

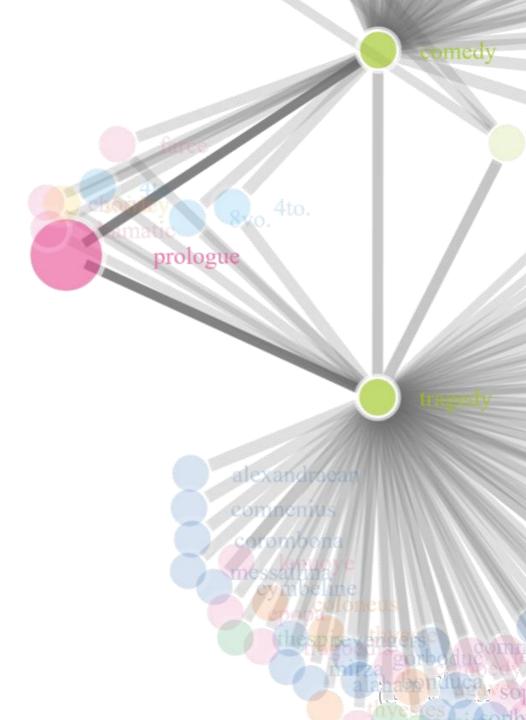
# Outline of session:

• What is Corpus Linguistics?

Why is it useful?

• Specific concerns for historical texts and creation of historical corpora

Hands-on element

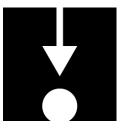


# What is corpus linguistics?

- Established method in linguistics
- Digital method used to study large volumes of text



'Corpus' = body



- Specialist software
  - E.g. CQPweb (Andrew Hardie), AntConc (Laurence Anthony), SketchEngine, #LancsBox and many others

# Theoretical grounding of corpus linguistics:

- 'You shall know a word by the company it keeps' (Firth)
- Usage-based to look for patterns in language use
- Interest in how the language 'functions' i.e. how it is used in 'real language examples', rather than how it could be used ('formal')

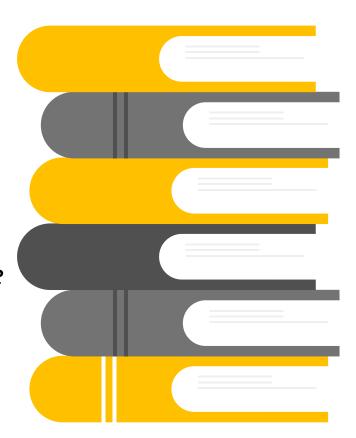


# Why is corpus linguistics useful?

- Typically based on counting features to tell us more about linguistic phenomenon - quantitative
- Widely used in Digital Humanities
- Provide different perspectives on texts:

'Corpus analysis offers a 'surface' reading, a glimpse of the panoramic wide vista of a word or a concept across fragments of texts' (Findlay 2018)

Can be used to confirm pre-existing literary findings/theory



# Things we need:

- A corpus
  - Pre-built or build your own!
  - We're going to focus on using pre-built but can discuss building our own if of interest to group
- A research question
- Appropriate software
- Search strings/terms





# Historical Texts and their challenges

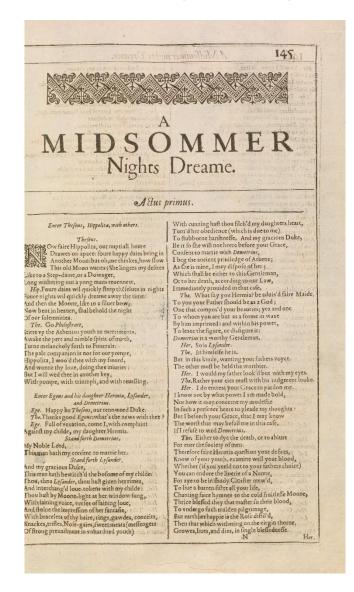
# Some issues...

- 1. Converting texts (inc. manuscripts) to a machine-readable format
  - a) Keying
  - b) OCR
  - c) Standardising spellings (where appropriate)
  - d) Grammatical tagging
- 2. Precision vs recall

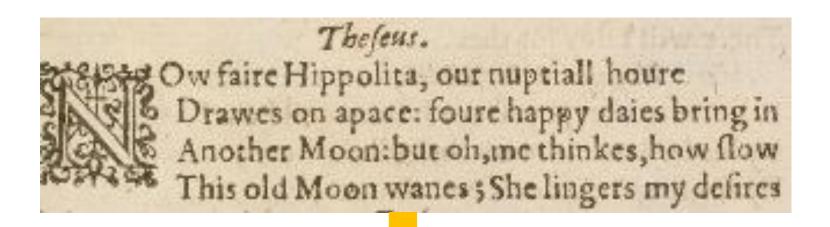


# Converting texts

# An issue of complexity









**ORIGINAL** 



EEBO-TCP

Now faire Hippolita, our nuptiall hower Draws on apase: fower happy daies bring in An other Moone: but oh, me thinks, how slow This old Moone <u>waues</u>! She lingers my desires,



CQPweb

Now fair Hippolyta, our nuptial hour Draws on apace: four happy days bring in Another Moon: but oh, me thinks, how slow This old Moon wanes; She lingers my desires MANUAL KEYING (TRANSCRIPTION)



(STANDARDISED USING VARD2)

#### **ORIGINAL**



**OCR** 

here the words deserve the emphasis of italics—"even spies can't get the necessary travel permits." The remark is so shocking that it is difficult to sort out its full implications. It has always been assumed that the twin duties of a spy were, first to provide himself with a full cargo of forged papers, among which a mere travel permit would be an inconsiderable detail, knocked off, as it were, in a matter of moments, and, second, to extract genuine papers from other people. And if he cannot perform the first, and less difficult, task, how can he ever proceed with the second?

It is indeed a poor spy who cannot even get to the scene of his activities, and the cannot get to the scene of his activities are directed towards cating one cannot get to the scene of his activities, and the cannot get to the scene of his activities, and the cannot get to the scene of his activities are directed towards cating one cannot get to the scene of his activities and the cannot get the department has an authorized complement is

get to the scene of his activities, and the cal men outside of the service. The degree if desperate plea of an eager junior, turned back at his own station by a ticket-collector sents merely the general shortage of highly service which reposents the sents merely the general shortage of highly service which reposents the service which repose the normally employed in scrutinizing the degree of undermanning which is a direct residates on suburban season-tickets, that he of the Government providing standards would willingly be parachuted into the remuneration outside the service greatly appropriate territory would be hardly excess of those they provide inside is mere likely to obtain either sympathy or employment.

The complexity and variety of all that the modern spy needs to pass as a citizen of the modern welfare State may explain the pusillanimity implied in the conductor's Sir,-As an ex-Civil servant and there

STANLEY MAYNE, General Secretar Institution of Professional Servants. 17, Hans Piace, S.W.1, Jan. 9.

dog-the customer. Caveat emptor applies only to the public. The retailer will cancel orders or return unsaleable goods (regardless of whether they were ordered on sale or return or not) because he is the man who sets the trap and a trap baited with unpalatable cheese is a waste of time and money for all concerned.

Once, however, this different relationship is understood, and the intensely competitive conditions which have produced it are realized, the American retailer will be found to be more imaginative and more

just over 10 years in terms of general usiness activity, with Arizona and Caliornia next. In growth of population alifornia, Oregon, and Washington lead, hile in the centre of the country, in the gricultural states in the Middle West, here has been a drop in population.

#### AREAS OF EXPANSION

These developments, if properly undertood, can be of immense value to the ritish exporter. The areas where expanon, both of population and industrial ctivity, has been greatest are those which in be approached by sea; they are those here the lower freight rates on British essels reduce the disadvantages of the ritish manufacturer compared with the anufacturer in the north-east or Midule Vest, and may in some cases, if rates tariff are sufficiently reduced, give im a positive advantage. They are also te areas where resentment at "eastern nperialism" is greatest and where, thereore, there is little, if any, more resistance British goods than to goods from the dustrial north-east.

The Far West is becoming every year tore self-sufficient and no longer has to import " from the east the finished goods

Times Digital **Archive** 

"Exports to America." *Times*, 13 Jan. 1950, p. 5. The Times Digital Archive. link.gale.com/apps/doc /CS16992813/TTDA?u= unilanc&sid=bookmark -TTDA&xid=7e083e85. Accessed 31 May 2022.



spoilt and pampered individual.

But to do business with him it is necessary to treat him as he is used to being treated by his domestic suppliers.

The terms are set by him-they are the terms on which he is willing to buy , not those on which his supplier would like to sell .

There is no " way we have always done business .

"There is, indeed, an entirely different relationship between manufacturer, wholesaler, and retailer in the United States from that which exists in other countries .

Whereas in Europe dog is inclined to eat dog all down the line, each party being satisfied when he has sold his goods to the next in the chain , there is , in the United States , a partnership whose combined activities are directed towards eating one dog-the customer .

Caveat emptor applies only to the public .

The retailer will cancel orders or return unsaleable goods ( regard- less of whether they were ordered on sale or return or not ) because he is the man who sets the trap and a trap baited with unpalatable cheese is a waste of

#### **CQPweb**

**Times Online:** 1950s

Text:

TMZ 1950 01 13

Date: 1950

Ellen Roberts (@E Roberts19)

## **OCR** issues

**ORIGINAL** 



OCR (!)

in the course of the evening's Entertainments will be prewiif be f nted, The amazing Exhibition of the DANCING DOGS. l, and From France and Italy, by Sign. and Signora Maifa. This Exhibition will conclude with a Variety of Dogs e Perdreffed En Militaire, befieging a Town; and two Bull Wed-Dogs, one of them is an English Bull Dog, that rather the St. than quit his hold fuffers himfelf to be drawn Thirty ; and Feet high, whilst the Machine is surrounded with Fireice, on Works, reprefenting a heavy Difcharge of Small Arms k, 'till and Artillery. ming, To which will be added a new Pantomime, called, -HARLEQUIN'S REVENGE: s Cele-Or, The Camp in an Uproar. their

employed 814
ported were gra
great beams,
tails, &c.
Copenbagen,
Norway mention
no ways extrao
that quarter has
Vienna, April
stadt, that on
tion (or enrolli

and that they a

frontier regimes

# Times Digital Archive

"ROYAL SOCIETY of MUSICIANS. Under the Patronage, and by Command of their." *Times*, 6 May 1785, p. 1. *The Times Digital Archive*, link.gale.com/apps/doc/CS169 08454/TTDA?u=unilanc&sid=b ookmark-

TTDA&xid=6a7ebe3c. Accessed 31 May 2022.



#### L'-tYT.

Wiih various'forpirifrg EaCperimeats, particularly the Sympathetic Clock, Rings, Box, and Pigeon, Wateh, Orange, &c.

Bc. - In the courfS of thelevening 's Entertainments will be pre- S uted , The amazing Exhibition of the D A N C I N G DO G S .. Ftem France and Italy , by Sign .

and Signora Maifa .

This Fxhibition will coticlude with a Variety of Dogs dreffed E. IdiliC; ire, befieging a Town; 2nd two Bell Dogs, one of them is an EngliSh Bull **Dog**, that rather that, quit his hold fuffers hinifelf to be drawn Tisirty Feet high, NvhilSt the Machinre is furrounded with FireWVorks, reprefedtineg a heavy DiScharge of Small Arms and Artillery.

To which will be added a new Pantomime , called , - HARLEQUIN 's REVENGE : Or , The Camp in an Uproar. tVith Additions and .

Alterations , particularly a new Scone of HARLEQtIN 's Marriage .

Boxes 3s; Pitt as.

Gall. is .

Side Gd'eries 6d.

Doors to be opened at Half paSt Five , to begin at Half paft

#### CQPweb

Times Online: 1780s Text: TMZ 1785\_05\_06

Date: 1785

atc. 1705

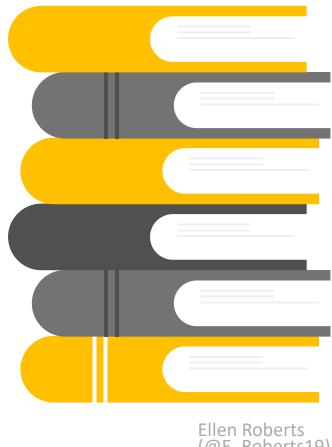
Ellen Roberts (@E\_Roberts19)

# Why a 'clean' text is important:

Most corpus software relies on 'string-matching'

 Computers are 'dumb' and don't understand what we are looking for and to 'look' for alternatives

- E.g. if we search for 'dog', the computer will search for a 'd' followed by an 'o' then a 'g'
  - Sees words as 'strings' or consecutive characters
  - Doesn't know that it constitutes a type of animal



# E.g. 'dog'

#### Noun or verb?

### Quick search results

Showing 1-4 of 4 results in 4 entries

Widen search? Find 'dog' in: » phrases (544) » definitions (1649) » etymologies (424) » quotations (9753) » full text (5378)

View as: List | Timeline

Sort by: Entry | Frequency | Date

OE

?1550

1519

1835

......

#### 1. dog, n.1 View full entry

...A domesticated carnivorous mammal, Canis familiaris (or C. lupus familiaris), which typically has a long snout, an acute sense of smell, non-retractile claws, and a barking, howling, or...

#### 2. dog, n.<sup>2</sup> View full entry

...In oaths and asseverations: = god...

#### 3. dog, v.<sup>2</sup> View full entry

...transitive. To follow like a dog on the heels of; to track (a person, or his or her trail, footsteps, etc.) closely and persistently. In extended use: to pursue doggedly, esp....

#### 4. dog, v.2 View full entry

...transitive (chiefly in passive). Used as a euphemism for 'damn'. ...

#### Spelt how?



Breakdown position:

#### OED (Eng) Variants in EEBOv3

Query "(doggue|dogge|dogg|dogg|dogg|doog|dooge)" returned 31,771 matches in 7,930 different texts (in 1,202,214,511 words [44,422 texts]; frequency: 26.427 instances per million words)

Showing frequency breakdown of words in this query, at the query node; there are 8 different types and 31,771 tokens at this concordance position. [9.254 seconds]

Show: Frequency breakdown of words only

15	Node v	Show: Trequency breakdown of words only	(for words)	
No.	Query result	No. of occurrences	Percent	
1	Dog	30988	97.54%	
2	doge	685	2.16%	
3	Dogg	39	0.12%	
4	doggue	23	0.07%	
5	dogge	17	0.05%	
6	dogue	13	0.04%	
7	Doog	4	0.01%	
8	dooge	2	0.01%	

Download frequency breakdown table

#### 112

## Much adoe about Nothing.

Verges. If you heare a child crie in the night you must call to the nurse, and bid her still it.

Watch. How if the nurse be asseepe and will not

Dog. Why then epart in peace, and let the childe wake her had been it baes, will neuer answere a calfe when he bleates.

Verges. 'Tis verie true.

Dog. This is the end of the charge: you constable are to present the Princes owne person, if you meete the Prince in the night, you may state him.

Verges. Nay birladie that I thinke a cannot.

Dog. Fine shillings to one on't with anie man that knowes the Statues, he may staichim, marrie not without the prince be willing, for indeed the watch ought to offend no man, and it is an offence to stay a man against his will.

Verges. Birladie Ithinkeit be fo.

Dog. Ha, ah ha, well masters good night, and there be anie matter of weight chances, call vp me, keepe your fellowes counsailes, and your owne, and good night, come neighbour.

blouds, betweene foureteene & fine & thirtie, sometimes fashioning them like Pharases souldiours in the rechie painting, sometime like god Bels priests in the old Church window, sometime like the shauen Hercules in the smircht worm eaten tapestrie, where his cod-peece seemes as massie as his club.

Con. All this I see, and see that the fashion we are sout more apparrell then the man; but are not thou thy selfe giddie with the fashion too that thou hast shifted out of

thy tale into telling me of the fashion?

Bor. Not so neither, but know that I have to night wood Margaret the Lady Heroes gentle-woman, by the name of Hero, she leanes me out at her mistris chamber-vvindow, bids me a thousand times good night: I tell this tale vildly. I should first tell thee how the Prince Claudio and my Master planted, and placed, and possessed by my Master Don lohn, saw a far off in the Orchard this amiable incounter.

Con. And thought thy Margaret was Hero?

Bor. Two of them did, the Prince and Claudio, but the diuell my Master knew she was Margaret and partly by his oathes, which first possest them, partly by the darke night which did deceive them, but chiefely, by my villa-

Even as character abbreviations – a search for 'dog' would return this too, unless we account for it in our digital version of the text



# A possible solution?: Corpus Annotation

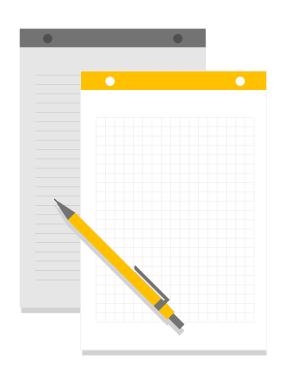


## What is annotation?

• 'It can be defined as the practice of adding interpretative, linguistic information to an electronic corpus'

• 'Annotation can also refer to the end-product of this process: [...] the electronic **representation** of the language material itself...'

Geoffrey Leech (1997:2)



### In other words...

Annotation is another tool in the corpus toolbox

- Annotation consists of mark-up tags added to the text
  - For both text and word-based levels



## Taggers:

- Examples of taggers:
  - CLAWS (Constituent Likelihood Automatic Word-tagging System) – GRAMMAR/WORD CLASS
  - Stanford tagger GRAMMAR
  - VARD (Variant Detector) SPELLING
  - USAS (UCREL Semantic Analysis System) SEMANTICS

The Encyclopedia of Shakespeare's language project on CQPweb - **Enhanced** Shakespearean Corpus



# Tags 'in the wild':

```
<text title="A MIDSOMMER Nights Dreame." id="MND">
     <act n="1" title="Actus primus" id="MND 1">
     <scene n="1" type="scene" title="" id="MND 1 1">
     Enter
                 VV0
                          enter
                                      M1
                                              VERB
                                                           enter VERB
                                                                           Enter
                 NP1
                                      A4:1
                                              SUBST
                                                           theseus SUBST
     Theseus
                          theseus
                                                                           Theseus
                 YCOM
                         PUNC
                                      STOP
                                              PUNC STOP
                 NP1
                                      Z99
                                              SUBST
                                                           hippolyta SUBST Hippolita
    Hippolyta
                         hippolyta
11
                 YCOM
                         PUNC
                                      STOP
                                              PUNC_STOP
12
     with
                 IW
                         with
                                      Z5
                                              PREP
                                                          with PREP
                                                                           with
                                              SUBST
     others
                 NN2
                         other
                                      A6:1
                                                          other_SUBST
                                                                           others
                 YSTP
                          PUNC
                                      STOP
                                              PUNC STOP
14
15
     </stage>
     <u who="MND Theseus" label="Theseus.">
17
     <1b/>
     Now
                 RT
                                      T1:1:2
                                              ADV
                                                           now ADV
                                                                           Now
                          now
     fair
                 IJ
                          fair
                                              ADJ
                                                           fair_ADJ
                                                                           faire
                                      G2:2
                 NP1
                                      Z99
                                              SUBST
     Hippolyta
                          hippolyta
                                                           hippolyta_SUBST Hippolita
                                      STOP
                 YCOM
                          PUNC
                                              PUNC STOP
21
                 APPGE
                                      Z8
                                              PRON
                         our
                                                           our PRON
     our
                                                                           our
    nuptial
                 IJ
                                      54
                                              ADJ
                                                          nuptial ADJ
                                                                           nuptiall
                          nuptial
    hour
                 NNT1
                                      T1:3
                                              SUBST
                                                          hour_SUBST
                                                                           houre
                          hour
25
     <1b/>
     </u>
     <u who="MND Hippolyta" label="Hip.">
29
     Four
                 MC
                          four
                                      N1
                                              ADJ
                                                           four ADJ
                                                                           Foure
     days
                 NNT2
                          day
                                      T1:3
                                              SUBST
                                                          day SUBST
                                                                           daies
     will
                         will
                                      T1:1:3
                                             VERB
                                                          will VERB
                 VM
                                                                           wil
```

# Tags 'in the wild':

dog Noun or verb?

Destruction straight shall dog them at the heels





Destruction\_NN1 straight\_RR shall\_VM

dog\_VVI

them\_PPHO2 at\_II the\_AT heels\_NN2

Richard II (5: 3)

Ellen Roberts (@E\_Roberts19

## Annotation 'in the wild':

ESC: First Folio Plus	(pre-final version	): powered by CQPweb
-----------------------	--------------------	----------------------

Metadata for ESC: First Folio Plus (pre-final version)			
Corpus title	ESC: First Folio Plus (pre-final version)		
CQPweb's short handles for this corpus	shakfinc006 / SHAKFINC006		
Total number of texts in corpus	38		
Total word tokens in all corpus texts	1,038,509		
Word types in the corpus	24,942		
Standardised type:token ratio (1,000-token basis)	0.3759 types per token		
Non-standardised type:token ratio	0.0240 types per token		

#### Text metadata and word-level annotation

	Approximate date of first production, in two bins		
	Simple genre categories		
The database stores the following information for each text in the corpus:	Genre categories, taking 'problem plays' into account		
	Play code		
	Source		
The <b>primary</b> classification of texts is based on:	Simple genre categories		
	Part-of-speech tag ( <u>C6 tagset</u> )		
	Lemma		
	Semantic tag ( <u>USAS tagset</u> )		
Words in this corpus are annotated with:	Simple POS (Oxford Simplified Tagset)		
	Tagged lemma		
	Full USAS analysis (USAS tagset)		
	Unregularised spelling		
The <b>primary</b> word-level annotation scheme is:	Part-of-speech tag		

Textual annotation

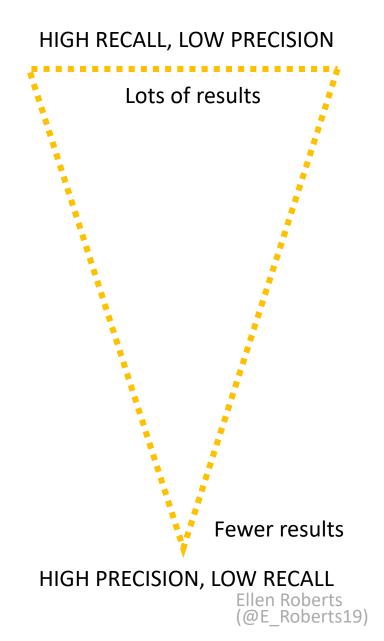
Word-level annotation



Ellen Roberts (@E\_Roberts19)

## Precision vs. recall

- Depends on our aims and quality of data
  - E.g. Use 'dog' in early modern English generally (broad q) vs. as a verb in Shakespeare (narrow q)
- For 'messy' data, high recall or GENERAL RESULTS may be desired
  - We might want to input all variant spellings in, and then filter the corpus results
- For 'clean' data, high precision or SPECIFIC RESULTS may be desired
  - We can make use of highly tagged corpora to filter results as an output from the corpus





# Some preliminaries:

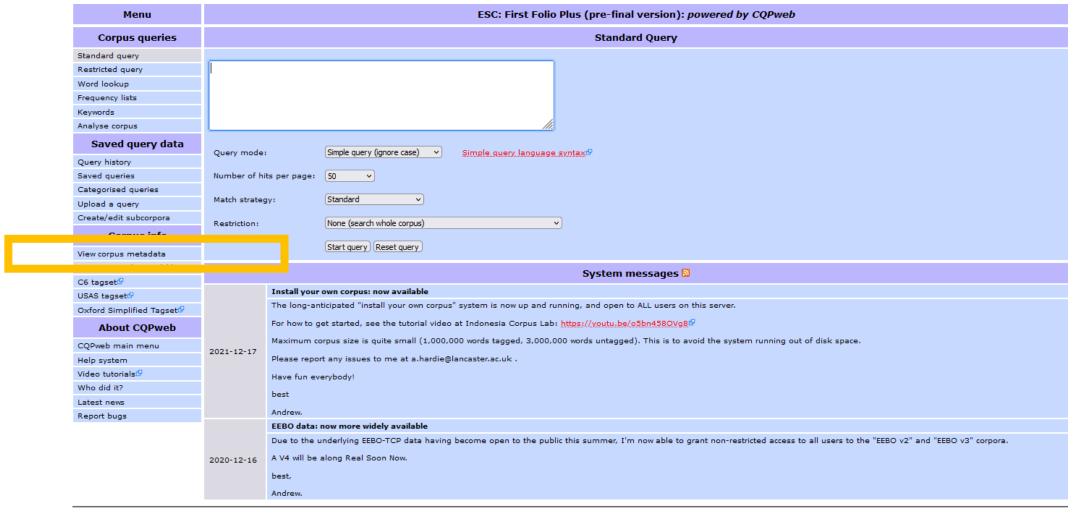
Session links available at: github.com/EllenRoberts/QMLHS

 Sign up to a CQPweb account, using the instructions outlined on GitHub.

• In addition, sign up to have the Encyclopedia of Shakespeare's Language data added to your CQPweb library.



riorence Early English Newspapers	Heisinki Corpus (Diacoronic)	нізтРор	
Lake District Corpus: 28GS	Lancaster Newsbooks Corpus (1654 part)	Paston Letters Vol 1	
Sample of ``Phil"	Shakespeare First Folio		
	Enhanced Shakespearean Corpus		
ESC: Comparative Plays (pre-final version)	ESC: EEBO-TCP Segment (pre-final version)	ESC: First Folio Plus (pre-final version)	
ESC: Poems (pre-final)	ESC: Quartos (pre-final version)		
	Historical News Text		
British Library C19 News: Belfast Newsletter	British Library C19 News: The Era	British Library C19 News: Glasgow Herald	
British Library C19 News: Hampshire/Portsmouth Telegraph	British Library C19 News: Ipswich Journal	British Library C19 News: Liverpool Mercury (early period)	
British Library C19 News: Liverpool Mercury (mid period)	British Library C19 News: Liverpool Mercury (late period)	British Library C19 News: Northern Echo	
British Library C19 News: Pall Mall Gazette	British Library C19 News: Reynold's Daily	British Library C19 News: Western Mail	
Times Online: 1780s	Times Online: 1790s	Times Online: 1800s	
Times Online: 1810s	Times Online: 1820s	Times Online: 1830s	
Times Online: 1840s	Times Online: 1850s	Times Online: 1860s	



Menu	ESC: First Folio Plus (pre-final version): powered by CQPweb  Metadata for ESC: First Folio Plus (pre-final version)		
Cornus queries			
Standard query	Corpus title	ESC: First Folio Plus (pre-final version)	
		shakfinc006 / SHAKFINC006	
Word lookup	Total number of texts in corpus	38	
Frequency lists	Total word tokens in all corpus texts	1,038,509	
Keywords	Word types in the corpus	24,942	
Analyse corpus	Standardised type:token ratio (1,000-token basis)	0.3759 types per token	
Saved query data	Non-standardised type:token ratio	0.0240 types per token	
Query history	Text metadata and word-level annotation		
Saved queries		Approximate date of first production, in two bins	
Categorised queries		Simple genre categories	
Upload a query	The database stores the following information for each text in the corpus:	Genre categories, taking 'problem plays' into account	
Create/edit subcorpora		Play code	
Corpus info		Source	
View corpus metadata	The primary classification of texts is based on:	Simple genre categories	
Corpus manual unavailable		Part-of-speech tag ( <u>C6 tagset</u> )	
C6 tagset <sup>©</sup>		Lemma	
USAS tagset®		Semantic tag ( <u>USAS tagset</u> )	
Oxford Simplified Tagset®	Words in this corpus are annotated with:	Simple POS (Oxford Simplified Tagset)	
		Tagged lemma	
About CQPweb		Full USAS analysis (USAS tagset)	
CQPweb main menu		Unregularised spelling	
Help system	The <b>primary</b> word-level annotation scheme is:	Part-of-speech tag	
Video tutorials			
Who did it?			
Latest news			
Report bugs			

CQPweb v3.3.15 © 2008-2021 You are logged in as user [efr5872]

Let's search for the word: 'will'

You	Your query "will" returned 5,182 matches in 38 different texts (in 1,038,509 words [38 texts]; frequency: 4,989.846 instances per million words) [0.081 seconds - retrieved from cache]				
<	<<	>> >  Show Page: 1			Show in random order Choose action
No	Text	Solution 1 to	50	Pag	ge 1 / 104
1	<u>1H4</u> 1H4_1_1	a twelvemonth old , And bootless t is to tell	you we	will	go : Therefore we meet not now . Then let me hear
2	<u>1H4</u> 1H4_1_1	to Jerusalem . Cousin , on Wednesday next , our Cou	ıncil we	will	hold At Windsor, and so inform the Lords: But come
3	<u>1H4</u> 1H4_1_1	be done , Than out of anger can be uttered . 1H4_Westmo	orland:I	will	my Liege . Exeunt Enter Henry Prince of Wales , Sir John
4	<u>1H4</u> 1H4_1_2	none . 1H4_Prince: What , none ? 1H4_Falstaff: No , not so n	nuch as	will	serve to be Prologue to an Egg and Butter . 1H4_Prince:Well ,
5	<u>1H4</u> 1H4_1_2	the wicked . I must give over this life	e, and I	will	give it over : and I do not , I am a
6	<u>1H4</u> 1H4_1_2	for he was never yet a Breaker of Proven	rbs : He	will	give the devil his due . 1H4_Poins: Then art thou damned for keeping
7	<u>1H4</u> 1H4_1_2	we may do it as secure as sleep	: if you	will	go , I will stuff your Purses full of Crowns : if
8	<u>1H4</u> 1H4_1_2	it as secure as sleep : if you wi	ill go , I	will	stuff your Purses full of Crowns : if you will not ,
9	<u>1H4</u> 1H4_1_2	I will stuff your Purses full of Crowns	: if you	will	not , tarry at home and be hanged . 1H4_Falstaff:Hear ye Yedward
10	<u>1H4</u> 1H4_1_2	and go not, I'll hang you for going . 1H4_Poi	ins:You	will	chops . 1H4_Falstaff:Hal , wilt thou make one ? 1H4_Prince:Who , I
11	<u>1H4</u> 1H4_1_2	1H4_Falstaff: Why, that 's well said. 1H4_Prince: Well, con	ne what	will	, I 'll tarry at home . 1H4_Falstaff: I 'll be a Traitor
12	<u>1H4</u> 1H4_1_2	John , I prithee leave the Prince & me a	alone, I	will	lay him down such reasons for this adventure, that he shall
13	<u>1H4</u> 1H4_1_2	those men that we have already waylaid , yourself	fandI,	<u>will</u>	not be there : and when they have the booty , if
14	<u>1H4</u> 1H4_1_2	shall we part with them in setting forth? 1H4_Poins:W	hy, we	will	set forth before or after them, and appoint them a place
15	<u>1H4</u> 1H4_1_2	wherein it is at our pleasure to fail; a	nd then	<u>will</u>	they adventure upon the exploit themselves , which they shall have no
16	<u>1H4</u> 1H4_1_2	set upon them . 1H4_Prince: Aye , but t is like the	hat they	will	know us by our horses , by our habits , and by
17	<u>1H4</u> 1H4_1_2	I 'll tie them in the wood, our vi	sors we	<u>will</u>	change after we leave them : and sirrah , I have Cases
18	<u>1H4</u> 1H4_1_2	to immask our noted outward garments . 1H4_Prince:But I do	ubt they	will	be too hard for us . $1H4\_Poins$ : Well , for two of them
19	<u>1H4</u> 1H4_1_2	reason, I 'll forswear Arms. The virtue of t	this Jest	<u>will</u>	be , the incomprehensible lies that this fat Rogue will tell us
20	<u>1H4</u> 1H4_1_2	this Jest will be , the incomprehensible lies that this fat	t Rogue	will	tell us , when we meet at Supper : how thirty at
21	<u>1H4</u> 1H4_1_2	my Lord . Exit Poins 1H4_Prince:I know you	all, and	<u>will</u>	awhile uphold The unyoked humour of your idleness: Yet herein will
22	<u>1H4</u> 1H4_1_2	will awhile uphold The unyoked humour of your idleness : Ye	t herein	will	I imitate the Sun, Who doth permit the base contagious clouds
23	<u>1H4</u> 1H4_1_2	offence a skill, Redeeming time, when men think	k least I	<u>will</u>	. Enter the King , Northumberland , Worcester , Hotspur , Sir
24	<u>1H4</u> 1H4_1_3	You tread upon my patience : But be	sure, I	will	from henceforth rather be myself, Mighty, and to be feared
25	<u>1H4</u> 1H4_1_3	Or you shall hear in such a kind from	n me As	will	displease ye . My Lord Northumberland , We License your departure with
26	<u>1H4</u> 1H4_1_3	King . 1H4_Hotspur: And if the devil come and roar for	r them I	will	not send them . I will after straight And tell him so
27	<u>1H4</u> 1H4_1_3	come and roar for them I will not send	them . I	will	after straight And tell him so : for I will ease my
28	<u>1H4</u> 1H4_1_3	I will after straight And tell him s	o : for I	will	ease my heart , Although it be with hazard of my head
29	<u>1H4</u> 1H4_1_3	Uncle . Enter Worcester . 1H4_Hotspur: Speak of Mortimer ?			
30	<u>1H4</u> 1H4_1_3				lift the downfall Mortimer As high in the Air , as this
31	<u>1H4</u> 1H4_1_3	mad 1H4_Worcester: Who struck this heat up after I was gone ? 1H4_Hots	pur:He	will	( forsooth ) have all my Prisoners : And when I urged
32	<u>1H4</u> 1H4_1_3	say 1H4_Worcester:Peace Cousin, say no more. An	d now I	will	unclasp a Secret book , And to your quick-conceiving Discontents , I
33	<u>1H4</u> 1H4_1_3	my purposes . Those Prisoners you shall keep . 1H4_Hotspur	:Nay, I	will	; that 's flat : He said , he would not ransom
34	<u>1H4</u> 1H4_1_3	Mortimer : Forbade my tongue to speak of Mortimer			•
35	<u>1H4</u> 1H4_1_3				easily be granted you, my Lord. Your Son in Scotland
36	<u>1H4</u> 1H4_1_3	it on . 1H4_Hotspur:I smell it : Upon my	life, it	will	do wondrous well . $1H4\_Northumberland$ :Before the game 's afoot , thou still





1H4 Poins:

1H4 Prince:

1H4 Prince:

1H4 Prince:

1H4\_Falstaff: Why , that 's well said .

1H4 Falstaff:

1H4\_Prince: I care not .

1H4 Falstaff:

You will chops .

1H4 Falstaff:

Hal, wilt thou make one?

Who, I rob? I a Theefe? Not I.

There 's neither honesty, manhood, nor good fellowship in thee, nor thou cam'st not of the blood-royall, if thou dar'st not stand for ten shillings.

Well then , once in my dayes Ile be a mad-cap .

Well, come what will, Ile tarry at home.

Ile be a Traitor then , when thou art King .

I care not .





Who, I rob? I a Thief? Not I.

There 's neither honesty, manhood, nor good fellowship

in thee , nor thou camst not of the blood royal ,

Well then , once in my days I 'll be a madcap .

if thou darst not stand for ten shillings .

Well, come what will, I'll tarry at home.

I 'll be a Traitor then , when thou art King .

1H4 Falstaff:

1H4 Prince:

1H4 Prince:

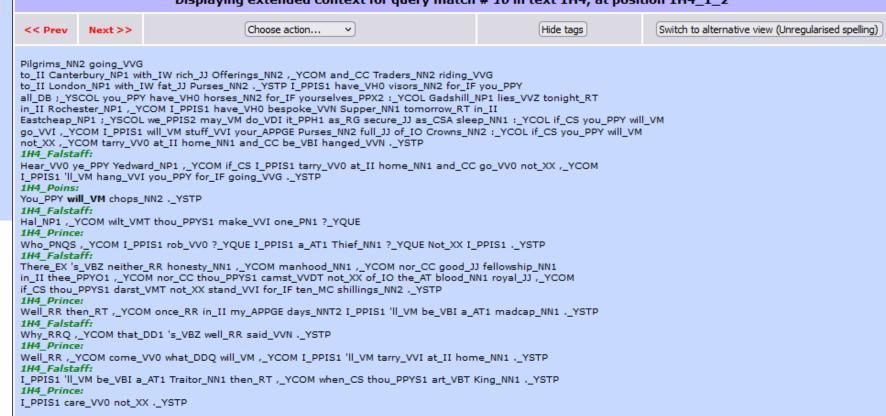
1H4 Falstaff:

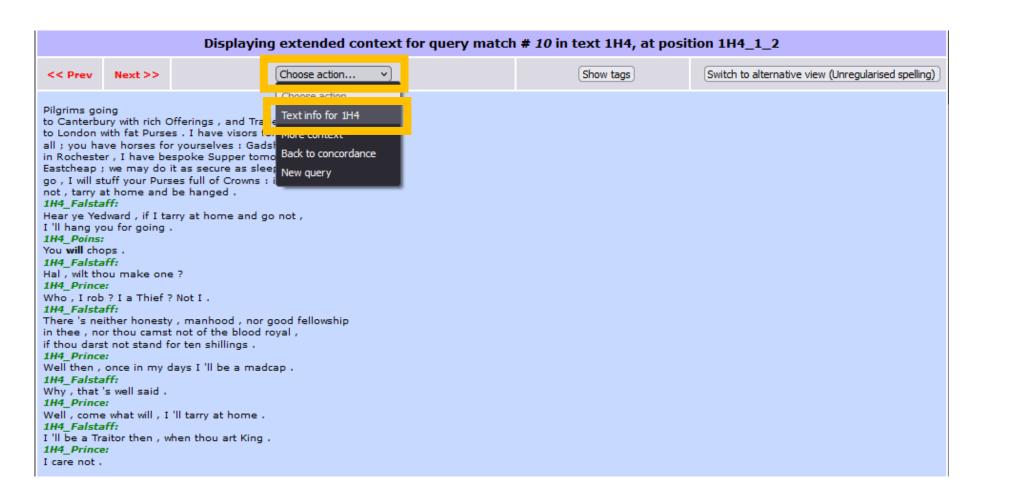
1H4 Prince:

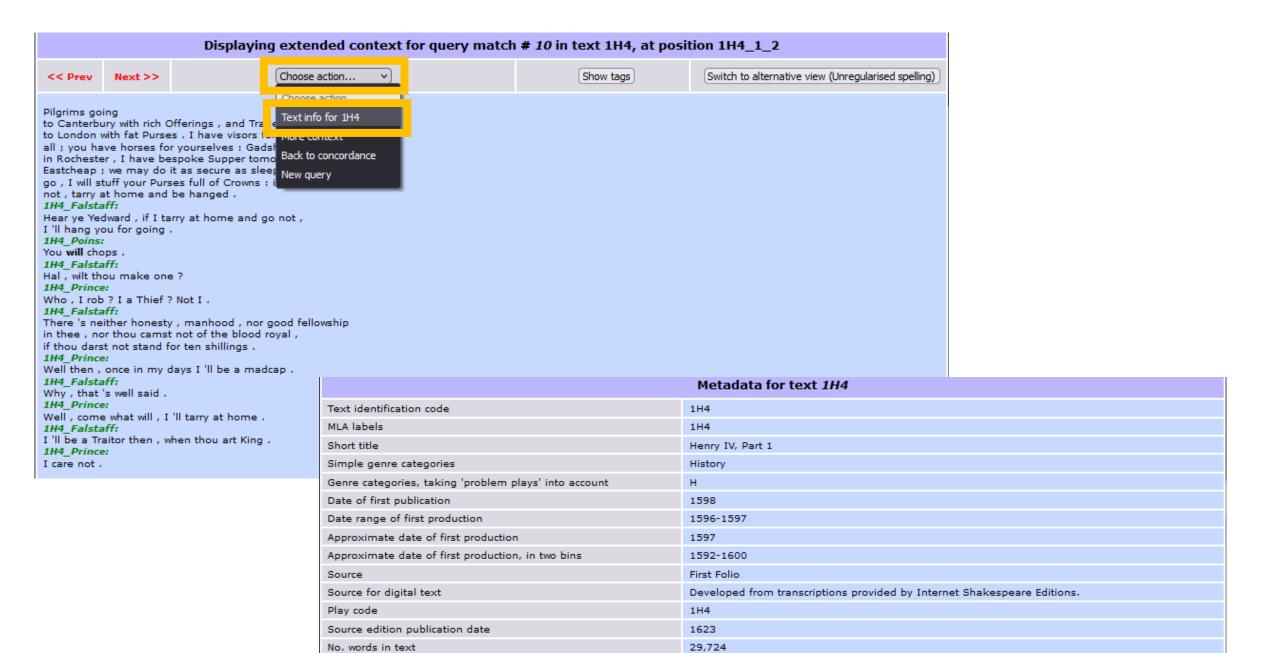
I care not .

1H4 Falstaff:

Why , that 's well said .







## More advanced queries

- Simple Query mode:
  - Search for exact words or phrases
    - E.g. cat
  - Queries using wildcard searches
    - E.g. ca\*t, ca?t, ca+t
  - Queries using POS tags
    - E.g. dog\_VV\*
  - Queries using lemmas (care with this depends on accuracy!)
    - E.g. {dog}
  - Queries using OR searches
    - E.g. (cat | dog)
- Using freq breakdown:

Quantifier	Explanation
*	Match 0 or more times
+	Match 1 or more times
?	Match 1 or 0 times

#### Ca\*t

No.	Query result	No. of occurrences	Percent
1	Canst	178	37.47%
2	Cast	110	23.16%
3	cat	33	6.95%
4	caught	33	6.95%
5	camst	31	6.53%

#### Ca+t

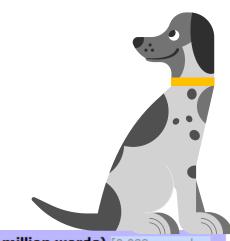
Ca	?

No.	Query result	No. of occurrences	Percent
1	Cast	110	95.65%
2	Cart	5	4.35%

No.	o. Query result No. of occurrences		Percent
1	Canst	178	40.27%
2	Cast	110	24.89%
3	caught	33	7.47%
4	camst	31	7.01%
5	Capulet	23	5.20%

# Uniting queries 1

- E.g. \*\_JJ\* dog
- In other words, any adjective preceding 'dog'



Yo	Your query "*_JJ* dog" returned 35 matches in 19 different texts (in 1,038,509 words [38 texts]; frequency: 33.702 instances per million words) [0.088 seconds - retrieved from cache]									
<	<<	>>	>	Show Page: 1	Line view		Show in random order	Choose action v		
No	Text		Solution 1 to 35 Page 1 / 1							
1	2H4 2H4_1_3			thyself to ca	ast him up . So , so , ( thou	common Dog	) didst thou disgorge Thy glutton bosom	of the Royal Richard,		
2	<u>2H4</u> 2H4_4_3			from curbed License plucks The mu	uzzle of Restraint; and the	wild Dog	Shall flesh his tooth in every Innocent . C	my poor Kingdom		
3	AYL AYL_1_1			becomes me for my good . AYL_Oliver: Get you with him , you old dog . AYL_Adam: Is old dog my reward : most true , I have						
4	$\underline{AYL} \ AYL \underline{1} \underline{1}$			good . AYL_Oliver:Get you with him , you old dog . AYL_Adam:Is old dog my reward : most true , I have lost my teeth in						
5	<u>CE</u> CE_3_2		and my heart of steel, she had transformed me to a Curtal dog, & made me turn in the wheel. CE_AntiphoSyracuse:Go hie thee					tiphoSyracuse:Go hie thee		
6	<u>CE</u> CE_5_1		venom clamours of a jealous woman, Poisons more deadly than a <u>mad dog</u> 's tooth. It seems his sleeps were hindered by thy railing							
7	<u>Cor</u> Cor_1_1		especially against Caius Martius . Cor_All: Against him first : He 's a very dog to the Commonalty . Cor_2Citizen: Consider you what Services he has done for							
8	<u>Cym</u> Cym_2_1		C	Cym_SecondLord: No my Lord; nor crop the ears of them. Cym_Clotten: Whoreson dog: I gave him satisfaction? would he had been one of						
9	<u>H5</u> H5_2_1			you shog off? I would have you	solus . H5_Pistol:Solus ,	egregious dog	? O Viper vile ; The solus in thy most ma	rvellous face		
10	<u>H5</u> H5_2_3			Straws, men's Faiths are Wafer-	Cakes, and holdfast is the	only Dog	: My Duck , therefore Caveto be thy Cou	nsellor . Go ,		

## Uniting queries 2

- E.g. \*\_JJ\* (dog|cat)
- In other words, any adjective preceding 'dog' OR 'cat'



Y	Your query "*_JJ* (dog cat)" returned 39 matches in 21 different texts (in 1,038,509 words [38 texts]; frequency: 37.554 instances per million words) [0.477 seconds]								
<	<<	>>	>  Show Page: 1 Clin	e view	Show in random order	Choose action v			
No	Text		Solut	tion 1 to 39 Pa	age 1 / 1				
1	<u>1H4</u> 1H4_3_1		and a moulten Raven, A couching Lion, and a	ramping Cat	, And such a deal of skimble-skamble Stuff, As	puts me			
2	<u>2H4</u> 2H4_1_3		thyself to cast him up . So , so , ( thou	common Dog	) didst thou disgorge Thy glutton bosom of the l	Royal Richard,			
3	<u>2H4</u> 2H4_4_3		from curbed License plucks The muzzle of Restraint; and the wild Dog Shall flesh his tooth in every Innocent. O my poor Kingdom						
4	AYL AYL_1_1		becomes me for my good . AYL_Oliver: Get you with him , you old dog . AYL_Adam: Is old dog my reward : most true , I have						
5	AYL AYL_1_1		good . AYL_Oliver:Get you with him , you old dog . AYL_Adam:Is old dog my reward : most true , I have lost my teeth in						
6	<u>CE</u> CE_3_2		and my heart of steel, she had transformed me to a Curtal dog, & made me turn in the wheel. CE_AntiphoSyracuse:Go hie thee						
7	<u>CE</u> CE_5_1		venom clamours of a jealous woman, Poisons more deadly than a <u>mad dog</u> 's tooth. It seems his sleeps were hindered by thy railing						
8	Cor Cor_1_1		especially against Caius Martius . Cor_All: Against him first : He 's a very dog to the Commonalty . Cor_2Citizen: Consider you what Services he has done for						
9	Cym Cym_2_1		Cym_SecondLord:No my Lord; nor crop the ears of them. Cym_Clotten:	Whoreson dog	: I gave him satisfaction ? would he had been or	ne of			
10	<u>H5</u> H5_2_1		you shog off? I would have you solus . H5_Pistol: Solus ,	egregious dog	? O Viper vile; The solus in thy most marvellor	us face			

## Have a go

- Try searching for the following things how many results do you get?:
- 'love'
  - As a noun
  - As a verb
  - Followed by a noun (hint: can include proper nouns!)
- 'fool'
  - As a noun
  - As a lemma
  - Pre-modified by an adjective



#### Answers

- Try searching for the following things
   how many results do you get?:
- 'love'
  - As a noun
  - As a verb
  - Followed by a noun (can include proper nouns!)
- 'fool'
  - As a noun
  - As a lemma
  - Pre-modified by an adjective

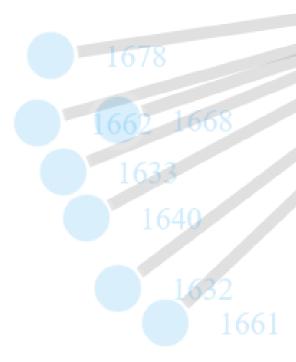
Option 1	Option 2	Result for option 1	Result for option 2
love_N*	love_NN*	1,428	1,428
love_V*	love_VV*	625	625
love *_N*	love *_NN*	62	33
fool_N*	fool_NN*	388	388
{fool}	NA	506	-
*_JJ* fool	NA	71	- Ellen Roberts (@E_Roberts19

### Collocation

- Frequent or habitual co-occurrence of two words/lexemes
  - E.g.
  - 'fish and ...'
  - 'save ...'



- 'COLLOCATION is the relation of co-occurrence between an obligatory core word or phrase (the node) and individual COLLOCATES: word-tokens which are directly observable and countable in texts.' (Stubbs)
- Number of uses: linguistic analysis, lexicography, etc



### Collocation

Min. freq cut off of 5 Stat used: Log Ratio

#### Showing collocate 'life' for node 'save'

 The co-occurrence or relationship between two tokens/words can be measured in different ways

 We set a span to the left and right of the node/word of interest

query "save" returned 219 matches in 38 different texts (in 1,038,509 words [38 texts]; frequency: 210.879 instances per million words), sorted on position +1 (219 hits), collocating with life (21 hits) [0.076 seconds]							
<<	>>	>	Show Page: 1	Line view		Show in random order	Choose action v
Text				Solution 1 to 21	Pā	nge 1 / 1	
<u>1H6</u> 1H6_3_2	!		Talbot ? 1H6_Fal	lstaff: Aye, all the Talbots in the world, to	save	my life . Exit . 1H6_Captain: Cowardly Knight , ill	fortune follow thee
<u>1H6</u> 1H6_4_6	;		On that a	advantage, bought with such a shame, To	save	a $\boldsymbol{paltry}$ life , and slay bright Fame , Before young	Talbot
<u>2H6</u> 2H6_3_1			that we	ere no policy: The King will labour still to	save	his $\mathbf{Life}$ , The Commons haply rise , to save his $\mathbf{Life}$	îe
<u>2H6</u> 2H6_3_1			still to sa	ave his Life , The Commons haply rise , to	save	his $\mathbf{Life}$ ; And yet we have but trivial argument , $\mathbf{M}$	lore
<u>2H6</u> 2H6_4_7	,		fare with your dep	arted souls, And therefore yet relent, and	save	my life . 2 $H6\_Cade$ : Away with him , and do as I co	ommand
<u>AW</u> AW_4_1			on To gather from the	e . Haply thou mayst inform Something to	<u>save</u>	thy life . $AW\_Paroles$ : O let me live , And all the s	secrets
AYL AYL_3_	5		in you than in	the ordinary Of Nature 's sale-work? God	save	my little life , I think she means to tangle $my$ eyes	
<u>CE</u> CE_5_1			I bestri	d thee in the wars , and took Deep scars to	<u>save</u>	thy life; even for the blood That then I lost for	
<u>CE</u> CE_5_1			vouchsafe n	ne speak a word : Haply I see a friend will	<u>save</u>	my life , And pay the sum that may deliver me .	
Cor Cor_4_5			Hea	rth , not out of Hope ( Mistake me not ) to	<u>save</u>	my life: for if I had feared death, of all	
Cor Cor_5_4			not us . Enter a l	Messenger . Cor_Messenger:Sir , if you 'd	<u>save</u>	your life , fly to your House , The Plebeians have ${\bf g}$	ot
<u>H5</u> H5_4_4			cent ecus . H5Pistol:What	are his words ? H5_Boy:He prays you to	save	his life, he is a Gentleman of a good house,	
LLL LLL_2_1	l		your eye . LLL_Rosaline: No point ,	with my knife . $LLL\_Berowne$ :Now God	save	thy life . LLL_Rosaline: And yours from long livin	g . <i>LLL_Berowne:</i> I can not
LLL LLL_4_2	2		duty , adieu . <i>LLL_Jaque</i>	enetta:Good Costard go with me: Sir God	save	your life . LLL_Dull: Have with thee my girl . Exit	. LLL_Holofernes:Sir
MA MA_5_4			good day,	I yield upon great persuasion , & partly to	save	your life, for I was told, you were in a	
MM MM_2_4	ı		upon that pain . MM_Isabella:Tr	rue . MMAngelo: Admit no other way to	save	his life ( As I subscribe not that , nor any other	
MM MM_5_1	l		And you may mary	vel, why I obscured myself, Labouring to	save	his life: and would not rather Make rash remonstra	ance of my
<u>R3</u> R3_4_3			R3_Richard: Wrong not her Birth, she is a	Royal Princess . R3_QueenElizabeth:To	save	her life, I 'll say she is not so . R3Richard:Her	
<u>TS</u> TS_1_3			therefore frame your mann	ners to the time Your fellow Tranio here to	save	$\boldsymbol{m}\boldsymbol{y}$ life , Puts $\boldsymbol{m}\boldsymbol{y}$ apparel , and $\boldsymbol{m}\boldsymbol{y}$ countenance on	,
<u>TS</u> TS_1_3			you, as b	ecomes: While I make way from hence to	save	my life : You understand me ? TS_Biondello:I sir	, never a
TS TS_4_2			as an apple doth an o	yster, & all one . <i>TSTraAsLucentio:</i> To	save	your life in this extremity, This favour will I do yo	ou .

Node —

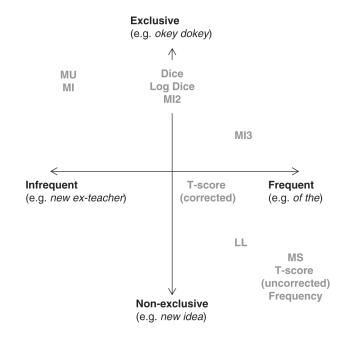
SPAN: 3 words to left and right

## Quick note on statistics

• We can use different statistics in collocation



They can be used for different things (again depending on our research priority)



Statistic ID	Statistic name	Statistic cut-off value	L and R		Minimum collocation freq. (NC)	Filter	
4b	MI2	3	L5-R5	5	1	function words removed	- Example
4b–MI2(	(3), L5–R	.5, C5–N0	C1; functi	ion words re	emoved		

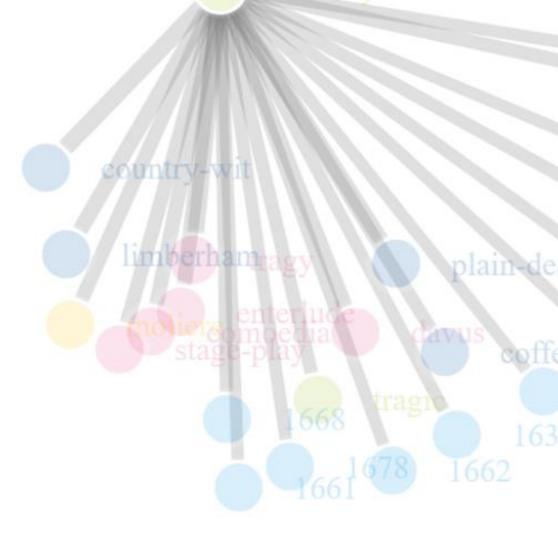
CPN or equivalent is highly encouraged - readers know **exactly** what parameters were used and can **replicate** 



# Let's explore some in our corpus

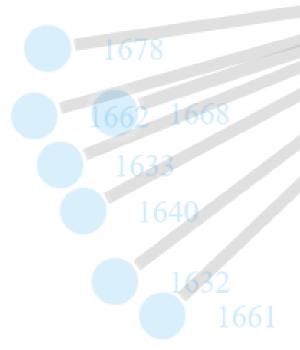
- 'thou'
- 'you'
- 'devil'

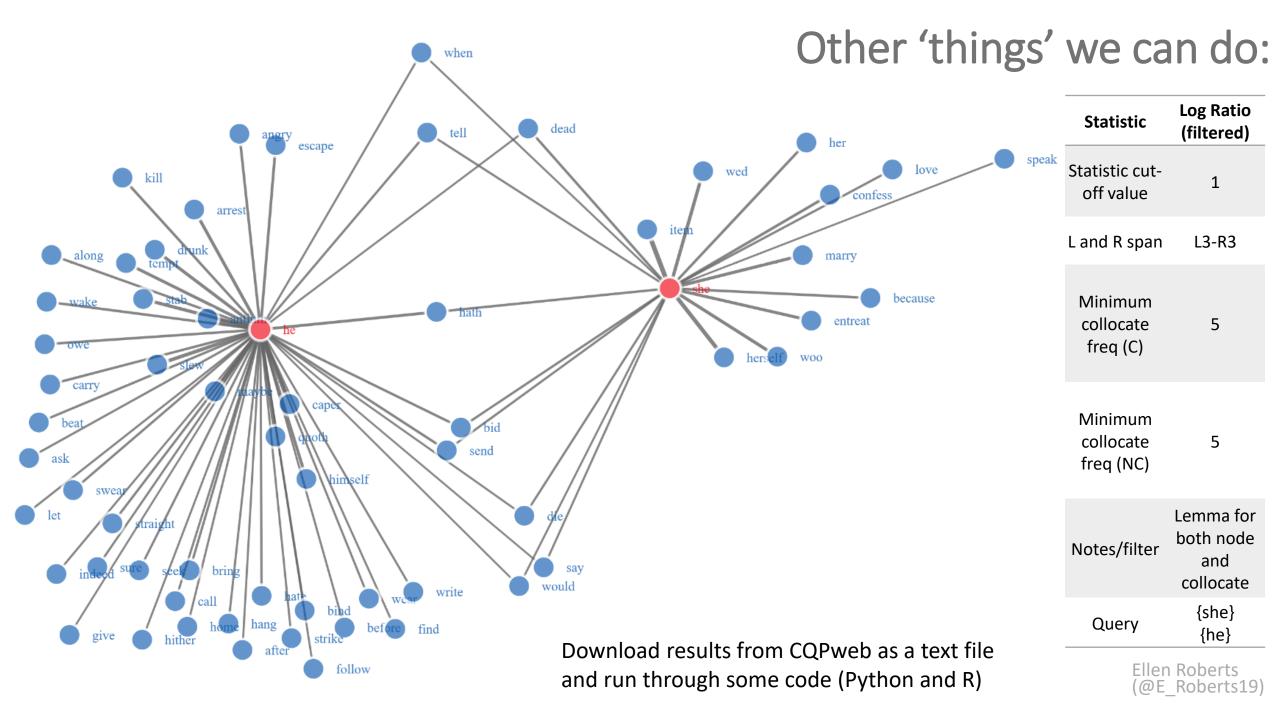
- Are there any interesting collocations you spot?
- Any patterns?
- Use default Log Ratio (filtered) as a starting point (finds more exclusive words associated with our node) – feel free to try changing the stats/span and see how this changes your results!



## Restricted query

- Collocations between different social classes for 'you'
  - Some things we might have observed:
    - 'Rogue' vs. 'whoreson'
    - Politeness markers pray/beseech/please





### Conclusion

- Corpus linguistics provides other perspectives on texts
- Important to ensure the corpus and queries match the research concerns/question
- Ensure that all stages of the process are included in outputs for replication purposes (where possible – data)
  - These are just some of the methods in corpus linguistics for more, see the MOOCs at Lancaster University (Shakespeare's Language and Corpus Linguistics)

