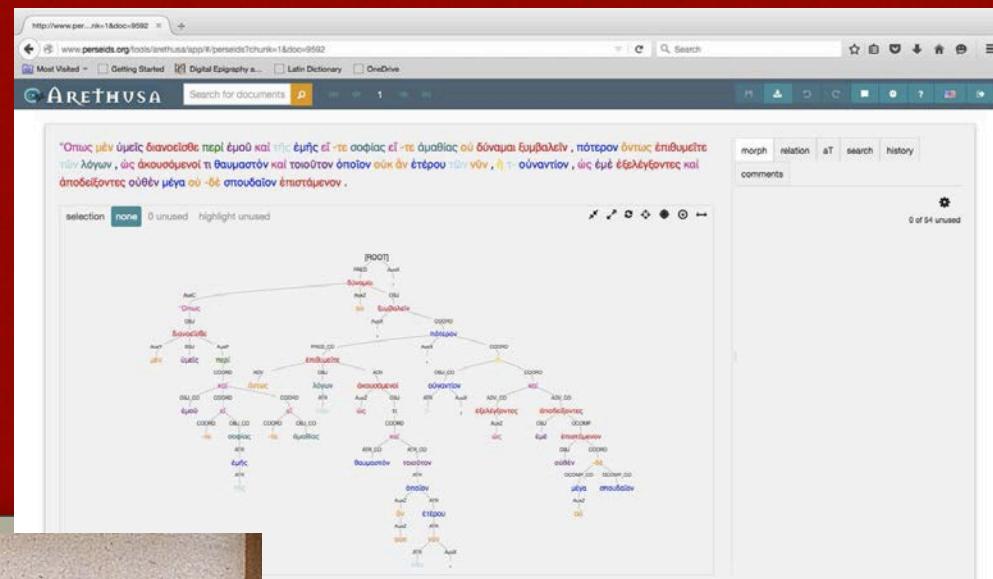
30 παραλαμβάνοιτο' ἀν πρέποντα οἵτοι διὰ μακρών, ὡς τὸ

5 γραμμάτων (περὶ γ. h. e. πρεγμάτων, supra versum scriptis m. rec.) P.

6 ἀμονοστέρα P. 9 αὐτῆς P. 13 τῶν supra versum ante ἄλλων add. P.

17 δρόμος P. 19 συναλείφη in συναλουσῇ corr. m. rec. P. 21 εἰ δὲ

συναλείφη τοῦτο εἰς τὸ μακρόν. P. 22 εἰδῆς in γραμμής ποιεῖται P.

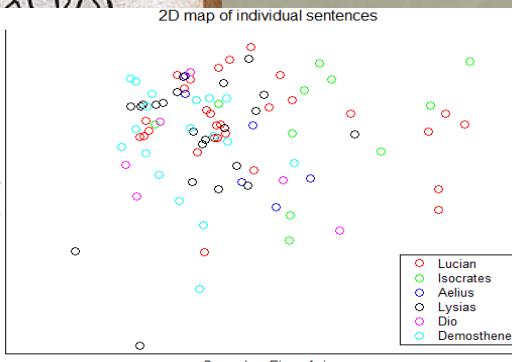


ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΕΡΜΗΝΕΙΑ

ΡΩΤΟΝ Δῆθε ματτόνο
εἴη ματτόπειτα τίθεν αὐτόν
τάφαστε, μὴ αὐτόφανστε, λα
μψόν ταῦτη φωνή, ταῦτη
παθημάτων, σύμβολα. λα
μενα ταῦτη φωνή, μὴ ως πρόσθιμον
ματτα πᾶσι ταῦτα. σύμβολα

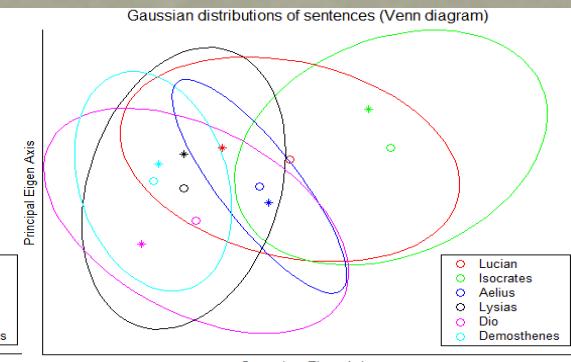


Principal Eigen Axis



2D map of individual sentences

Secondary Eigen Axis



Gaussian distributions of sentences (Venn diagram)

Principal Eigen Axis

Secondary Eigen Axis

- Lucian
- Isocrates
- Aelius
- Lysias
- Dio
- Demosthenes

METREEEX TREEBANK ANALYSIS

Timothy Russell-Wagner

Treebanks

Metrics

Console

Table

Chart

Scatter

PCA

Select All Unselect All Invert Selection

Treebank Id Load

- Aelius_Rome_197_17
- Dio_42_2a
- lysias_InPancleonom
- Isocrates_Pace_13
- Lucian_Zeuxisla

metreex analysis

Mon Mar 27 2017 15:24:44
---- Console started. Type 'help' for a list of commands. ----
Attempting to load tree with id m3pmakk93ylnkhxl
Attempting to load tree with id 9g50guweglwy5kqb
Attempting to load tree with id 5krwvewpr25f6jf4
Attempting to load tree with id ct1ggzdspofmmdch
Attempting to load tree with id muq9q5218gm30von
File id=muq9q5218gm30von loaded.
File id=m3pmakk93ylnkhxl loaded.
File id=5krwvewpr25f6jf4 loaded.
File id=9g50guweglwy5kqb loaded.
File id=ct1ggzdspofmmdch loaded.
>

Treebanks

Metrics

Treebanks

Metrics

Select AllUnselect AllInvert Selection

Select AllUnselect AllInvert Selection

Isocrates_Pace_1.3

Dio_42_2a

Aelius_Rome_197_17

Lucian_Zeuxis1a

lysias_In Pacleonem

Thucydides_Histories_1.118-1.146

Lysias_Eratosthenes1a

Aelius_Rome_197_18

Lucian_Zeuxis1c

Thucydides_Histories_1.89-1.117

Aelius_Rome_197_22

Dio 42

Aelius_Rome_197_16

Lucian_Zeuxis1h

Lysias_Olympiacus2

Dio_42_2c

Lucian_Zeuxis1b

Demosthenes_Philiplicia

Lysias_Olympiacus_3-5

Lysias_Olympiacus_6-9

ApplyExport Data As TSV

Number of nodes

Percentage of Leaves

Percentage of Height

Percentage of Width

Percentage of Max Family Width

Percentage of ATR

Percentage of Verb Attributives

Percentage of Adjectival Attributives

Percentage of de Coordinates

Percentage of Nodes under ATR

Percentage of Leaves W-1,0

Percentage of ATR W-1,0

Percentage of Verb Attributives W-1,0

Percentage of Adjectival Attributives W-1,0

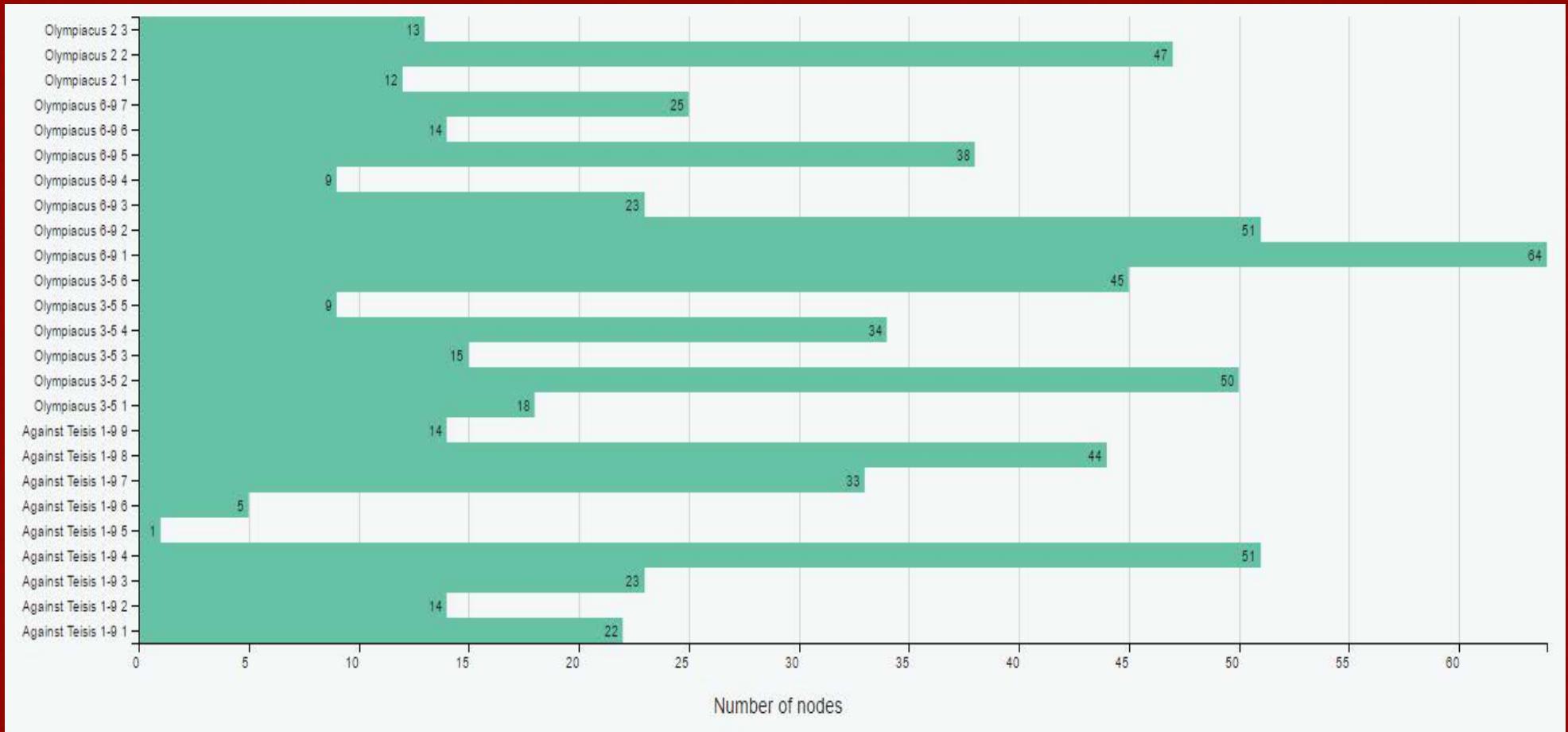
Percentage of de Coordinates W-1,0

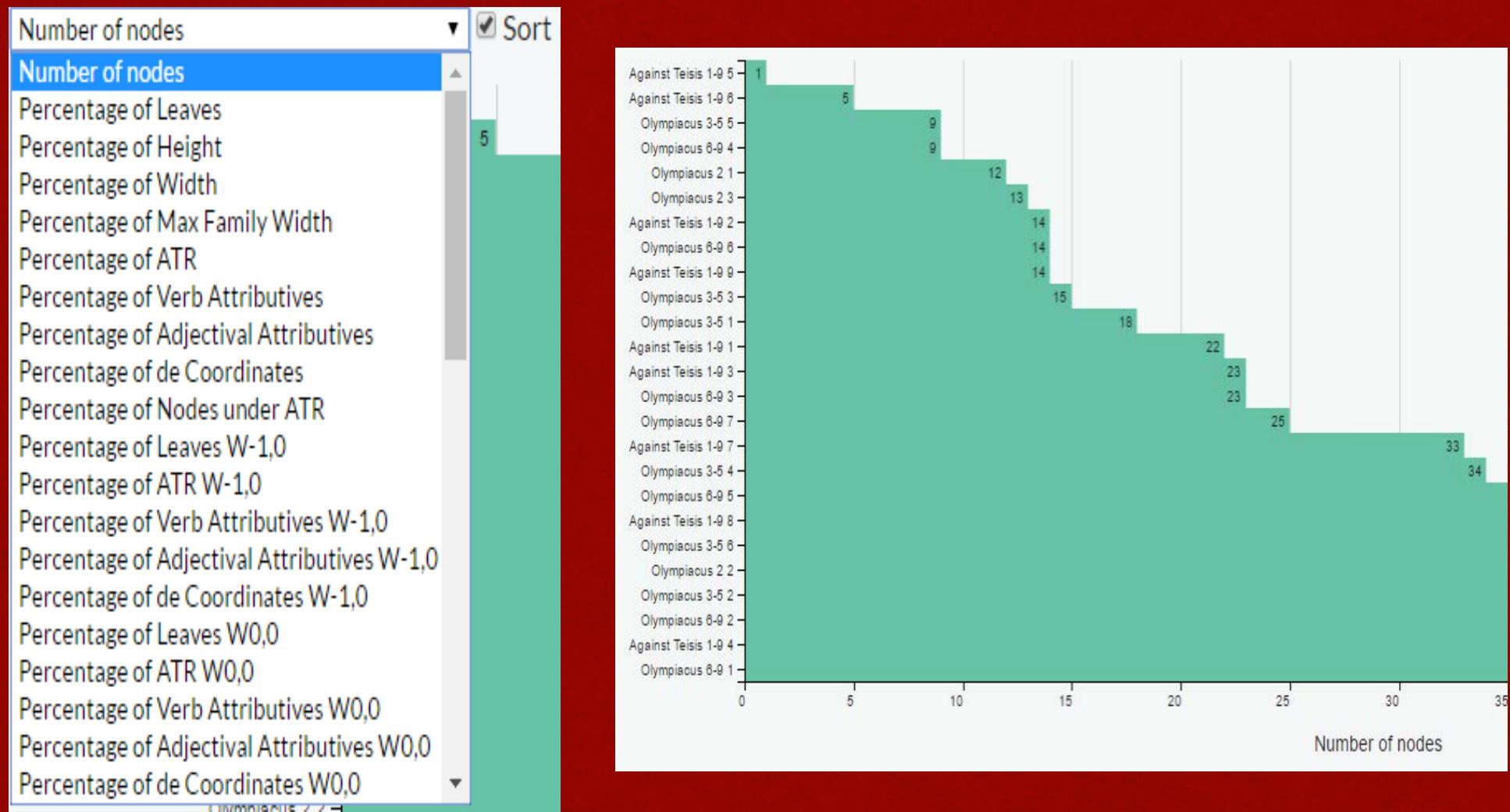
Percentage of Leaves W0,0

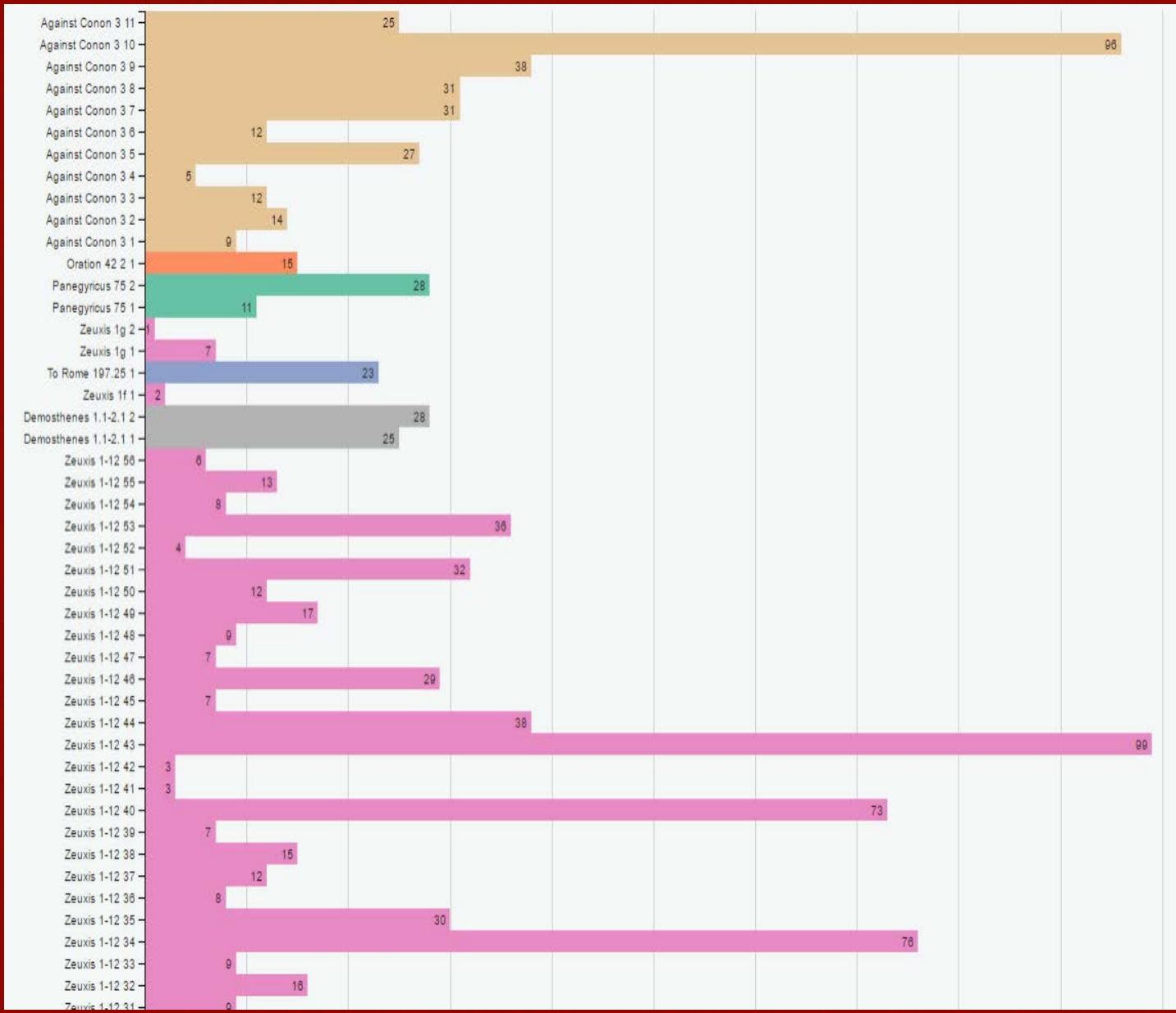
Percentage of ATR W0,0

Percentage of Verb Attributives W0,0

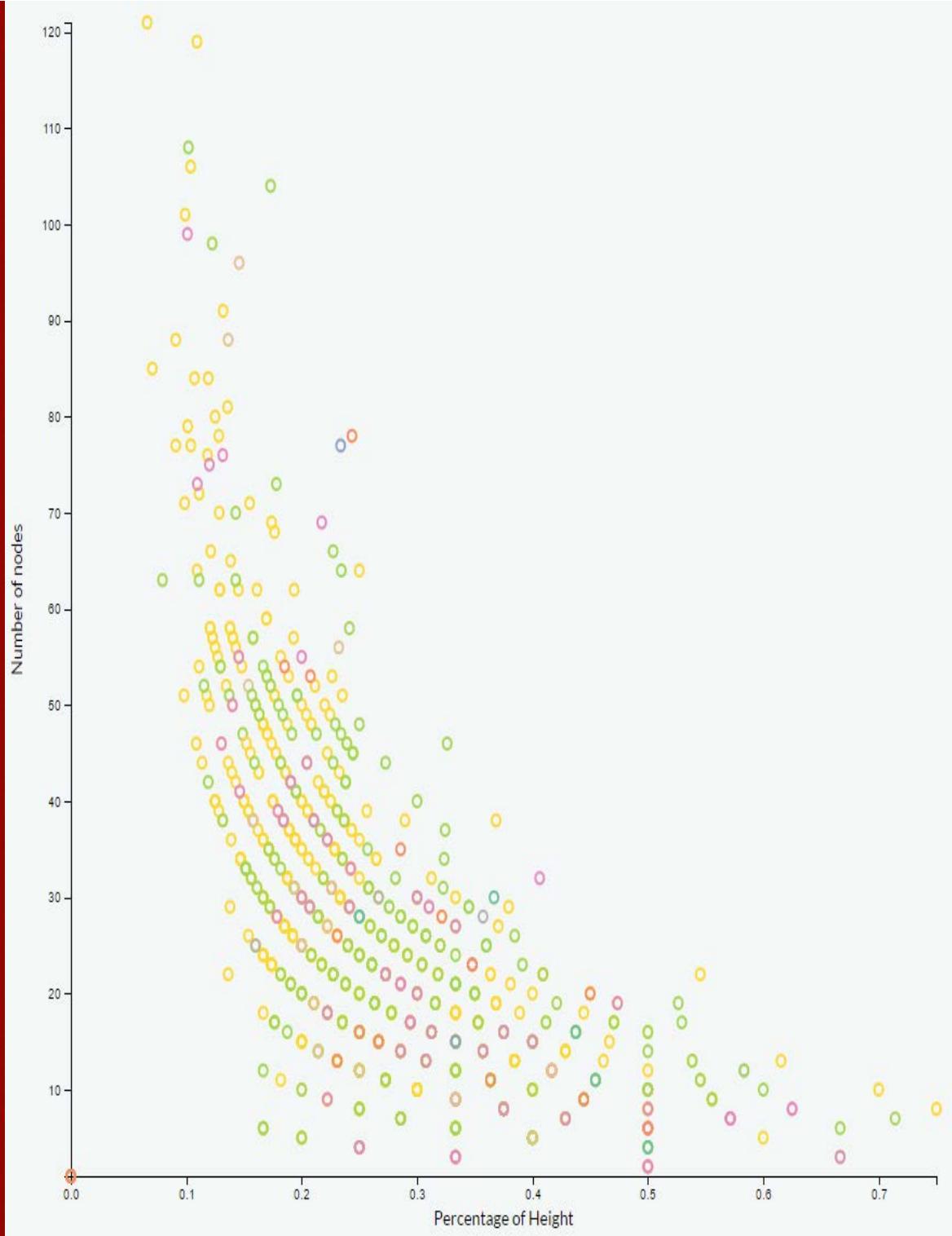
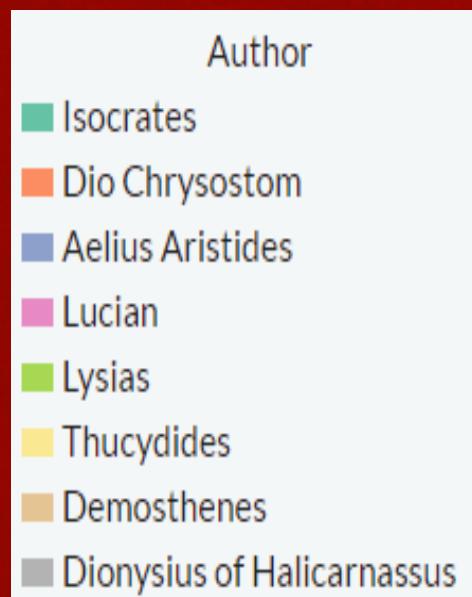
Metrics		Percentage of de ordinates	Percentage of Nodes under ATR	Percentage of Leaves W-1,0	Percentage of ATR W- 1,0	Percentage of Verb Attributives W-1,0	Percentage of Adjectival Attributives W-1,0	Percentage of de Coordinates W-1,0	Percentage of Leaves W0,0	Percentage of ATR W0,0	Percentage of Verb Attributives W0,0	Percentage of Adjectival Attributives W0,0	Percentage of de Coordinates W0,0
Olympiacus	6	0.13	0.65	0.47	0.38	0.04	0.04	0.09	0.02	0.11	0.00	-0.04	0.00
	1	0.05	0.61	0.42	0.25	0.03	0.02	0.03	0.02	-0.06	-0.03	-0.02	0.00
	2	0.04	0.31	0.43	0.22	0.00	0.02	0.02	0.08	0.02	0.00	0.02	-0.02
	3	0.00	0.36	0.35	0.26	0.04	0.00	0.00	0.09	-0.17	-0.04	0.00	0.00
	4	0.00	0.75	0.44	0.44	0.22	0.00	0.00	0.22	0.00	0.00	0.00	0.00
	5	0.00	0.24	0.53	0.21	0.03	0.03	0.00	0.00	-0.05	0.03	-0.03	0.00
	6	0.00	0.14	0.57	0.14	0.00	0.07	0.00	0.14	0.00	0.00	-0.07	0.00
Philippic 1	7	0.04	0.33	0.44	0.24	0.04	0.00	0.00	0.04	-0.16	-0.04	0.00	0.00
	1	0.04	0.50	0.54	0.07	0.04	0.00	0.00	-0.04	0.00	0.04	0.00	0.00
	On peace	1	0.00	0.67	0.43	0.29	0.10	0.00	0.00	-0.05	-0.10	0.00	0.00
Histories	1	0.02	0.16	0.44	0.16	0.00	0.05	0.02	-0.02	-0.02	0.00	-0.05	-0.02
	2	0.00	0.33	0.39	0.26	0.00	0.09	0.00	0.04	0.00	0.00	0.09	0.00
	3	0.03	0.36	0.38	0.21	0.05	0.00	0.00	0.08	-0.05	-0.05	0.00	0.00
	4	0.00	0.18	0.47	0.13	0.00	0.03	0.00	0.20	0.00	0.00	-0.03	0.00
	5	0.00	0.17	0.55	0.15	0.01	0.04	0.00	0.01	-0.04	0.01	-0.04	0.00
	6	0.00	0.55	0.62	0.38	0.03	0.00	0.00	0.03	0.03	-0.03	0.00	0.00
	7	0.00	0.36	0.45	0.18	0.09	0.00	0.00	-0.00	0.09	0.00	0.00	0.00
	8	0.00	0.82	0.47	0.35	0.06	0.12	0.00	-0.12	-0.12	-0.06	0.00	0.00
	9	0.00	0.59	0.47	0.41	0.00	0.12	0.00	0.00	0.06	0.00	0.12	0.00
	10	0.00	0.30	0.52	0.20	0.02	0.02	0.00	0.04	0.07	0.02	0.02	0.00
	11	0.00	0.30	0.50	0.20	0.00	0.10	0.00	0.30	0.00	0.00	-0.10	0.00
	12	0.00	0.18	0.55	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	13	0.00	0.17	0.58	0.08	0.00	0.08	0.00	0.08	0.08	0.00	0.08	0.00
	14	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00

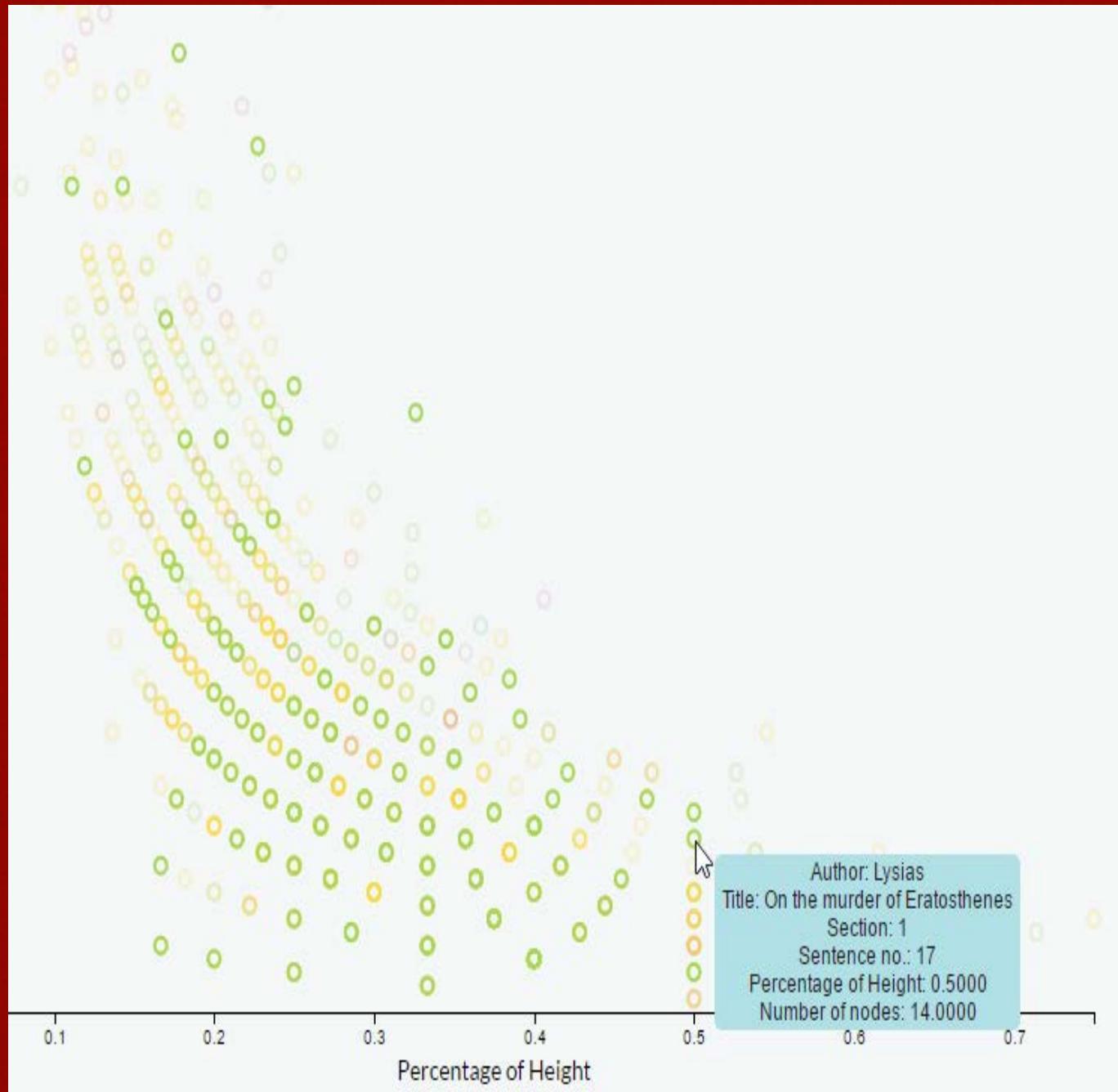




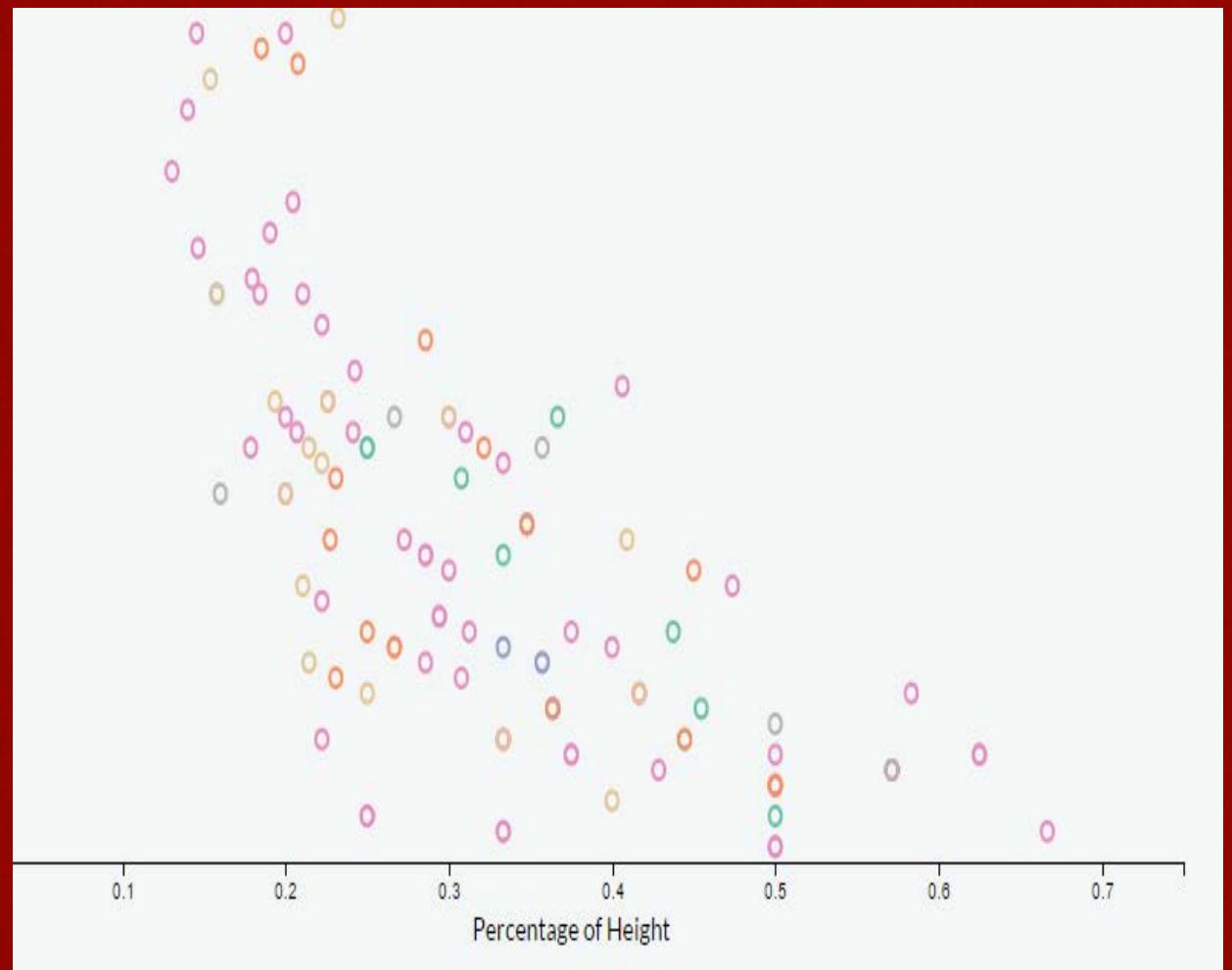


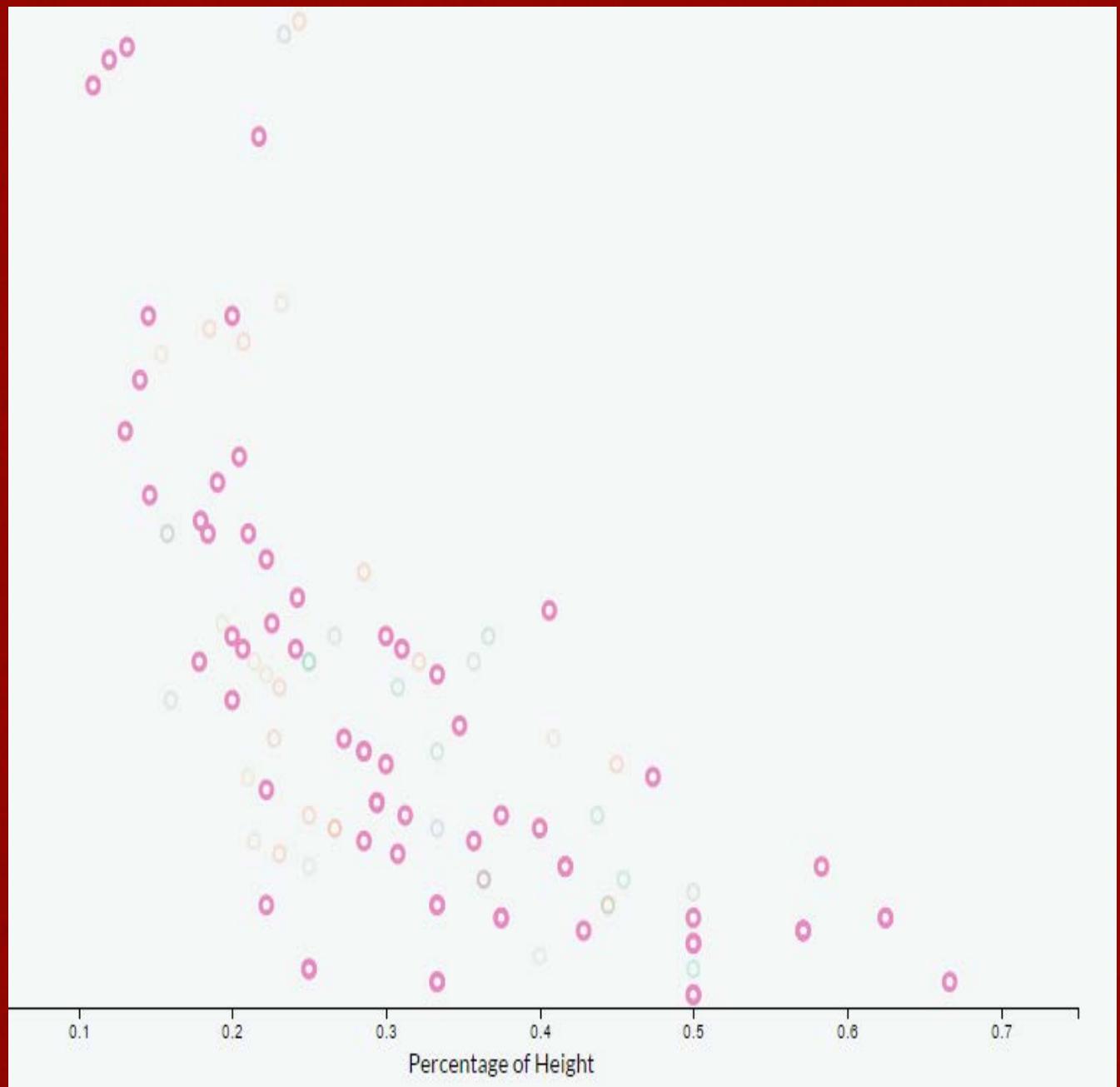
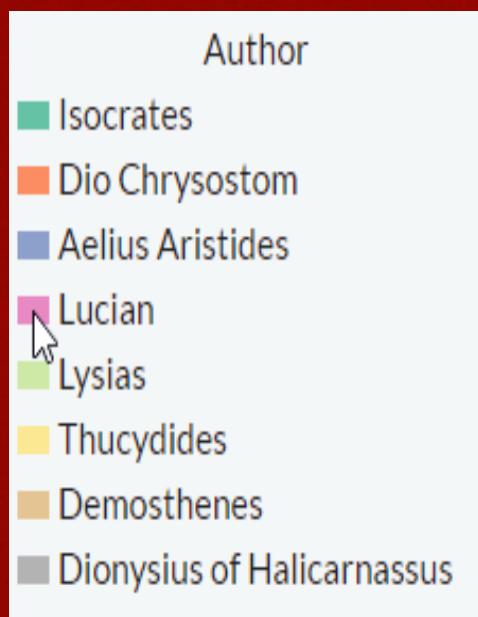
Y Axis: Number of nodes
X Axis: Percentage of Height





- Isocrates
- Dio Chrysostom
- Aelius Aristides
- Lucian
- Lysias
- Thucydides
- Demosthenes
- Dionysius of Halicarnassus

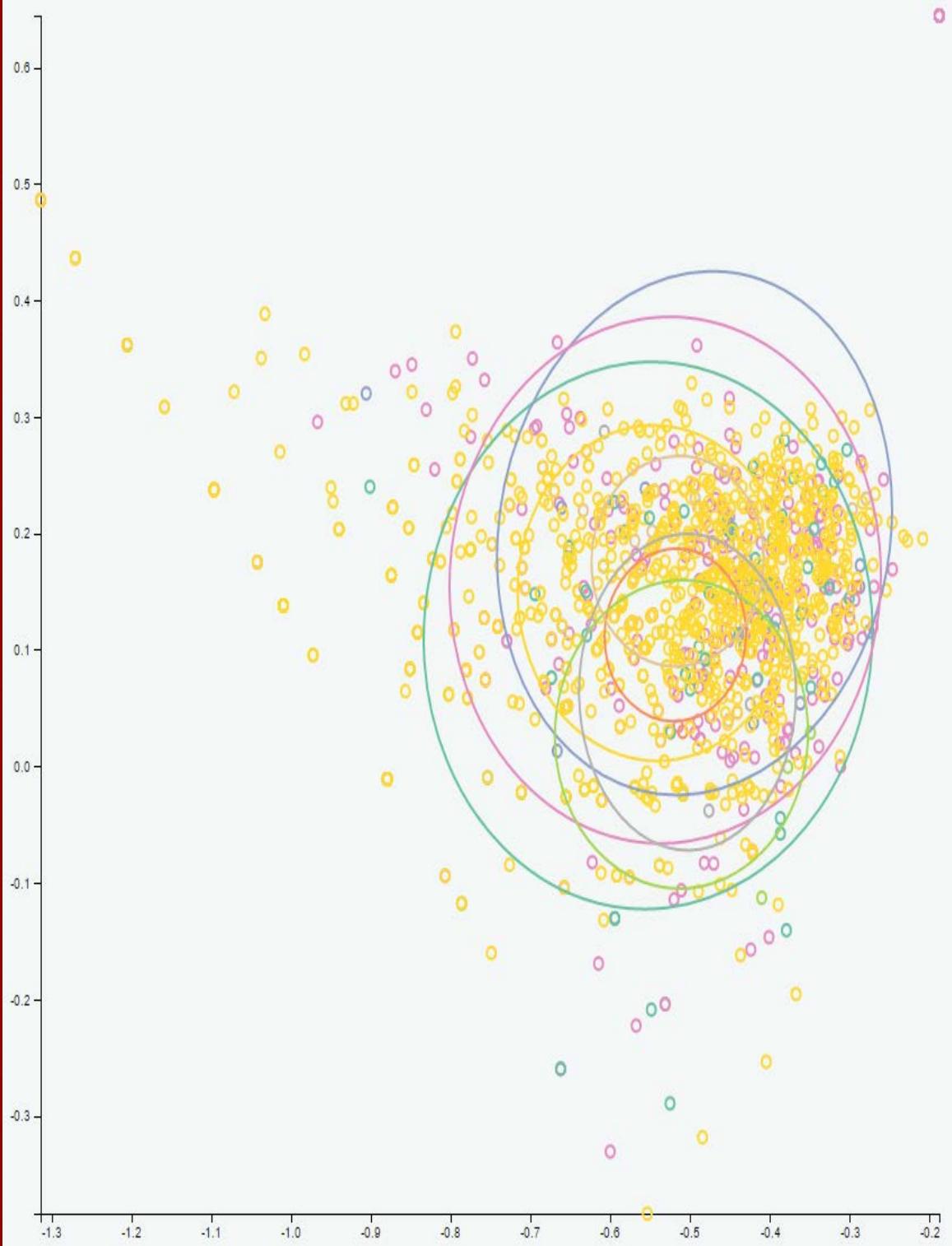




Author	Percentage of Height					Number of nodes				
	Min	Max	Mean	Variance	Std. Dev.	Min	Max	Mean	Variance	Std. Dev.
Isocrates	0.250	0.500	0.372	0.009	0.092	4.000	30.000	19.222	91.694	9.576
Dio Chrysostom	0.000	0.500	0.266	0.022	0.149	1.000	78.000	21.650	404.450	20.111
Aelius Aristides	0.158	0.364	0.308	0.006	0.080	11.000	77.000	27.000	577.000	24.021
Lucian	0.000	0.667	0.315	0.022	0.148	1.000	99.000	24.328	441.072	21.002
Lysias	0.000	0.714	0.282	0.014	0.120	1.000	108.000	22.905	281.426	16.776
Thucydides	0.066	0.750	0.273	0.009	0.097	2.000	121.000	23.426	253.913	15.935
Demosthenes	0.136	0.417	0.245	0.008	0.090	5.000	96.000	33.056	645.350	25.404
Dionysius of Halicarnassus	0.160	0.571	0.371	0.028	0.168	7.000	30.000	20.000	114.500	10.700

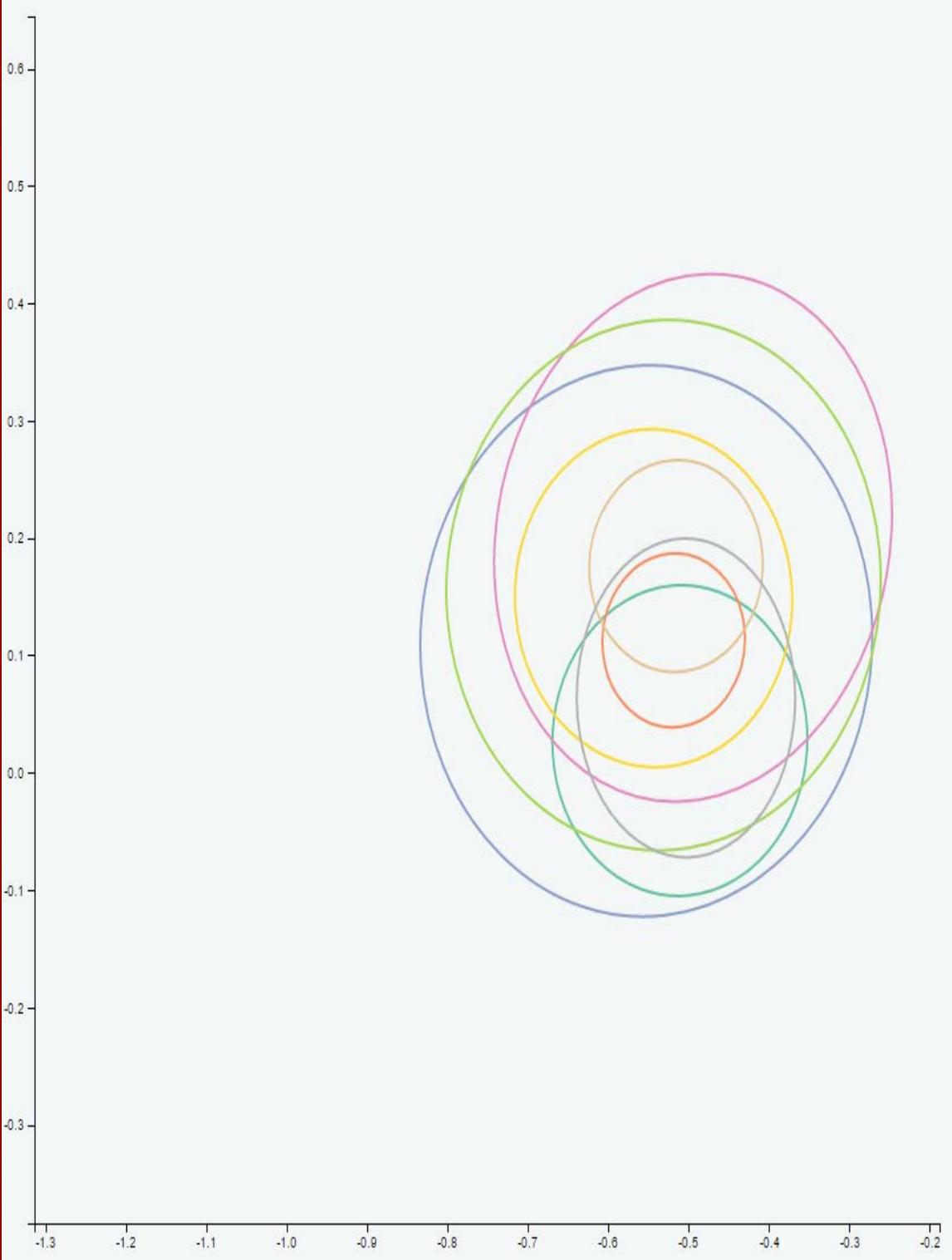
Draw Ellipse For Each: Author ▾

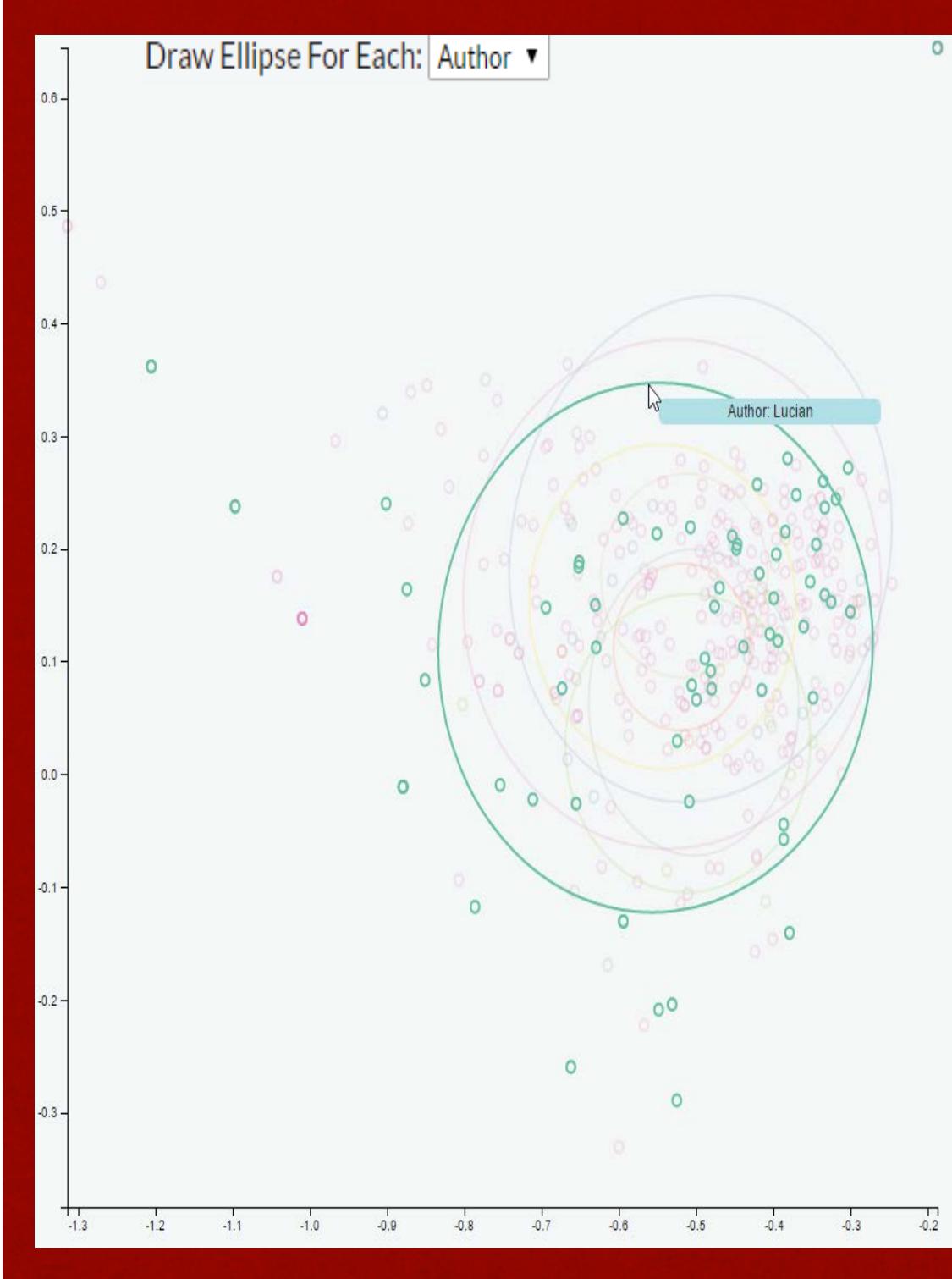
- Lucian
- Aelius Aristides
- Dio Chrysostom
- Lysias
- Isocrates
- Thucydides
- Demosthenes
- Dionysius of Halicarnassus



Draw Ellipse For Each: Author ▾

- ● Isocrates
- ● Aelius Aristides
- ● Lucian
- ● Dio Chrysostom
- ● Lysias
- ● Thucydides
- ● Demosthenes
- ● Dionysius of Halicarnassus





METREEEX TREEBANK ANALYSIS

Timothy Russell-Wagner