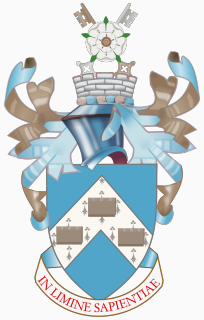

Topicalization is (Still) Disappearing: information uniformity as a dimension of specialization

DiGS 25, Workshop: *The Legacy of the Penn Corpora*

Joel C. Wallenberg, University of York

Today's Talk

Topicalization as competing grammars

Topicalization and Accent Clash

Topicalization and Informational Uniformity

- Methods:
  testing information spread as a dimension of specialization

Conclusions

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  - **contrastive topic** with focus elsewhere in clause.
  - **focus with scalar contrast** (cf. also "true A'-movement of Frey 2006 and subs.).
- However, the movement is always optional even in these contexts.
- Both contexts require an accent, intonational peak, on the fronted constituent.

English "Topicalization"

- Felicitous in two English discourse contexts, both of which require a certain type of contrast and accent to appear on the fronted XP.

  (1) She's going to use three groups of mice. One, she'll feed them mouse chow, just the regular stuff they make for mice. Another she'll feed them veggies. And the third she'll feed junk food.

  (2) She was here two years. [checking transcript] Five semesters she was here.
  (Prince, 1999)

English Topicalization

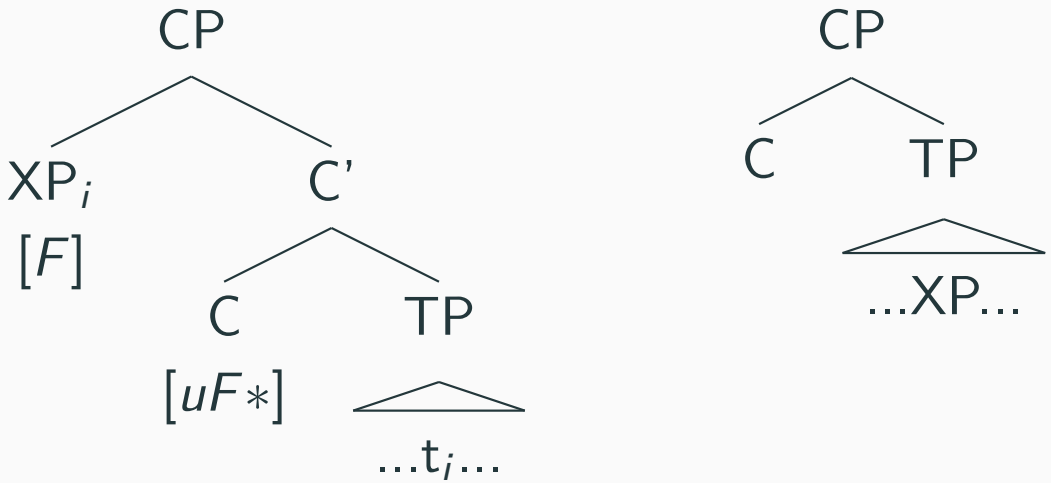
- As long as the accent pattern is kept constant, both orders are felicitous:

  (3) She's going to use three groups of mice. One, she'll feed them mouse chow, just the regular stuff they make for mice. Another she'll feed them veggies. And **the third** she'll feed **junk food**.

  (4) She's going to use three groups of mice. One, she'll feed them mouse chow, just the regular stuff they make for mice. Another she'll feed them veggies. And she'll feed **the third junk food**.

Sketch of Topicalization in Minimalism

- Move is triggered by the feature content of some head.
- Given "Merge...preempts Move" (Chomsky, 2000), a feature cannot encode optional movement.
- Therefore, optional movement involves a choice (for the **Numeration**) between two variants of a functional head, out of an inventory of possible heads.
  - In line with "Borer-Chomsky Conjecture" (Borer, 1984), (Baker, 2008).



- This is the core case of morphosyntactic doublet (i.e. competing heads) described in (Kroch, 1994).

Sketch of Topicalization in Minimalism

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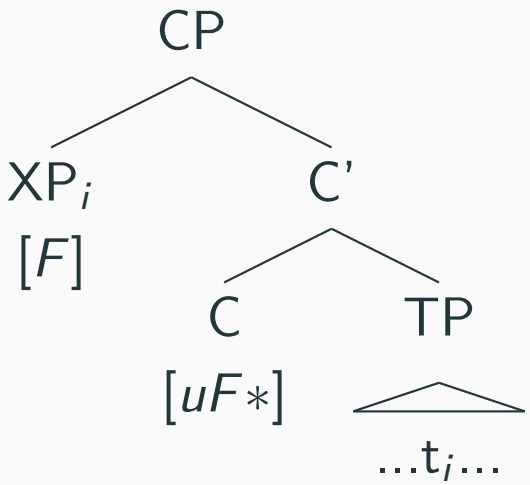

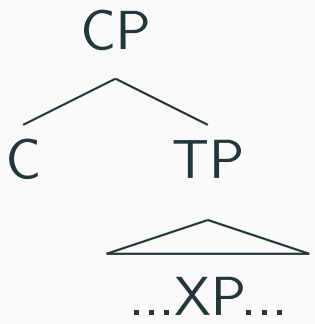

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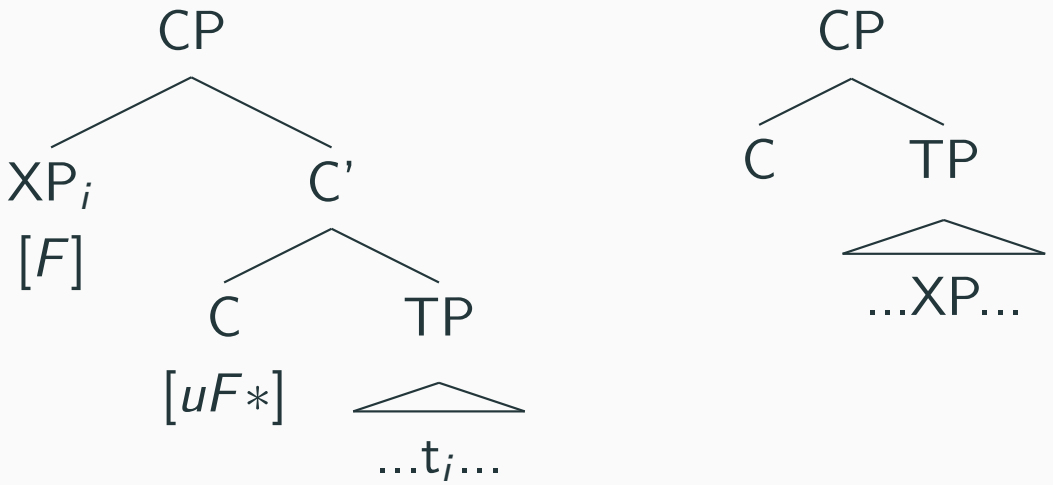

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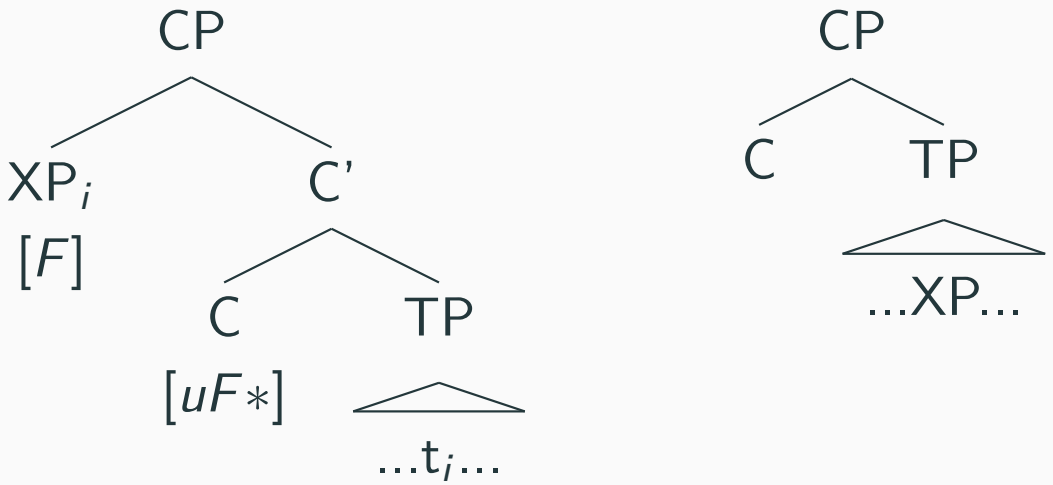

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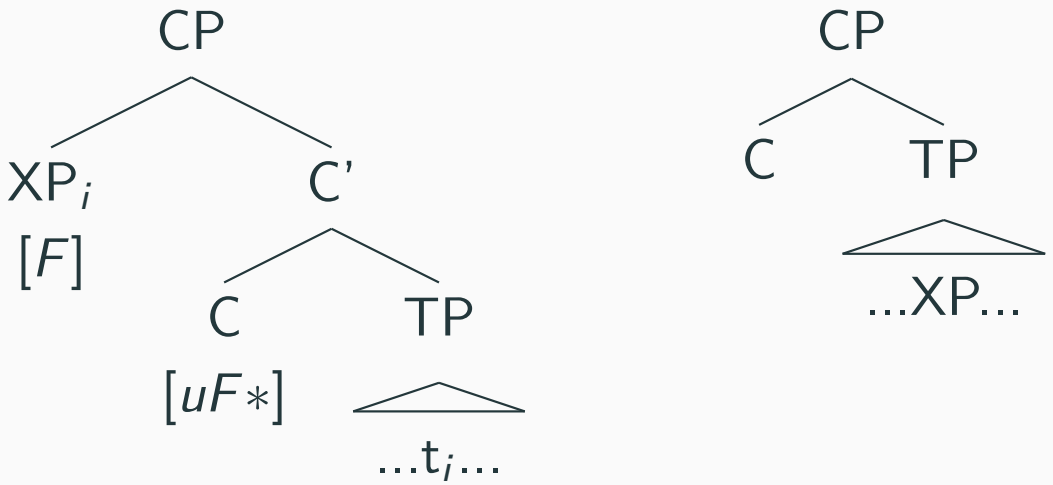

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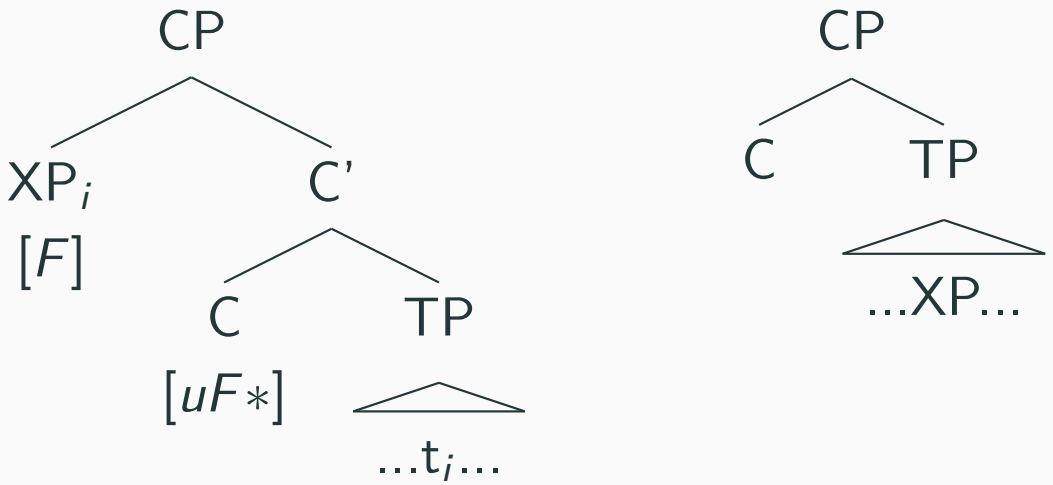

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- The doublet exists when an appropriate contrastive constituent exists.
- **Cost:** Default clausal prosody must be altered.

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(17) Arable for Corn, you may wash with pale Straw-Colour
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(19) ? Joel Viola likes (but Memel she doesn't).

(20) Joel, Viola likes (but Memel she doesn't).

From PPCMBE, nominal objects ($\chi^2 = 260$, $p < 2 \times 10^{-16}$):

	Fronted	In Situ	Prop. Fronted
Pron Sbj	631	20,071	0.031
Nom Sbj	119	16,808	0.0071

Topicalization and Accent Clash

- They do exist in the wild, but usually with pauses:

(21) All sins, except a sin against itself, Love should forgive.
(WILDE-1895-1,70.859 in PPCMBE)

(22) All lives, save loveless lives, true Love should pardon.
quad (WILDE-1895-1,70.860 in PPCMBE)

Topicalization and Accent Clash

- Speyer also showed that as V2 options are lost in English, direct object topicalization declines.
  - Note: not all apparent V2 orders have the same structure in ME and OE (Haeberli, 1999, 2000, 2002; Kroch & Taylor, 1997), ao.

(23) þone wæterscipe beworhte **se wisa cyning Salomon**
the conduit built the wise king Salomon
"The wise King Salomon constructed the conduit"
(Ælfric's Catholic Homilies, 10th c., from YCOE (Taylor, Warner, Pintzuk, & Beths, 2003)))

The accent clash account

- **Question:** what sense of accent clash includes two adjacent DPs, but excludes a lexical verb?
- It must be at a constituent level, and so fairly abstract.
- **Question:** do we expect the decline of topicalization to halt once V2 is lost, or for topicalization to specialize for the non-clash case?
- **Observation:** an account of the same facts in terms of informational (Shannon, 1948) spread – the Smooth Signal Redundancy Hypothesis (Fenk & Fenk, 1980; Fenk-Oczlon, 2001; Aylett & Turk, 2004; Levy & Jaeger, 2007; Frank & Jaeger, 2008; Jaeger, 2010; Turk, 2010; Chingacham, Demberg, & Klakow, 2023; Wallenberg, Bailes, Cuskley, & Ingason, 2021)

  – makes the same predictions as to subject type and pauses, but also two more...

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- Potential **improvement in informational uniformity** is a continuous variable, **predicting slow change over time:**

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- Potential **improvement in informational uniformity** is a continuous variable, **predicting slow change over time:**
  - The two syntactic forms overlap in function (Prince, 1998), and therefore compete in use (Kroch, 1994).
  - The competition is mitigated by specialization, but along a continuous dimension, and so total specialization is impossible and slow change results (Wallenberg, 2016).

Uniformity of information distributions

Strings can vary in terms of how the information is spread or clustered. The **order of elements** in a sentence derives **more uniform** or **more asymmetric** distributions of information (Cuskley, Bailes, & Wallenberg, 2021).

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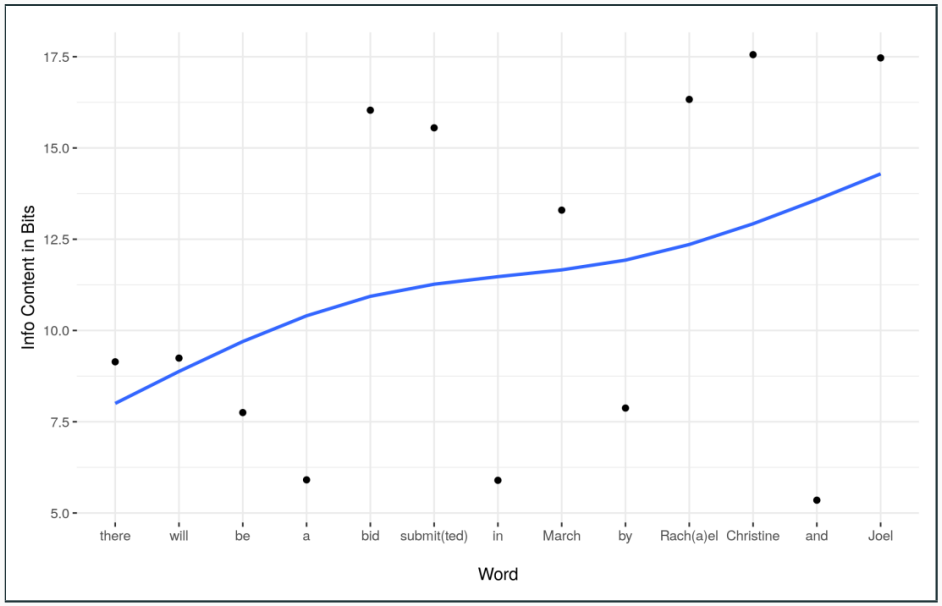
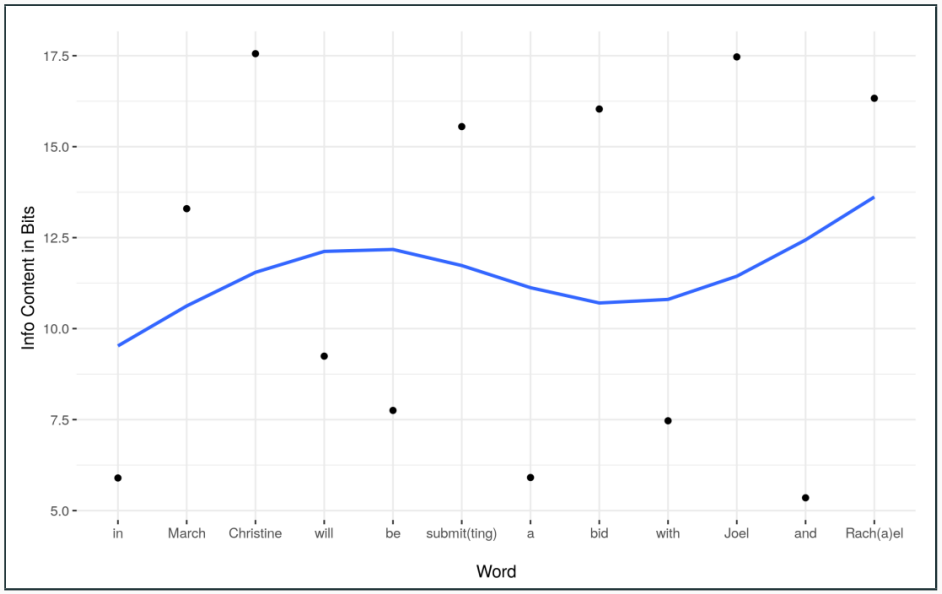
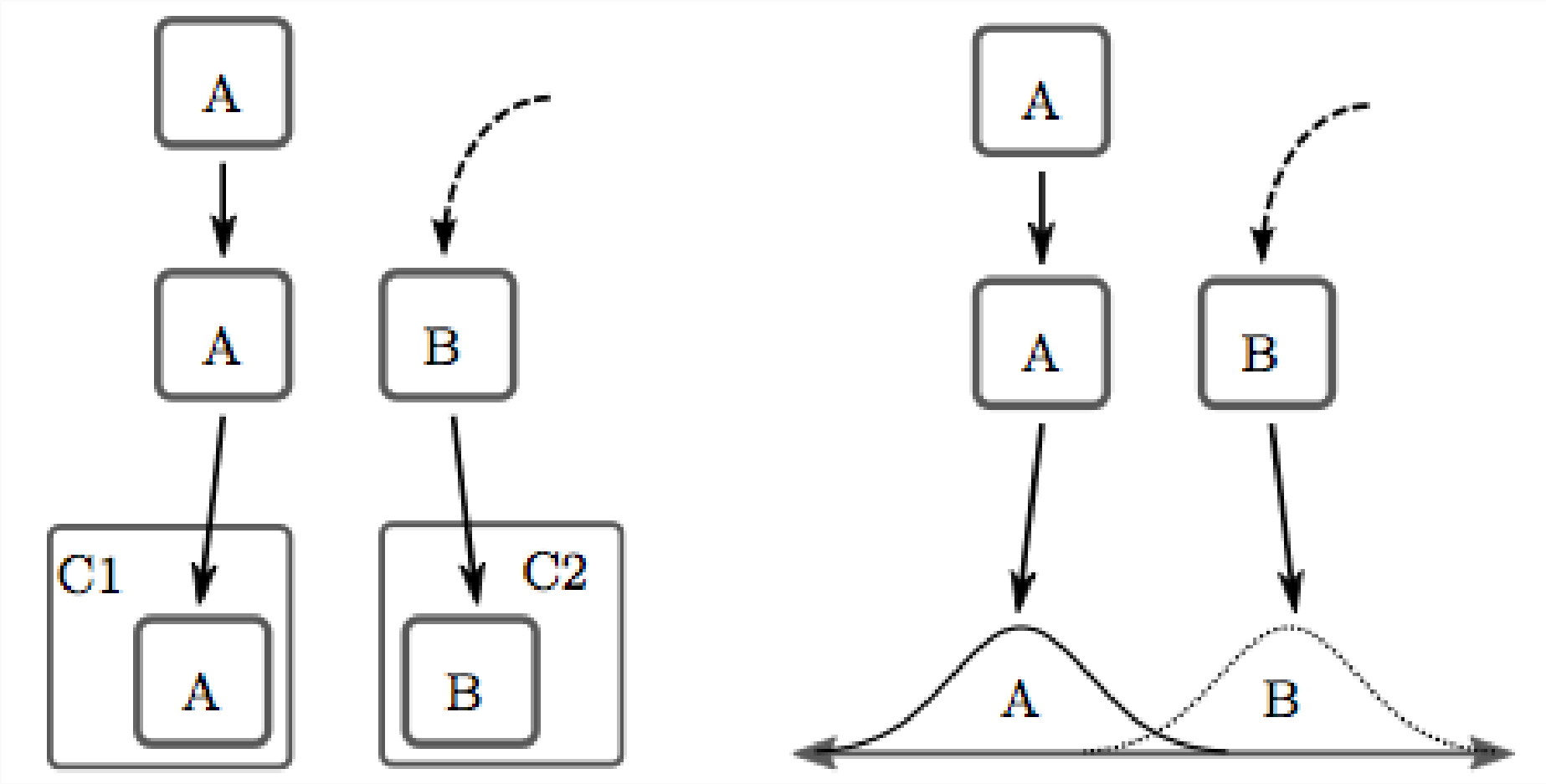




We can measure how uniform an information distribution is with **Deviation of the Rolling Mean (DORM)** (Cuskley et al., 2021).

Hypothesis: specialization along continuous dimensions



(figure courtesy of J. Fruehwald)

Topicalization and Informational Uniformity

Predictions:

1. Slow change over time.
2. No specialization by subject type over time (i.e. CRE).
3. Topicalization should also be disfavored when Pron-Obj lands adjacent to Pron-Sbj.
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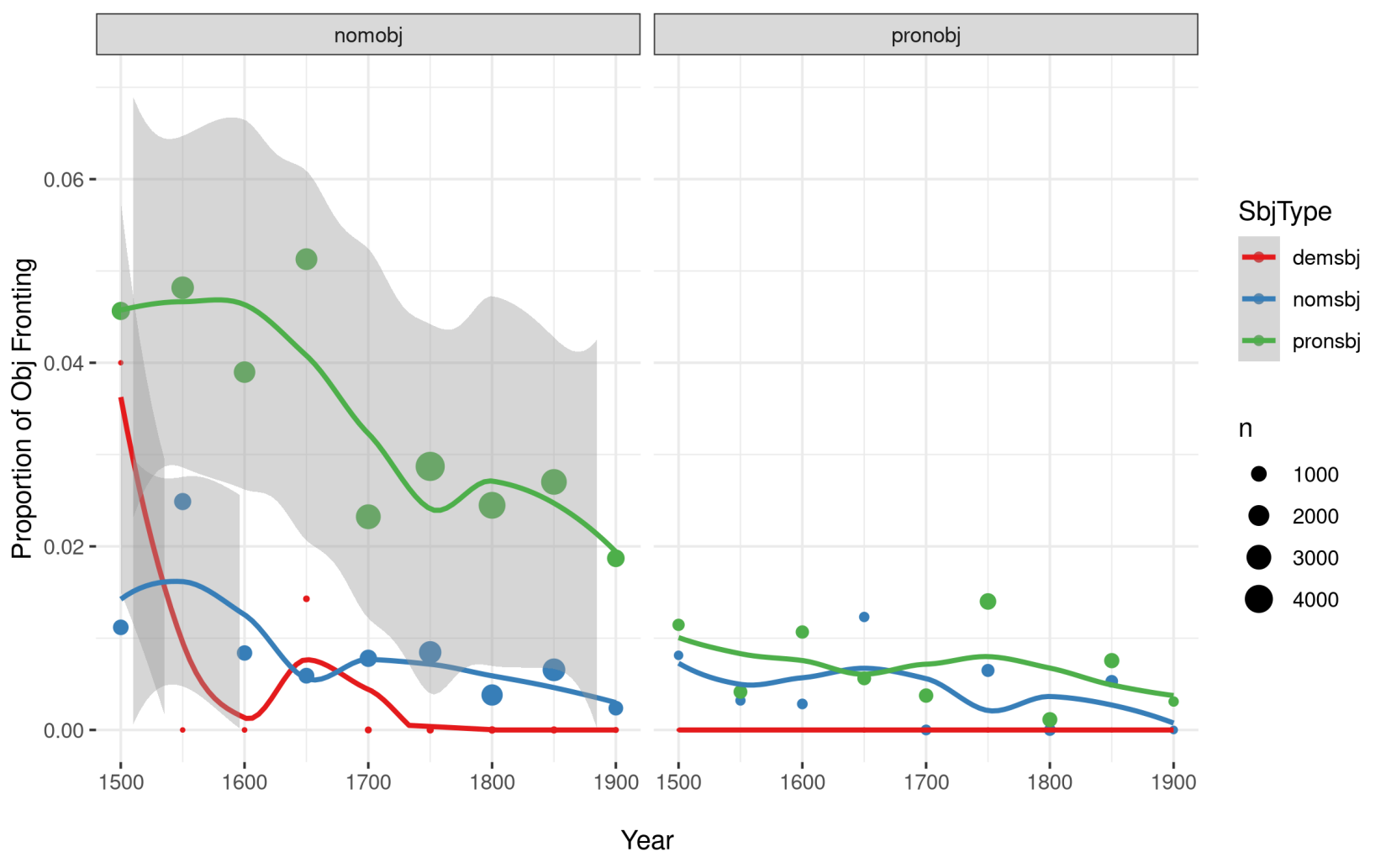

(47,115 finite main clauses; dem Sbjs omitted)

Note: significant effects of **Year, Obj, Sbj**, sig **Obj:Sbj** interaction, but no sig Obj, Sbj interactions with Year (Constant Rate Effect).

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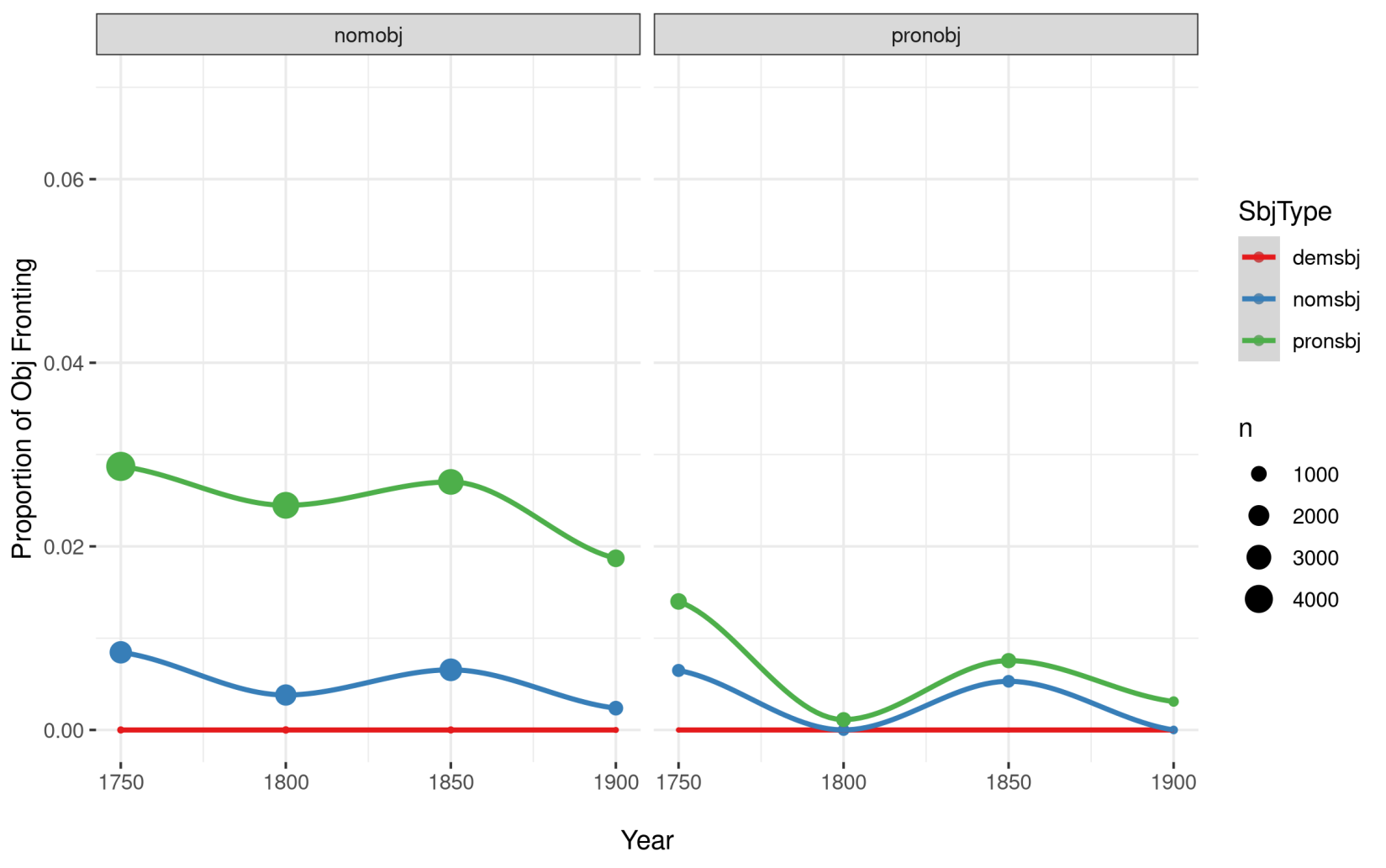

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- Appended Calibrated DORMs to output of CS coding queries.

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6.79	6.15	10.1	9.25	6.15	10.4

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Sample variance of rolling means = 1.33 bits^2

low DORM $\rightarrow$ more uniform

high DORM $\rightarrow$ more lopsided

UIDO: Uniform information density optimization

- For a given array of values (e.g. information values of words in a sentence):
  1. The array of information content values is ordered greatest to least.
  2. Starting with the second and penultimate value in the array and moving inward, every other number is swapped, mixing up the large and small values.
  3. DORM is calculated for the resulting array.
  4. If this is lower than the original DORM, the array is kept. Otherwise, the algorithm proceeds with the original array.
  5. Every pair of numbers is swapped, checking to see whether the DORM is lowered after each swap. The lowest DORM is the UIDO.
- Calibrates DORMs by a baseline "best DORM", which should also capture **improvement in DORM**.

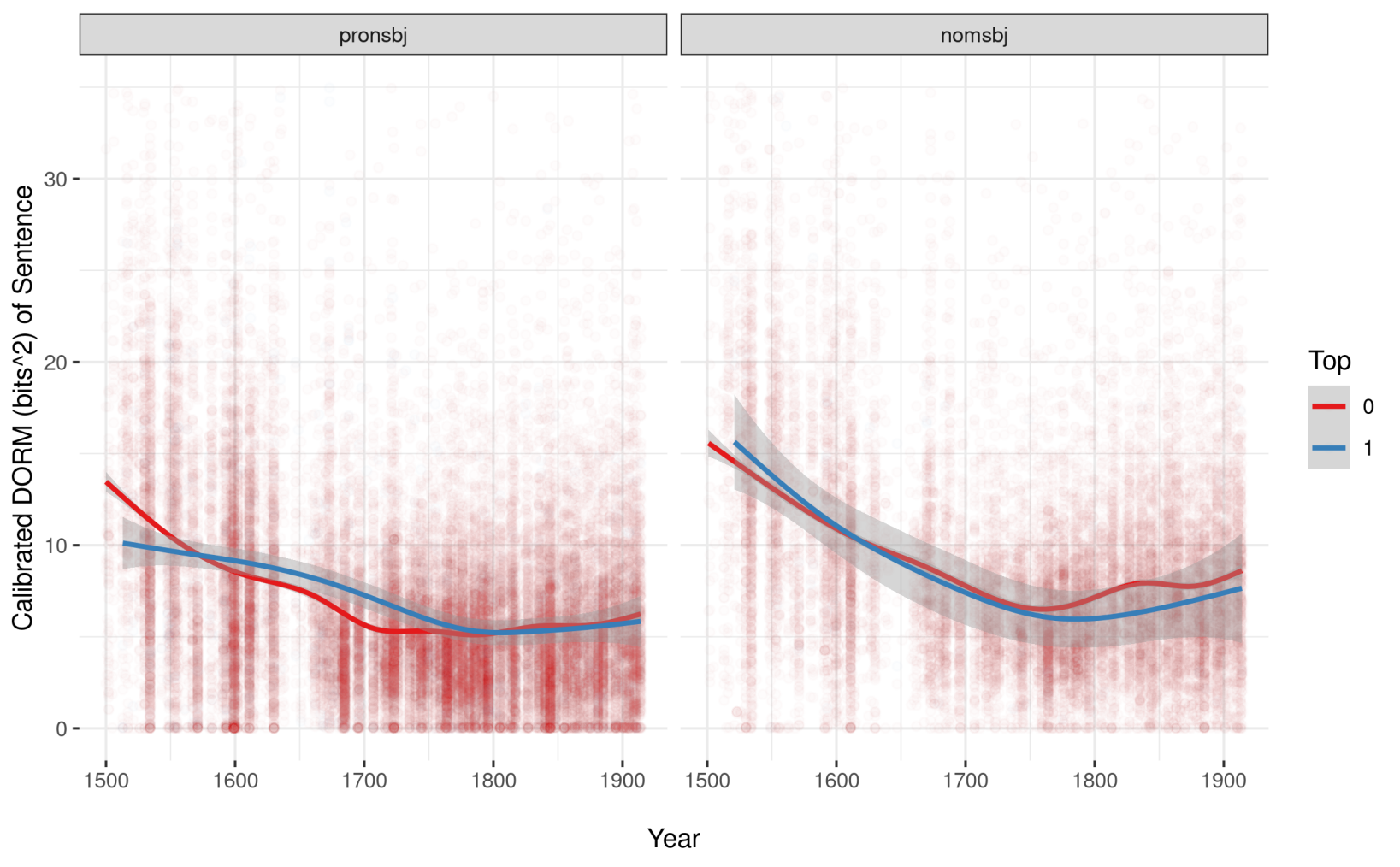
Calibrated DORM Worked Before

- Based on this account of information uniformity, (Wallenberg et al., 2021) predicted a previously undetected argument-type effect in the English and Icelandic OV to VO changes.

...but not super great this time: Results

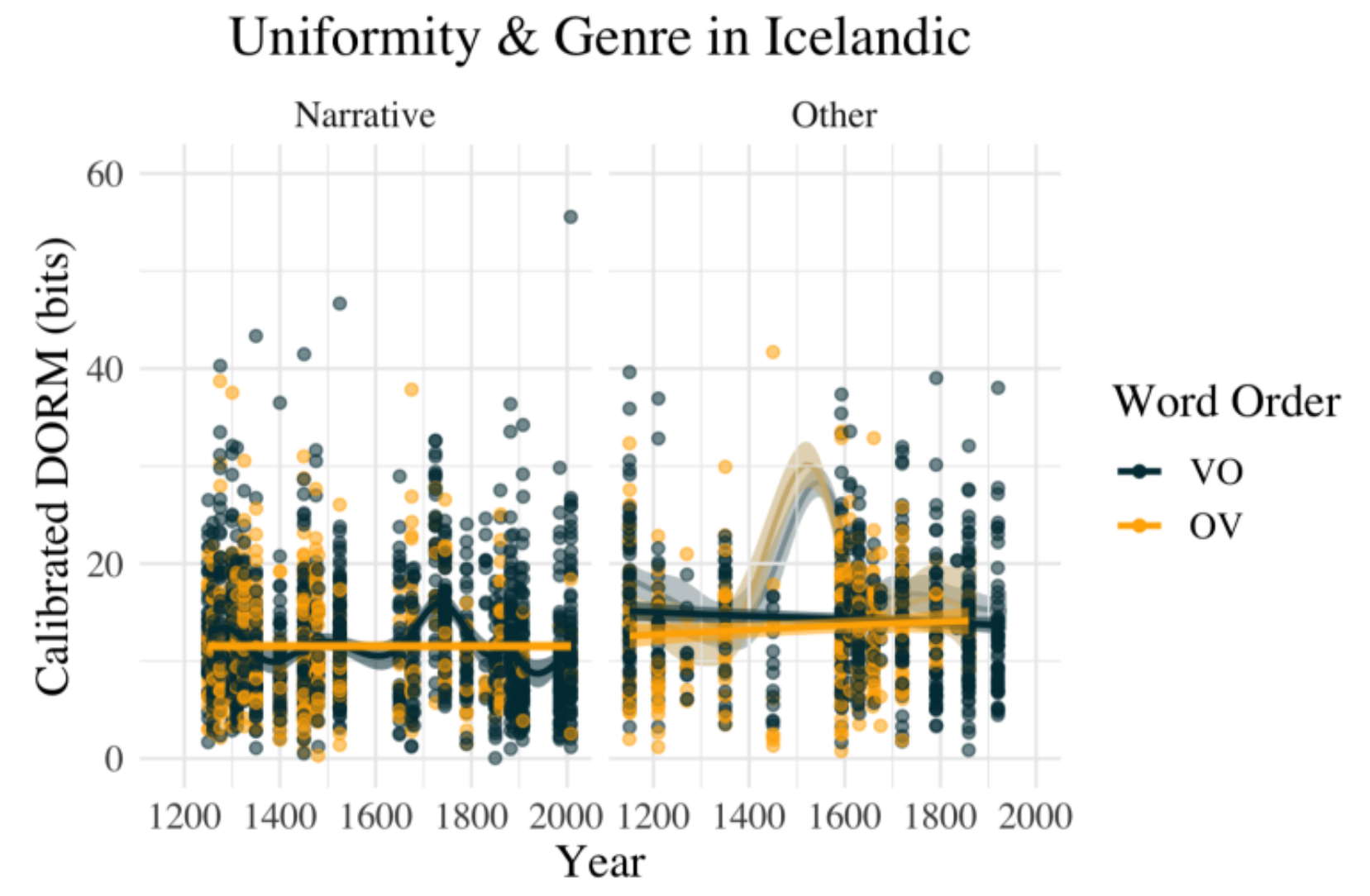
- Mixed-effects logistic regression predicting Top with SbjType, ObjType, Year, SbjType:ObjType, and calDORM showed **no significant main effect of calDORM** (β = -0.004, p = 0.51).
- Predicting Top with calDORM alone was borderline (p = 0.06).
- The SbjType:ObjType interaction **disfavors Top when both Sbj and Obj are pronouns** (β = -0.91, p = 0.004), as well as when both are nominals.

Results: Calibrated DORMs over Time



- Possible specialization in the nomsbj case: modeling DORM with 3-way Sbj:Top:Year interaction improves model fit with $p = 0.001$, but only AIC confirms: -10.

That Decline is Odd: Icelandic calDORMs over Time



- The average uniformity of sentences is constant across the history of Icelandic.

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- Could prosodic cost be the selectional pressure driving the change?

Future Work

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- **I now regularly engage in, and hear of, ways of manipulating the parsed corpora that I couldn't imagine a decade ago.**

Acknowledgements, and thanks for listening!

Thank you to my collaborators on the CAIL project (ESRC), audiences at NYU, Saarbrucken, Manchester, Konstanz, Edinburgh, and the late great Anthony Kroch.

Questions?

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