INDIVIDUALITY IN SYNTACTIC VARIATION

AN INVESTIGATION OF THE 17TH-CENTURY GERUND ALTERNATION

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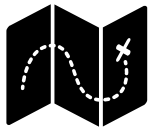
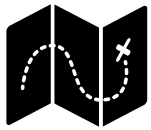


Why is the individual important to consider?

(1) Increasing evidence that individuals are quite different in L1-attainment (Dabrowska 2012), and differences in individual usage exist to the extent that they can be used to identify speakers (Barlow 2013, Nini 2018).

(2) If a population is very heterogeneous, not considering individual behavior makes you run the risk of:
- Missing patterns (Gries & Hilpert 2010; Tagliamonte & Baayen 2012)
- mistakenly identifying patterns (Fonteyn 2017)



- Growing body of historical (socio-)linguistic studies on **syntactic change** devote more attention to:
  - **Agents of change and diffusion** (e.g., Pratt & Denison 2000 [but: Van Bergen 2013]; Bergs 2005; Raumolin-Brunberg 2009)
  - **How individual behavior feeds into population-level change** (e.g., Nevalainen *et al.* 2011; Nevalainen & Raumolin-Brunberg 2016; Baxter & Croft 2016; Hundt *et al.* 2017; Petré 2017; Petré & Van de Velde 2018).

THE GERUND ALTERNATION

HISTORICAL DEVELOPMENT

VARIANT OF: … should affect us more then *the shedding **of** the warmest blood in our veins* (John Flavell, 1668 > EMMA)

vs.

VARIANT Ø: … made an end of ø *Shedding ø the Blood of Rams* (George Fox, 1686 > EMMA)

HISTORICAL DEVELOPMENT

Old English

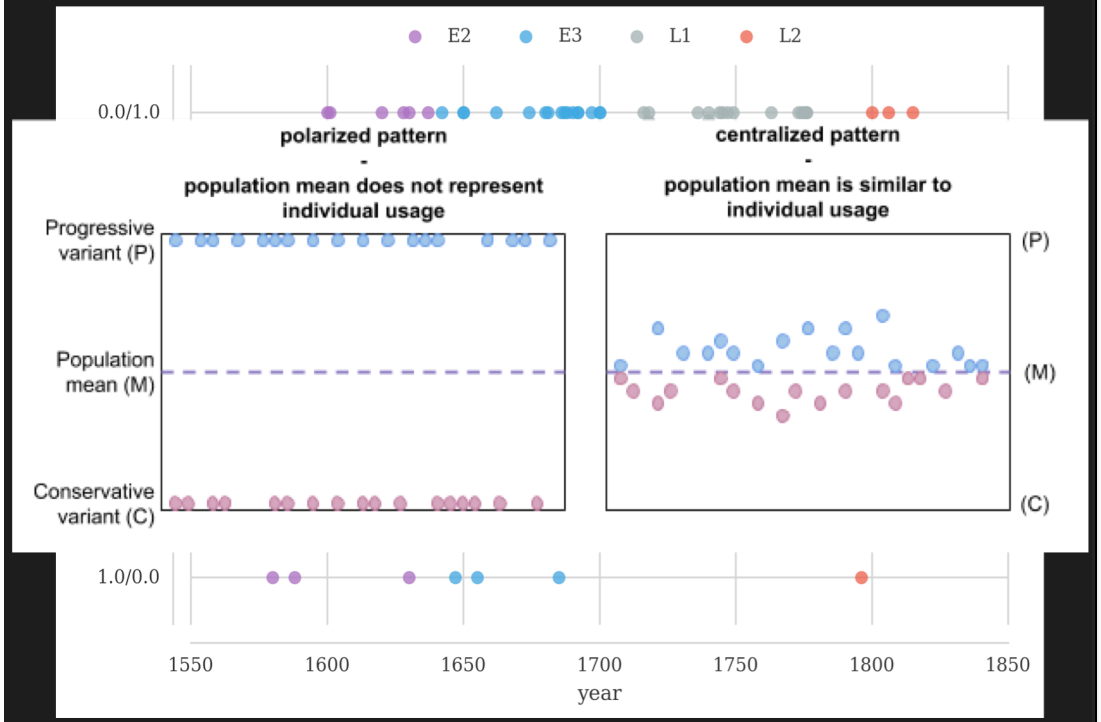
Gerund is an abstract deverbal noun in -ing, with nominal syntactic features (NG) (e.g. *by shedding **of** blood*)

Middle English

Gerund was re-analysed as part of the verb system and acquired the ability to govern a *direct object* (Fanego 2004) (c. 1250 - e.g. *by shedding blood*)

Modern English

Gradual spread of the *of*-less variant (Fanego 2004) to new syntactic environments



(Figure taken from Fonteyn (2017) – data from PPCEME and PPCMBE)

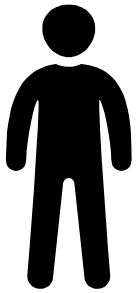
Variable users?

- The rise of gerunds with direct objects is a slow, gradual change of an abstract pattern, with "a **significant fraction** of mixed-usage speakers throughout the change" (Baxter & Croft 2016: 165; Nevalainen et al. 2011)
- Thus, the we observe a **centralized** pattern.
- Suggestion of **homogeneity**: individual usage resembles the population level mean in such cases.

However:

- These are very simple statistics that do not take into account whether (and how) each individual conditions variation.
- Not every 50-50 distribution is the same…

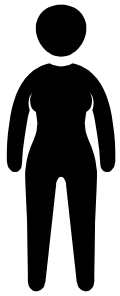
Andrea



BY	THROUGH
by reading books	*through reading of books*

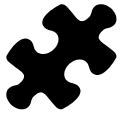
50% VG – 50% NG

Lauren



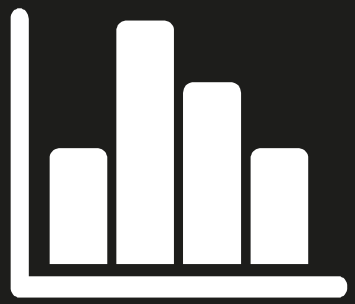
BY	THROUGH
by reading of books	*through reading books*

50% NG – 50% VG



RESEARCH QUESTIONS

- How consistently do speakers in a population converge on the same constraint effects on linguistic variables? Do we observe **'individual conditioning**' of (syntactic) variation? (Guy 2015; Mackenzie 2019)
- If so, how/where does that individuality reveal itself in the individual's linguistic behavior?



DATA AND ANALYSIS

CORPUS

Early Modern Multiloquent Authors (EMMA; Petré *et al.* 2018)

- Sample of 50 of the most prolific English writers born in the 17th century (mostly belonged to the London-based elite)
- 5 generations

In this study:

- 19 randomly selected speakers, born between 1600 and 1645 (3 generations)
- Focus on *prose* and *letters*
- 14,078 gerunds

DATA SET - GENERAL

Generation 1 (◦1599 – 1613)	Generation 2 (◦1621 – 1627)	Generation 3 (◦1639 – 1644)
OF: 1349 (40.90%)	OF: 1148 (29.98%)	OF: 1496 (21.52%)
Ø: 1949 (59.10%)	Ø: 2681 (70.02%)	Ø: 5455 (78.84%)

Generation 1 (1599 - 1613)		Generation 2 (1621 - 1627)		Generation 3 (1639 - 1644)	
Heylyn, Peter	OF: 344 (46.17%) Ø: 401 (53.83%)	Boyle, Roger	OF: 79 (29.15%) Ø: 192 (70.85%)	Mather, Increase	OF: 201 (23.93%) Ø: 639 (76.07%)
Prynne, William	OF: 496 (47.06%) Ø: 558 (53.83%)	Pierce, Thomas	OF: 91 (23.58%) Ø: 295 (76.42%)	Crouch, Nathaniel	OF: 197 (19.64%) Ø: 806 (80.36%)
Fuller, Thomas	OF: 172 (38.83%) Ø: 271 (61.17%)	Fox, George	OF: 213 (35.80%) Ø: 382 (64.20%)	Behn, Aphra	OF: 18 (6.57%) Ø: 256 (93.43%)
Milton, John	OF: 235 (40.94%) Ø: 339 (59.06%)	Boyle, Robert	OF: 79 (13.30%) Ø: 515 (86.70%)	Burnet, Gilbert	OF: 509 (20.72%) Ø: 1948 (79.28%)
Taylor, Jeremy	OF: 102 (21.16%) Ø: 380 (78.84%)	Swinnock, George	OF: 55 (17.35%) Ø: 262 (82.65%)	Penn, William	OF: 571 (24.02%) Ø: 1806 (75.98%)
		Bunyan, John	OF: 401 (51.74%) Ø: 374 (48.26%)		
		Flavell, John	OF: 58 (26.01%) Ø: 165 (73.99%)		
		Tillotson, John	OF: 82 (31.78%) Ø: 176 (68.22%)		
		Dryden, John	OF: 90 (21.95%) Ø: 320 (78.05%)		

GENERAL MODELS

Rather than controlling for individual variation (cf. Gries & Hilpert 2010), this study wishes to determine:

(i) the extent of individual variation

(ii) how/where individuals differ

Conditional inference tree (binary splits until no longer justified)

- **ctree**(gerund ~ **age + author + det + func + generation + genre + verb_type**, data=df)

Random forest (1000 conditional inference trees contribute to final model)

- **cforest**(gerund ~ **age + author + det + func + generation + genre + verb_type**, data=df, controls=cforest_control(mtry = 6, ntree=1000))

Determiner

BARE
- *By **ø** destroying Souls*, he …

POSS
- ***his** fearing God more then Man* was …

THE
- ***The** seeing of our Friends in Heaven* will ...

A
- a cry will be among you, and ***a** wishing you had never been born*

QUANT
- … **no** reverencing of images

DEM
- ***This** forgetting of the God that saves us …*

Function

BY, IN, FOR, OF, TEMP, …
- ***by** onely torturing of men*
- ***in** the destroying of the …*
- ***after** his blaspheming Shakespeare.*

OBJECT
- I would seriously **recommend** *the Arming of our Pikemen*

SUBJECT COMPLEMENT
- … that **there** should **be** christening of children
- **It is** not the giving out of mercy that troubles him, but …

SUBJECT
- The laying down of life **did** abundantly proclaim his love

Verb Type

LEX
- … whilst others make them groan, by **abusing** them to sin, and **subjecting** them to their lusts.

'LIGHT'
- He is accus'd of Malevolence, and of **taking** Actions in the worst Sence
- … that prayers, and supplication, and **giving** of thanks be made for all men

HAVE
- there is more required to make a good Scholler, then onely the **having** of many bookes

External

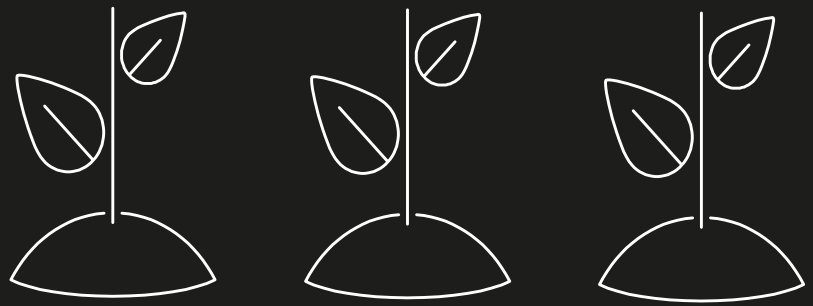
GENERATION
- G1
- G2
- G3

AGE
- Numeric
  - Age of author at time token was produced

GENRE
- letters
- Prose

AUTHOR
- 19 levels

Factors based on Fanego (2004), De Smet (2013) & Fonteyn (2019)



RESULTS

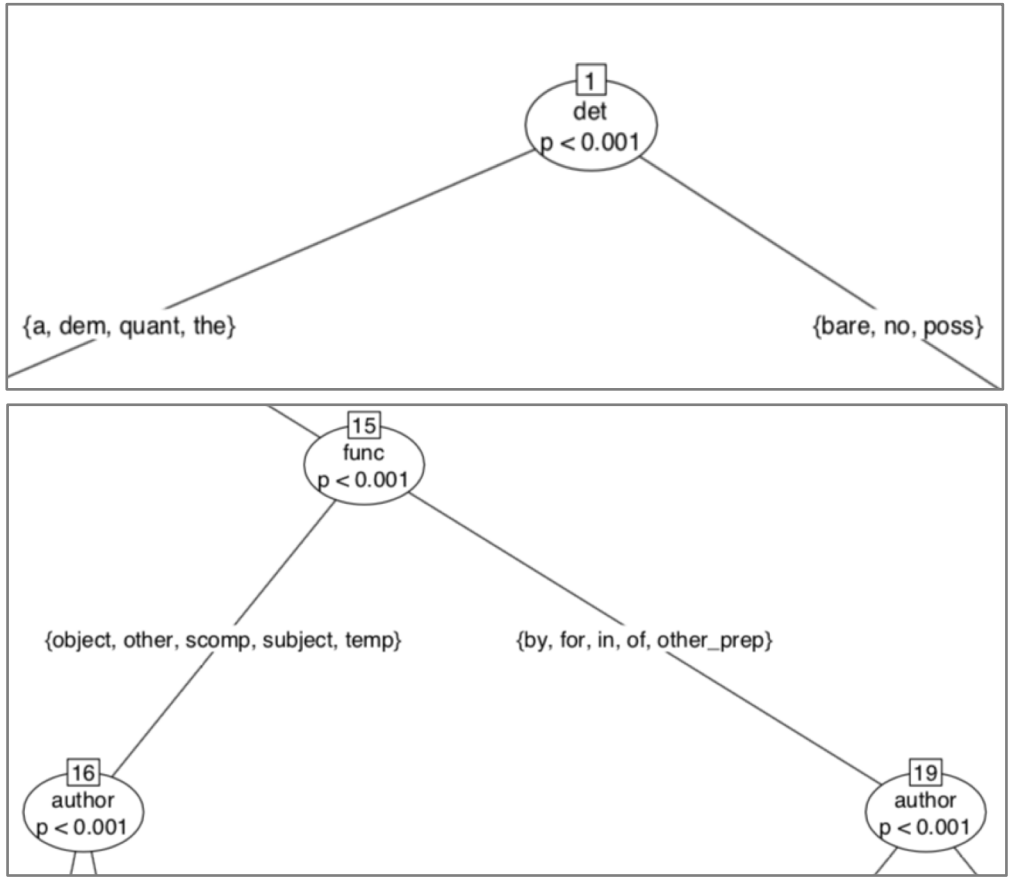
Model residuals

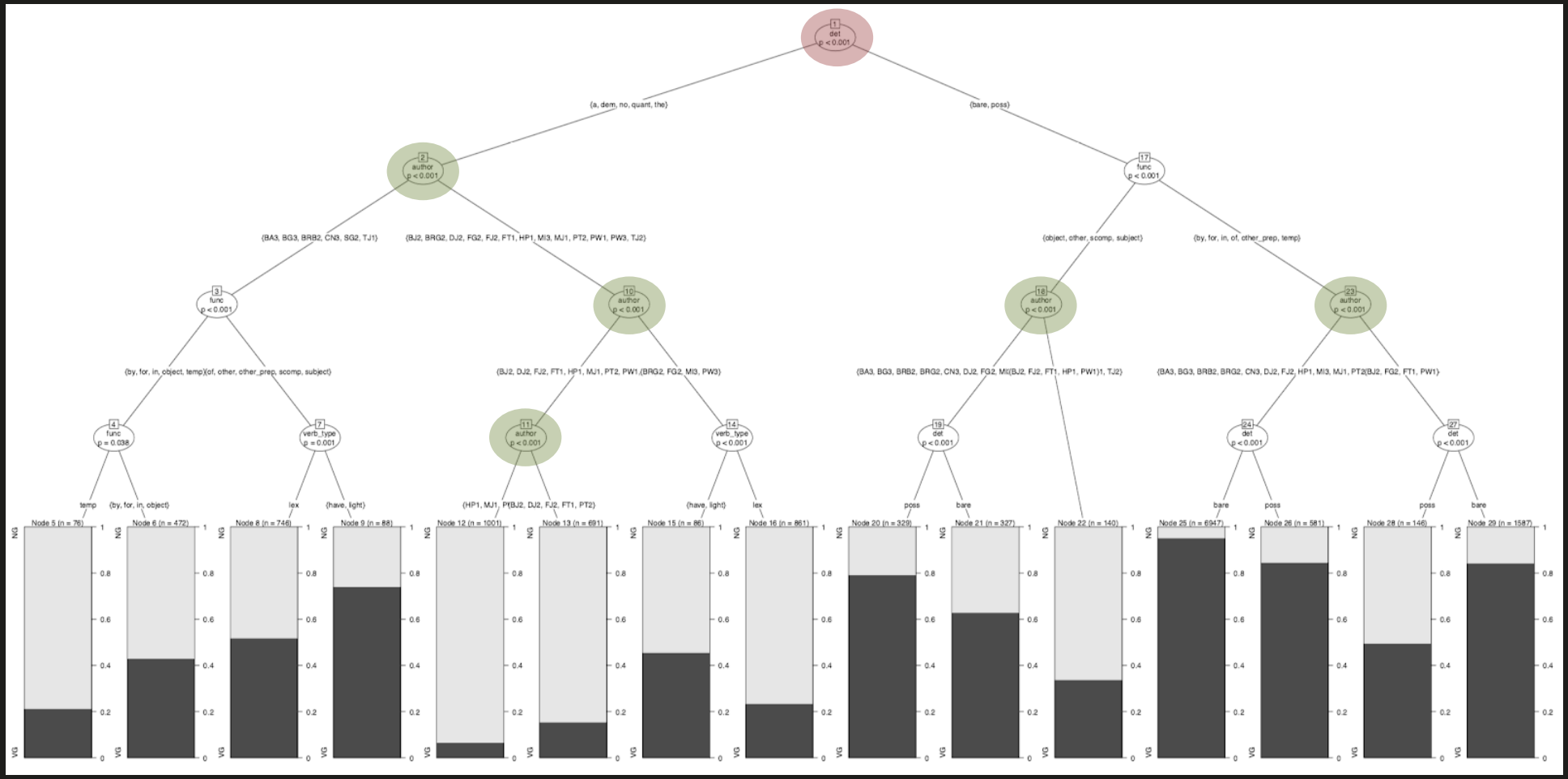
Accuracy	0.85
AUC	0.81

Binary splits

(1) determiner
{a, the, dem} vs. {bare, no, poss}

(15) within {bare, no, poss}
> split: function
{prepositions} vs. {other + temp}



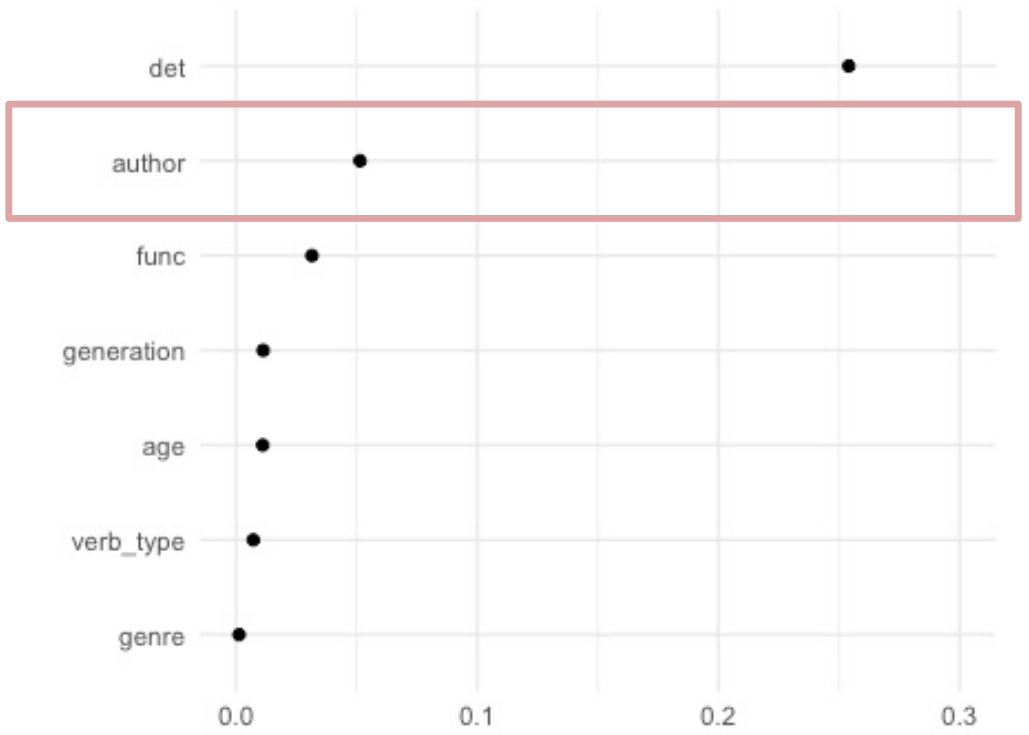

1
det
p < 0.001
{a, dem, no, quant, the}
{bare, poss}
2
author
p < 0.001
17
func
p < 0.001
{BA3, BG3, BRB2, CN3, SG2, TJ1}
{BJ2, BRG2, DJ2, FG2, FJ2, FT1, HP1, MI3, MJ1, PT2, PW1, PW3, TJ2}
{object, other, scomp, subject}
{by, for, in, of, other_prep, temp}
3
func
p < 0.001
10
author
p < 0.001
16
author
p < 0.001
23
author
p < 0.001
{by, for, in, object, temp}
{of, other, other_prep, scomp, subject}
{BJ2, DJ2, FJ2, FT1, HP1, MJ1, PT2, PW1}
{BRG2, FG2, MI3, PW3}
{BA3, BG3, BRB2, BRG2, CN3, DJ2, FG2, MI}
{BJ2, FJ2, FT1, HP1, PW1)1, TJ2}
{BA3, BG3, BRB2, BRG2, CN3, DJ2, FJ2, HP1, MI3, MJ1, PT2}
{BJ2, FG2, FT1, PW1}
4
func
p = 0.038
7
verb_type
p < 0.001
11
author
p < 0.001
14
verb_type
p < 0.001
19
det
p < 0.001
24
det
p < 0.001
27
det
p < 0.001
temp
{by, for, in, object}
lex
{have, light}
{HP1, MJ1, PT}
{BJ2, DJ2, FJ2, FT1, PT2}
{have, light}
lex
poss
bare
bare
poss
poss
bare
Node 5 (n = 76)
Node 6 (n = 472)
Node 8 (n = 746)
Node 9 (n = 88)
Node 12 (n = 1001)
Node 13 (n = 691)
Node 15 (n = 86)
Node 16 (n = 861)
Node 20 (n = 329)
Node 21 (n = 327)
Node 22 (n = 140)
Node 25 (n = 6947)
Node 26 (n = 581)
Node 28 (n = 146)
Node 29 (n = 1587)
NG
VG
0
0.2
0.4
0.6
0.8
1

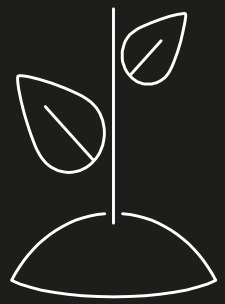
Model residuals

Accuracy	0.86
AUC	0.81

Variable importance

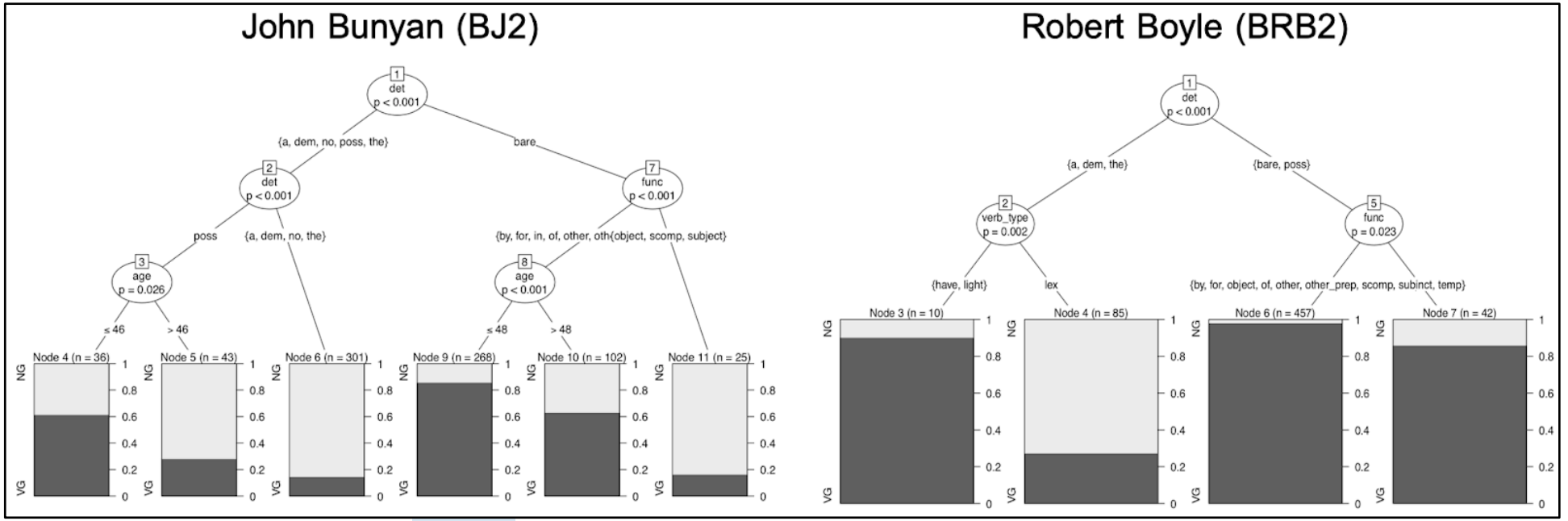
det	0.253
author	0.051
func	0.032
generation	0.011
age	0.011
verb_type	0.007
genre	0.001



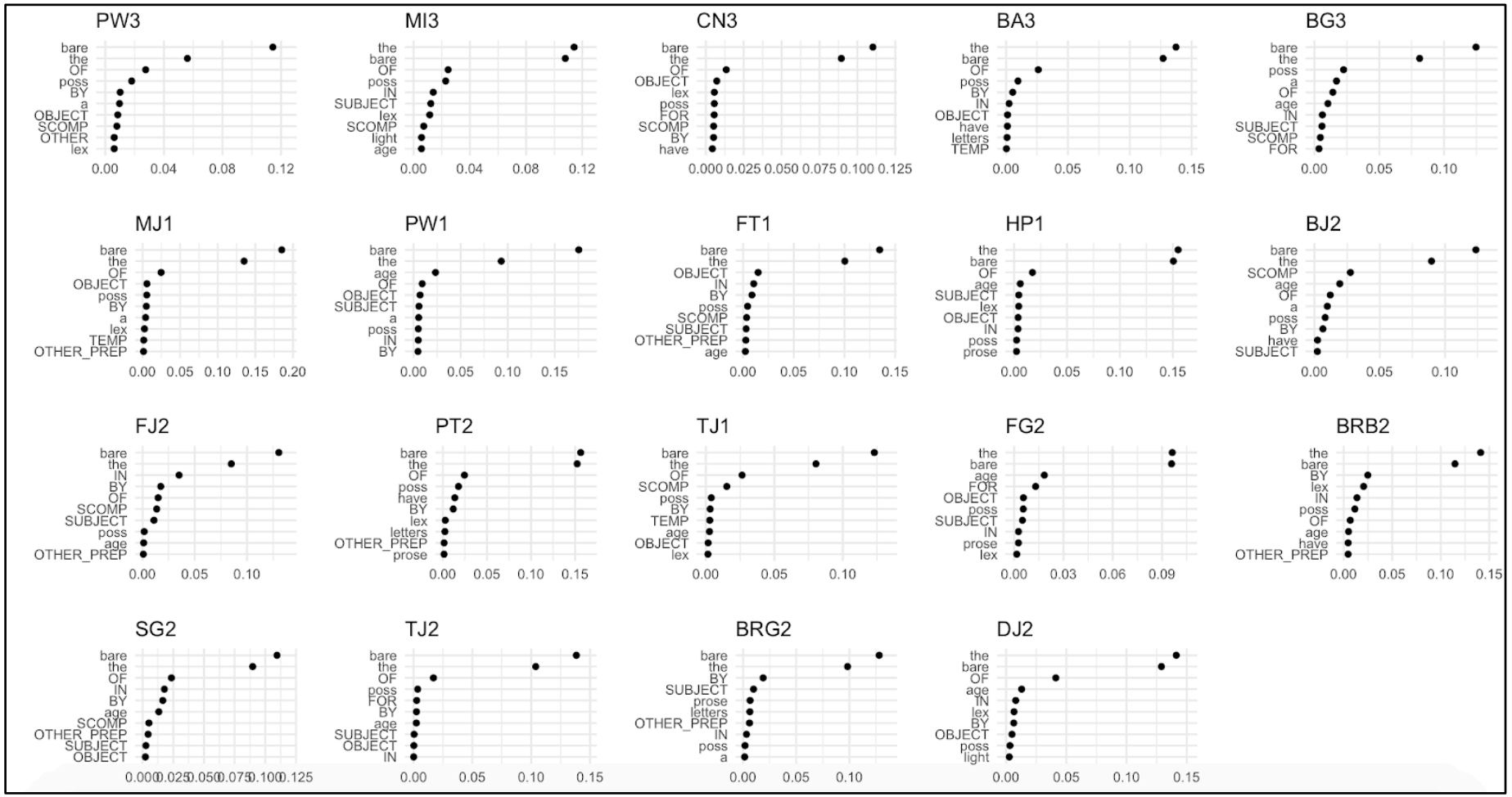


INDIVIDUAL MODELS

BARE + SUBJECT



Robert Boyle	1675	generation 2	Ø	… embracing… or not	embracing	this Religion, is an act of humane choice
John Bunyan	1685	generation 2	OF	Thus you see,	breaking	of bread, was the work


PW3
bare
the
OF
poss
BY
a
OBJECT
SCOMP
OTHER
lex
0.00
0.04
0.08
0.12
MI3
the
bare
OF
poss
IN
SUBJECT
lex
SCOMP
light
age
0.00
0.04
0.08
0.12
CN3
bare
the
OF
OBJECT
lex
poss
FOR
SCOMP
BY
have
0.000
0.025
0.050
0.075
0.100
0.125
BA3
the
bare
OF
poss
BY
IN
OBJECT
have
letters
TEMP
0.00
0.05
0.10
0.15
BG3
bare
the
poss
a
OF
age
IN
SUBJECT
SCOMP
FOR
0.00
0.05
0.10
MJ1
bare
the
OF
OBJECT
poss
BY
a
lex
TEMP
OTHER_PREP
0.00
0.05
0.10
0.15
0.20
PW1
bare
the
age
OF
OBJECT
SUBJECT
a
poss
IN
BY
0.00
0.05
0.10
0.15
FT1
bare
the
OBJECT
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BY
poss
SCOMP
SUBJECT
OTHER_PREP
age
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0.05
0.10
0.15
HP1
the
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OF
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SUBJECT
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OBJECT
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BJ2
bare
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SCOMP
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SUBJECT
0.00
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0.10
FJ2
bare
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SCOMP
SUBJECT
poss
age
OTHER_PREP
0.00
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0.10
PT2
bare
the
OF
poss
have
BY
lex
letters
OTHER_PREP
prose
0.00
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0.10
0.15
TJ1
bare
the
OF
SCOMP
poss
BY
TEMP
age
OBJECT
lex
0.00
0.05
0.10
FG2
the
bare
age
FOR
OBJECT
poss
SUBJECT
IN
prose
lex
0.00
0.03
0.06
0.09
BRB2
the
bare
BY
lex
IN
poss
OF
age
have
OTHER_PREP
0.00
0.05
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0.15
SG2
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IN
BY
age
SCOMP
OTHER_PREP
SUBJECT
OBJECT
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0.025
0.050
0.075
0.100
0.125
TJ2
bare
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0.10
0.15
BRG2
bare
the
BY
SUBJECT
prose
letters
OTHER_PREP
IN
poss
a
0.00
0.05
0.10
DJ2
the
bare
OF
age
IN
lex
BY
OBJECT
poss
light
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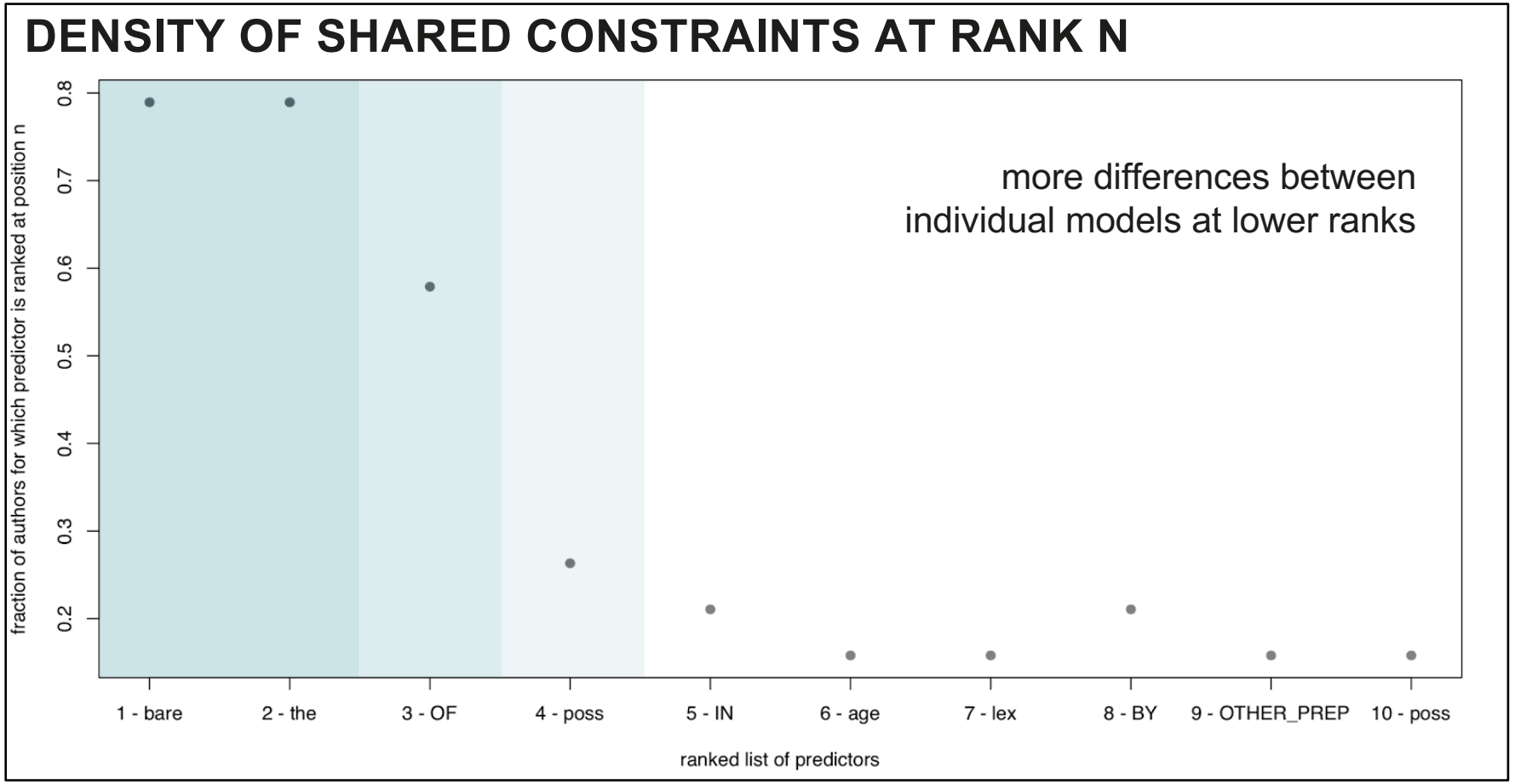
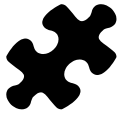
0.10
0.15

DENSITY OF SHARED CONSTRAINTS AT RANK N

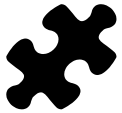




CONCLUSIONS

- Even with centralized patterns of variation and change, there can still be substantial heterogeneity in terms of how individual language users condition the (syntactic) alternation pair in flux.
- These results can be explained by the fact that **different individuals** can come across different exemplars of the competing constructions, and consequently will build slightly **different cognitive models** (e.g. Dabrowska 2012).
- Yet, at the same time, there are clearly some **generalizations** that can be made across all authors in the sample.

  e.g. <nominal determiners> vs. <bare, poss>



CONCLUSIONS

- The post hoc analysis helped determine **the locus** of this individual variance:
  - individuals appear to behave homogeneously with regard to a very select number of (obvious) grammatical contexts,
  - but as the personalized models become more specific, including more (interacting) factors, they also become more idiosyncratic.

THANK YOU.

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