

Using association plots to investigate language change:

Distributional shifts in the *into*-causative

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A. *into*-causative

A.I. Synchronic properties

A.II. Diachronic origin

B. Data & corpus

B.I. Problems

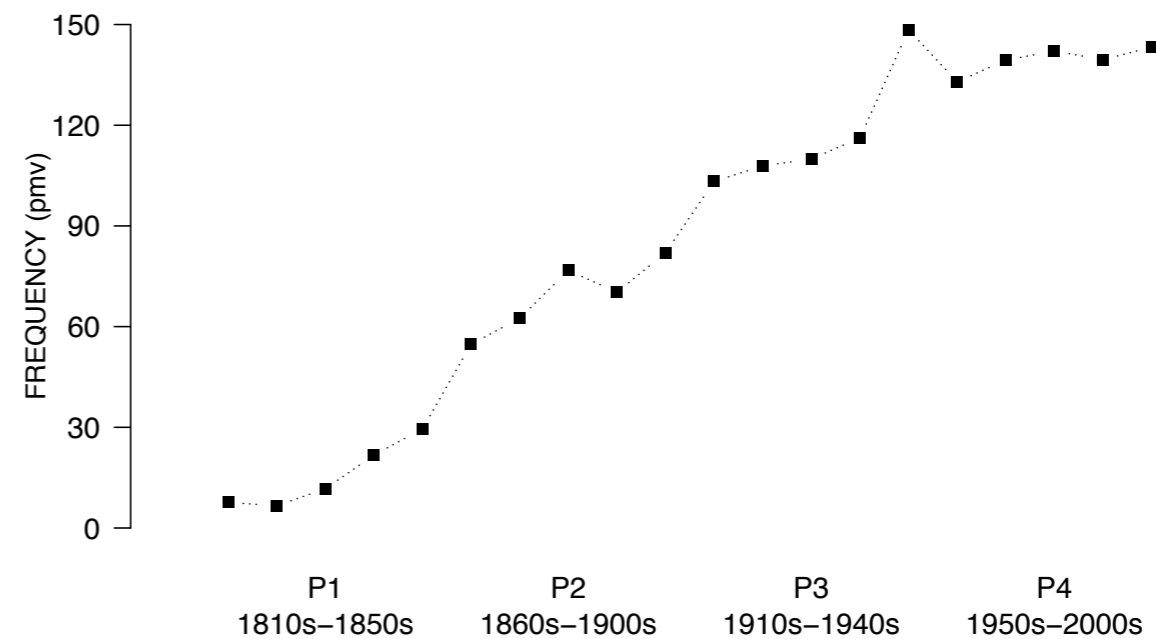
B.II. Visualization

C. Association plots

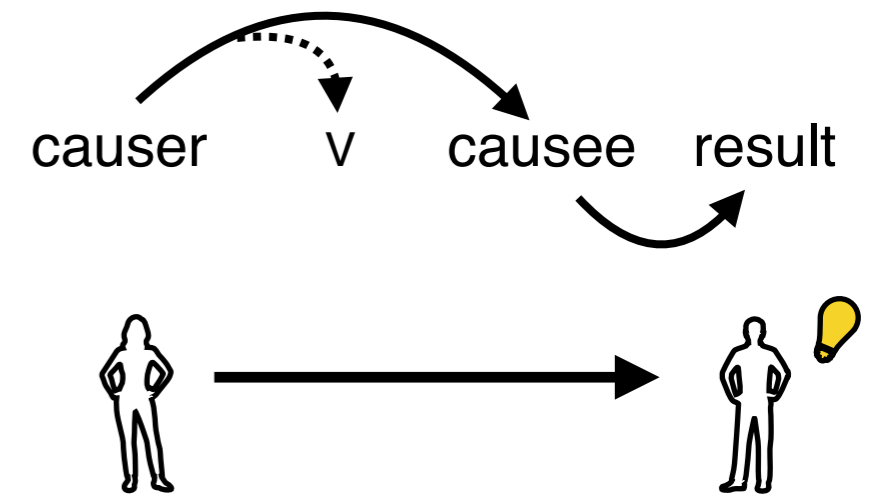
C.I. Shifts in verb classes

C.II. Shifts in argument structure

D. Epilogue



- (1) “Who was that one who talked us into taking this limo?” SUBJ V OBJ OBL_{into Ving}
- (2) Dr. Wilson (the reliably great Robert Sean Leonard) tries to **blackmail the staff-less House ... into hiring** a new team by kidnapping his beloved guitar.
- (3) The Bush campaign **frightened the American people into believing** that the threat of terrorism would increase if Bush were defeated.
- (4) Hearers will be **duped or deceived into believing** falsehoods.
- (5) I will not **sphroxyfy gullible people into looking up** fictitious words in the dictionary.



talk somebody into doing sth.

* **talk** somebody

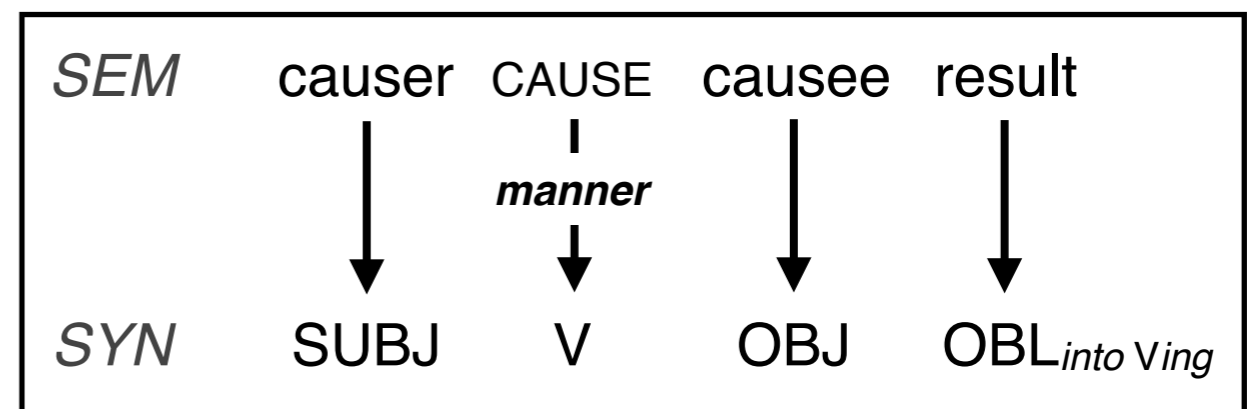
talk business

- (1) “Who was that one who *talked us into taking* this limo?”
- (2) Dr. Wilson (the reliably great Robert Sean Leonard) tries to ***blackmail the staff-less House ... into hiring*** a new team by kidnapping his beloved guitar.
- (3) The Bush campaign ***frightened the American people into believing*** that the threat of terrorism would increase if Bush were defeated.
- (4) Hearers will be ***duped or deceived into believing*** falsehoods.
- (5) I will not ***sphroxyfy gullible people into looking up*** fictitious words in the dictionary.


‘X CAUSES Y TO DO Z by V’


talk somebody into doing sth.
* ***talk*** somebody
talk business


CAUSATION





- (1) “Who was that one **who talked us into taking** this limo?”

 wheedle coax charm
talk persuade argue
humor chit-chat flatter
- (2) Dr. Wilson (the reliably great Robert Sean Leonard) tries to **blackmail the staff-less House ... into hiring** a new team by kidnapping his beloved guitar.

 force coerce torture
blackmail brainwash
beat push pressure
- (3) The Bush campaign **frightened the American people into believing** that the threat of terrorism would increase if Bush were defeated.

 bully shame shock
frighten intimidate
tease guilt scare
- (4) Hearers will be **duped or deceived into believing** falsehoods.

 deceive trick fool
dupe con betray
hypnotize mislead
- (5) I will not **sphroxify gullible people into looking up** fictitious words in the dictionary.
Stimulate your own mind into thinking creatively.

 guide lead steer
stimulate trigger
calm rationalize

HISTORY

A. The King **moved** the army into France. [into NP]



B. It **turned** mirth into mourning. [into -ing_N]
They **cast** us into trembling and fear.



C. They **awed** us into truth-speaking. [into -ing_{N/V}]



(6) he was honestly **trepanned** ... **into giving** sentence against himself. [1678]

(7) Besides, you **Hector'd me into saying** I lov'd both [1689]

(8) ... and then you have charged me with **bullocking** you into owning the truth. [1749]



FORCE

(9) The house was large and elegant, and **betrayed** me into furnishing it rather better than suited my present circumstances [1763]



TRICK

(10) I wish I could **tease** her into loving me a little. [1781]



FEAR

(11) the civilities ... **flattered** her into believing she had excited a partiality that a very little time would ripen into affection [1782]

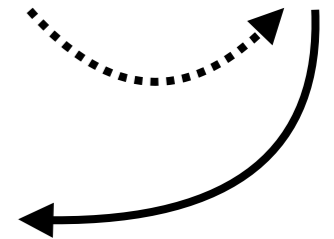


COMM

(12) ... and ... **led** him into speaking of his own plays. [1824]



MISC



DATA

Corpus of Historical American English (COHA)

400 million words, 1810–2009

fiction, magazine, news, non-fiction `[class="VERB"] []* "into"%c ".*ing"%c within s;`

```
suz — less ◀ cqp -e — 106×24

#-----
#
# User:      <unknown> (<unknown>)
# Date:      Sat Nov 10 13:57:27 2018
# Corpus:    coha-s (CORPUS OF HISTORICAL AMERICAN ENGLISH -- COHA (Sentence Version))
# Name:      COHA-S:Last
# Size:      12694 intervals/matches
# Context:   25 characters left, 25 characters right
#
# Query: COHA-S; [class="VERB"] []* "into"%c ".*ing"%c within s;
#-----
176336637: was n't and would n't be [[[ compromised into being ]]] . " I 'm not letting peo
350968873: , we often use choices to [[[ coerce our kids into doing ]]] our bidding without them
224668457: witnesses . He was being [[[ terrorized into making ]]] a statement by the same
196575199: e to you . " " W is ? " " [[[ Turned you into something ]]] ? " " Ghastly ' say , la
300253744: he University of Virginia [[[ came into being ]]] . One of those boys late
273215249: lity of intensity that he [[[ throws into everything ]]] , he is really a great l
203363864: Dov Baer have the gall to [[[ fool other people into thinking ]]] that he could look insid
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312184892: recasting the weather has [[[ come into being ]]] since Defoe 's day , and
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annotation

```
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	CPOS	DECADE PERIOD	YEAR	LEFT	MATCH	RIGHT	EX	V1	CLASS	VOICE	V2
2	350968873	2000s	P4	2000 let 's face it , we often use choices to	coerce our kids into doing	our bidding with y		coerce	force/pressure	active	do
3	224668457	1990s	P4	1997 an the other witnesses . He was being	terrorized into making	a statement by t y		terrorize	irritation/fear	passive	make
4	203363864	1980s	P4	1982 l a man like Dov Baer have the gall to	fool other people into thinking	that he could loc y		fool	deception/trickery	active	think
5	381910540	1950s	P4	1956 ited to . Mr. Anderson asserted Ford '	pressured him into selling	his franchise in 1 y		pressure	force/pressure	active	sell
6	300548238	1920s	P3	1928 modern and ingenious photographers	bully people into assuming	. If a subject doe y		bully	irritation/fear	active	assume
7	7606809	1830s	P1	1834 ian they take you for , if they think to	coax you into being	President as long y		coax	communication/per	active	be
8	9789027	1830s	P1	1835 aking a solitary morning ride , he was	betrayed into kissing	, with real emoti y		betray	deception/trickery	passive	kiss
9	45881576	1860s	P2	1869 niels says the idea that that man can	force you into selling	is ridiculous . " " y		force	force/pressure	active	sell
10	50470593	1870s	P2	1873 injury you can put upon any one is to	provoke him into displaying	his nature . No g y		provoke	irritation/fear	active	display
11	245833206	2000s	P4	2009 r waking Bonnie . But unless he could	talk Madeline into sending	his things up wit y		talk	communication/per	active	send
12	1685287	1820s	P1	1823 sire to slay any man ; I only desired to	terrify some one into giving	me some pence y		terrify	irritation/fear	active	give

meta data

example

```
#
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12	1685287	1820s	P1	1823 sire to slay any man ; I only desired to	terrify some one into giving

V1	CLASS	VOICE	V2	
coerce	force/pressure	active	do	
terrorize	irritation/fear	passive	make	
fool	deception/trickery	active	think	
pressure	force/pressure	active	sell	
bully	irritation/fear	active	assume	
coax	communication/per	active	be	
betray	deception/trickery	passive	kiss	
force	force/pressure	active	sell	
provoke	irritation/fear	active	display	
talk	communication/per	active	send	
terrify	irritation/fear	active	give	
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9	45881976	1860s P2	1869	niels says the idea that that man can	force you into s
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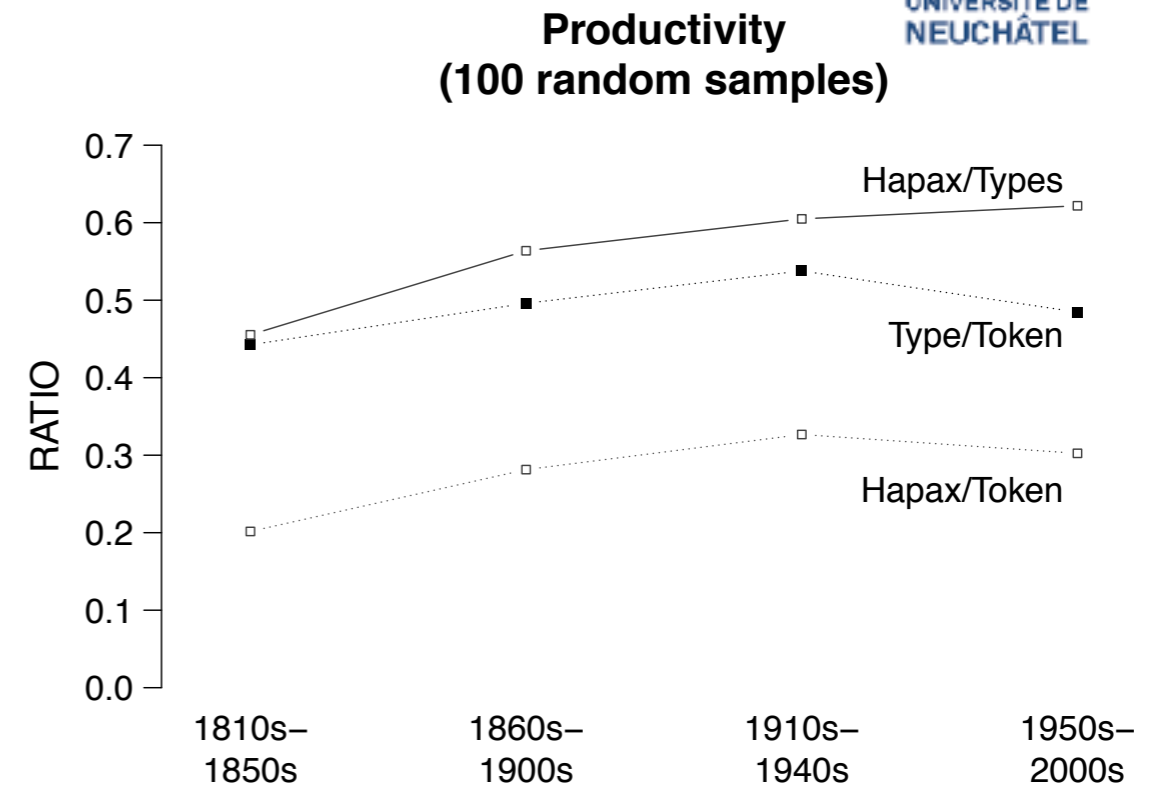
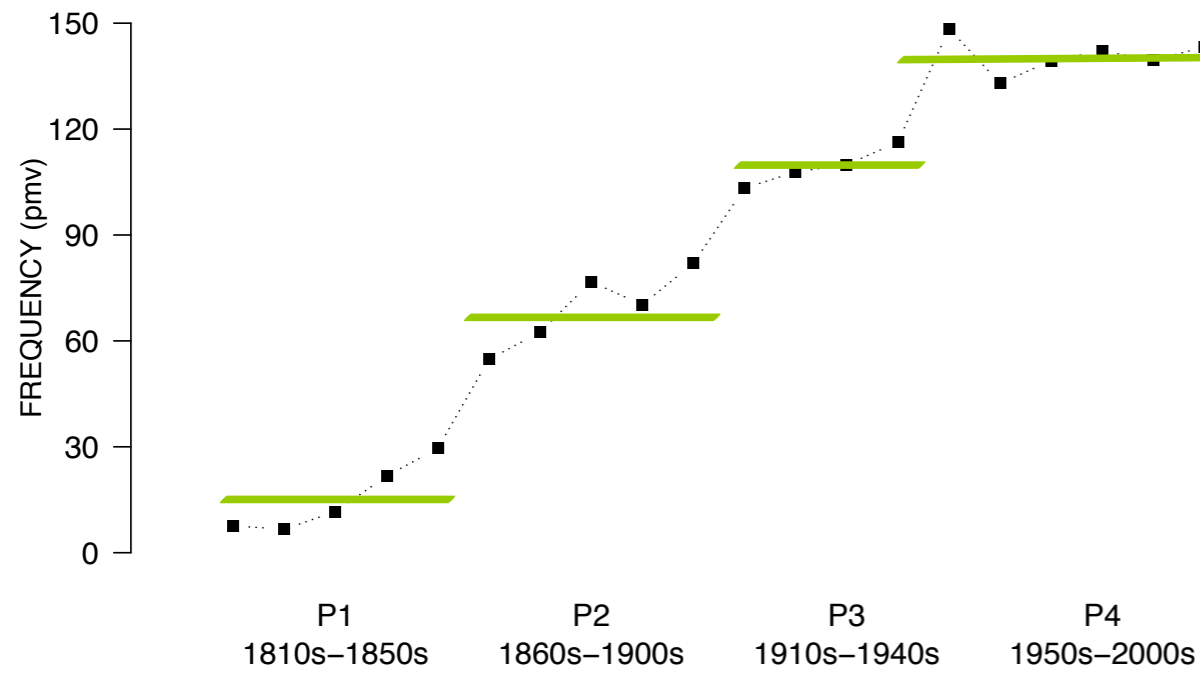
DECADE	FREQ
1810s	1
1820s	5
1830s	17
1840s	37
1850s	53
1860s	102
1870s	130
1880s	172
1890s	157
1900s	202
1910s	266
1920s	310
1930s	310
1940s	328
1950s	425
1960s	372
1970s	392
1980s	427
1990s	474
2000s	513
SUM	4693

EX	V1	CLASS	VOICE	V2
y	coerce	force/pressure	active	do
y	terrorize	irritation/fear	passive	make
y	fool	deception/trickery	active	think
y	pressure	force/pressure	active	sell
y	bully	irritation/fear	active	assume
y	coax	communication/per	active	be
y	betray	deception/trickery	passive	kiss
y	force	force/pressure	active	sell
y	provoke	irritation/fear	active	display
y	talk	communication/per	active	send
y	terrify	irritation/fear	active	give

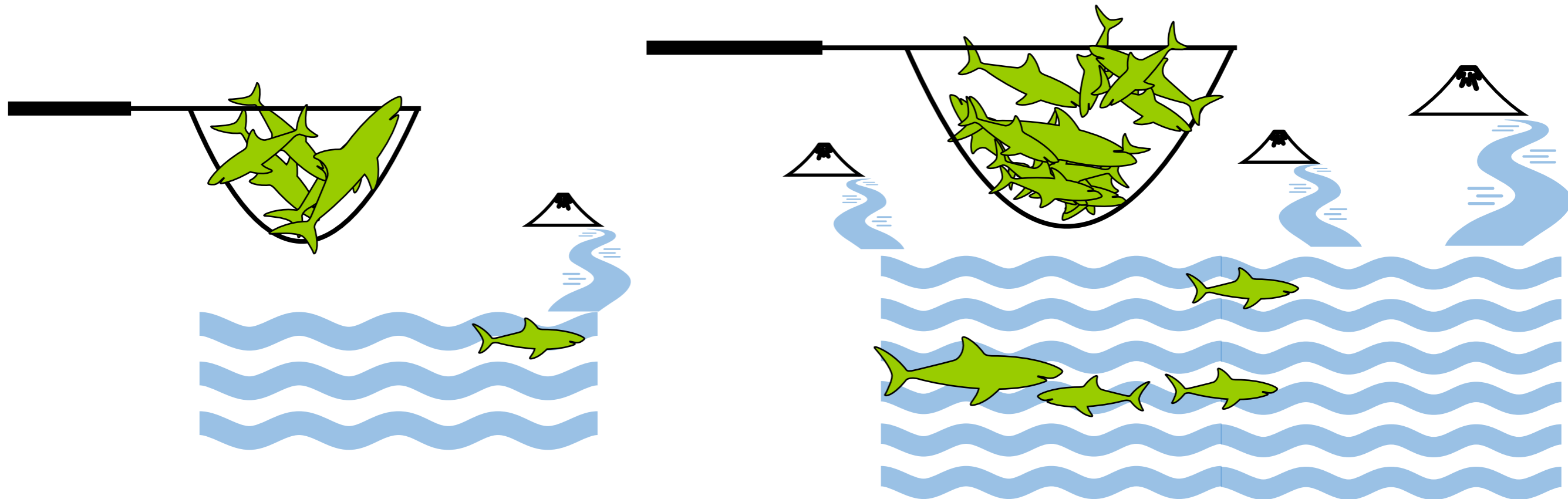
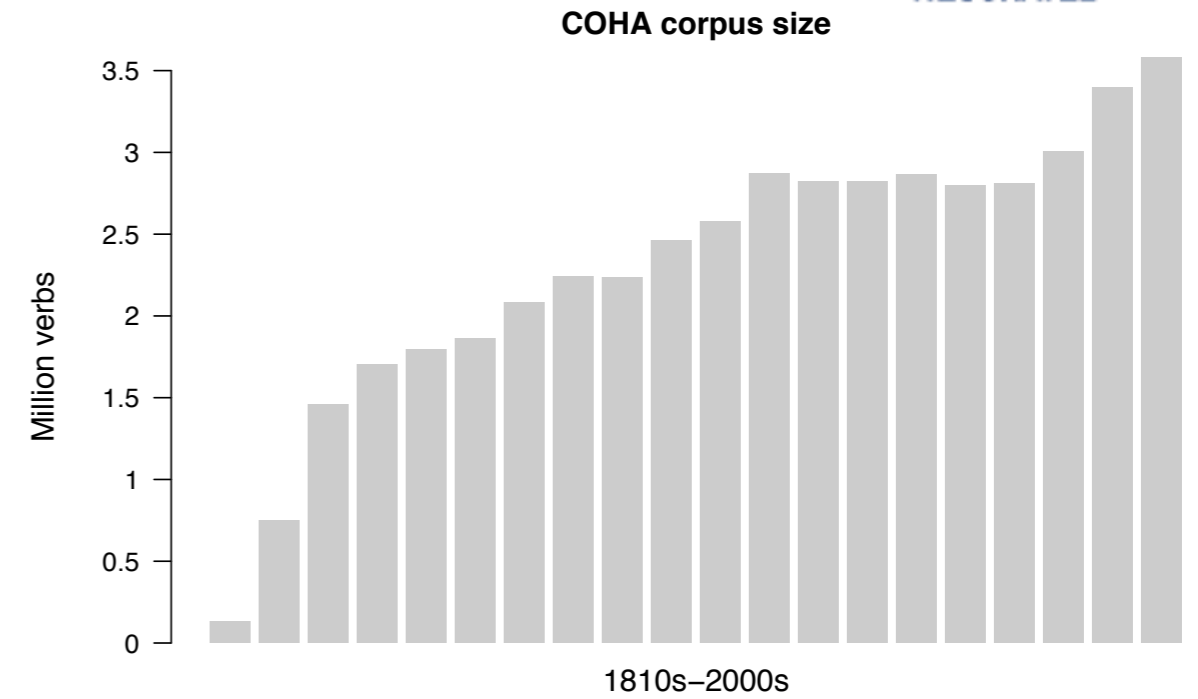
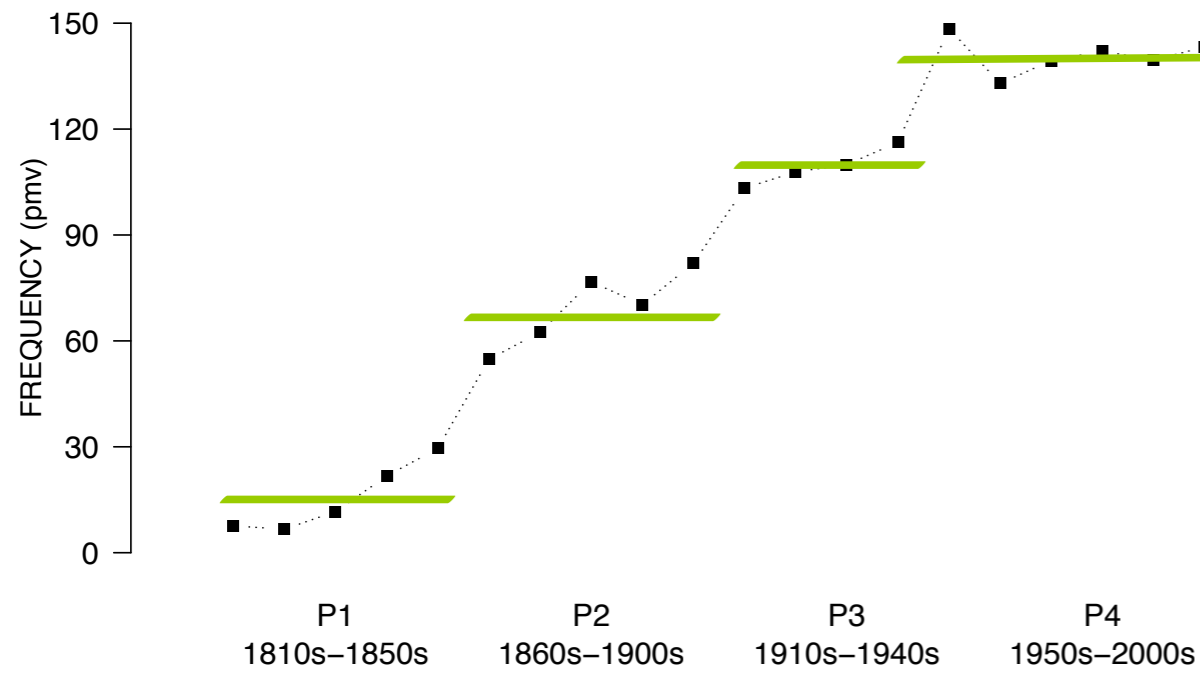


ANALYSIS

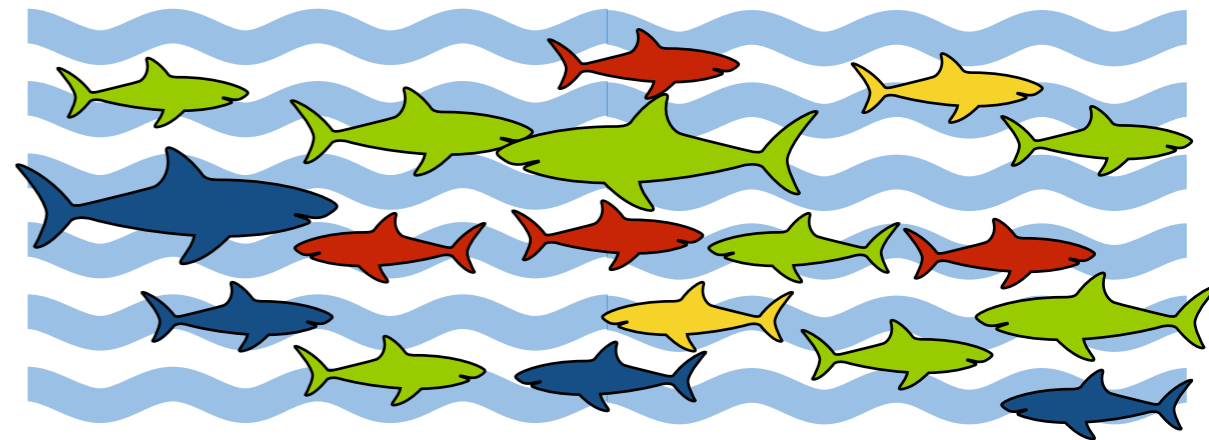
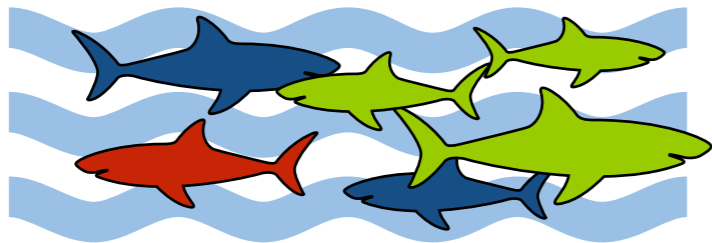
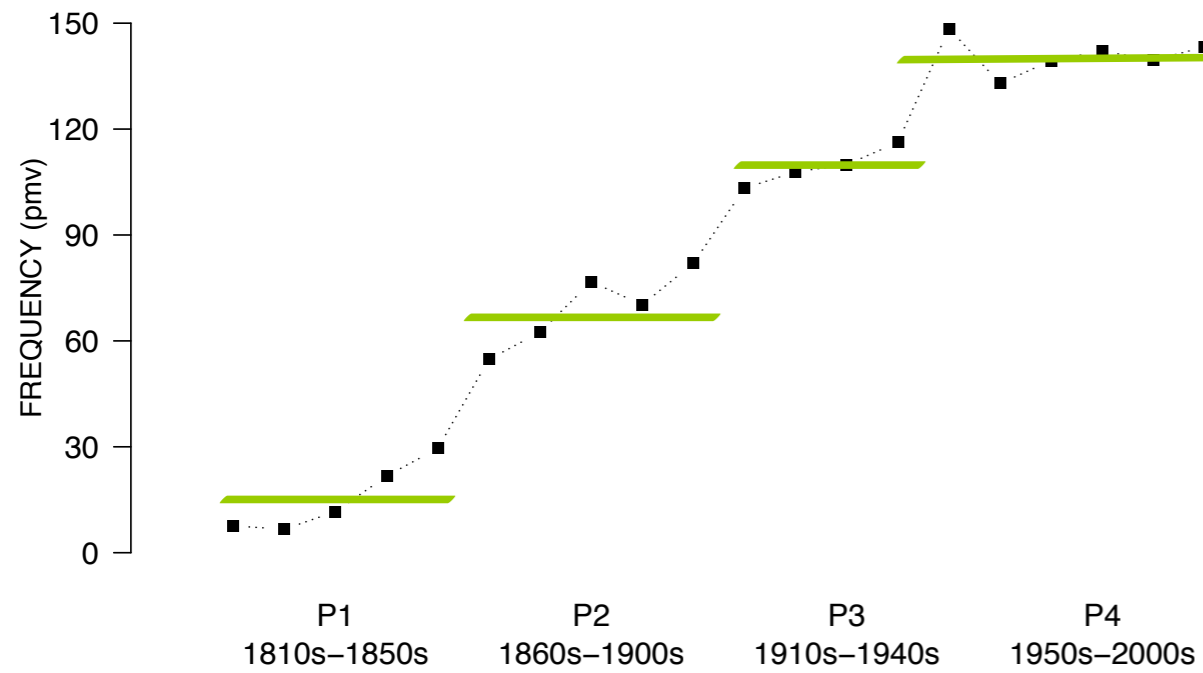
Excursus: Corpus data

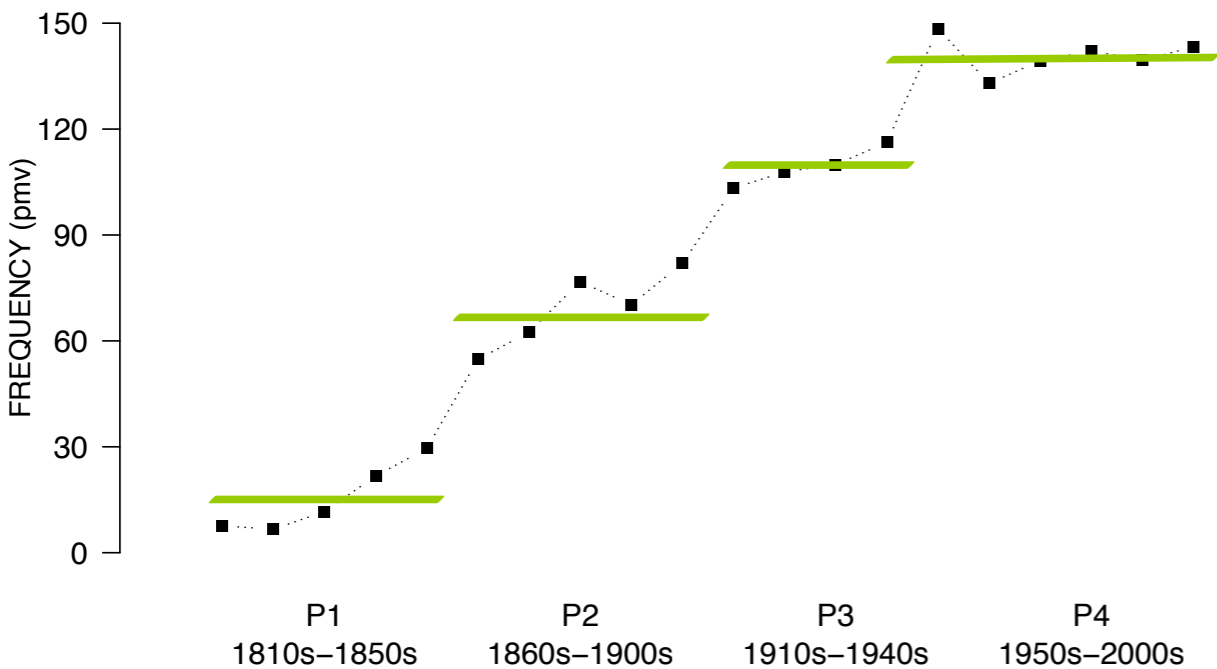


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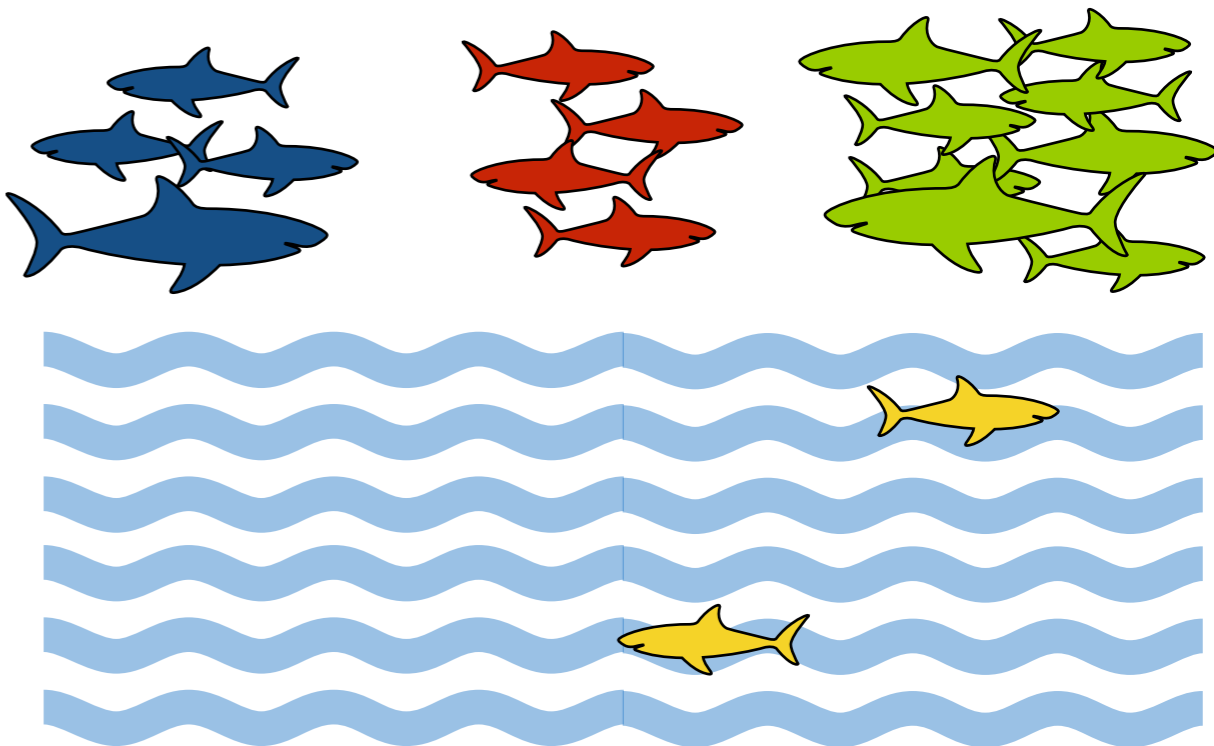
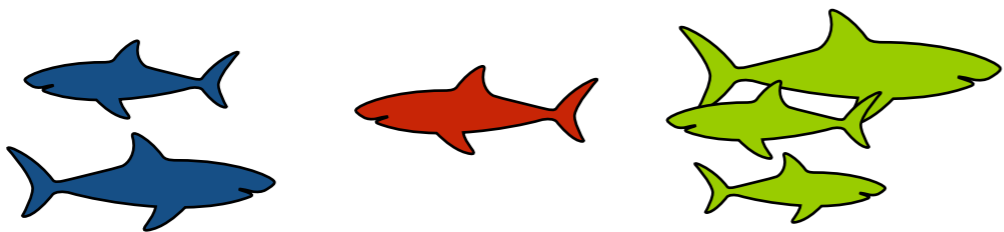


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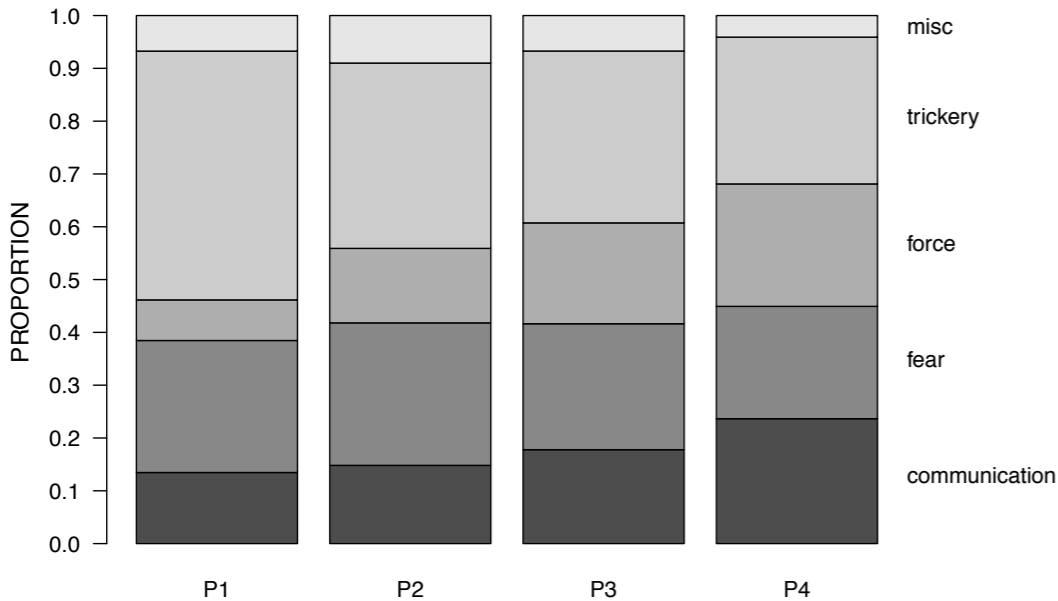
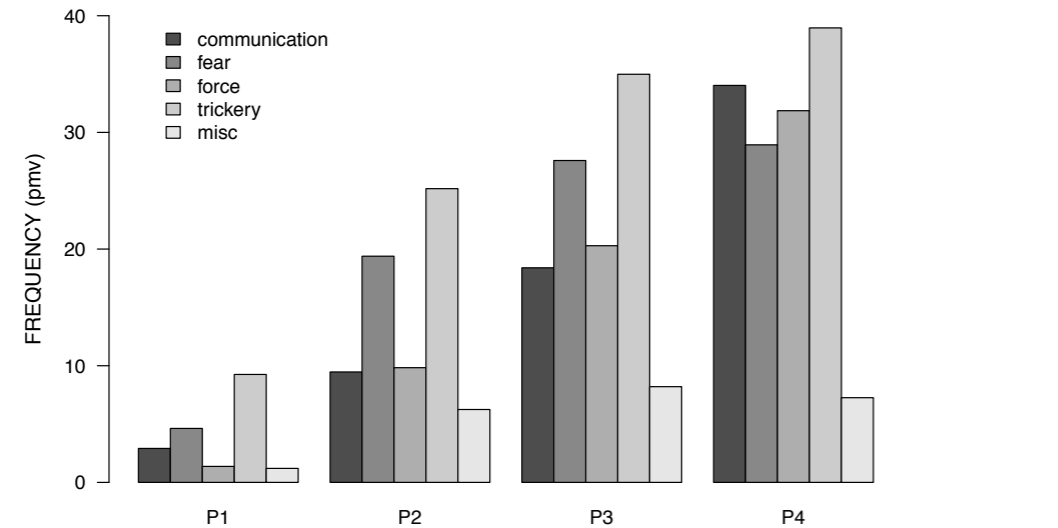
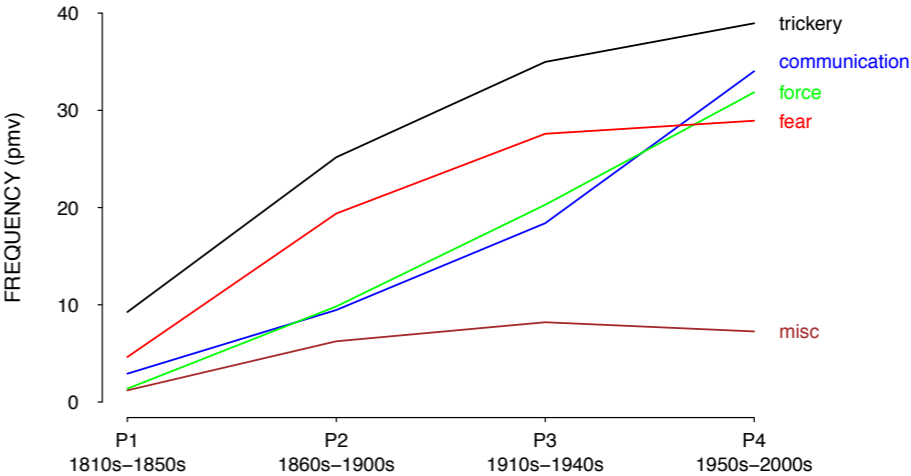


	P1	P2	P3	P4	Sum
communication	17	103	204	628	952
fear	27	211	306	534	1078
force	8	107	225	588	928
misc	7	68	91	134	300
trickery	54	274	388	719	1435
Sum	113	763	1214	2603	4693



Case study I: Shifts in verb classes

	P1	P2	P3	P4	Sum
communication	17	103	204	628	952
fear	27	211	306	534	1078
force	8	107	225	588	928
misc	7	68	91	134	300
trickery	54	274	388	719	1435
Sum	113	763	1214	2603	4693



HAIR	male	female	SUM
dark	12.5 14	21	35
light	6	15	21
SUM	20	36	56

$$20 * 35 / 56 = 12.5$$

HAIR	male	female	SUM
dark	12.5 14	22.5 21	35
light	7.5 6	13.5 15	21
SUM	20	36	56

HAIR	male	female
dark	0.18	0.10
light	0.30	0.17

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

$$\chi^2 = 0.75 \quad p = 0.38, \text{ n.s.}$$

ASSOCIATION PLOTS

Case study I: Shifts in verb classes

	P1	P2	P3	P4	Sum
communication	22.9 17	103	204	628	952
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$$\chi^2 = 137.62$$

$$p < 0.001, ***$$

$$V = .098$$

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	P1	P2	P3	P4	Sum
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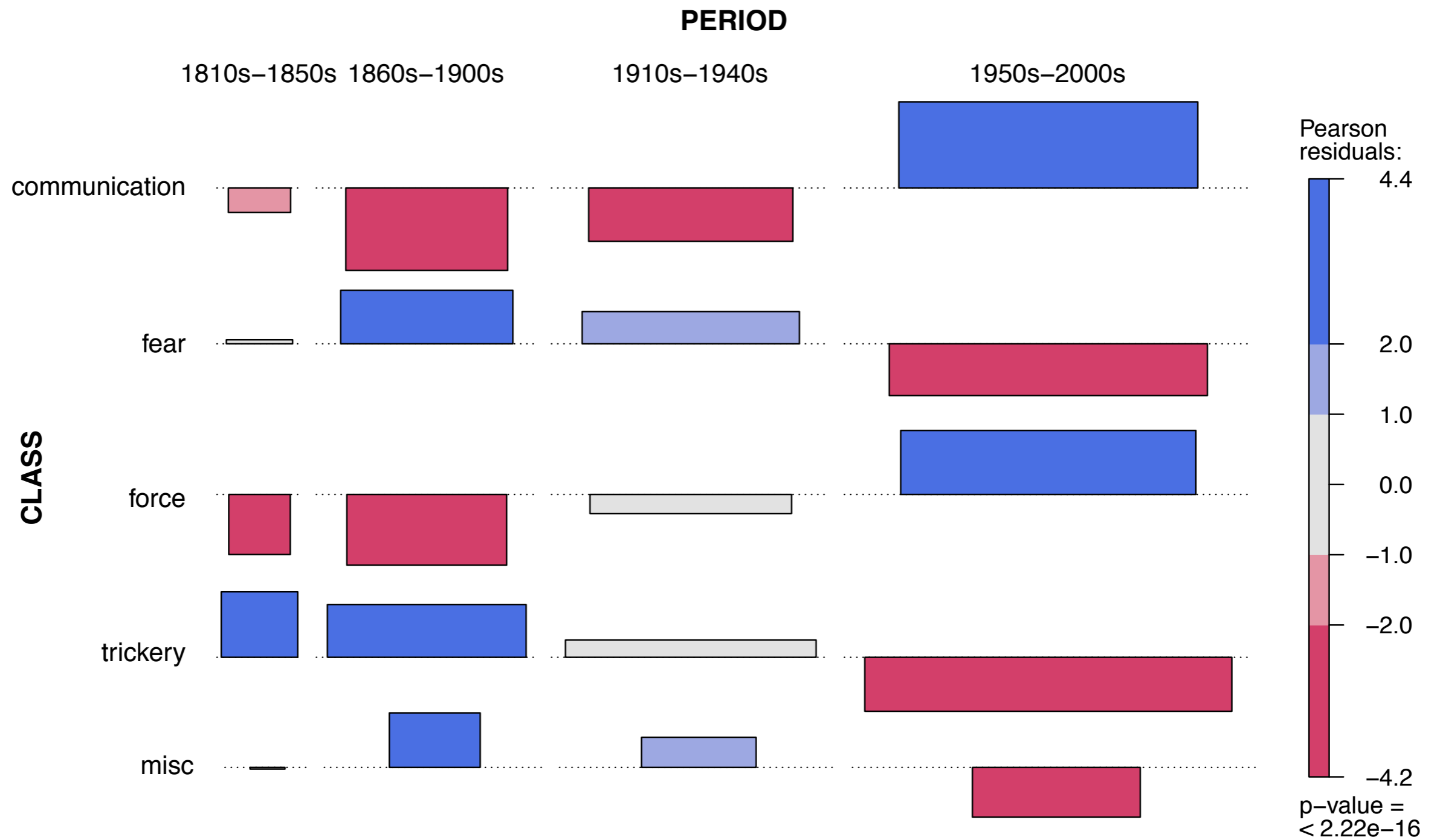
	P1		P2		P3		P4		Sum
communication	<i>22.9</i>	17	<i>154.7</i>	103	<i>246.3</i>	204	<i>528.0</i>	628	952
fear	<i>25.9</i>	27	<i>175.3</i>	211	<i>278.8</i>	306	<i>597.9</i>	534	1078
force	<i>22.3</i>	8	<i>150.9</i>	107	<i>240.1</i>	225	<i>514.7</i>	588	928
misc	<i>7.2</i>	7	<i>48.8</i>	68	<i>77.6</i>	91	<i>166.4</i>	134	300
trickery	<i>34.6</i>	54	<i>233.3</i>	274	<i>371.2</i>	388	<i>795.9</i>	719	1435
Sum		113		763		1214		2603	4693

$$\chi^2 = 137.62$$

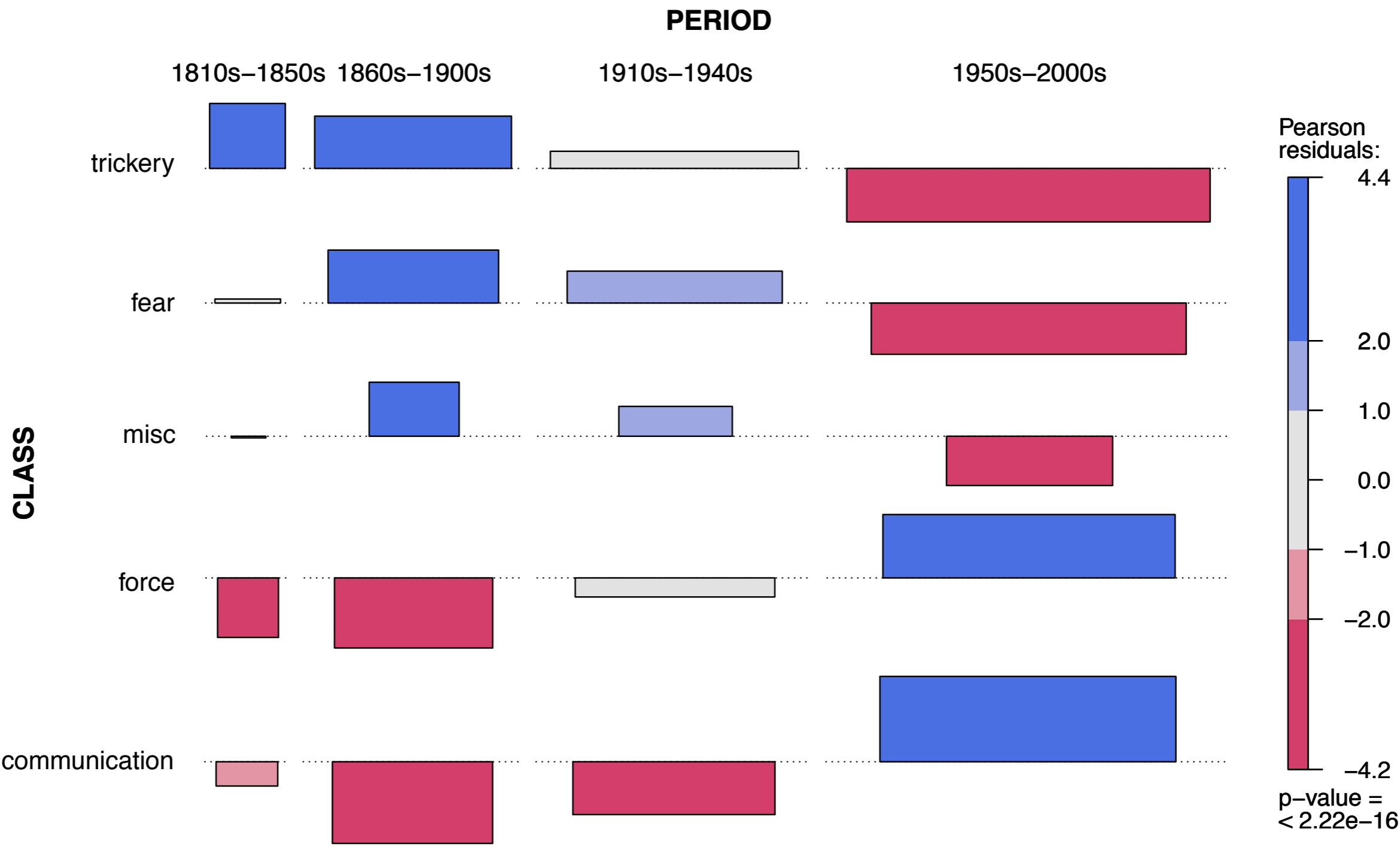
$$p < 0.001, ***$$

$$V = .098$$

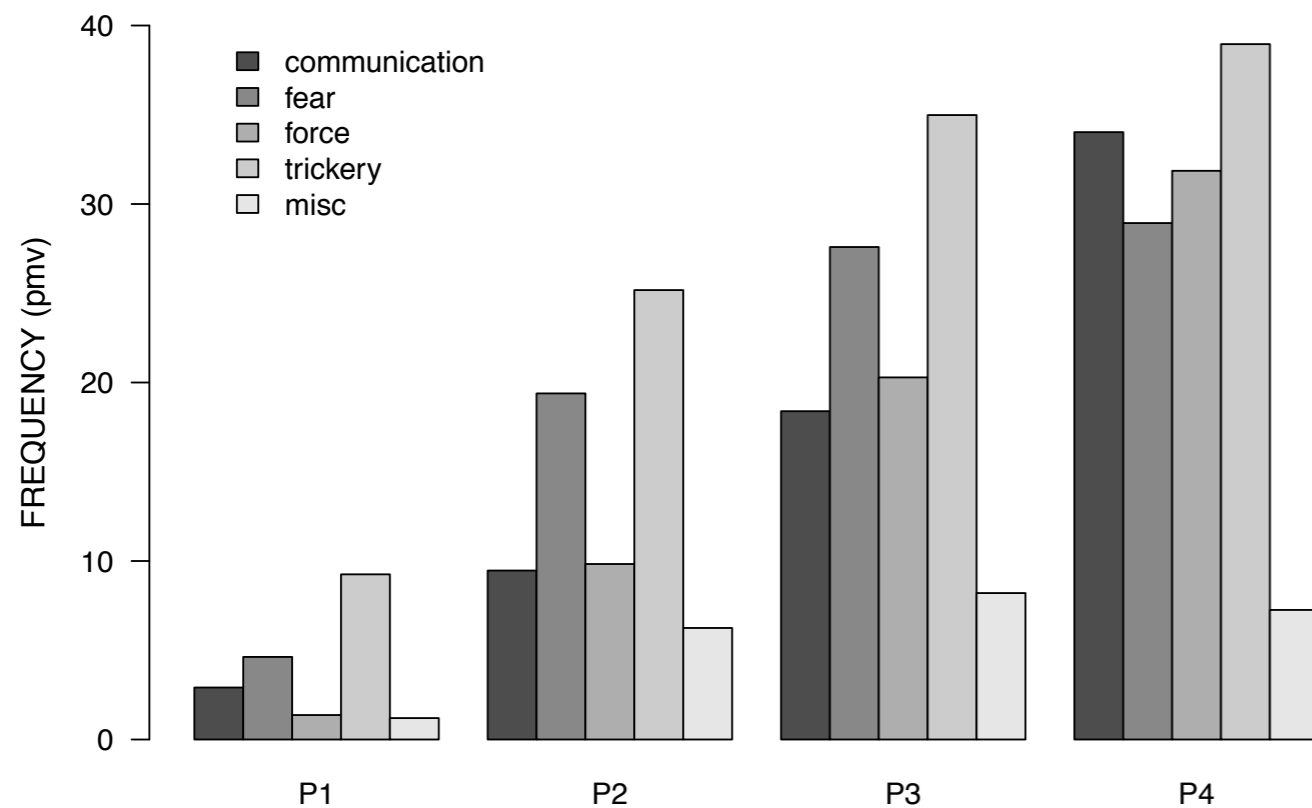
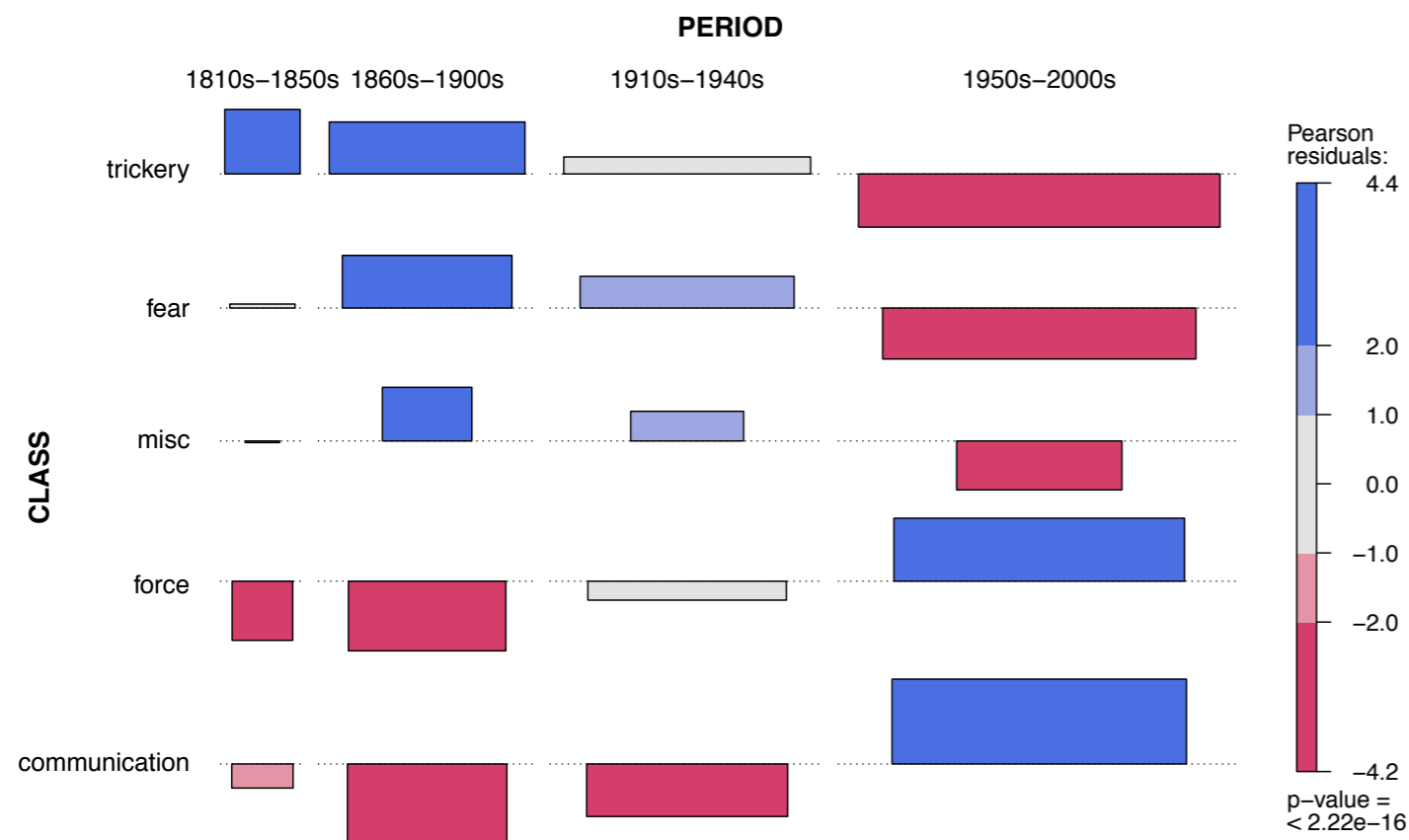
Case study I: Shifts in verb classes



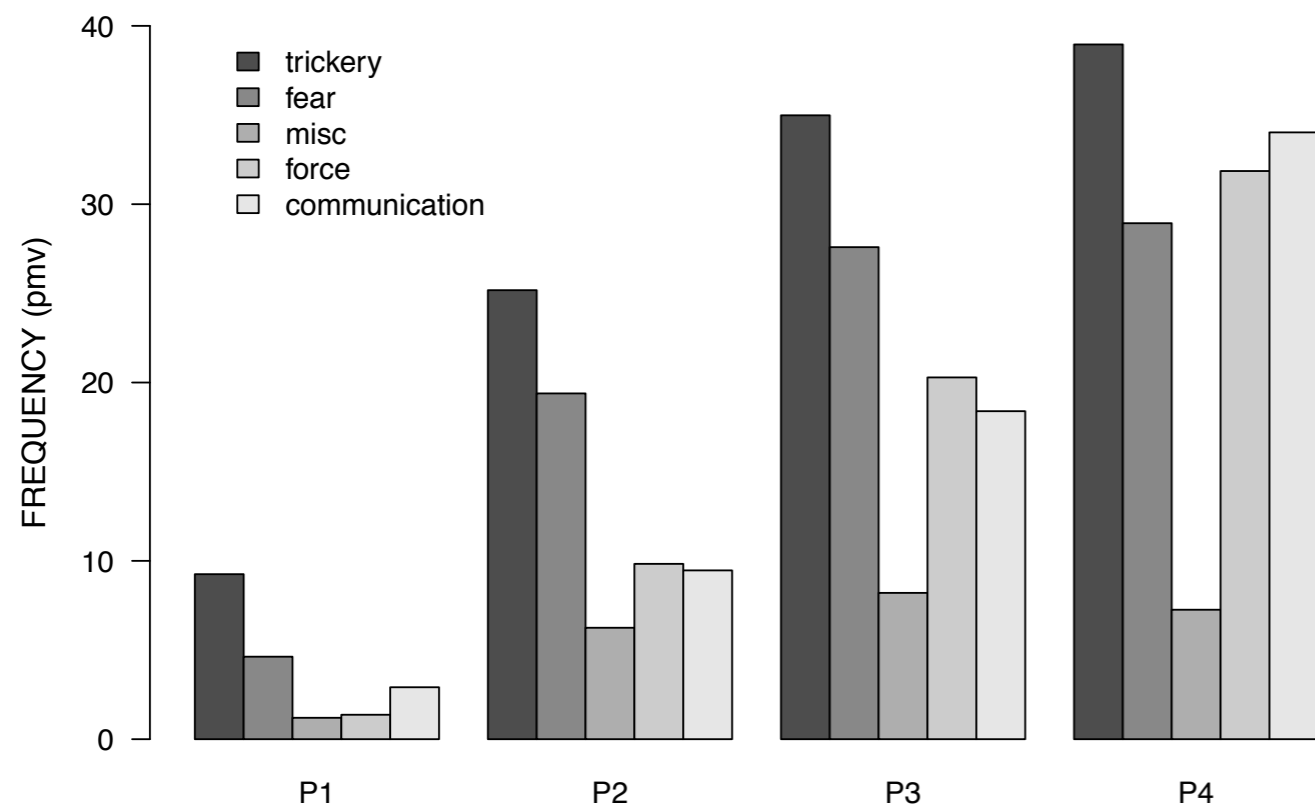
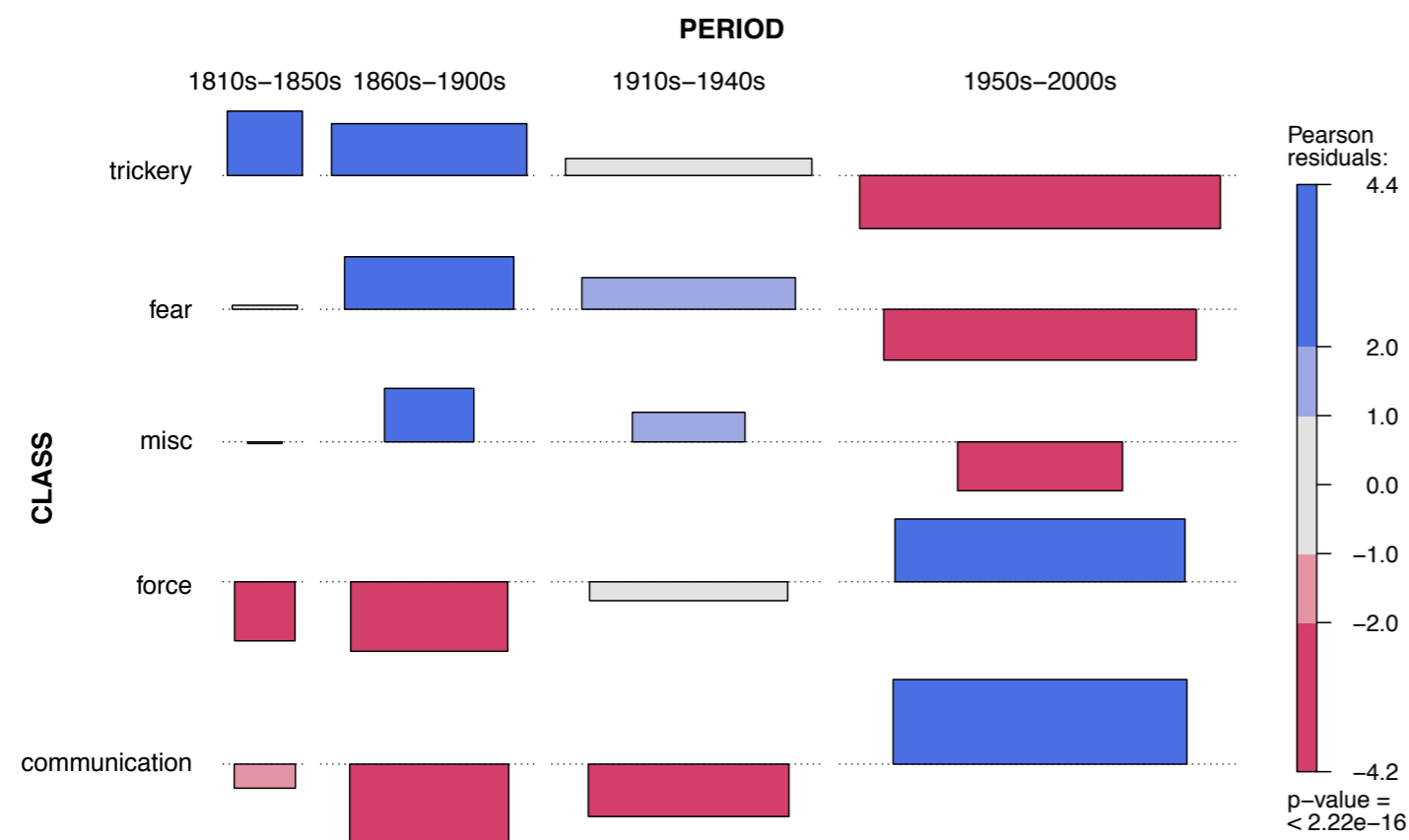
Case study I: Shifts in verb classes



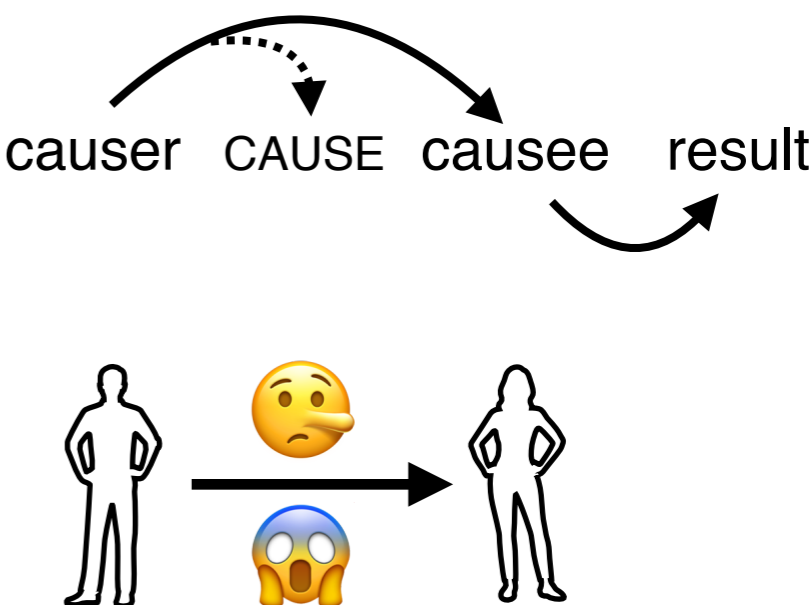
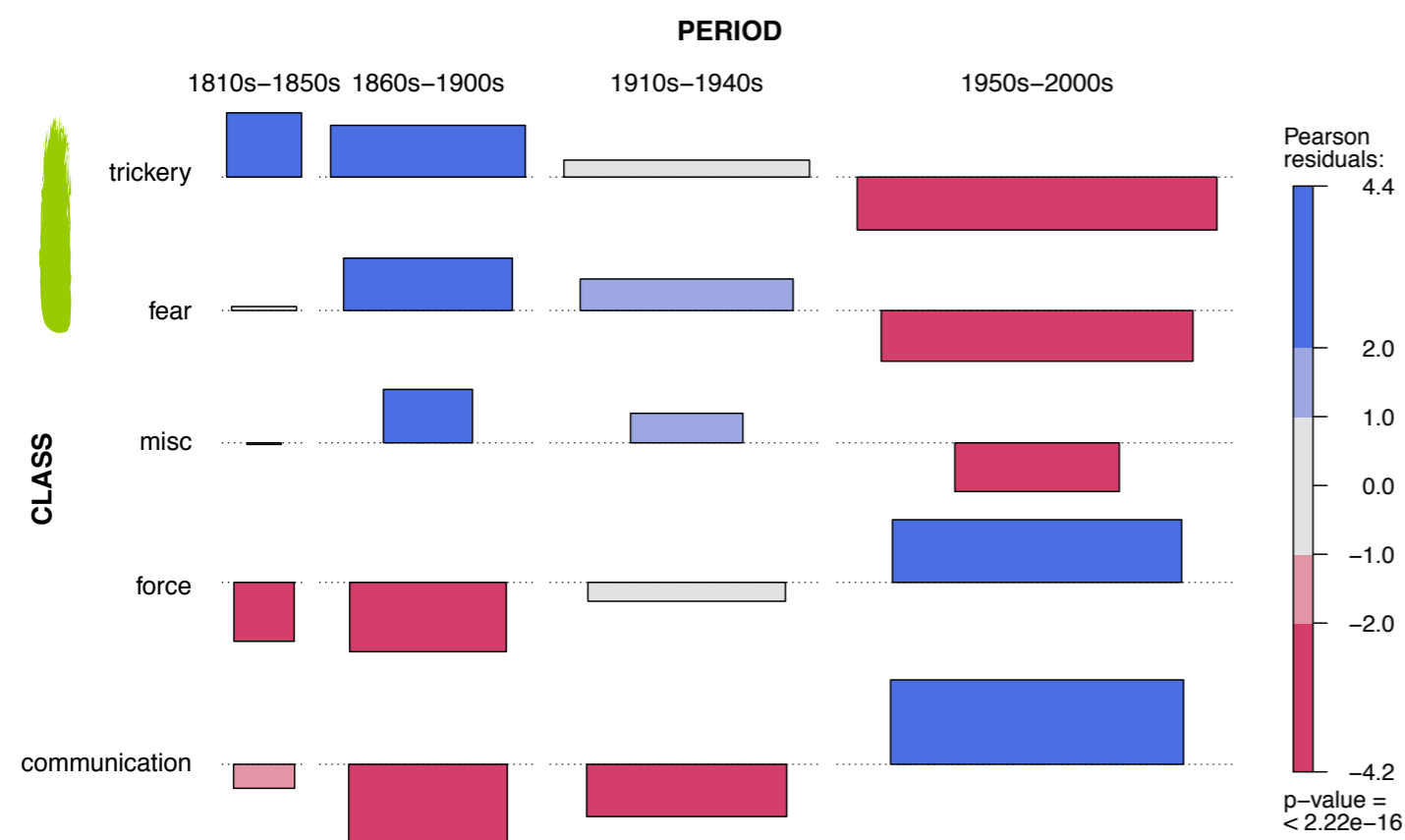
Case study I: Shifts in verb classes



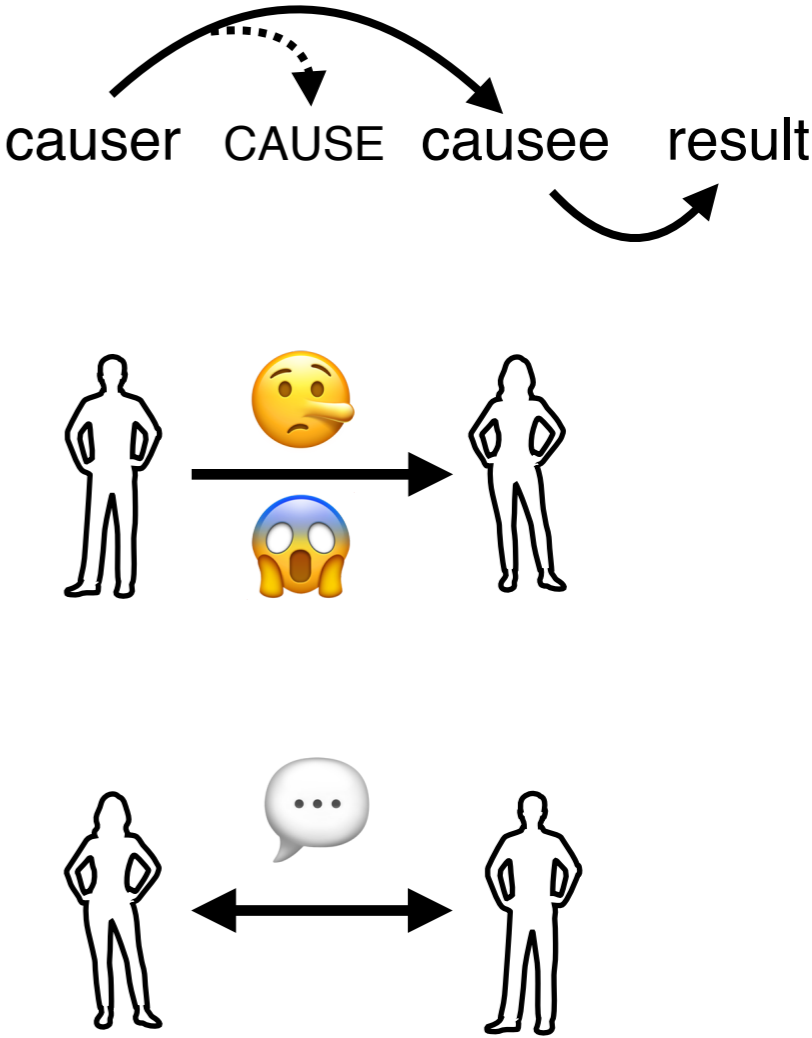
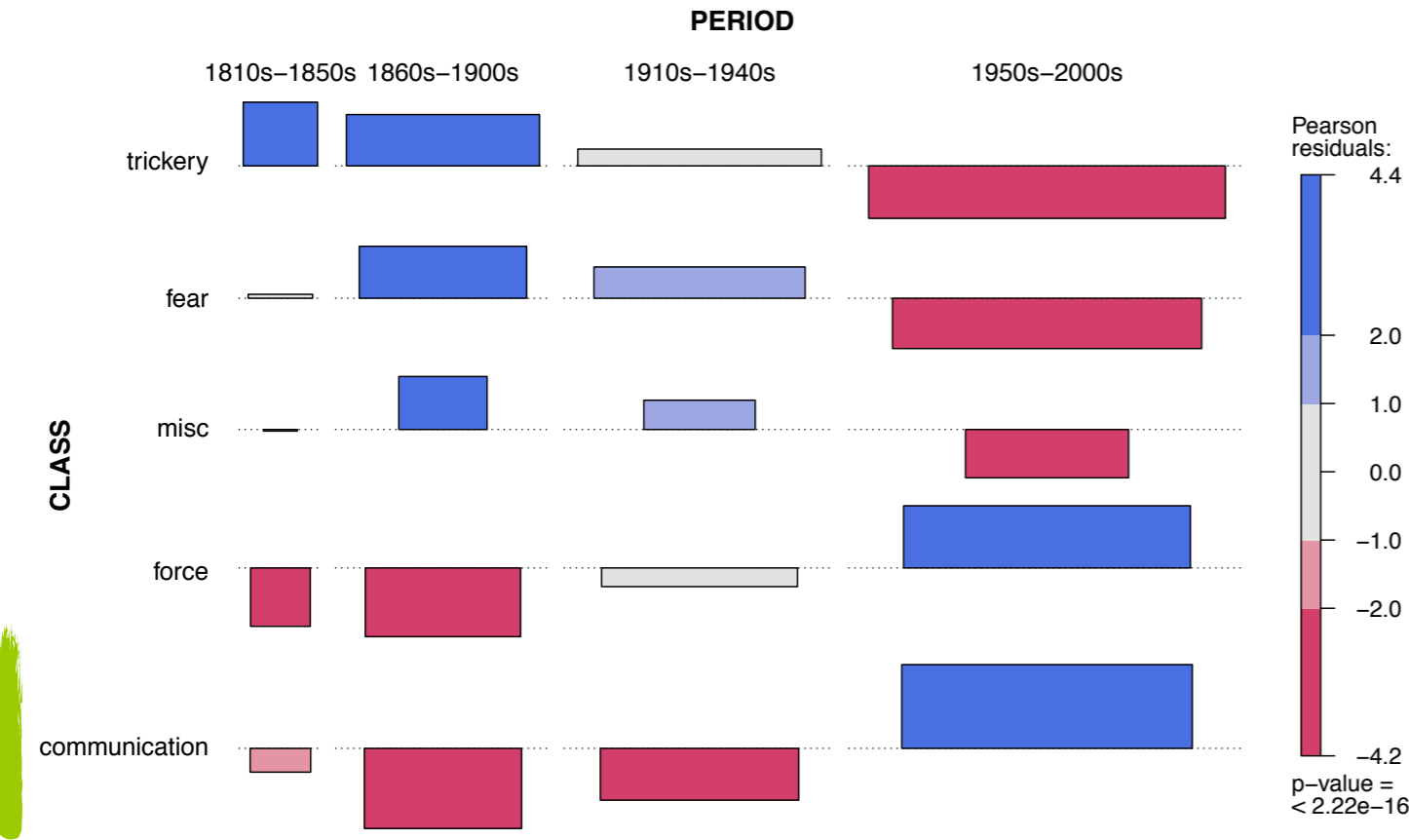
Case study I: Shifts in verb classes



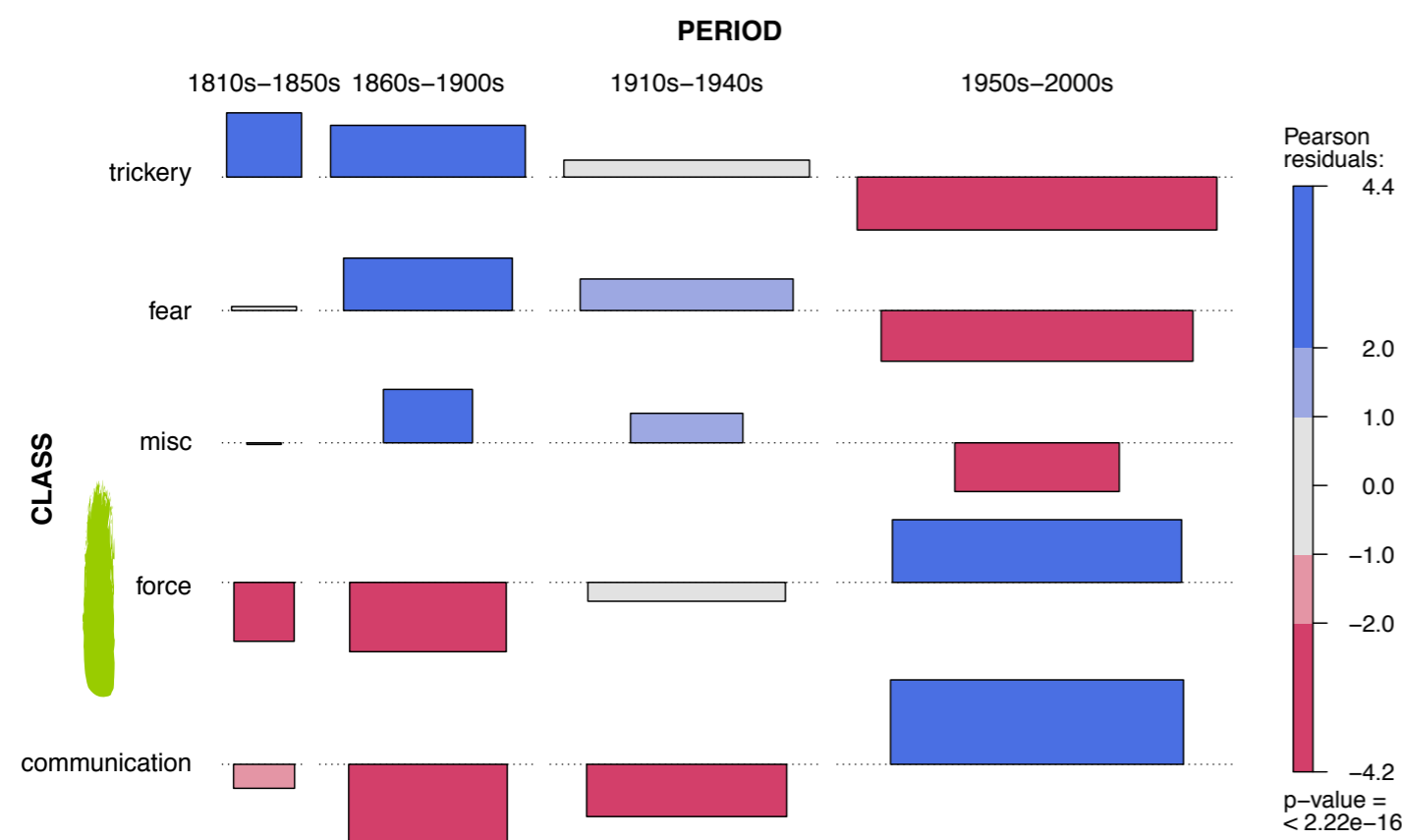
Case study I: Shifts in verb classes



Case study I: Shifts in verb classes

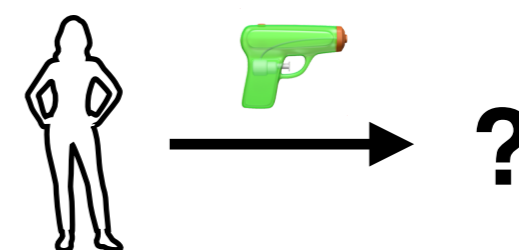
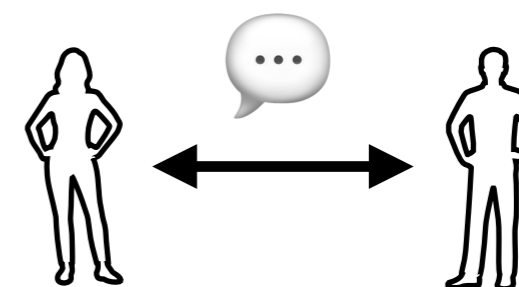
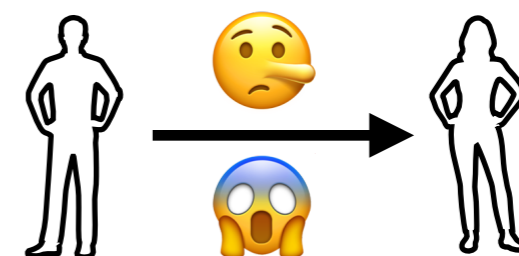
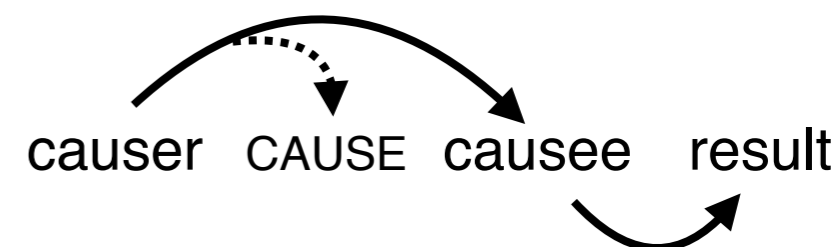


Case study I: Shifts in verb classes



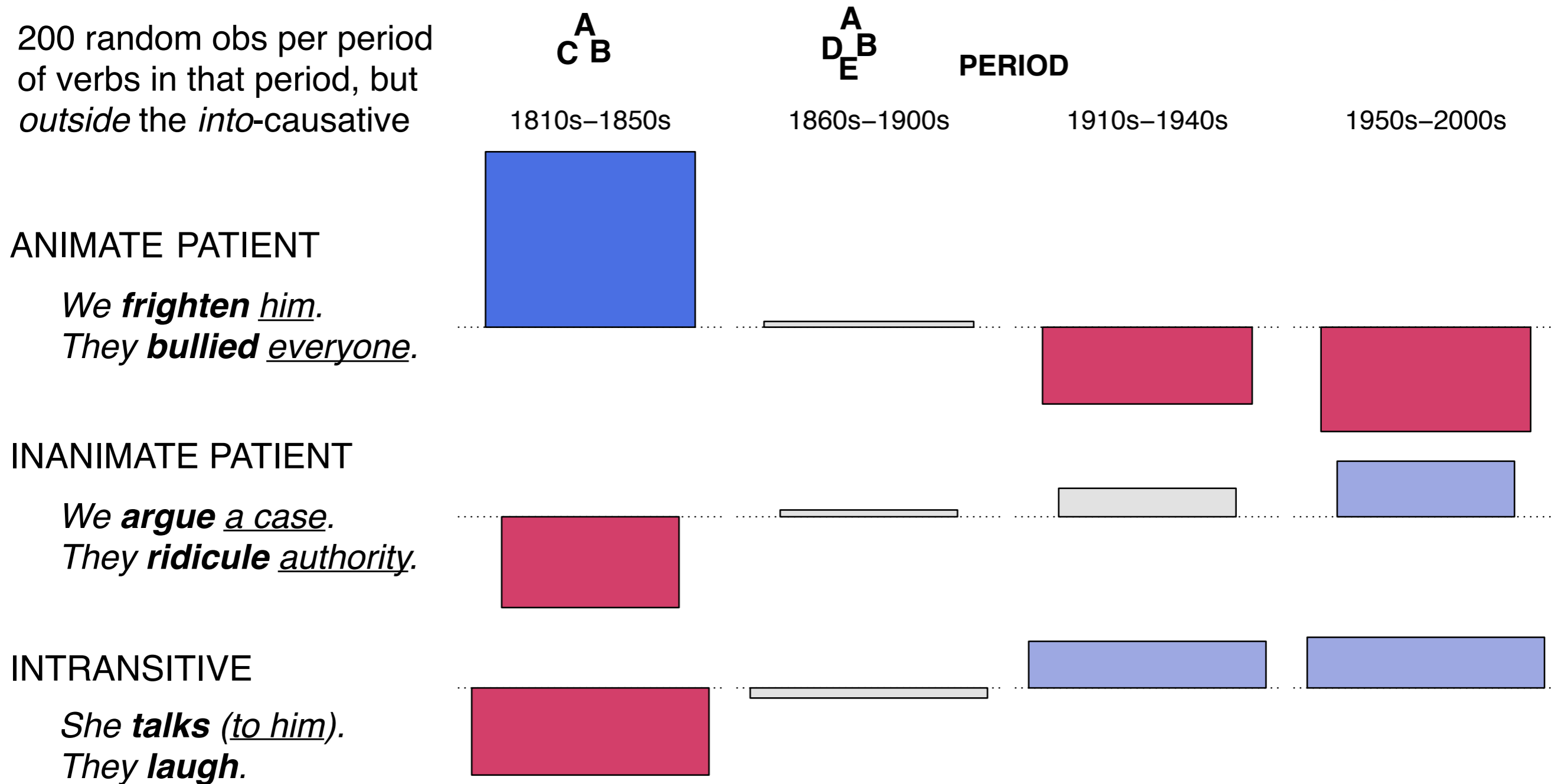
force { *a tear*
a discussion
a door open

torture { *one's mind*
one's feelings



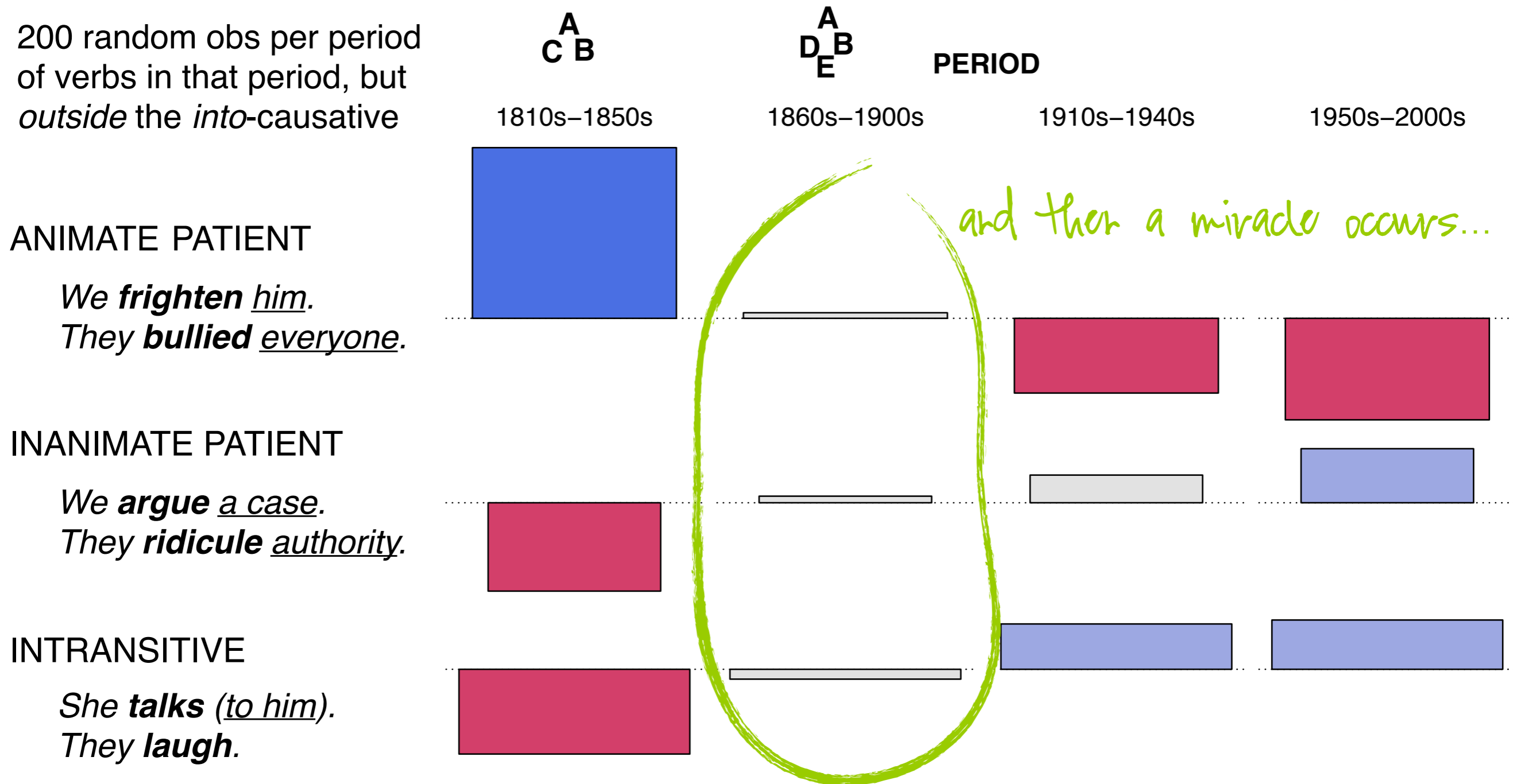
Case study II: Shifts in argument structure

200 random obs per period
of verbs in that period, but
outside the *into*-causative



Case study II: Shifts in argument structure

200 random obs per period
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Case study II: Shifts in argument structure

200 random obs per period
of verbs in that period, but
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ANIMATE PATIENT

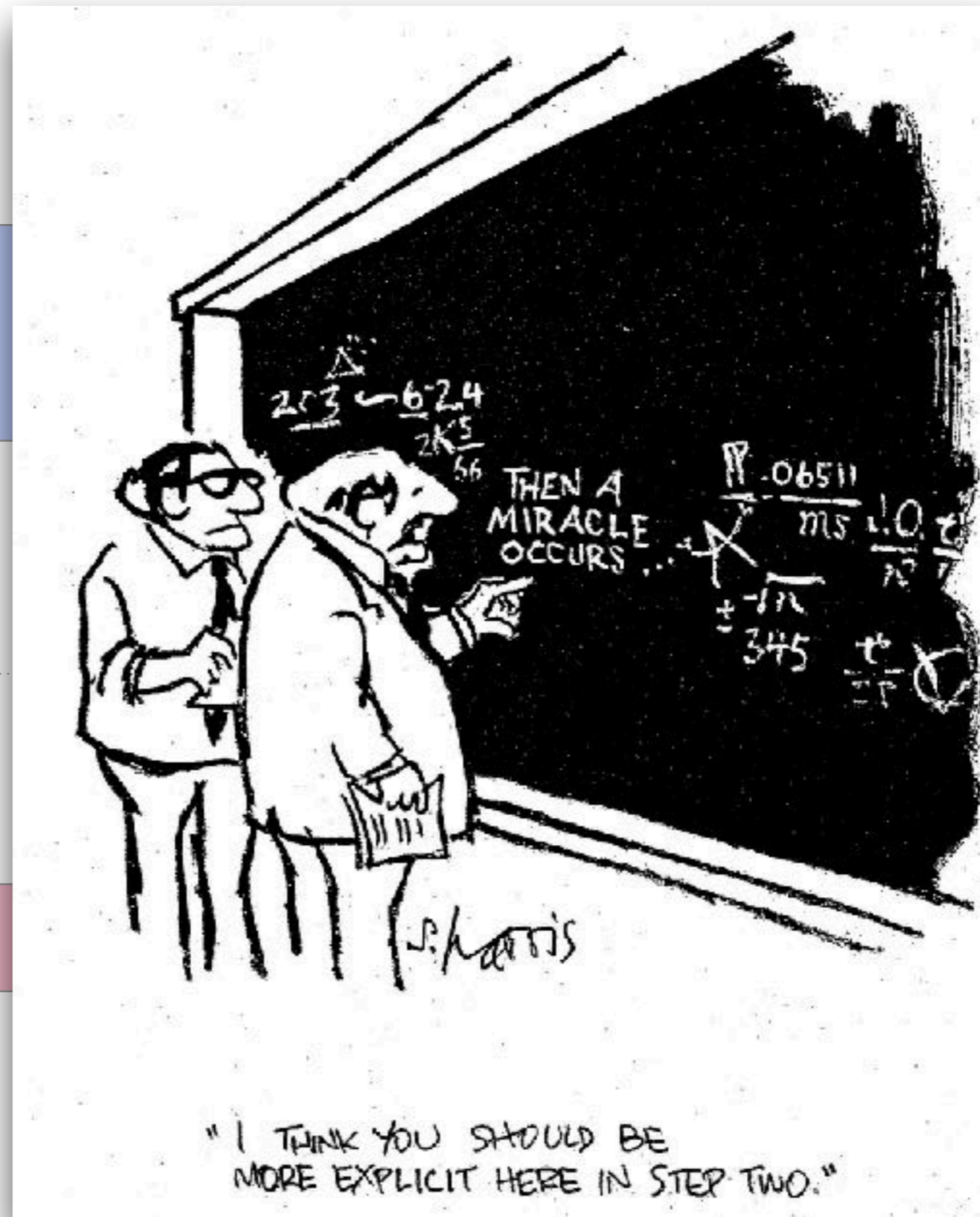
We **frighten** him.
They **bullied** everyone.

INANIMATE PATIENT

We **argue** a case.
They **ridicule** authority.

INTRANSITIVE

She **talks** (to him).
They **laugh**.

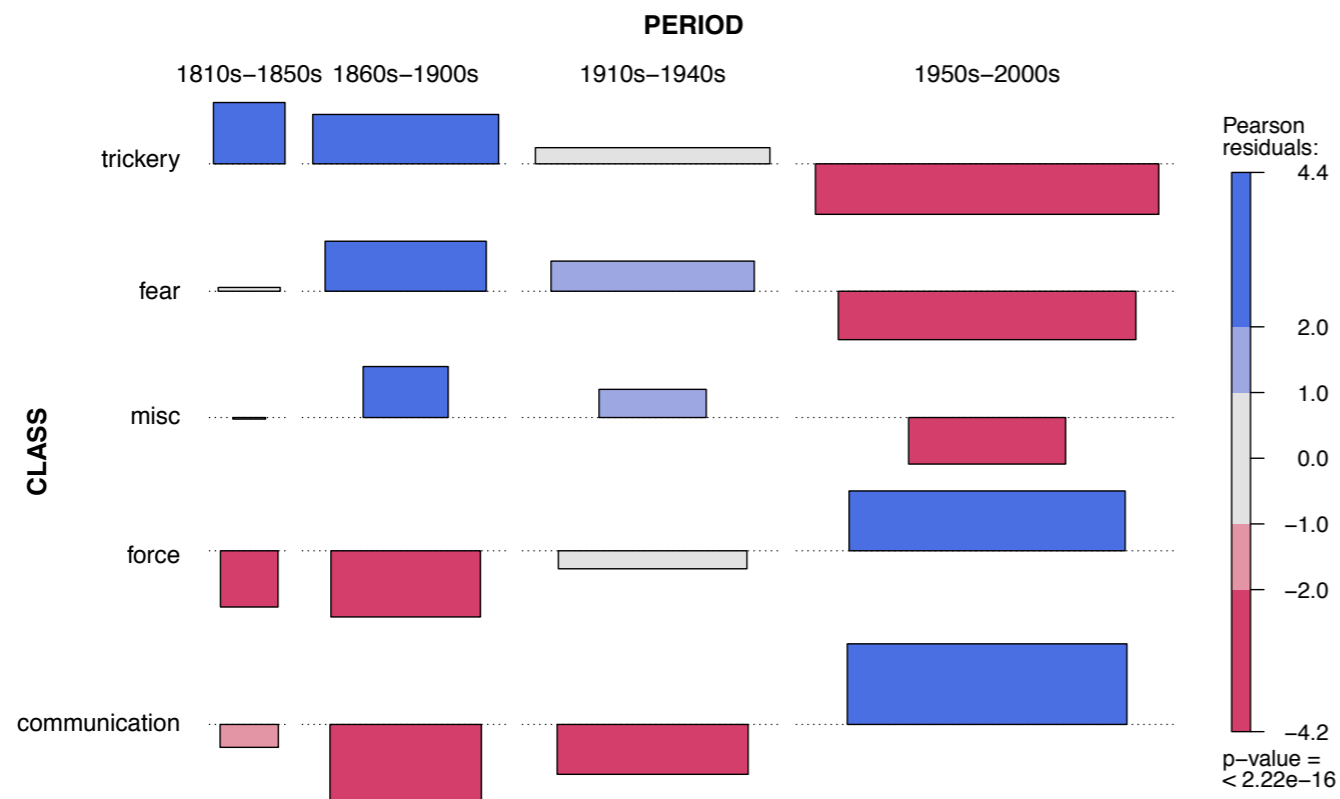


1950s–2000s

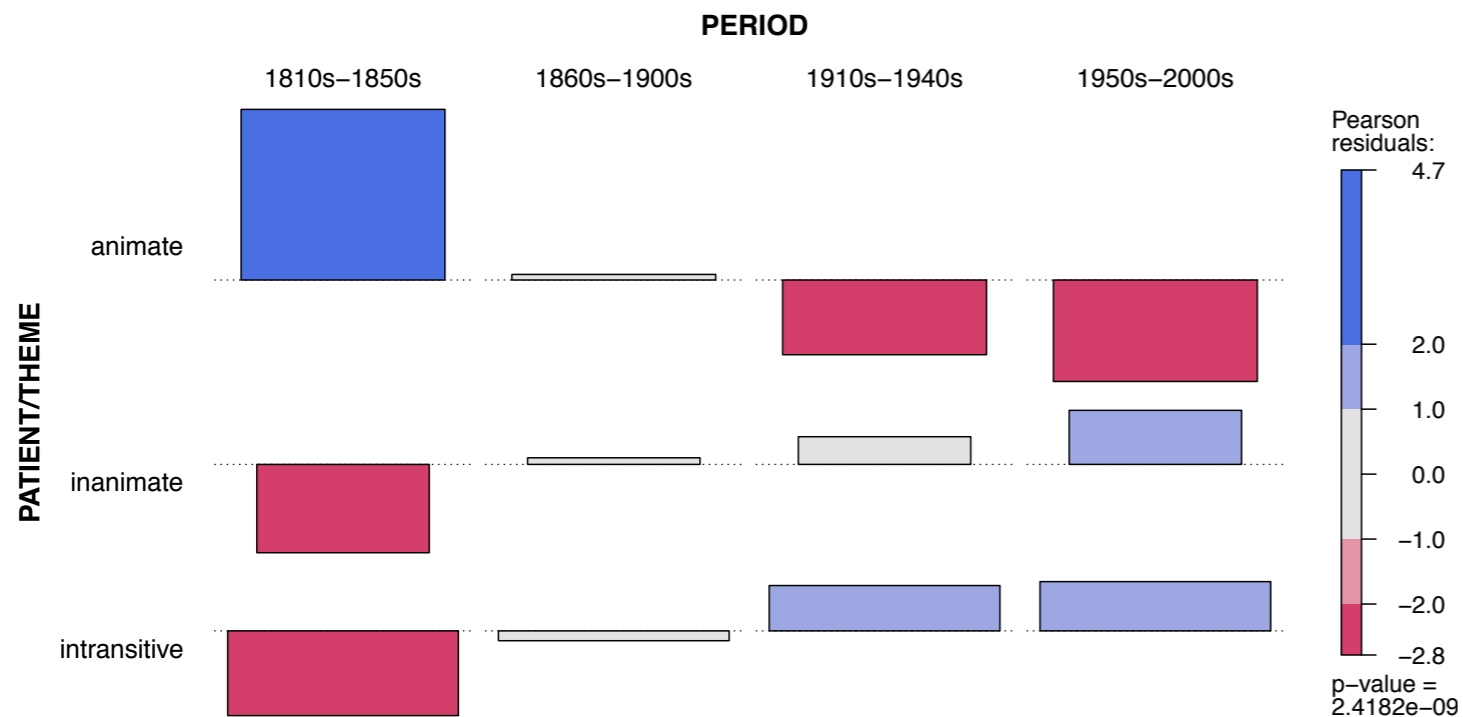
ide occurs...



Association plots: Interpretation



semantic classes

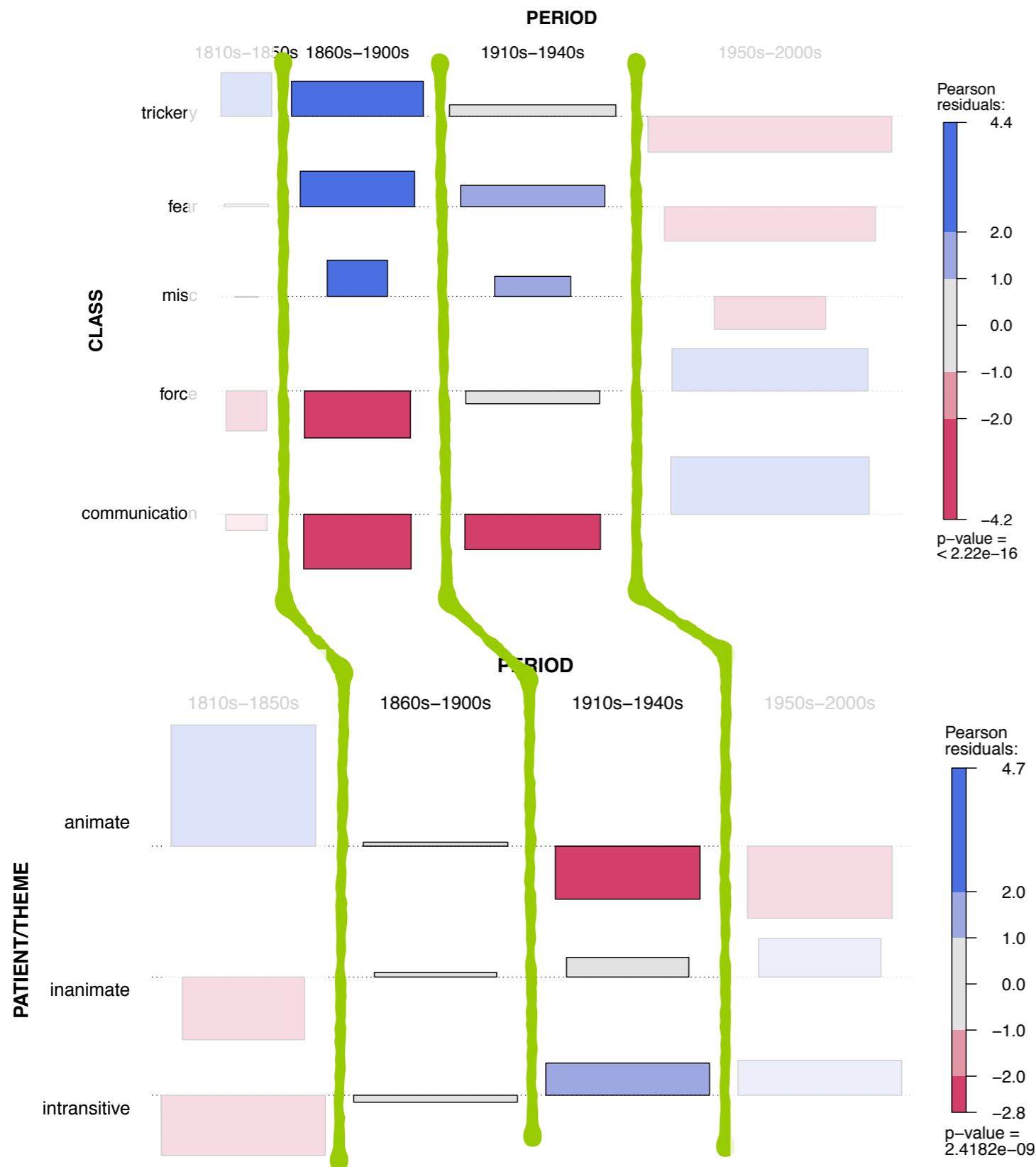


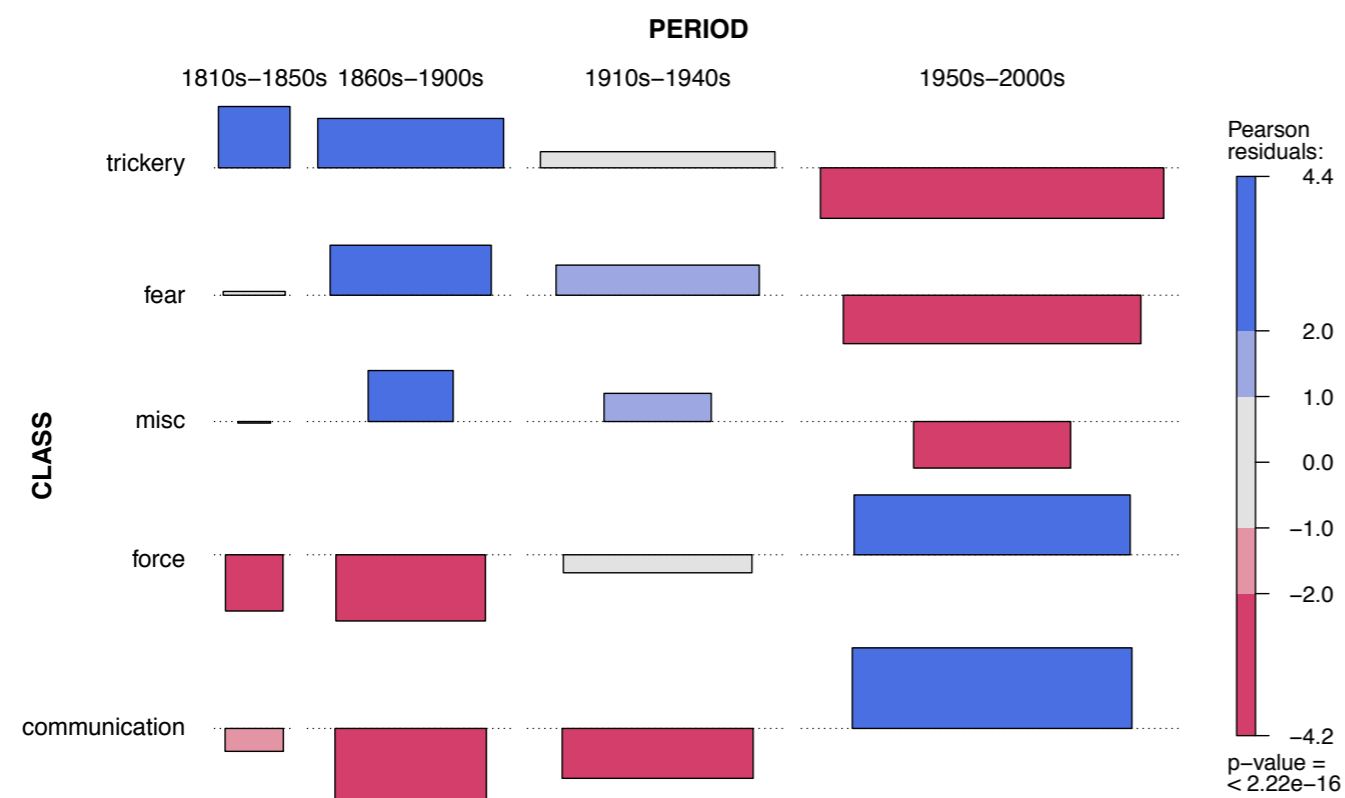
argument structure

Association plots: Interpretation

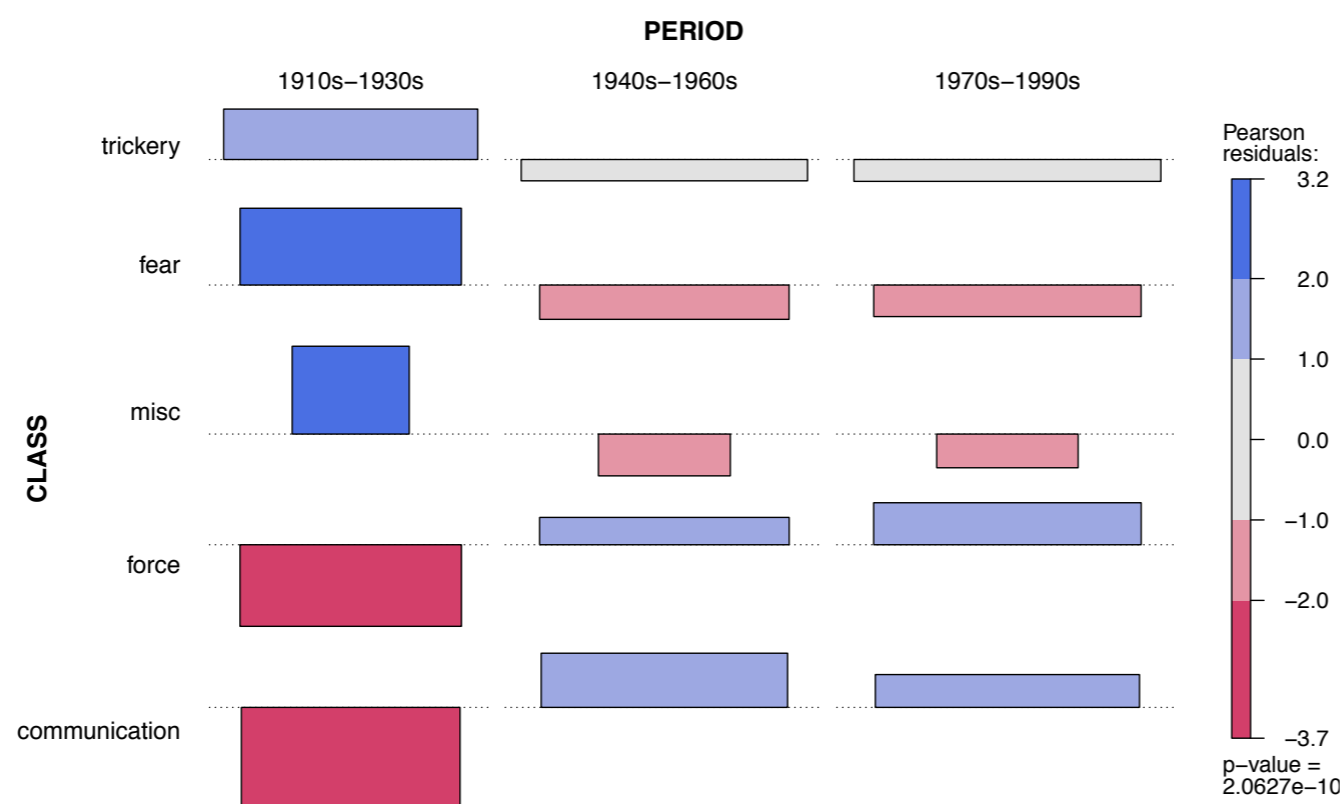
semantic classes

argument structure



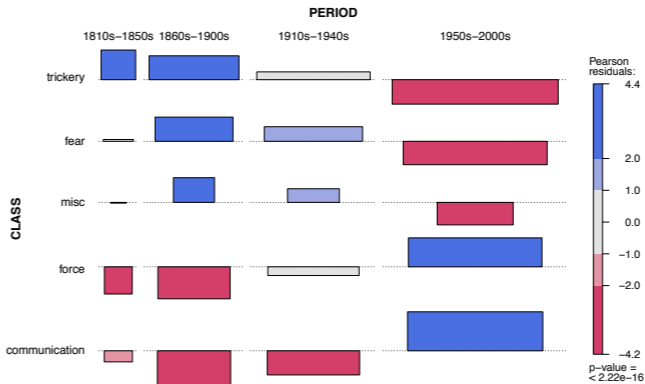
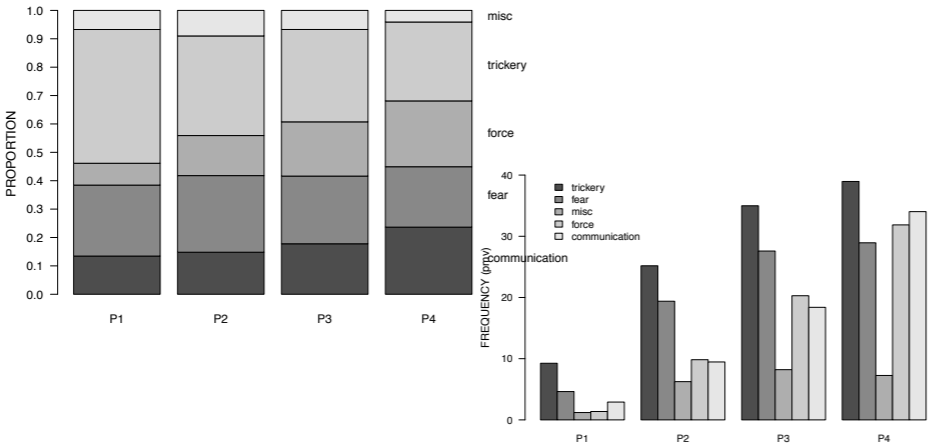
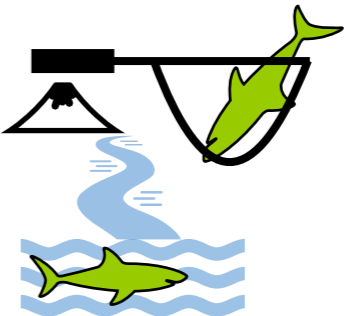
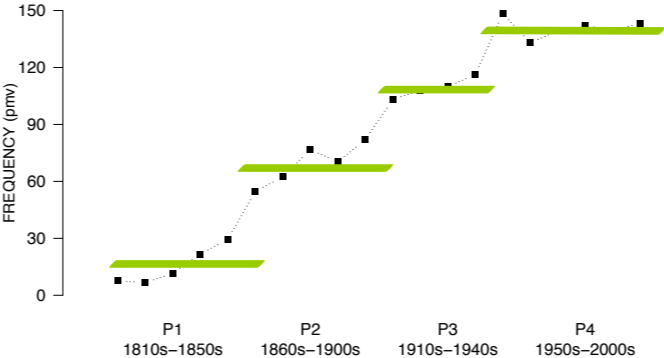
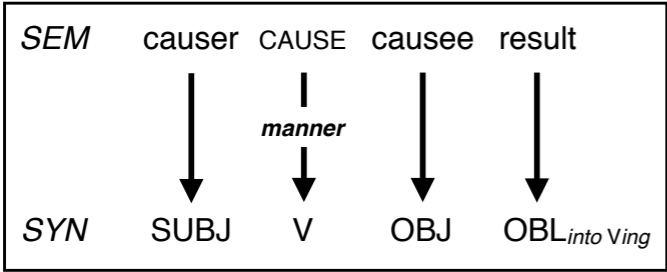


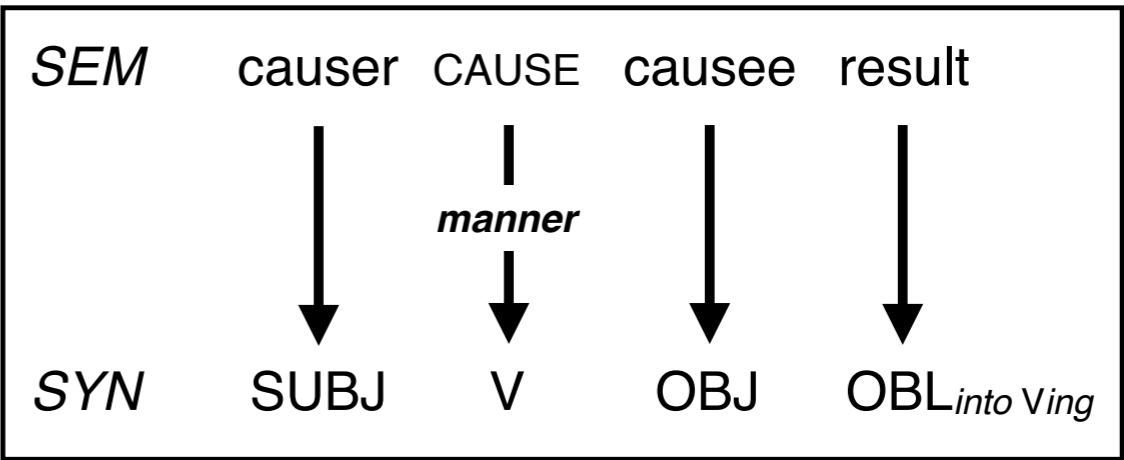
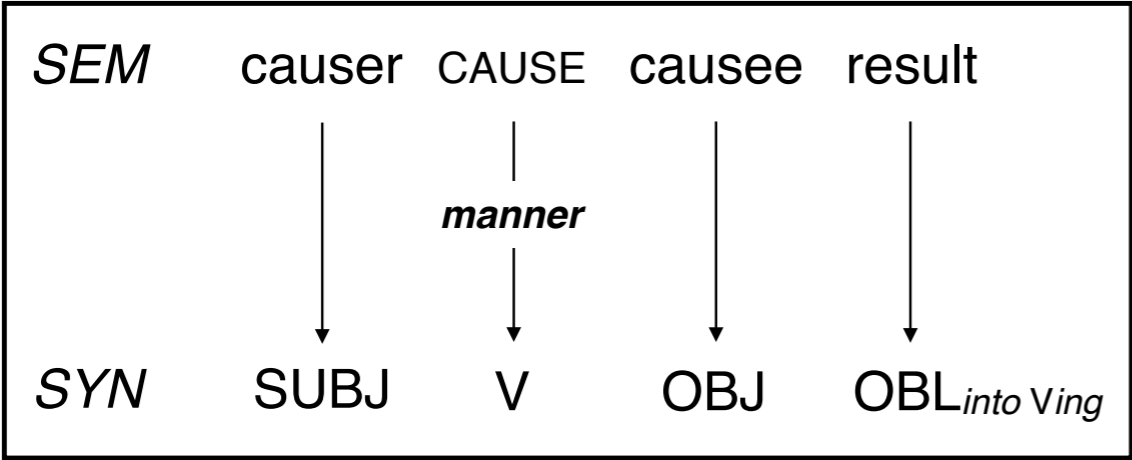
1810s–2000s



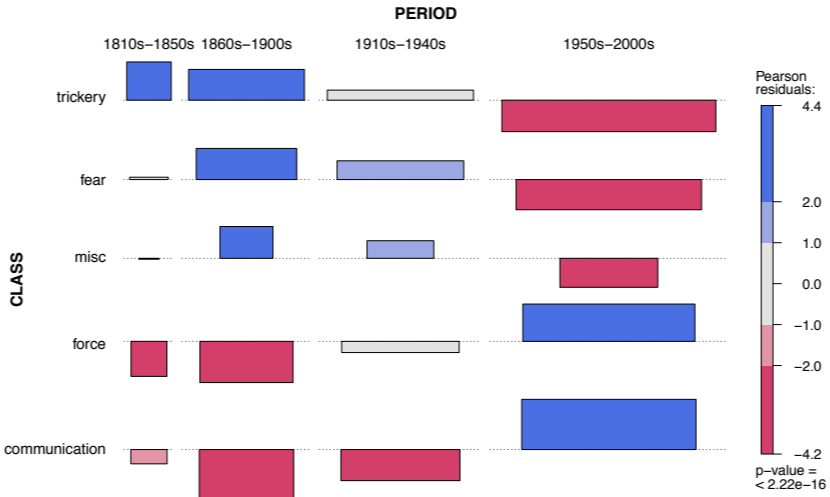
1910s–1990s

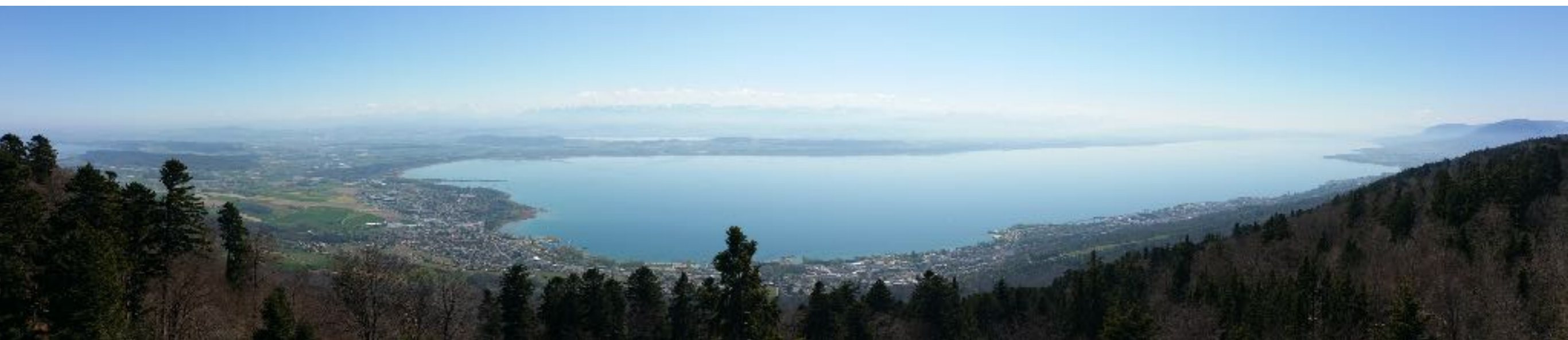
EPILOGUE





CAUSATION





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