

Authenticity criticism

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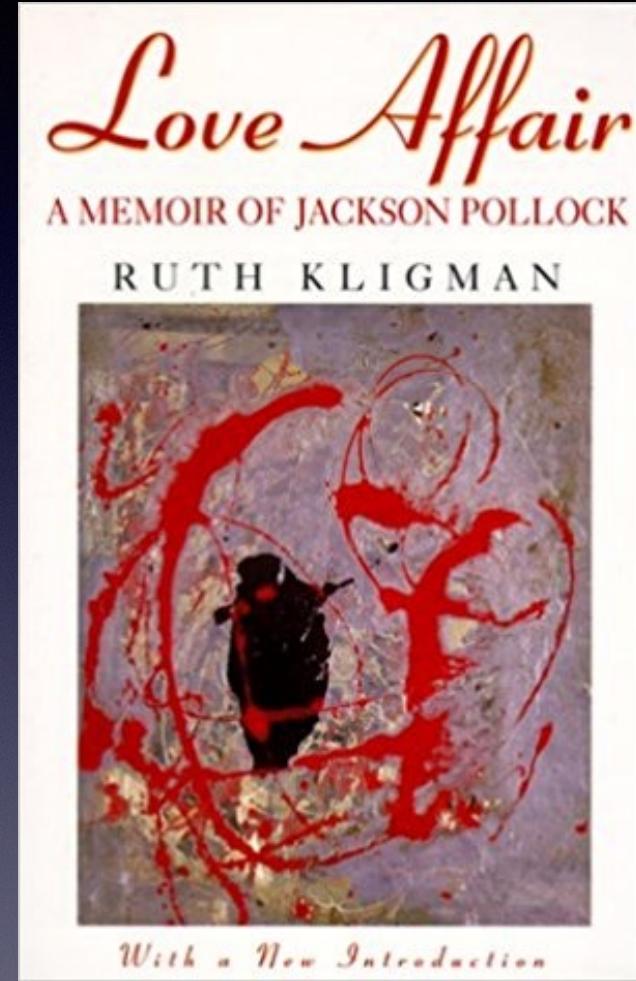
Jackson Pollock x Lee Krasner



Ruth Kligman



Red, Black and Silver

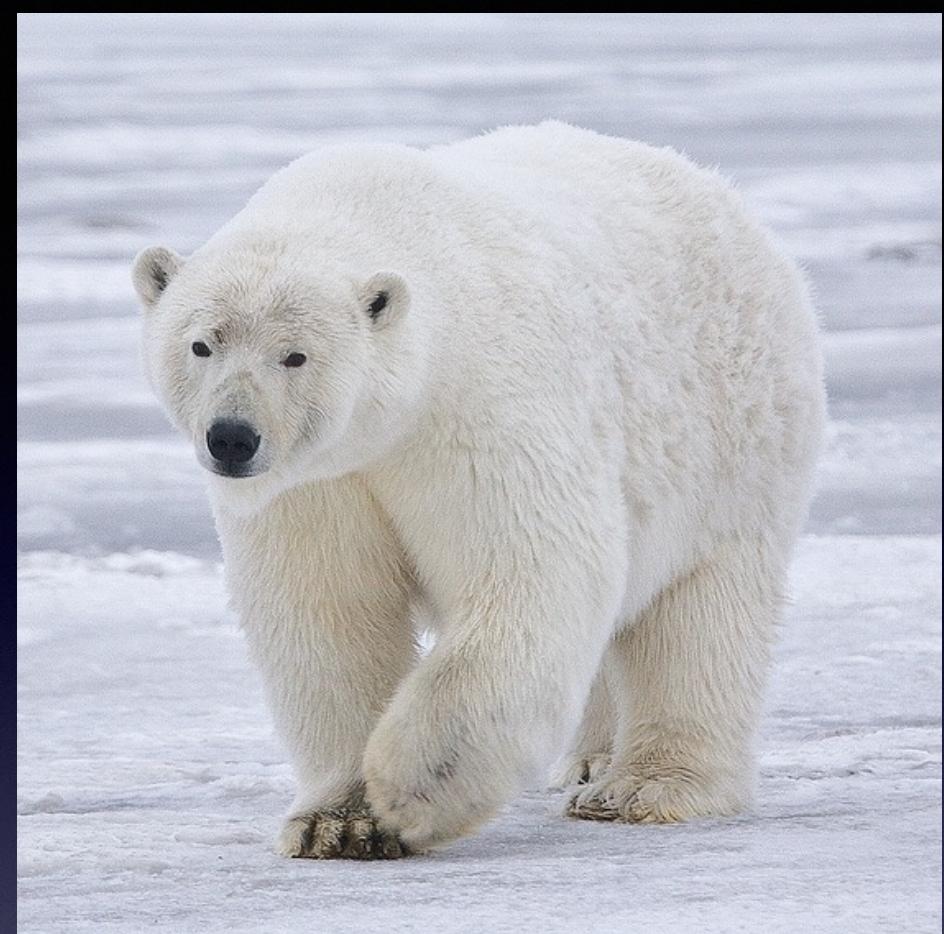




ART & DESIGN

A Real Pollock? On This, Art and Science Collide

By PATRICIA COHEN NOV. 24, 2013

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Jonathan Jones on art

Pollock and the polar bear: could an animal hair solve a great art mystery?

Ruth Kligman claimed Jackson Pollock painted her a lover's gift before he died. But can this splashy pastiche actually be real - and could a polar bear hair, from the rug in his studio, prove it?

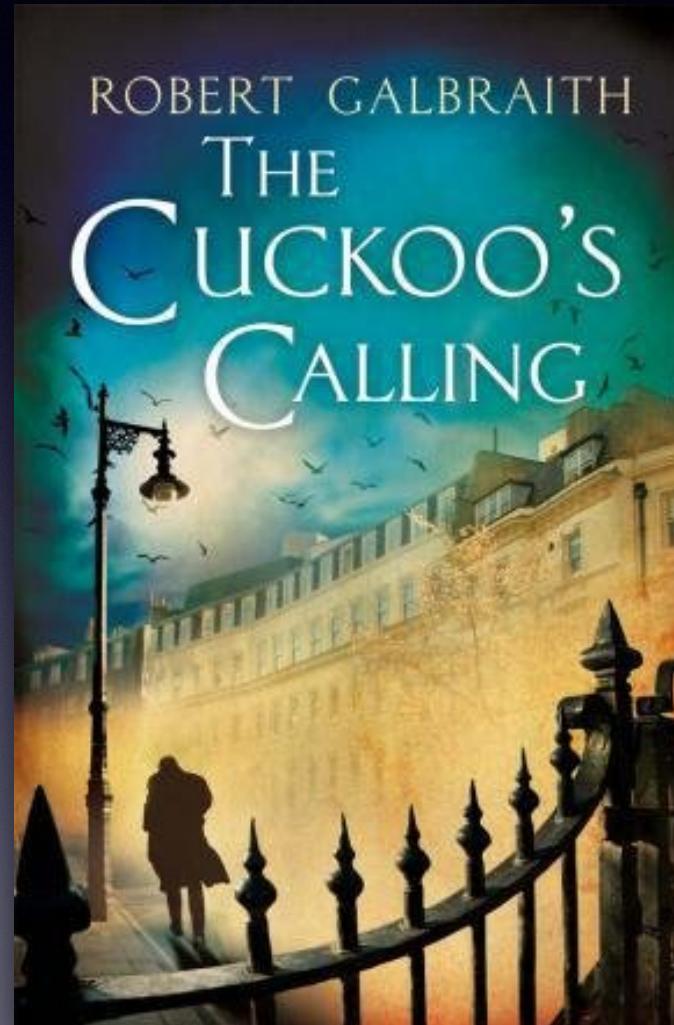
People do crazy things to show
that something is *real*.

Connoisseurship

- Authentication still expert-driven (art-market professional)
- Same problems in Arts: knowledge
 - dies with the experts
 - is too intuitive, implicit to be shared
 - is difficult to replicate (cf. inter-subjectivity)
- Huge economic potential
 - Much more explicit legal system than for textual authorship
 - Experts do not give up control?

Robert Galbraith

- Publishes debut in April 2013
- *The Cuckoo's Calling* (detective)
- “former military police investigator”
- Well received by critics (“stellar debut”)
- Only 500 copies sold...



Twitter

- India Knight (columnist at *Sunday Times*)
- Tweets she liked novel
- Jude Callegari: “author = J.K. Rowling”
- “Why?”; “I just know”
- Closes Twitter-account...
- Knight informs Richard Brooks, editor at *Sunday Times*



Richard Brooks

- Discovers Rowling and Galbraith have same agent...
- (Rowling recently changed!)
- Callegari turns out: best friend of wife of partner at Rowling's legal reps...
- Contacts two forensic linguists

Language Log

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Rowling and "Galbraith": an authorial analysis

July 16, 2013 @ 7:35 am · Filed by Ben Zimmer under Computational linguistics, Language and technology, Linguistics in the news

[« previous post](#) | [next post »](#)

The *Sunday (UK) Times* recently revealed that J.K. Rowling wrote the detective novel *The Cuckoo's Calling* under the pen name Robert Galbraith. The newspaper explained that, as part of their investigation, they sought the assistance of two scholars who have developed software to help with authorship attribution: [Peter Millican](#) of Oxford University and [Patrick Juola](#) of Duquesne University. Given the public interest in the Rowling revelation, I asked Patrick to write a guest post describing the authorial analysis that he conducted. (For more on the story, see my post on the *Wall Street Journal's Speakeasy blog*.)

[Guest post by Patrick Juola]

With the recent announcement by London's *Sunday Times* that J.K. Rowling had written the recently published novel *The Cuckoo's Calling*, several people have asked about the process that led up to this. I'm grateful to Ben Zimmer for giving me a chance to write a bit about it.

BACKGROUND

I don't know how much background most linguists have in "forensic stylometry." The basic theory is pretty simple: language is a set of choices, and speakers and writers tend to fall into habitual, or at least common, choices. Some choices come from dialect (the reason an Englishman drives a *lorry* but an American a *truck*), some from social pressure (if I need to impress someone with my vocabulary, I can utilize a polysyllabic lexicon instead of just using big words), and some just seem to come. An example of the latter category is in the use of many function words. If you ask yourself where the salad fork is relative to the plate, you quickly

Millican & Juola

- “Juola and Associates”
- Forensic linguistics
- Statistic analysis of writing style,
e.g. for authorship attribution
- Cf. bomb letters or suicide notes
- Find that Galbraith // Rowling (in
comparison to control authors)



And then...

- Brooks contacts Galbraith's agent
- Quickly responds: "yes, indeed"
- Marketing stunt?
 - Anonymous tweet?
 - Early critics were friends...
- Response: "Disappointed and angry"
- Sales rose 4000% overnight (#1 on Amazon)

INVESTIGATION

How J.K. Rowling's Pseudonym Was Uncovered

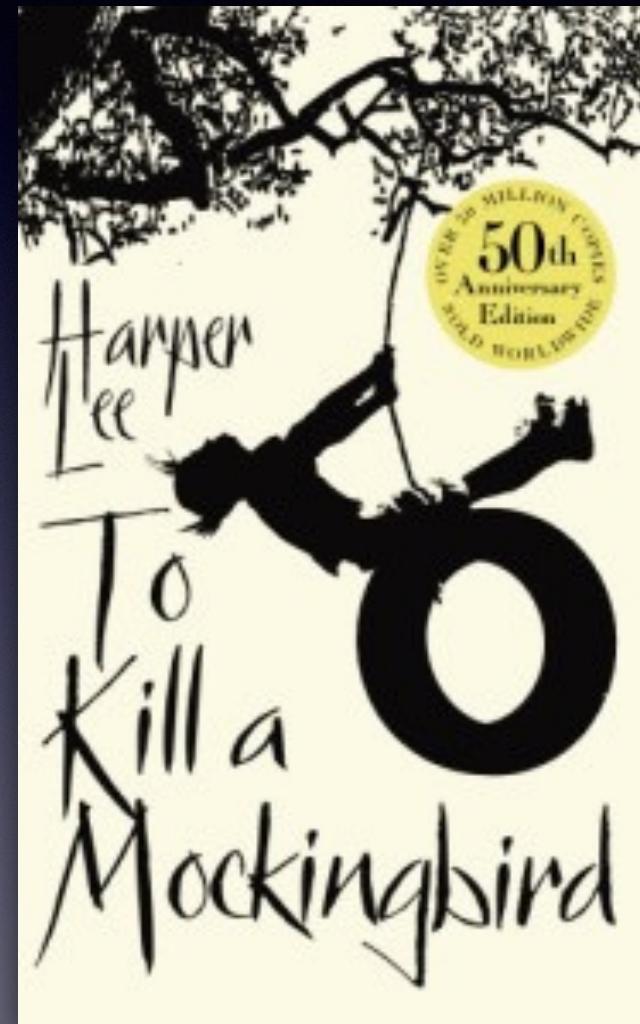
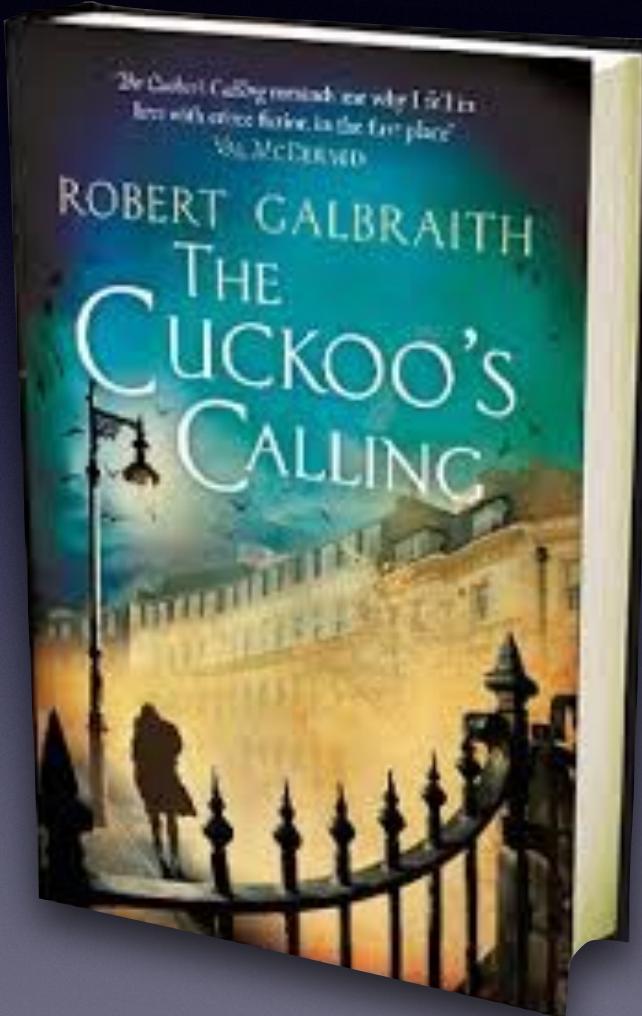
By Jesse David Fox  Follow @JesseDavidFox

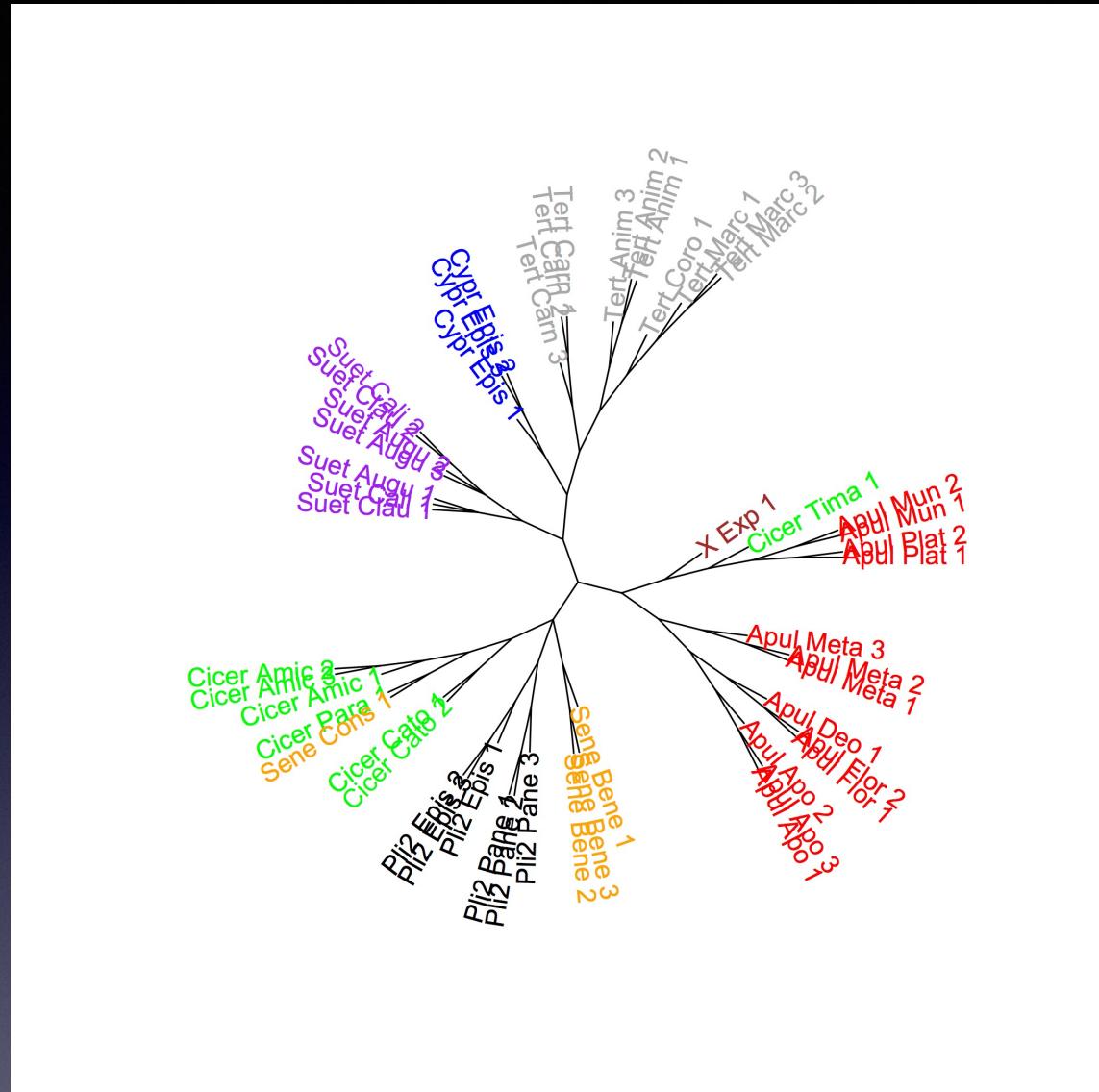
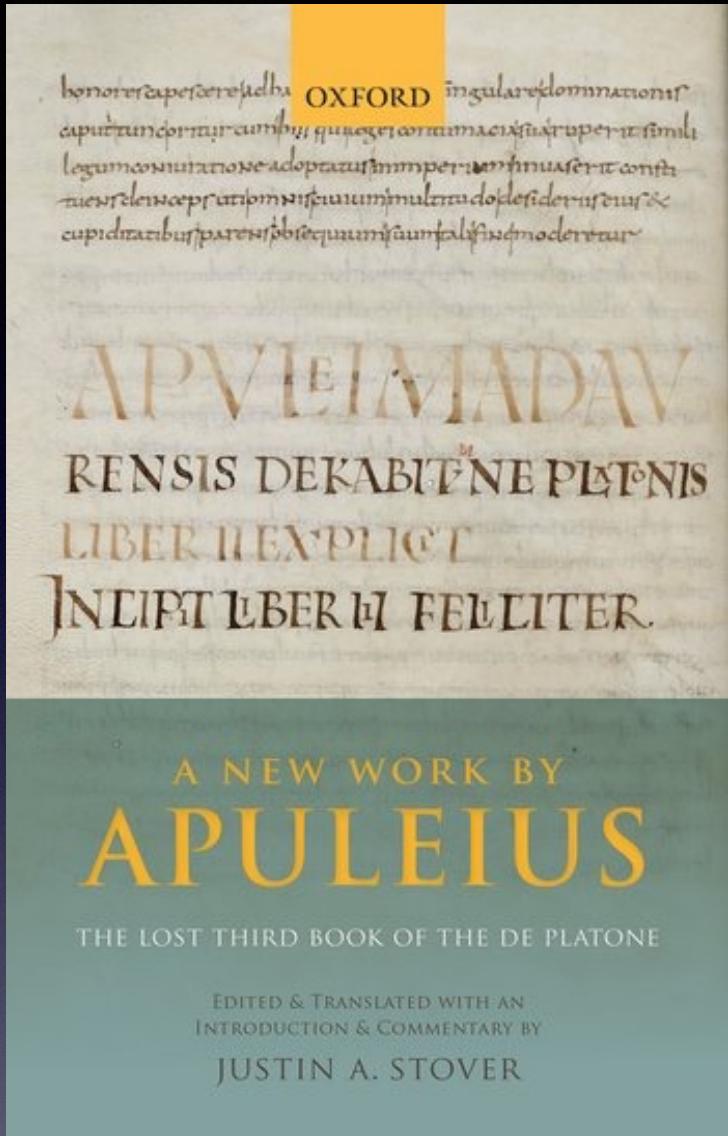


This weekend, it came out that J.K. Rowling had published a well-reviewed mystery novel, *The Cuckoo's Calling*, under her unassuming (and very British) name, Robert Galbraith. Released in April, the book sold only 1,500 copies, an amount that Harry Potter book has probably sold since you started reading this post. Rowling has been quoted saying she'd "hoped to keep it secret a little longer," at least through the release of Galbraith's follow-up, but the *Sunday Times* was able to solve the mystery. Today, the *New York Times* explained exactly how it all went down. Here is a timeline:

- On Thursday, an employee at the *Sunday Times* tweeted praise for *The Cuckoo's Calling*, remarking that it didn't seem like the work of a professional writer.
- "After midnight she got a tweet back from an anonymous person who said, 'It's not a first-time novel — it was written by J. K. Rowling,'" the *Sunday Times* arts editor, Richard Brooks, explained.
- When the employee tweeted "How do you know for sure?" the pseudonymous tweeter replied with "I just now" and went on to delete his or her account.

Modern literary applications





But also relevant to historic literature...

But what does “real” mean?



Authenticating the writings of Julius Caesar



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ABSTRACT

In this paper, we shed new light on the authenticity of the *Corpus Caesarianum*, a group of five commentaries describing the campaigns of Julius Caesar (100–44 BC), the founder of the Roman empire. While Caesar himself has authored at least part of these commentaries, the authorship of the rest of the texts remains a puzzle that has persisted for nineteen centuries. In particular, the role of Caesar's general Aulus Hirtius, who has claimed a role in shaping the corpus, has remained in contention. Determining the authorship of documents is an increasingly important authentication problem in information and computer science, with valuable applications, ranging from the domain of art history to counter-terrorism research. We describe two state-of-the-art authorship verification systems and benchmark them on 6 present-day evaluation corpora, as well as a Latin benchmark dataset. Regarding Caesar's writings, our analyses allow us to establish that Hirtius's claims to part of the corpus must be considered legitimate. We thus demonstrate how computational methods constitute a valuable methodological complement to traditional, expert-based approaches to document authentication.

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1. Introduction

Throughout the twentieth century, influential post-structuralist thinkers, such as Foucault or Barthes have fiercely argued against the importance of the notion of 'authorship' (Barthes, 1968; Foucault, 1969). Across many fields in the Humanities for instance, this famously led to a temporary devaluation of the importance attached to the relationship between texts and their original producers (Love, 2002). However, numerous examples demonstrate that the public interest in authorship currently shows few signs of abating. The highly mediated discovery of a pseudonymously published novel by the appraised Harry Potter novelist J.K. Rowling is a good example in this respect (Juola, 2013; 2015). In recent years, many other authorship-related research, such as the Shakespeare controversy (Burrows, 2012), has continued to make frequent headlines in the popular media. In academia too, the much debated application of bibliometry (Cronin, 2001) or well-known cases of plagiarism (Maurer, Kappe, & Zaka, 2006) hardly suggest that the

notion of authorship would have suffered a major loss of public interest. Unsurprisingly, automated authorship analysis (Juola, 2006; Koppel, Schler, & Argamon, 2009; Stamatas, 2009b) currently receives increasing attention in Computer and Information Sciences too, as a form of document authentication with promising practical applications across various domains, such as plagiarism detection (Stein, Lipka, & Prettenhofer, 2011) or even in forensic sciences (Chaski, 2005; Juola, 2015).

Most computational authorship studies in computer science are still restricted to present-day document collections. In this paper, we illustrate the broader applicability of computational authorship verification by reporting a high-profile case study from Classical Antiquity (Koppel & Seidman, 2013; Stover, Winter, Koppel, & Kestemont, 2016). The 'War Commentaries' by Julius Caesar (*Corpus Caesarianum*) refers to a group of Latin prose commentaries, describing the military campaigns of the world-renowned statesman Julius Caesar (100–44 BC), the founder of the Roman Empire. While Caesar must have authored a significant portion of these commentaries himself, the exact delineation of his contribution to this important corpus remains a controversial matter. Most notably, Aulus Hirtius – one of Caesar's most trusted generals – is sometimes believed to have contributed significantly to the corpus. Thus, the authenticity and authorship of the Caesarian corpus is a philological puzzle that has persisted for nineteen centuries. In this paper, we

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Julius Caesar



- Founder of the Roman empire
- 100-44 BC (famous assassination by Brutus)
- Military expeditions expanded Roman Empire
- Authored famous Latin prose commentaries,
e.g. *De Bello Gallico*

02601b 3 2 84 Regius 4738.

IN ERNT EBR' ELE ERS BELL' CLEL IVLAN' DENAR RATI ONETE M P RVM

GALLIA EST OMNIS DIVISA IN PARTES TRES; QUARUM
UNAM INCOLUNT BELGAE. NAM AQUITANI. TETHAM
QUAMPSORUM LINGUA CELTAE. NRA. GALLI APPELLANTUR.
HIC OMNES LINGUA. INSTANTIIS. LEGIBUS. INTER SE DIFFERUNT. GALLOS
ABAQUITANIS. GARUNNA FLUMEN. ABELGIS MATRONA & SEQUANA DIVIDA.
HORUM OMNIM FORTISSIMIS FANT BELGAE. PROPTerea QD' ACUTA
ATQ; HUMANITATE PROVINIAE. LONGIS SIME ABSUNT MINIME QUE PROS
MERCIATORIS. SAEPE COMEANT. ATQ; EAQUEAE PRO EFFEMINANDOS. ATQ;
MOS PECCANT. INPOSTANT. PROXIMIQUE GERMANIS. QUI TERRIS REN
INCIDUNT. QUID. CUM CONTINENTER BELLUM GERUNT. QUOD ETIUS
HELVIIS. QUOC. RELIQUOS GALLOS VICTORIĘ PESENTUR. QUOD FERE CONCILIAPSI
PRÆLUS CUM GERMANIS CONTENDUNT. CUM AUT SINI FINIB; COS PROB
DENT. AUT IPSI. IN EORUM FINIB; BELLUM GERUNT; EORUM UNCA PARIS QUA
GALLOS OPTINERE DICTUM EST. INTIUM CAPIT. AFLUMINE RHOTANO. CON
TINDEUR GARUNNA FLUMEN. OCEANUM FINIS BELGORUM ATTINGIT.
LAURO ABSEQUANIS & HELVETIIS. FLUMEN RENUM. UERGIT PRO SEPTENTRI
ONIS BELGAE. AB EXTREMIS GALLIAE FINIB; ORIUNTUR. PECCANT. INFER
SUS IN PARTEM FLUMINIIS RENI. SPEDUNT. IN SEPTENTRIONEM. ELEMENTA
ACQUANTIA GARUNNA FLUMINE. AD PYRENÉOS MONTES. ET CAMPARI
OCEANI. QUAE PRO HIS PANIC. PETUND; SPEDUNT. IN OCCASUM SOLIS.



5703.

Authorship?

Accomplished author (no ghost writer), but had help

- Reports by legates
- Generals, such as Aulus Hirtius: Book 8 of *Bellum Gallum*

Corpus Caesarianum

1. Bellum Gallicum
2. Bellum civile
3. Bellum Alexandrinum
4. Bellum Africum
5. Bellum Hispaniense

Suetonius: “[Caesar] also left *commentarii* of his deeds during the Gallic War and the Civil War with Pompey. For the author of the *Bellum Alexandrinum*, *Africum*, and *Hispaniense* is uncertain. Some think it is Oppius, others Hirtius, who supplemented the last, incomplete book of the *Bellum Gallicum*”

Letter Hirtius (forgery?)

‘I have continued the accounts of Caesar on his deeds in Gaul, since his earlier and later writings did not fit together, and I have also finished the most recent and incomplete account, extending it from the deeds in Alexandria down to the end, not admittedly of civil discord, of which we seen no end, but of Caesar’s life’

Which texts did Caesar / Hirtius write?
Bellum Alexandrinum?

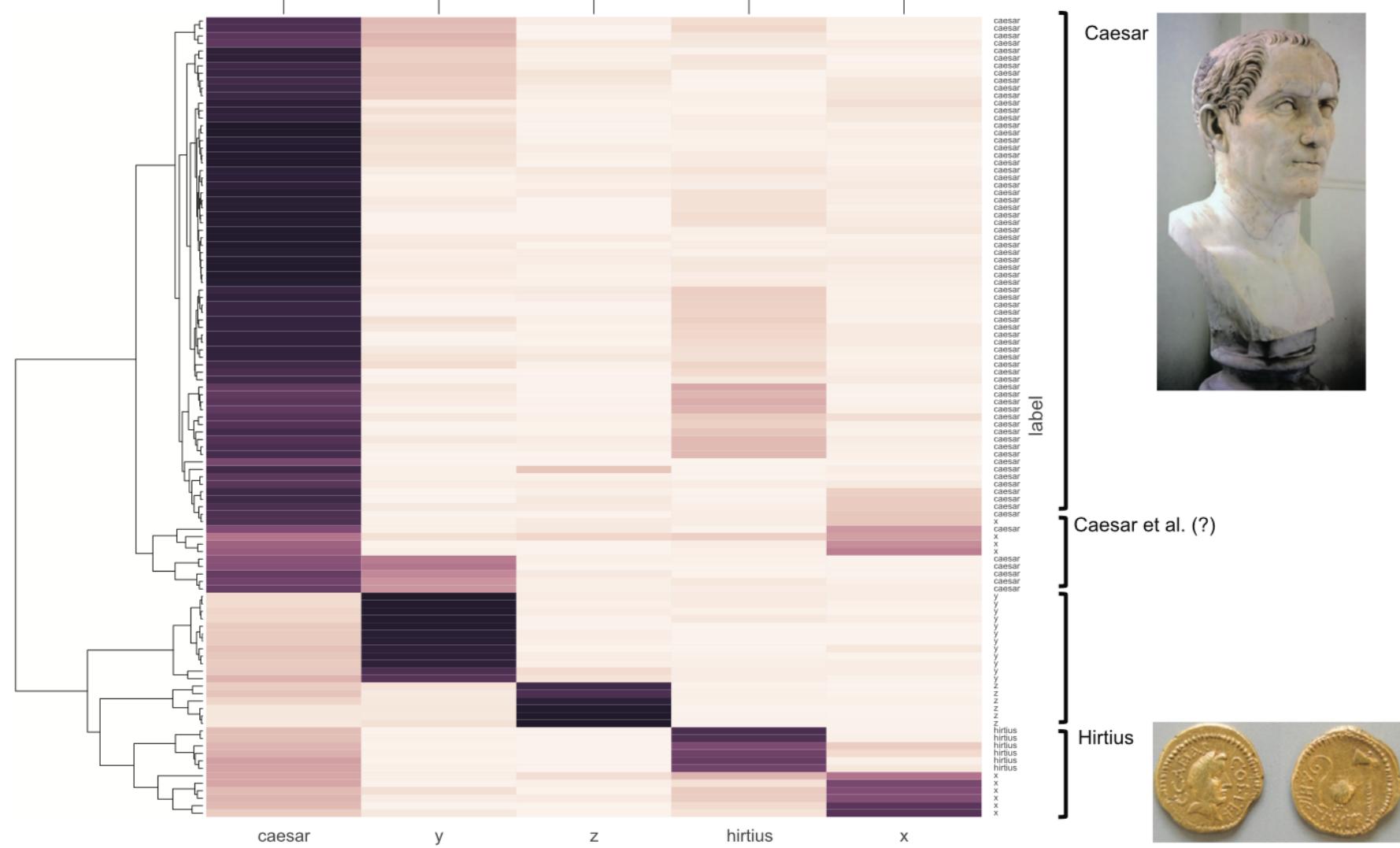


Fig. 4. Cluster and heatmap visualisation of the results of the O2 verification procedure on the Caesarian corpus. Cell values represent the average probability of a sample being attributed to one of the five profiles distinguished. Five independent analyses were run with the five top-performing metric-VSM combination in the benchmark section. O2 seems not only able to distinguish authentic Caesarian material from non-authentic writings, but arguably also differentiates between a ‘pure’ Caesarian style and the mixed style resulting from e.g., the general’s dependence on pre-existing briefs by legates.

“Real”, as opposed to:
Fake? Misattributed? Impure?

Authenticity criticism, which can take many forms is vital to producing a solid, trustworthy scholarly edition. You have to know what you are selling to your audience.

Stylometry

- Quantitative study of writing style
- Style <=> meta-data
 - Authorship (authorship attribution)
 - Date (stylochronometry)
 - Text variety (genre studies)
 - ...
- Large community in Digital Humanities
 - Reasonably well organised, institutionalised

The Evolution of Stylometry in Humanities Scholarship

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Abstract

This paper traces the historical development of the use of statistical methods in the analysis of literary style. Commencing with stylometry's early origins, the paper looks at both successful and unsuccessful applications, and at the internal struggles as statisticians search for a proven methodology. The growing power of the computer and the ready availability of manageable texts are transforming modern stylometry, which has captured the attention of the media. Stylometry's interaction with more traditional literary scholarship is also discussed.

1. Introduction

The successful uncovering of Joe Klein as author of *Primary Colors* by Don Foster, the coverage by CBS TV of the UCLA conference in 1996 discussing the attribution of *A Funeral Elegy*, Robert Matthews' thoughtful articles in *Newsweek* and *The Sunday Telegraph* (see, for example, Matthews, 1994), and the request by the BBC for the Bristol Stylometry Research Unit to investigate the authorship of the 'Cassandra' letters in *Tribune* followed by footage of Richard Forsyth and myself on their *Newsnight* programme are examples of how stylometry—the statistical analysis of literary style—has begun to intrigue the media. Indeed, the age of 'pop' stylometry could now be with us.

Not all such publicity has been necessarily good, however. Channel 4's *Sister-legal* programme unmasked flaws in the reliability of Andrew Morton's so-called 'census' technique, which had been used in UK courts in a number of high-profile criminal cases, and the Shakespeare scholar Stanley Wells recently was moved to write in the *Times Literary Supplement*:

'Most people who make a profession of the study of literature do so because they have an artistic rather than a scientific bent. They are, to put it simply, better at English than at Maths. But the investigation of authorship of disputed and apocryphal works relies increasingly on statistical tests that take their exponent into the realms of higher mathematics. Their works are packed with tables, charts and statistical analyses which many of those interested in the works investigated have neither the inclination nor even the intellectual ability to understand, let alone to assess.' (Wells, 1996).

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Literary and Linguistic Computing, Vol. 13, No. 3, 1998

What, then, does stylometry seek to do? It certainly does not seek to overturn traditional scholarship by literary experts and historians, rather it seeks to complement their work by providing an alternative means of investigating works of doubtful provenance. At its heart lies an assumption that authors have an unconscious aspect to their style, an aspect which cannot consciously be manipulated but which possesses features which are quantifiable and which may be distinctive.

Bailey (1979) lists the general properties which quantifiable features of a text should possess: 'They should be salient, structural, frequent and easily quantifiable, and relatively immune from conscious control.' By measuring and counting these features, stylometrists hope to uncover the 'characteristics' of an author.

The two primary applications of stylometry are attributional studies and chronological problems, and Laan (1995) has provided a sound exposition of the rationale behind such applications. Laan points out that these applications seem to be based on seemingly contradictory premises, with attributional studies claiming that the unconscious aspect of an author's style remains fixed whilst chronological studies claim that stylistic features develop rectilinearly during the course of an author's life. These claims may not be incompatible; the choice of features is the overriding concern. With attributional problems, it is certainly wise to work within the same genre when faced with a list of candidate authors for a disputed work and to work within as close a time period as possible when selecting appropriate 'control' authors. Genre effects generally will supersede authorial features in the discrimination process.

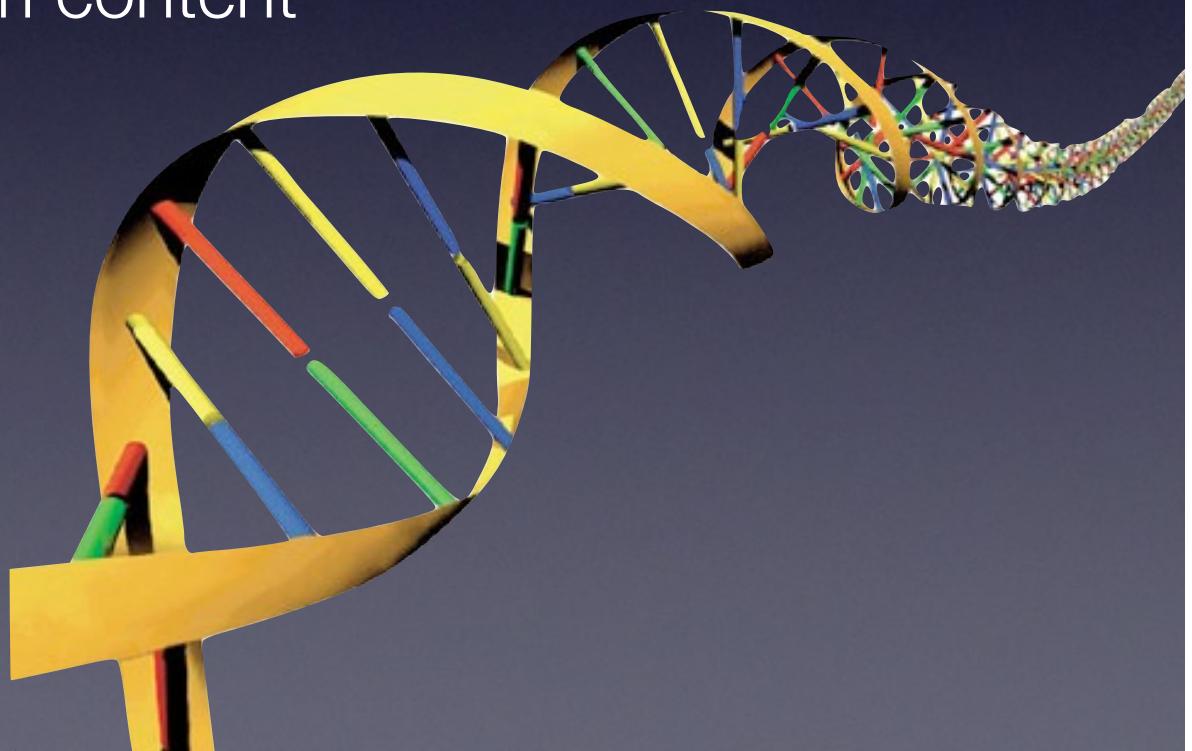
The major problem inhibiting stylometry's acceptance within humanities scholarship is that, as yet, there is no consensus as to correct methodology or technique. Rudman (1997) provides a perceptive analysis of this problem and illustrates well how, for every method that 'works', there soon appear counter-arguments pointing out crucial flaws. A methodology successful for one attributional problem does not necessarily 'work' for another. Practitioners search for the 'holy grail' of stylometry, a technique beyond reproach which may be applied successfully to all genres, languages, and eras.

The historical development of stylometry is reflected in the choice of quantifiable features used as authorial discriminators. Lexical features have predominated, yet this decade has seen the application of syntactic and semantic features to attributional problems, allied to the enormous growth in computing power and the

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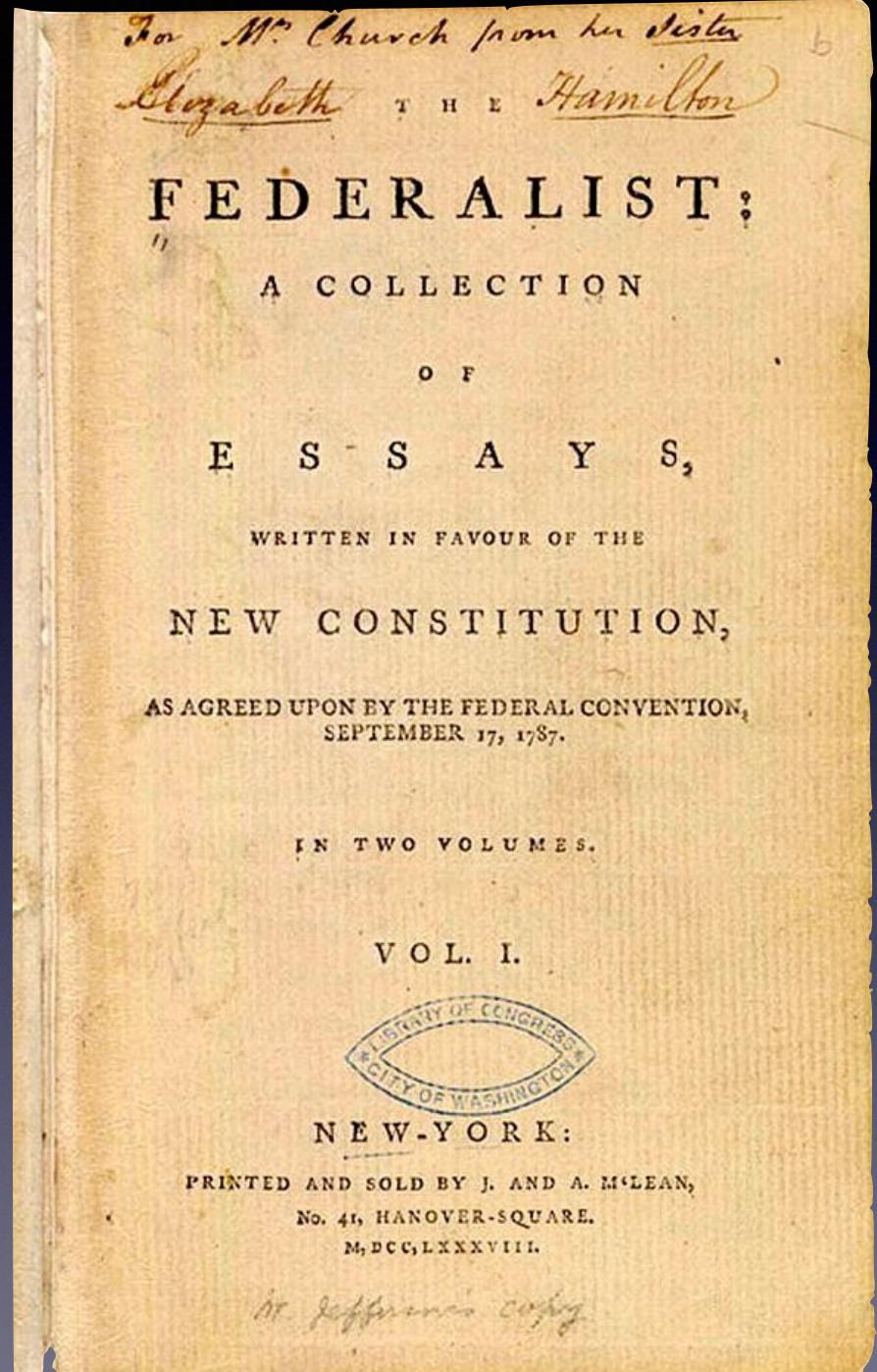
Authorship Attribution

- Stylistic DNA / Finger print
- **Stylome** (Van Halteren et al. 2005)
- Separate style from content
- (Tendentious)



Function words

- Small ‘content-free’ morphemes (the, of, an, ...)
- Frequent in all authors
- Cross-topic attribution
- Content-independent
- Idea attributed to Mosteller and Wallace (1960s)



Advantage?

Many observations
All authors, same set
Relatively content-independent



Count the number of f's on
the following slide...

Finished files are the result
of years of scientific study
combined with the experience
of many years.

How many?

Do we process functors
‘unconsciously’?

Finished files are the result
of years of scientific study
combined with the experience
of many years.

Which text is on the
following slide?



**PARIS
IN THE
THE SPRING**

So?

Difficult to spot errors...

Memory & Cognition
1977, Vol. 5 (6), 636-647

Detection errors on *the* and *and*: Evidence for reading units larger than the word

ADAM DREWNOWSKI
Rockefeller University, New York, New York 10021

and

ALICE F. HEALY
Yale University, New Haven, Connecticut 06520
and Haskins Laboratories, New Haven, Connecticut 06511

In five experiments, subjects read 100-word passages and circled instances of a given target letter, letter group, or word. In each case subjects made a disproportionate number of detection errors on the common function words *the* and *and*. The predominance of errors on these two words was reduced for passages in which the words were placed in an inappropriate syntactic context and for passages in which word-group identification was disturbed by the use of mixed typecases or a list, rather than a paragraph, format. These effects for the word *and* were not found for the control word *an*. These results were taken as evidence that familiar words are

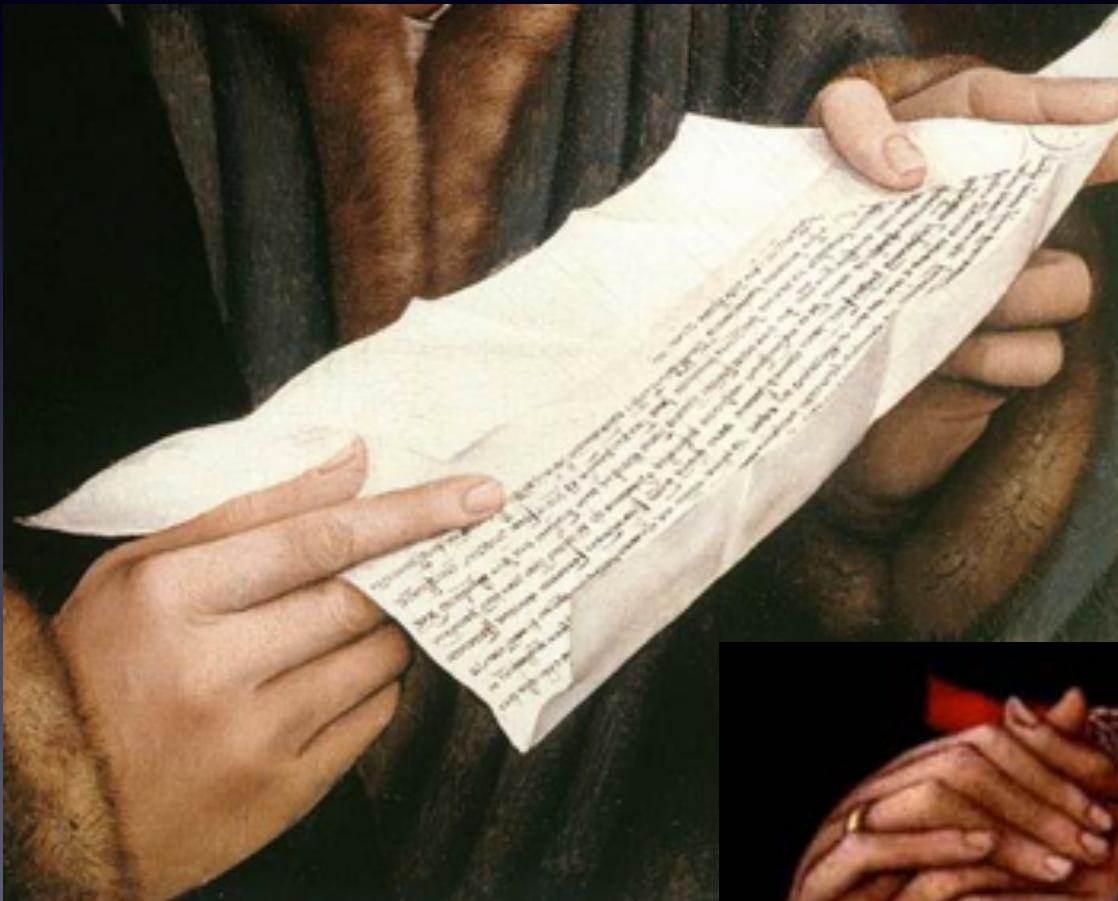
Unimportant?

Aoccdrnig to a rscheearch at Cmabrigde
Uinervtisy, it deosn't mttaer in waht oredr the
Itteers in a wrod are, the olhy iprmoatnt tihng is
taht the frist and lsat Itteer be at the rghit pclae.
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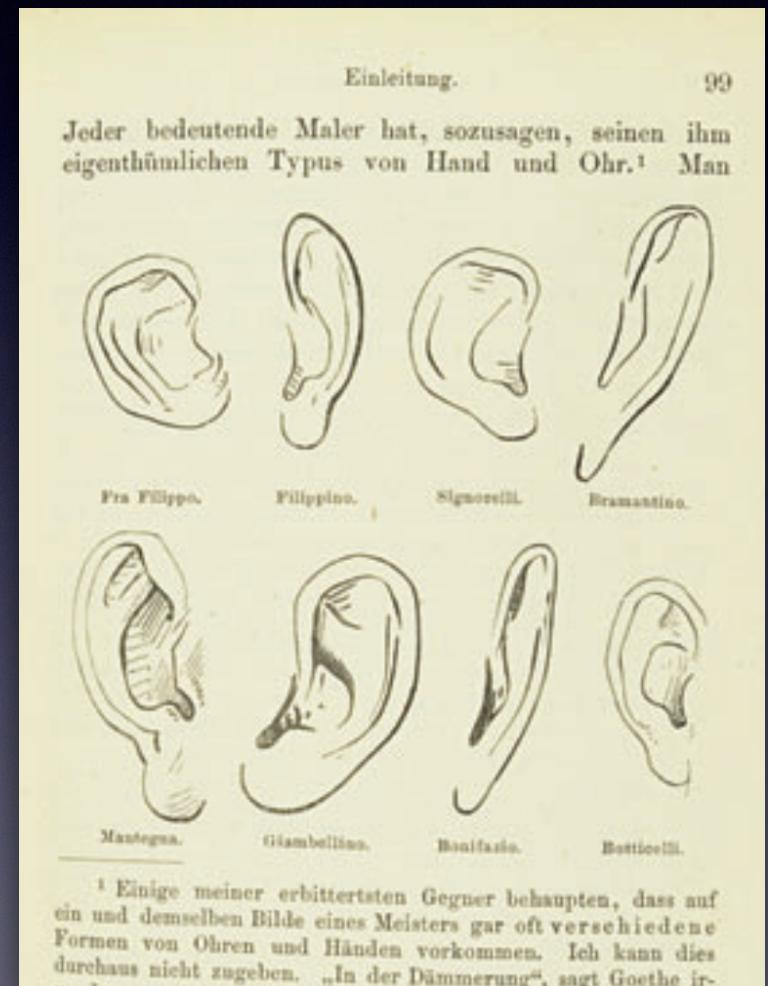
Parallel in art history

Morelli (1816–1891)



“Stylistic” analysis

- Morphological, visual inspection
- Pioneered by Giovanni Morelli (late 19C)
 - *Grundformen*
 - Ears and hands >< “content”
- Surprisingly similar to ‘function words’
 - Interesting to trace in other fields
 - E.g. Minio-Paluello, “particle method”
- Hardly any quantification for now?



Major difference

- Hard to compare because of “materiality”
- Authenticity means different things in arts and literature:
 - a late copy of Shakespeare can still be “real”
 - a copy of a Picasso, however perfect, cannot
- Cf. Walter Benjamin on “authenticity”

