



Friedrich-Alexander-Universität
Philosophische Fakultät und
Fachbereich Theologie



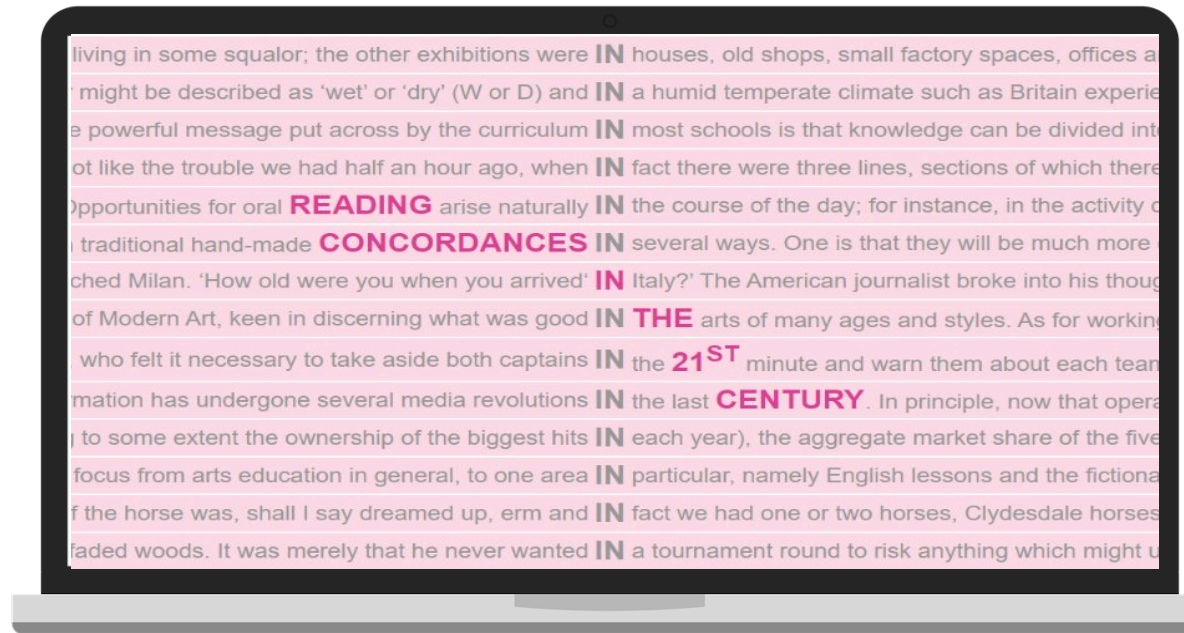
UNIVERSITY OF
BIRMINGHAM



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Research Council



4

Reading Concordances:

a training course in key corpus linguistics methodology

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@schtepf.bsky.social & @michamahlberg.bsky.social

Reading Concordances in the 21st Century (RC21) project team
Nathan Dykes • **Stephanie Evert** • **Michaela Mahlberg** • Alexander Piperski

Orientation

TODO

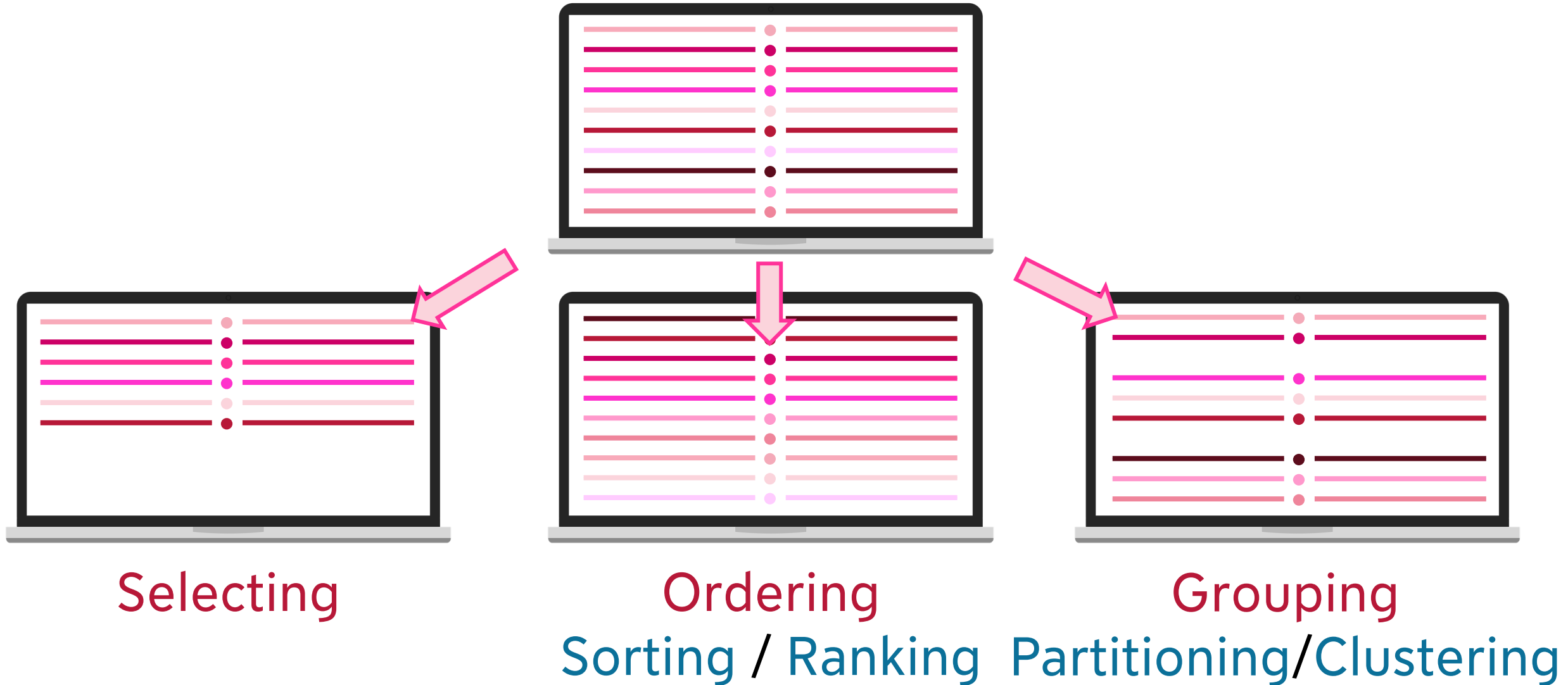
What we have learned so far ...

- Reading concordances with the help of software tools
- How to identify recurrent patterns and interpret them
- Strategies for organising concordance lines

What we're going to look at now ...

- What further algorithms could be useful?
- Which software tools do we need to apply these algorithms?
- How can we document the concordance reading process?

Concordance reading strategies



From strategies to algorithms

1. Selecting

- “zoom in” on a **subset** of the concordance lines
- either focus on specific pattern or discard unwanted lines

2. Ordering

- change **sequential ordering** of concordance lines in the display
- may want to combine multiple ordering criteria to break ties

3. Grouping

- form groups of related concordance lines
- requires **structured kwic display** in UI

From strategies to algorithms

1. Selecting

- “zoom in” on a **subset** of the concordance lines
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2. Ordering

- a) **Sorting**: reorder lines based on pairwise comparison
- b) **Ranking**: reorder lines based on preference score
- combine multiple Sorting and Ranking algorithms to break ties

3. Grouping

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- a) **Partitioning**: groups based on common property
- b) **Clustering**: (nested) groups based on pairwise similarity
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Combining algorithms

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3. Grouping

- a) **Partitioning**: groups based on common property
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subset

arrangement

The analysis tree



Our model of concordance reading: **analysis tree**

- **Selecting** creates branches that “zoom in” on a subset of lines
→ **subset node**
 - investigate different patterns with each branch
 - turns history of operations into a hierarchical tree structure
- **Ordering** and **Grouping** algorithms change how this subset is displayed to the analyst → **arrangement node**
 - different arrangements of the same subset are siblings in the tree
 - default arrangement: original corpus order
- Each node corresponds to a **concordance view**

Combining algorithms

- Subset operations can be combined sequentially or nested
 - consecutively narrow down on smaller subsets
- Arrangement operations form alternative views of a subset
 - consequence: can't "stack" multiple arrangements
 - combine sequence of **Ordering** algorithms as tie-breakers
 - multiple **Grouping** algorithms cannot (or should not) be combined
- Arrangement node = ≤ 1 **Grouping** + sequence of **Ordering** algo's
 - **Grouping** determines main structure, **Ordering** applies within groups

Corpus

DNOV-CWB

Analysis Tree

Query

"eyes" %c

Partition / Cluster ▼



Make selection ▼

♥ Bookmark

Welcome to

CandyConc

images do not represent actual gameplay

Corpus

DNOV-CWB

root node

Analysis Tree



Query result (4031)

Query

"eyes" %c

Partition / Cluster

⊕

Make selection

Bookmark

1	BH 1	ing on the gunwales of barges and small boats . Fog in the	eyes	and throats of ancient Greenwich pensioners , wheezing by
2	BH 3	m very cheerful , but I can not quite help their coming to my	eyes	. There ! I have wiped them away now and can go on again
3	BH 3	of the coach , brushed one of his large furry cuffs across my	eyes	(but without hurting me) , and showed me that it was wet .
4	BH 3	e greatest astonishment . But I thought that he had pleasant	eyes	, although he kept on muttering to himself in an angry man
5	BH 3	osegay of geraniums and told me I had been the light of his	eyes	-- indeed the old man said so!-- what a heart I had then ! Ar
6	BH 3	out it than I ought to have been ; and when I had cooled my	eyes	with lavender water , it was time to watch for London . I was
7	BH 3	n a beautiful girl ! With such rich golden hair , such soft blue	eyes	, and such a bright , innocent , trusting face ! " Miss Ada r ,
8	BH 3	ut it ; and the fire , which had left off roaring , winked its red	eyes	at us -- as Richard said -- like a drowsy old Chancery lion .
9	BH 3	fore it was quite said and whispered . His lordship , with his	eyes	upon his papers , listened , nodded twice or thrice , turned c
10	BH 4	Mr. Kenge , standing with his back to the fire and casting his	eyes	over the dusty hearth - rug as if it were Mrs. Jellyby 's biogr
11	BH 4	inutive , plump woman of from forty to fifty , with handsome	eyes	, though they had a curious habit of seeming to look a long
12	BH 4	thing , " Go along , you naughty Peepy ! " and fixed her fine	eyes	on Africa again . However , as she at once proceeded with
13	BH 4	ing him to me ? " Shaking her golden hair , Ada turned her	eyes	upon me with such laughing wonder that I was full of wonde
14	BH 4	died , she remembered how the tears would come into her	eyes	when she spoke of him and of the noble generosity of his c
15	BH 4	was painfully awake and vainly tried to lose myself , with my	eyes	closed , among the scenes of the day . At length , by slow c
16	BH 4	nd day was feebly struggling with the fog when I opened my	eyes	to encounter those of a dirty - faced little spectre fixed upon
17	BH 5	Richard , answering what he saw in Ada 's compassionate	eyes	, took the opportunity of laying some money , softly and unc
18	BH 6	of themselves , would have made a pretty large town in my	eyes	; and at last we got into a real country road again , with win
19	BH 6	ning sudden in his manner and a pleasant expression in his	eyes	images do not represent actual gameplay on
20	BH 6	, glancing at Richard and Ada , who entreated me with their	eyes	to speak] , " that perhaps she was a little unmindful of her h

root node

Analysis Tree

Query result (4031)

• sort: random

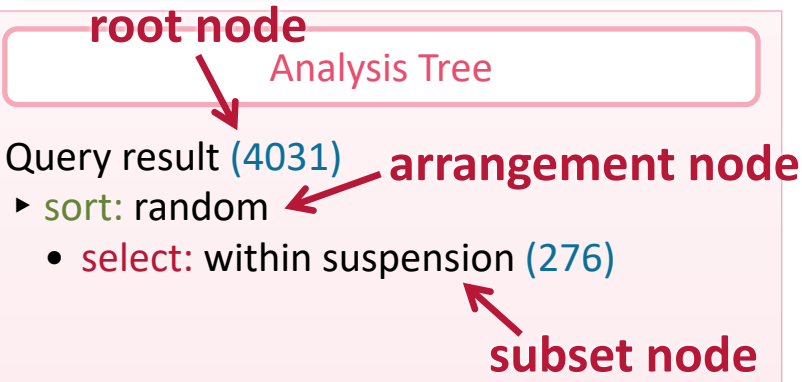
arrangement node

151	MC 39	you my word , as if he had been Mark Tapley . I opened my	eyes	, I can tell you , when he did so ; but I could not fancy I had
152	DS 29	ifidence of many years is destroyed in an instant , when my	eyes	are opened all at once , and when I find you revealed in yo
153	BH 55	hitened wall , leans her honest forehead upon it , wipes her	eyes	with her serviceable grey cloak , and quite enjoys herself lik
154	DS 50	lness that lies to lightly there ! Ay , look down on the closed	eyes	, Walter , with a proudly tender gaze ; for in all the wide wid
155	OT 17	npulses of passion or feeling , which , presented before the	eyes	of mere spectators , are at once condemned as outrageous
156	DS 33	g her head after resting it for a moment on both hands , her	eyes	met those of Harriet . In a moment , Harriet was at the door
157	BH 23	aid Mrs. Jellyby , still opening her letters , casting her bright	eyes	smilingly over them , and sorting them as she spoke] , " tha
158	LD 9	ad had no sight for the tears now standing in the colourless	eyes	; though he had had no hearing for the sob that checked the
159	TTC 21	man spoke when they entered the wine - shop , though the	eyes	of every man there were turned upon them . " Good day , g
160	OMF 22	ere , he now directed a scowling look into Fledgeby 's small	eyes	for the effect of the opposite treatment . Satisfied by what h
161	OT 14	s home four times a - year , that it brought the tears into her	eyes	to talk about them . When the old lady had expatiated , a lo
162	HT 13	s Rachael . Seen across the dim candle with his moistened	eyes	, she looked as if she had a glory shining round her head . I
163	OMF 16	Old Betty was proud , and said it with a sparkle in her bright	eyes	. ' Yes , but there are some little comforts that you would n't
164	DS 51	t Mr Pitt , upon the bookcase , represents it . That there are	eyes	in its own map , hanging on the wall . ' An unusually cold sp
165	BH 28	e hand with which she has caught it , and standing with her	eyes	fixed on the fire , puts it about and about between her own
166	PP 54	here was enough of the cannibal in the young gentleman 's	eyes	to render the compliment a double one . ' Dear me , Joseph
167	GE 17	ening that she had curiously thoughtful and attentive eyes ;	eyes	that were very pretty and very good . It came of my lifting up
168	LD 5	d to you to suspect-- ' At the word Suspect , she turned her	eyes	momentarily upon her son , with a dark frown . She then su
169	DC 16	ting themselves - that they seemed to twinkle instead of his	eyes	quite
170	DS 10	d a most excellent man , Sir [, ' pursued Walter , raising his	eyes	with a look of entreaty in the Captain 's behalf] , " was so gc

images do not represent actual gameplay

1	LD 16	stopping for a moment with a good - humoured laugh in his	eyes	, and laying his closed right hand , with its peculiar suppleness
2	BR 37	, I have slept so soundly [, ' said Lord George , rubbing his	eyes	and looking round the room] , ' that I do n't remember quite
3	DS 47	when you give Mrs Dombey to understand [' --the light in his	eyes	fell upon her as he separated his words each from each , w
4	DS 61	sh sorry [, ' said Cousin Feenix , lifting his wristbands to his	eyes	in the simplest manner possible , and without the least conc
5	OT 37	ppose , a married man [, ' replied Mr. Bumble , shading his	eyes	with his hand , and surveying the stranger , from head to fo
6	NN 22	e place . ' ' Well , when I was there [, ' resumed Smike ; his	eyes	sparkling at the prospect of displaying his abilities] ; ' I coul
7	DS 40	sh a nature now , ' --he [fancied he saw tears glistening in her	eyes	, and he thought , complacently , that he had forced them fr
8	BH 4	Mr. Kenge , standing with his back to the fire and casting his	eyes	over the dusty hearth - rug as if it were Mrs. Jellyby 's biogr
9	DS 17	oked pleasant . ' You see [, ' began the Captain , rolling his	eyes	slowly round the little room , and taking in as much of it as I
10	OMF 3	Eugene , leaning back , folding his arms , smoking with his	eyes	shut , and speaking slightly through his nose] , ' of Energy .
11	DC 39	I do n't think , Trotwood [, ' returned Agnes , raising her soft	eyes	to mine] , ' I would consider that . Perhaps it would be bette
12	BH 9	ray and regarding me , as I again strangely felt , though my	eyes	were not directed to him , with his late intent look] , " I am a
13	BH 23	aid Mrs. Jellyby , still opening her letters , casting her bright	eyes	smilingly over them , and sorting them as she spoke] , " tha
14	DS 10	d a most excellent man , Sir [, ' pursued Walter , raising his	eyes	with a look of entreaty in the Captain 's behalf] , ' was so gc
15	DS 20	r . Notwithstanding which , Ma'am [, ' he added , raising his	eyes	from his plate , and casting them across Princess 's Place ,
16	BH 26	wo n't sit down like a Christian [, " says Mr. George with his	eyes	musingly fixed on Judy] , " I ca n't comprehend . " " She kee
17	OMF 38	ollecting [, ' said Mrs Boffin , with her work abandoned , her	eyes	upon the fire , and her chin upon her hand] , ' do you recoll
18	DS 22	onder [, ' said Biler , blubbering outright , and smearing his	eyes	with his coat - cuff] , ' that I have n't been and drowned my
19	OMF 25	into tears . ' I think , R.W. [, ' cried Mrs Wilfer , lifting up her	eyes	it wo
20	DS 46	uttered the old woman , watching her daughter with her red	eyes	; ' so easy and so trim a - horseback , while we are in the m

images do not represent actual gameplay



root node

Analysis Tree

Query result (4031) arrangement node

▶ sort: random

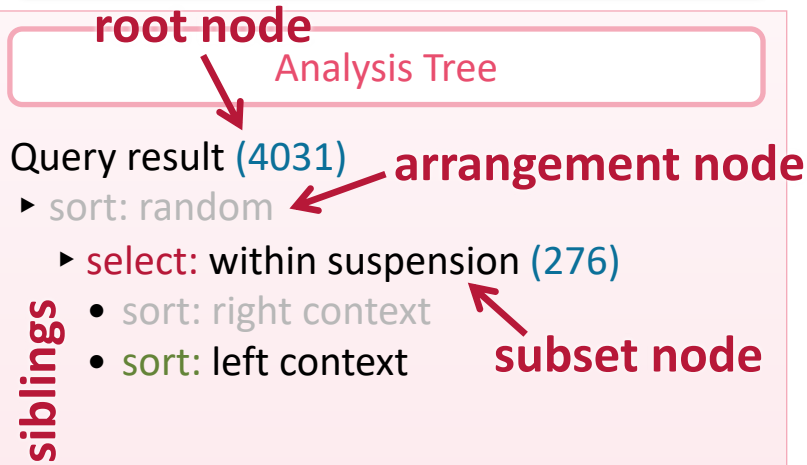
▶ select: within suspension (276)

• sort: right context

subset node

101	LD 14	le Dorrit began , sitting before the pale fire , and raising her	eyes	again to the face which in its harmonious look of interest ,
102	NN 31	. ' Oh [! ' said Newman , throwing some intelligence into his	eyes	all at once , and dropping them on his master] , ' I thought
103	BH 47	orge [, " says Allan , following the direction of the trooper 's	eyes	along the entry] , " have not been much acquainted , as yo
104	OMF 25	into tears . ' I think , R.W. [, ' cried Mrs Wilfer , lifting up her	eyes	and apostrophising the air] , ' that if you were present , it w
105	TTC 44	gement that may be [, " said Miss Pross , striving to dry her	eyes	and compose herself] , " I have no doubt it is best that Mrs.
106	GE 39	ng , Pip [, " said he , after again drawing his sleeve over his	eyes	and forehead , as the click came in his throat which I well r
107	BH 14	, my dear . I suppose [, " said Mr. Turveydrop , shutting his	eyes	and lifting up his shoulders with modest consciousness] , "
108	HT 23	Yonder , among the trees [, ' he added , having lifted up his	eyes	and looked about ; for he had watched her closely until nov
109	BR 37	, I have slept so soundly [, ' said Lord George , rubbing his	eyes	and looking round the room] , ' that I do n't remember quite
110	OCS 6	the first is dead , sweet Nell [, ' said Quilp , wrinkling up his	eyes	and luring her towards him with his bent forefinger] , ' to be
111	OMF 61	ching her cheek , with a grave smile , as she cast down her	eyes	and pouted again] ; ' look at me . I want to speak to you . '
112	MC 9	dergone in consequence [, ' cried Mrs Todgers , raising her	eyes	and shaking her head] , ' no one would believe ! ' ' Just like
113	BH 15	go out ? " " As often as I can [, " said Charley , opening her	eyes	and smiling] , " because of earning sixpences and shillings
114	LD 70	e best , my own [, ' she answered , laughing with glistening	eyes	and standing on tiptoe to kiss him] , ' if you will only humou
115	DS 31	e stooping of his neck , which the revelations making by his	eyes	and teeth proclaim to be a lie] , ' I am proud to see that my
116	MC 50	e time now drawing on [, ' said the old man , hurriedly -- his	eyes	and whole face brightening as he spoke--'will] make amenc
117	DS 20	ng his head at the unconscious Miss Tox , while his starting	eyes	appeared to make a leap towards her] , ' you might do that
118	BH 58	st I could do . " " You find me [, " says Sir Leicester , whose	eyes	are much attracted towards him] , " far from well , George F
119	BH 41	he returns without looking up from the ground on which her	eyes	
120	LD 48	sence of mind . ' Pray [, ' asked Lord Decimus , casting his	eyes	

101	OMF	59	es n't know anything about it [, ' with a sob , and wiping her eyes] , ' why , it wo n't matter to him . I see the service in the Pray
102	DC	60	' of doing good ; and if I could spare my brother [, ' with her eyes upon me] , ' perhaps the time could not . ' ' What I am , you
103	DS	27	looking round . ' Shall I tell you [, ' she continued , with her eyes fixed on her mother] , ' who already knows us thoroughly , a
104	OMF	58	a wink . ' I must own [, ' returned the dressmaker , with her eyes upon her work] , ' that we are not good friends at present . '
105	DC	45	' said Mrs. Markleham , mechanically following her with her eyes] , ' to find a man at Doctor Strong 's time of life , with the stre
106	DS	52	lth [, ' said the Grinder , glancing at Alice , who sat with her eyes fixed , as it seemed to him , on the wall behind him , but in i
107	OMF	15	at then ? ' ' Why then [, ' said Mrs Boffin , speaking with her eyes closed , and her left hand thoughtfully touching her brow] ,
108	LD	14	g at him in a suppliant way , and gradually withdrawing her eyes as he looked at her] , ' whether you would advise me what
109	DS	23	brig as a lad is capable on . Wal'r [, ' said the Captain , his eyes glistening with the praise of his young friend , and his hook
110	PP	23	great advantage of this , Mr. Weller [, ' continued Job , his eyes filling with tears as he spoke] , ' will be , that I shall be able
111	PP	27	ose . ' Certainly , Sam , certainly [, ' said Mr. Pickwick , his eyes glistening with delight at this manifestation of filial feeling or
112	MC	50	a time now drawing on [, ' said the old man , hurriedly -- his eyes and whole face brightening as he spoke--'will] make amenc
113	MC	19	o limitation , there is positively NO limitation [' --opening his eyes wide , and standing on tiptoe--'in] point of expense ! I have
114	NN	22	e place . ' ' Well , when I was there [, ' resumed Smike ; his eyes sparkling at the prospect of displaying his abilities] ; ' I coul
115	OCS	3	said the dwarf , who with his hand stretched out above his eyes had been surveying the young man attentively] , ' that shou
116	OMF	42	d the Reverend Frank Milvey , brushing his hand across his eyes] , ' when it has that homely figure on it . Richer , I think , tha
117	BR	76	ith , stopping in a narrow count to pass his hand across his eyes] , ' I could better afford to lose than Barnaby . We have alwa
118	BR	36	he secretary , drawing his sleeve in a hasty way across his eyes ; ' and why should I regret your having heard them ? ' ' Gas
119	NN	52	ink and cough very much , for he was no smoker) : and his eyes images do not represent actual gameplay I se
120	OMF	39	oodly silence , with his hands clasped behind him , and his eyes suspiciously wandering about Wegg.--'No] ! stop there . I k



No.	Query result	No. of occurrences	Percent
1	PRP\$	211	76.45%
2	JJ	37	13.41%
3	VBG	9	3.26%
4	NN	5	1.81%
5	DT	4	1.45%
6	WP\$	3	1.09%
7	IN	2	0.72%
8	POS	2	0.72%
9	VBN	2	0.72%
10	CC	1	0.36%

root node

Analysis Tree

arrangement node

subset node

Query result (4031)

▸ sort: random

▸ select: within suspension (276)

• sort: right context

• sort: left context

• partition: by POS tag @ L1,

sort: left context

siblings

1	OMF 38	collecting [, ' said Mrs Boffin , with her work abandoned , her	eyes	upon the fire , and her chin upon her hand] , ' do you recoll
2	BH 49	red thousand thanks , old fellow [, " says Mrs. Bagnet , her	eyes	sparkling with pleasure and her hand stretched out to him]
3	BH 22	brought into my head , master [, " returns the woman , her	eyes	filling with tears] , " when I look down at the child lying so .
4	OT 24	' she cried , jumping fiercely up : her face flushed , and her	eyes	starting from her head--'I] robbed her , so I did ! She was n
5	OMF 42	netimes I have fancied , sir [, ' said Bella , turning away her	eyes]	, ' that your great regard for Mrs Boffin is a very powerful m
6	DS 18	l , if ever there was one [, ' said Mrs Chick , drying both her	eyes	at once with great care on opposite corners of Miss Tox 's h
7	OT 7	deed . ' Ah [!' said Mr. Bumble , when the lady brought her	eyes	down to earth again] ; ' the only thing that can be done now
8	LD 2	' ' Not [, ' said Pet , apologetically and embarrassed by her	eyes]	, ' not , of course , that we are any company to you , or that
9	BH 8	ng that her spectacles were made the less engaging by her	eyes	being what Ada called] " choking eyes " , " meaning very pr
10	BH 23	Miss Summerson [, " said Mrs. Jellyby , sweetly casting her	eyes	for a moment on me and considering where to put the parti
11	PP 22	tared wildly at her . ' Wretch [, ' said the lady , covering her	eyes	with her hands] , ' what do you want here ? ' ' Nothing , ma'
12	HT 9	not yours . ' ' Dear Miss Louisa [, ' said Sissy , covering her	eyes	, and sobbing yet] ; ' I came home from the school that afte
13	OMF 61	ching her cheek , with a grave smile , as she cast down her	eyes	and pouted again] ; ' look at me . I want to speak to you . ' '
14	LD 55	eneral . ' ' Mr Dorrit [, ' said Mrs General , casting down her	eyes	as she rose with a bend] , ' must ever claim my homage an
15	DS 58	. ' I need not remind you [, ' said Harriet , casting down her	eyes	upon her black dress] , ' through what means our circumsta
16	OMF 25	ith stately resignation as she shook her head and dried her	eyes]	; ' we have at present no stipendiary girl to do so . We have
17	ED 13	ue . ' If we knew yesterday [, ' said Rosa , as she dried her	eyes]	, ' and we did know yesterday , and on many , many yester
18	DS 2	always be a balm and comfort to me [, ' here she dried her	eyes]	; ' it becomes necessary to provide a Nurse . ' ' Oh ! Ah ! ' s
19	TTC 44	gement that may be [, " said Miss Pross , striving to dry her	eyes	
20	DC 51	a gleam of light upon me , Trot [, ' said my aunt , drying her	eyes]	

images do not represent actual gameplay Mrs.

root node

Analysis Tree

Query result (4031) arrangement node

- ▶ sort: random
- ▶ select: within suspension (276)
- sort: right context
- sort: left context
- partition: by POS tag @ L1, sort: left context
 - ▶ select: set [PRP\$] (211)

siblings

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subset

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20	DC 51	a gleam of light upon me , Trot [, ' said my aunt , drying her	eyes]	

images do not represent actual gameplay Mrs.

root node

Analysis Tree

Query result (4031) arrangement node

- ▶ sort: random
- ▶ select: within suspension (276)
- sort: right context
- sort: left context
- partition: by POS tag @ L1, sort: left context
 - ▶ select: set [PRP\$] (211)
 - sort: by L1

subset node

subset

siblings

siblings

root node

Analysis Tree

arrangement node

subset node

subset

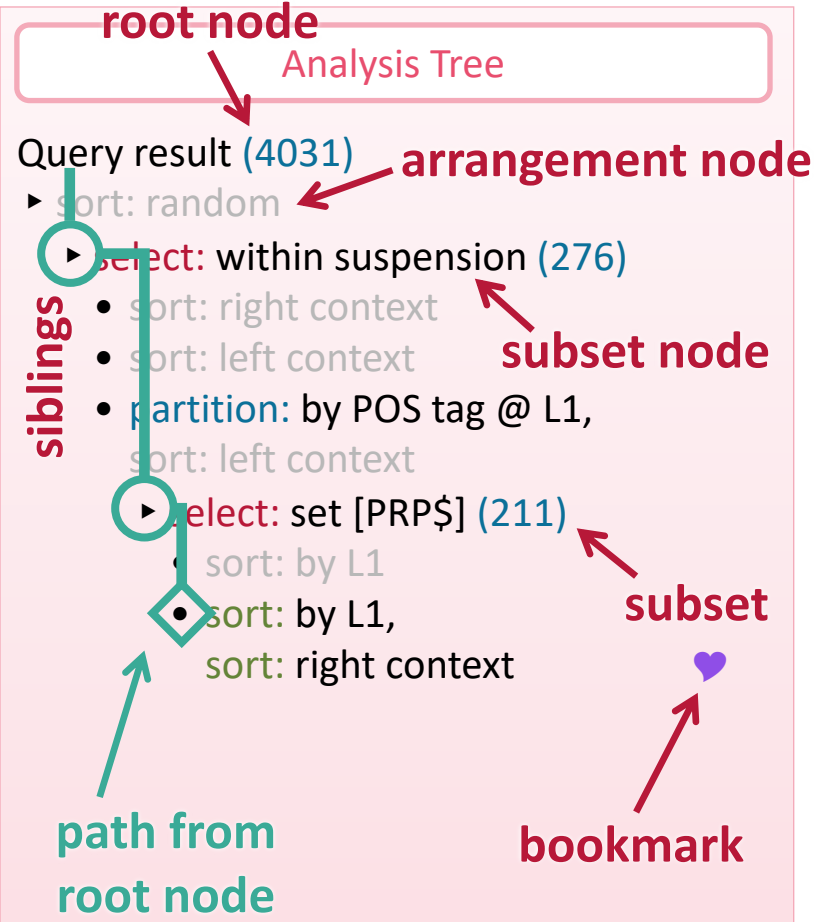
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- ▶ sort: random
 - ▶ select: within suspension (276)
 - sort: right context
 - sort: left context
 - partition: by POS tag @ L1, sort: left context
 - ▶ select: set [PRP\$] (211)
 - sort: by L1
 - sort: by L1, sort: right context

1	BH 30	ith us . " Well , my dear Esther [, " she returned , drying her	eyes	, " I must do the best I can and trust to my dear Prince neve
2	HT 4	circus [, ' muttered Louisa , haughtily , without lifting up her	eyes	, ' and father caught us . ' ' And , Mrs. Gradgrind [, ' said he
3	ED 13	rue . ' If we knew yesterday [, ' said Rosa , as she dried her	eyes	, ' and we did know yesterday , and on many , many yester
4	NN 49	gives me great pain [, ' continued Mrs Nickleby , drying her	eyes	, ' great pain ; but do n't hurt a hair of his head , I beg . On r
5	DS 3	my Mama [, ' returned the child , with tears springing to her	eyes	, ' in any frock . ' ' But people put on black , to remember pe
6	NN 34	culty . And even this [, ' said Madame Mantalini , wiping her	eyes	, ' is not the worst . He took some papers of value out of my
7	NN 37	her . I think I see him now [! ' said Mrs Nickleby , wiping her	eyes	, ' looking at me while I was talking to him about his affairs ,
8	LD 2	' ' Not [, ' said Pet , apologetically and embarrassed by her	eyes	, ' not , of course , that we are any company to you , or that
9	HT 32	this . ' " Deed , I am loath [, ' returned Rachael , drying her	eyes	, ' that any here should see me like this ; but I wo n't be see
10	LD 41	ha -- on this or any other occasion [, ' Mrs General shut her	eyes	, ' that I -- ha hum -- am not pleased with you . You make M
11	BR 51	ately , Varden [, ' said his wife , with her handkerchief to her	eyes	, ' that in case any more disturbances should happen -- whi
12	OMF 28	n vain to sustain it ; for the look dropped as it lighted on her	eyes	, ' that it might be so superfluous as to be almost impertiner
13	OMF 42	netimes I have fancied , sir [, ' said Bella , turning away her	eyes	, ' that your great regard for Mrs Boffin is a very powerful m
14	DC 48	gently trying to remove the handkerchief she pressed to her	eyes	, ' this is not only very ridiculous of you , but very wrong . In
15	DC 45	' said Mrs. Markleham , mechanically following her with her	eyes	, ' to find a man at Doctor Strong 's time of life , with the stre
16	MC 40	d kindly . ' Which shows [, ' said Mrs Gamp , casting up her	eyes	, ' what a little way you 've travelled into this wale of life , my
17	OCS 41	d . ' Oh Kit [! ' said his mother , with her handkerchief to her	eyes	, ' what have you done ! I never can go there again -- never
18	LD 14	th all the earnestness of her soul looking steadily out of her	eyes	, ' what I am going to ask you not to do ? ' ' I think I can .
19	DC 51	a gleam of light upon me , Trot [, ' said my aunt , drying her	eyes	, ' why , it wo n't matter to him . I see the service in the Pray
20	OMF 59	es n't know anything about it [, ' with a sob , and wiping her	eyes	

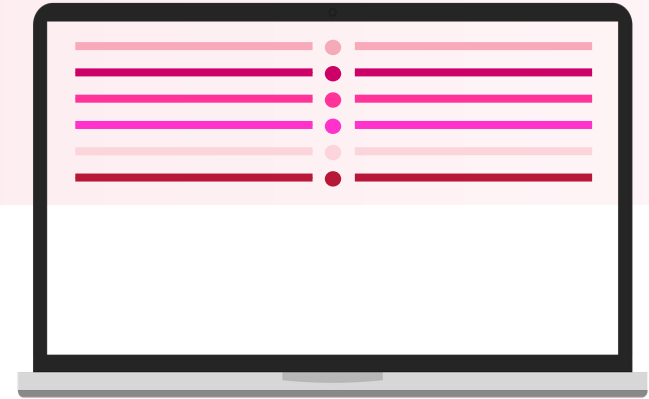
images do not represent actual gameplay

1	BH 30	ith us . " Well , my dear Esther [, " she returned , drying her	eyes	, " I must do the best I can and trust to my dear Prince neve
2	HT 4	circus [, ' muttered Louisa , haughtily , without lifting up her	eyes	, ' and father caught us . ' ' And , Mrs. Gradgrind [, ' said he
3	ED 13	rue . ' If we knew yesterday [, ' said Rosa , as she dried her	eyes	, ' and we did know yesterday , and on many , many yester
4	NN 49	gives me great pain [, ' continued Mrs Nickleby , drying her	eyes	, ' great pain ; but do n't hurt a hair of his head , I beg . On r
5	DS 3	my Mama [, ' returned the child , with tears springing to her	eyes	, ' in any frock . ' ' But people put on black , to remember pe
6	NN 34	culty . And even this [, ' said Madame Mantalini , wiping her	eyes	, ' is not the worst . He took some papers of value out of my
7	NN 37	her . I think I see him now [! ' said Mrs Nickleby , wiping her	eyes	, ' looking at me while I was talking to him about his affairs ,
8	LD 2	' ' Not [, ' said Pet , apologetically and embarrassed by her	eyes	, ' not , of course , that we are any company to you , or that
9	HT 32	this . ' " Deed , I am loath [, ' returned Rachael , drying her	eyes	, ' that any here should see me like this ; but I wo n't be see
10	LD 41	ha -- on this or any other occasion [, ' Mrs General shut her	eyes	, ' that I -- ha hum -- am not pleased with you . You make M
11	BR 51	ately , Varden [, ' said his wife , with her handkerchief to her	eyes	, ' that in case any more disturbances should happen -- whi
12	OMF 28	n vain to sustain it ; for the look dropped as it lighted on her	eyes	, ' that it might be so superfluous as to be almost impertiner
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14	DC 48	gently trying to remove the handkerchief she pressed to her	eyes	, ' this is not only very ridiculous of you , but very wrong . In
15	DC 45	' said Mrs. Markleham , mechanically following her with her	eyes	, ' to find a man at Doctor Strong 's time of life , with the stre
16	MC 40	d kindly . ' Which shows [, ' said Mrs Gamp , casting up her	eyes	, ' what a little way you 've travelled into this wale of life , my
17	OCS 41	d . ' Oh Kit [! ' said his mother , with her handkerchief to her	eyes	, ' what have you done ! I never can go there again -- never
18	LD 14	th all the earnestness of her soul looking steadily out of her	eyes	, ' what I am going to ask you not to do ? ' ' I think I can .
19	DC 51	a gleam of light upon me , Trot [, ' said my aunt , drying her	eyes	our
20	OMF 59	es n't know anything about it [, ' with a sob , and wiping her	eyes	, ' why , it wo n't matter to him . I see the service in the Pray

images do not represent actual gameplay



Strategy 1: Selecting



Selecting = add **Boolean variable** to lines

- keep concordance line if value is True
- exclude selected lines by logical negation of variable (all algorithms)

Examples

- selection based on metadata categories or numerical ranges
- select random subset (reproducible, stratified, ...)
- KWIC filter (lines containing certain words, lemmas, POS tags, ...)
- manual selection of individual concordance lines

Strategy 2: Sorting [Ordering]



Sorting = add **integer variable** with sort keys

- pairwise comparison of lines ($A < B$, $A = B$, $A > B$)
- resulting sort order $\rightarrow$ integers as **surrogate keys** ($A < B$, $A = B$, $A > B$)
- ties ($A = B$) can be broken by additional **Sorting** or **Ranking** algorithms

Examples

- sort alphabetically by left or right context
- sort by POS tag of first (L1) or second (L2) token before node
- sort by numerical (e.g. year) or categorical (e.g. author) metadata
- random shuffling (reproducible)

Aside: Context trees & KWIC patterns

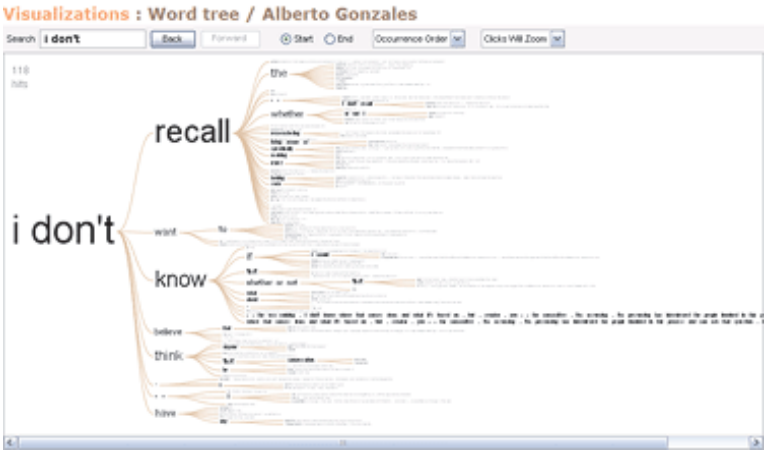


Fig 5: Alberto Gonzales' testimony in 2007.

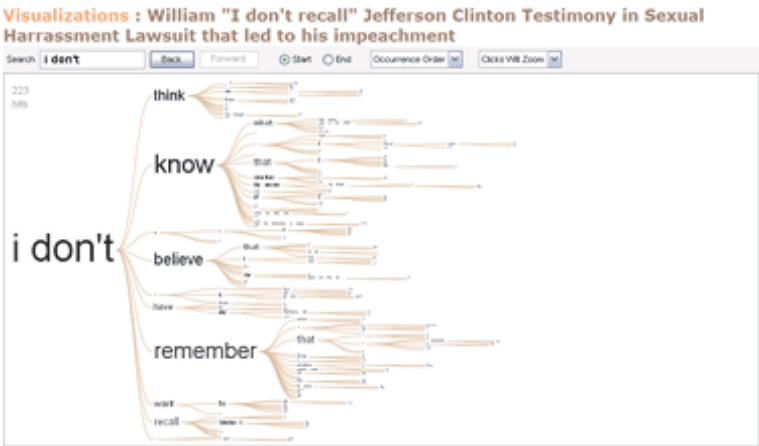
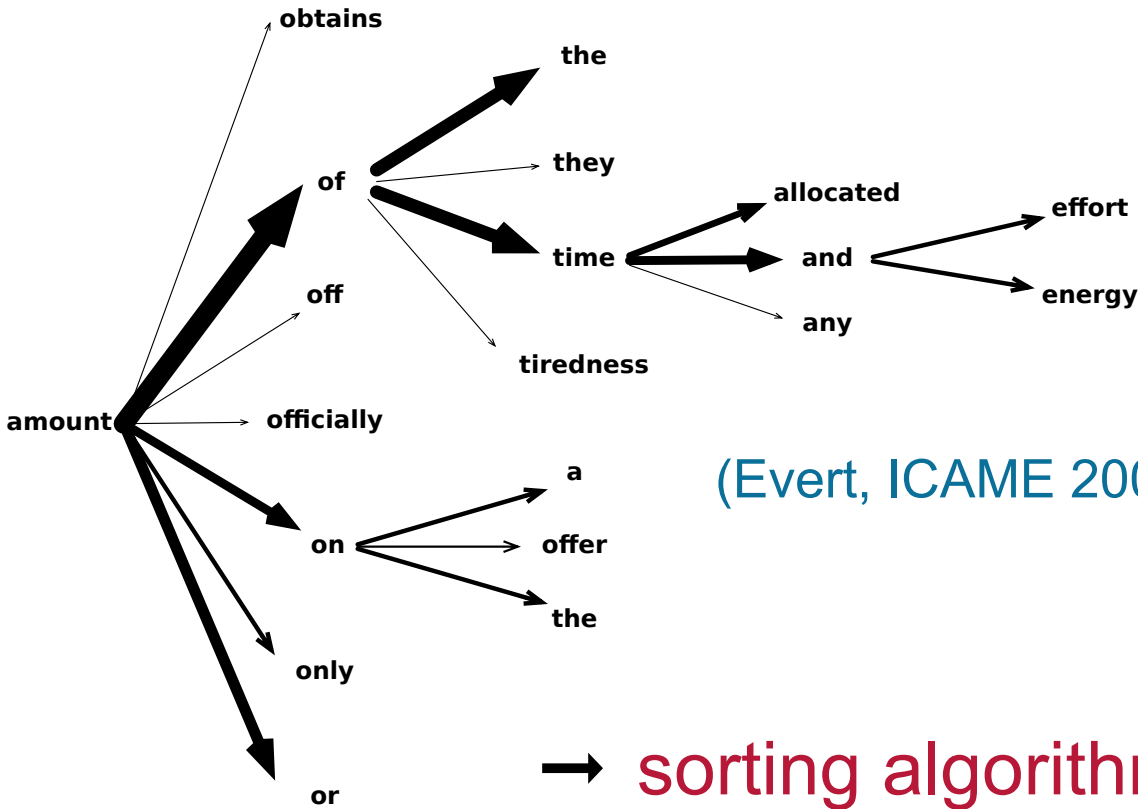


Fig 6: Bill Clinton's testimony in 1998.



(Evert, ICAME 2007)

The Word Tree
(Wattenberg & Viégas, 2008)

→ sorting algorithm for concordance reading
(Anthony 2022)
... but 3 different versions

Strategy 3: Ranking [Ordering]



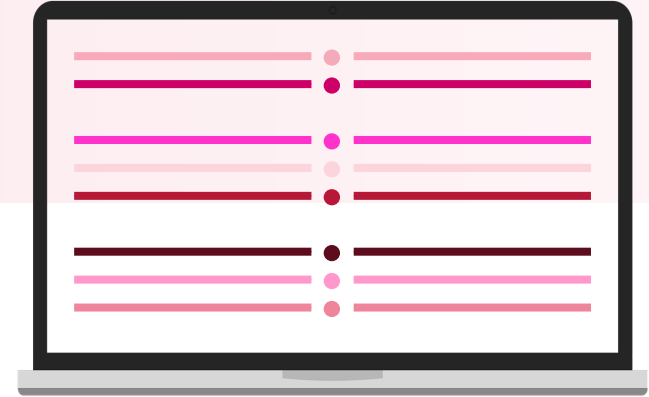
Ranking = add **floating-point variable** to lines

- values = preference score assigned to each line
- decreasing order: lines with highest scores shown at top
- ties can occur e.g. if scores happen to be integer values

Examples

- rank by readability, GDEX algorithm, or fit to selected CEFR level
- rank by frequency of the node string
- rank by similarity to query (for fuzzy search)
- rank by number of significant collocates of the node in context, or by number of user-specified keywords (KWIC grouper)

Strategy 4: Partitioning [Grouping]



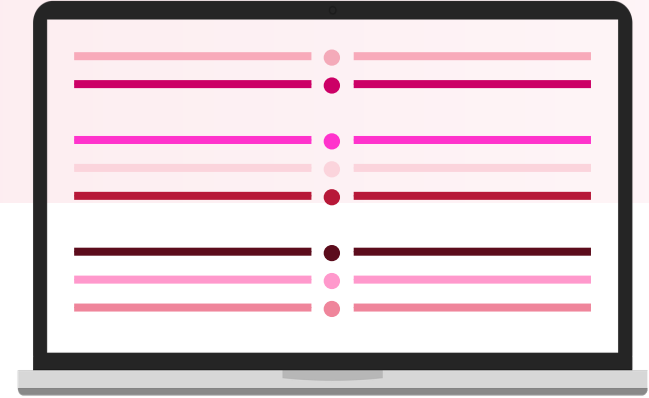
Partitioning = add **partition N°** to each line

- each line assigned to exactly one partition, based on a property of the concordance line (not on comparisons)
- also provide ordered list of partitions with display labels, etc.

Examples

- frequency breakdown of node strings
- partition by POS tag of first (L1) or second (L2) token before node
- partition by categorical metadata (variety, genre, speaker info, ...)
- partition by lemma trigram R1+R2+R3 (similar to KWIC patterns)

Strategy 5: Clustering [Grouping]



Clustering = add **ordered tree** over lines

- based on pairwise similarities of concordance lines
- hierarchical clustering → deep tree, flat clustering → single-level tree
- tree describes both nesting and preference order of clusters

Examples

- clustering based on lexical similarity (shared words), semantic similarity (sentence/word embeddings), or syntactic similarity
- clustering based on multiple metadata features → similarity score
- all clusterings: either flat or hierarchical, with different algorithms
- context tree (on POS tags, lemmas, semantic tags, ...)

Research documentation

- Analysis tree as **research documentation**
 - concordance view uniquely determined by path from root node
 - bookmarked nodes = basis for interpretation & discussion
- Exact **reproduction** with identical concordance data
 - readers can reproduce published results completely
 - but also explore further concordance views
- **Save / load** analysis tree → continue concordance reading later
- Analysis tree as **template** for concordance organisation
 - “replay” tree on a new concordance (possibly from different corpus)
 - interactive manual selection has to be omitted (→ not meaningful)

Hands-on: analysis tree in CLiC



<https://clic-fiction.com/>



clic-analysis-tree_head_19c.json

Load | Merge | Save | Clear | Help

Concordance

FlexiConc

Subsets

Keywords

Counts

Welcome to CLiC. The CLiC web app has been developed as part of the CLiC Dickens project, which demonstrates through corpus stylistics how computer-assisted methods

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- Evert, S. (2007). Context graphs. Presentation at the *ICAME 2007 Conference*, Stratford upon Avon, UK.
- Wattenberg, M. & Viégas, F. B. (2008). The word tree, an interactive visual concordance. *IEEE Transactions on Visualization and Computer Graphics*, 14(6):1221–1228.