

What makes an Allusion? A Digital Approach

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<http://tesserae.caset.buffalo.edu>

What is an allusion?

This is a long-standing question in literary and linguistic studies. By training a computer system to detect the allusions that readers find between two texts, we arrive at formal, measurable characteristics of allusion—and discover new intertexts that traditional researchers have overlooked.

Tesserae detects the re-use of distinctive two-word phrases across texts, accounting for differences in spelling and inflection.

English: William Wordsworth's *Prelude*, Book 1 vs. William Cowper's *The Task*

	target phrase	source phrase	matched on	score
1.	wordsworth prelude 1.233 Thoughtfully fitted to the Orphean lyre ;	cowper task 3.587 By magic summons of the Orphean lyre .	lyre, orphean	9
2.	wordsworth prelude 1.88 A backward glance upon the curling cloud	cowper task 4.472 There sit involved and lost in curling clouds	cloud, curl	9

Greek: Apoloniou's *Argonautica* vs. Homer's *Illiad*

	target phrase	source phrase	matched on	score
1.	A.R. 1.850 ῥηιδίως. Κύπρις γὰρ ἐπὶ γλυκὺν ἴμερον ὤρσεν	hom. il. 3.139 ὡς εἰποῦσα θεὰ γλυκὺν ἴμερον ἔμβαλε θυμῷ	ἴμερος, γλυκὺν	9
2.	A.R. 1.927 στησάμενοι κούρης Ἀθαμαντίδος αἰπὰ ῥέεθρα	hom. il. 8.369 οὐκ ἂν ὑπεξέφυγε Στυγὸς ὕδατος αἰπὰ ῥέεθρα .	ῥεῖθρον, αἰπὰ	9

Latin: Vergil's *Georgics* vs. Lucan's *Bellum Civile*

	target phrase	source phrase	matched on	score
1.	verg. g. 1.495 exesa inveniet scabra robigine pila	luc. 1.243 Et scabros nigrae morsu rubiginis enses.	robigo, scaber	9
2.	verg. g. 1.315 frumenta in viridi stipula lactentia turgent.	luc. 3.503 Nec, quamvis viridi lactetur robore, lentas	lacteo, uiride-uiridis	9

The Tesserae working-definition of allusion

Two-word (bigram) matching by lemma gives first-stage results. These are then ranked by the proximity of the words in the two-word phrases and the rarity of those words.

$$\text{score} = \ln \left(\frac{\sum \frac{1}{f(t_i)} + \sum \frac{1}{f(s_i)}}{d_t + d_s} \right)$$

Where,

$f(t)$ is the frequency of each matching term in the target phrase;
 $f(s)$ is the frequency of each matching term in the source phrase;
 d_t is the distance between matching words in the target;
 d_s is the distance between matching words in the source.

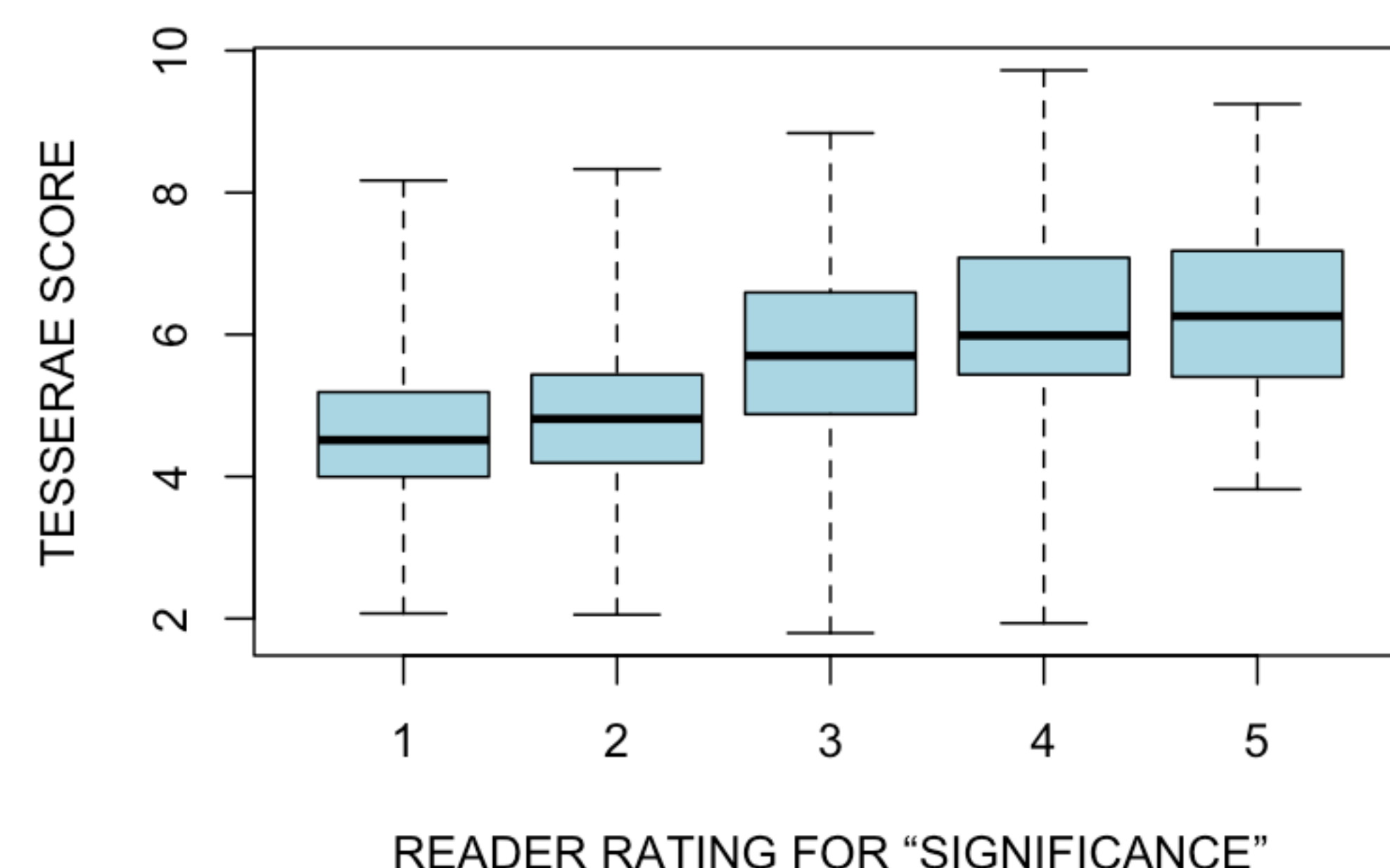
Distinctiveness in allusion is a function of the **frequency** and **proximity** of the words shared by the matching phrase. When rare words are re-used close together, we are confident of an allusion.

Can Tesserae judge the quality of allusions?

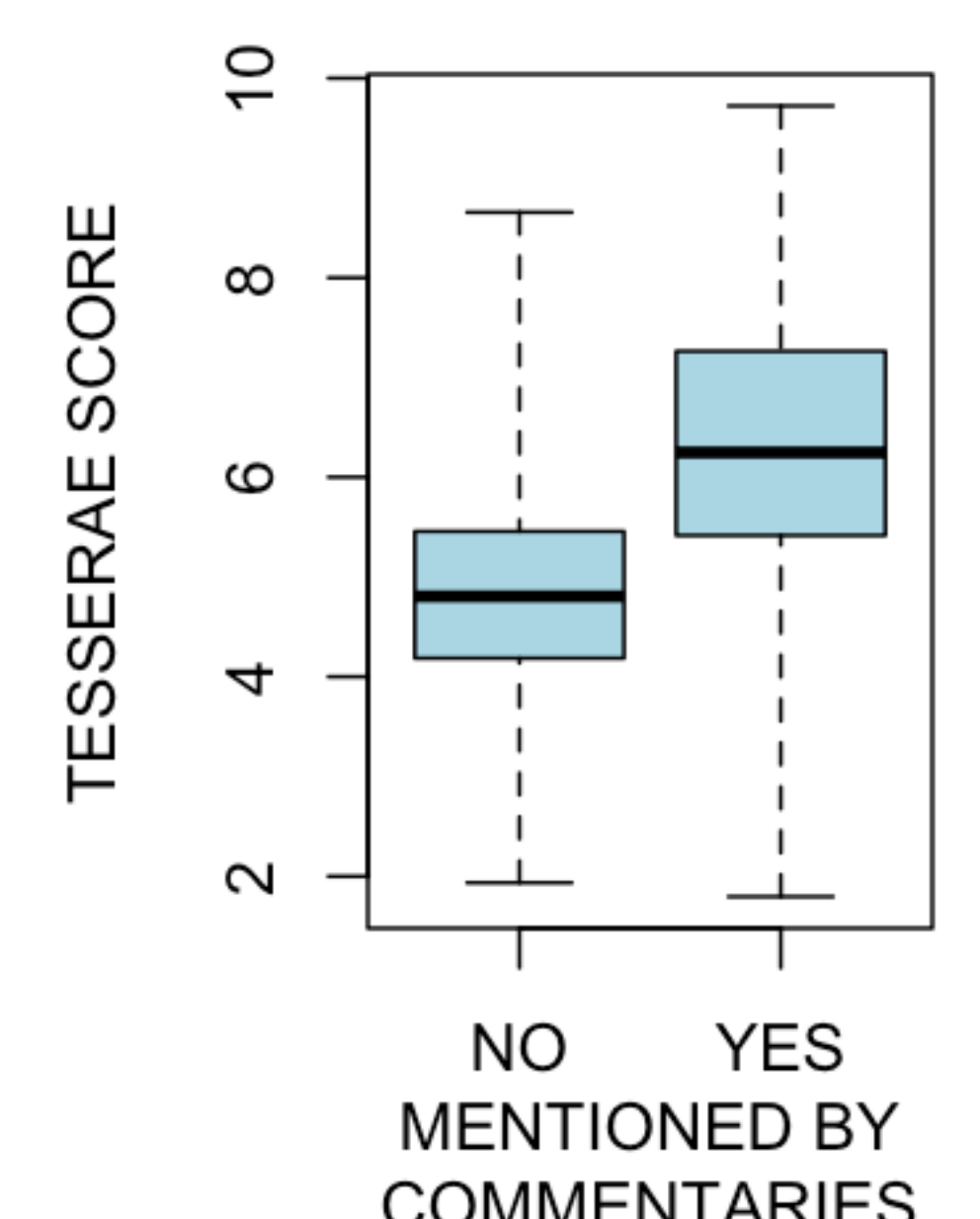
In a sample of Latin epic poetry, Tesserae's automatic scoring system predicted readers' judgments about the significance of allusions.

The figures at right show that, among re-used phrases detected by Tesserae, scores are higher for allusions deemed most significant by readers, and for those included in professional commentaries.

Score Tracks Significance According to Readers...



...and Commentaries



What about more complex allusions?

Not all allusions are characterized by the re-use of two-word phrases. In order to detect more subtle intertextuality, modules are currently under development to match phrases based on **synonyms**, **sound patterns**, and **themes**. At first these characteristics will be used to help determine the distinctiveness of a two-word match; at a later stage it may be possible to detect matches on these criteria alone.

These figures represent over 3,000 instances of text re-use drawn from Lucan's *Civil War*, Book 1, and Vergil's *Aeneid*. Graduate student and faculty readers were asked to rate allusions for literary significance on a scale of 1–5. Commentaries used were Heitland and Haskins (1887), Thompson and Bruère (1968), Viansino (1995), and Roche (2009). Boxes show the range of Tesserae scores covered by the middle 50% of allusions in a given category; dark horizontal bars give the median score; dashed lines show full score range.



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