



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

Conclusions

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 - **contrastive topic** with focus elsewhere in clause.
 - **focus with scalar contrast**.
- However, the movement is always optional even in these contexts.
- Both contexts require an accent, intonational peak, on the fronted constituent.

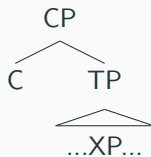
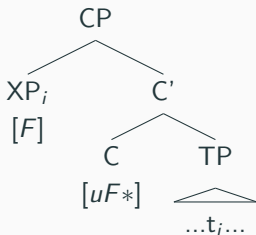
English “Topicalization”

- 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)

- 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

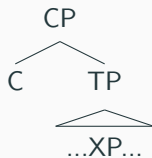
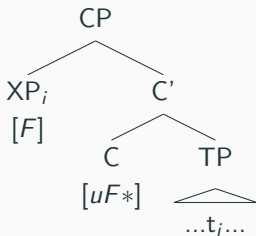
- Move is triggered by the feature content of some head.
- Given “Merge...preempts Move” (Chomsky, 2000), a feature cannot encode optional movement.
- Therefore, optional movement involves a choice (for the **Numeration**) between two variants of a functional head, out of an inventory of possible heads.
 - 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).

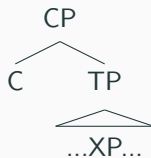
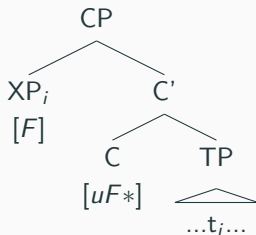
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- To be slightly more precise...



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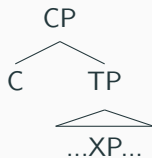
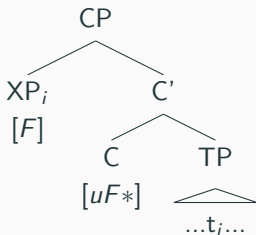
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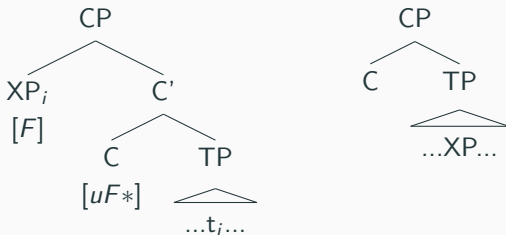
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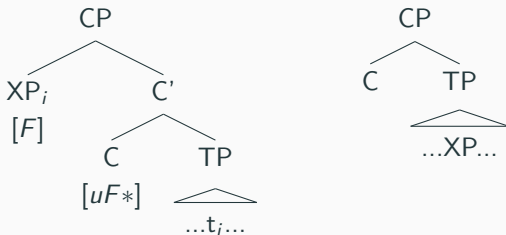
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- Cost:** Default clausal prosody must be altered.

The background features a light gray silhouette of a human head in profile, facing right. Inside the head, a stylized brain is depicted with wavy lines. A thick, dark gray wavy line starts from the left side of the slide, passes through the text area, and ends by entering the brain silhouette.

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- (9) Arable for Corn, you may wash with pale Straw-Colour
(WYLD-1725-2,114.263 in *Penn Parsed Corpus of Modern British English*, (Kroch et al., 2016))
- (10) But this auspicious calm the savage Maximin at last disturbed.
(TURNER1-1799-1,45.214 in PPCMBE)
- (11) Joel Viola likes.
- (12) Joel, Viola likes.

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

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- (13) All sins, except a sin against itself, Love should forgive.
(WILDE-1895-1,70.859 in PPCMBE)
- (14) 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), (Haeberli, 2000), (Haeberli, 2002), (Kroch & Taylor, 1997), ao.
- (15) 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)))

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 - The competition is mitigated by specialization, but along a continuous dimension, and so total specialization is impossible and slow change results (Wallenberg, 2016).

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 end, or for topicalization to specialize for the non-clash case?
- **Observation:** an account of the same facts in terms of informational spread – the Smooth Signal Redundancy Hypothesis (Shannon, 1948; Fenk & Fenk, 1980; Fenk-Oczlon, 2001; Aylett & Turk, 2004; Levy & Jaeger, 2007; Frank & Jaeger, 2008; Jaeger, 2010; Turk, 2010; Chingacham, Demberg, & Klakow, 2023)
 - makes the same predictions as to subject type, but also two more...



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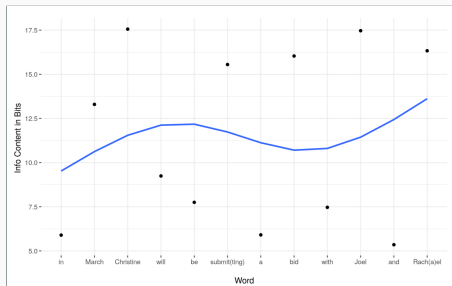
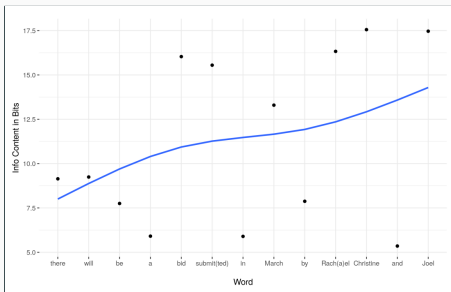
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Uniformity of information distributions

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).

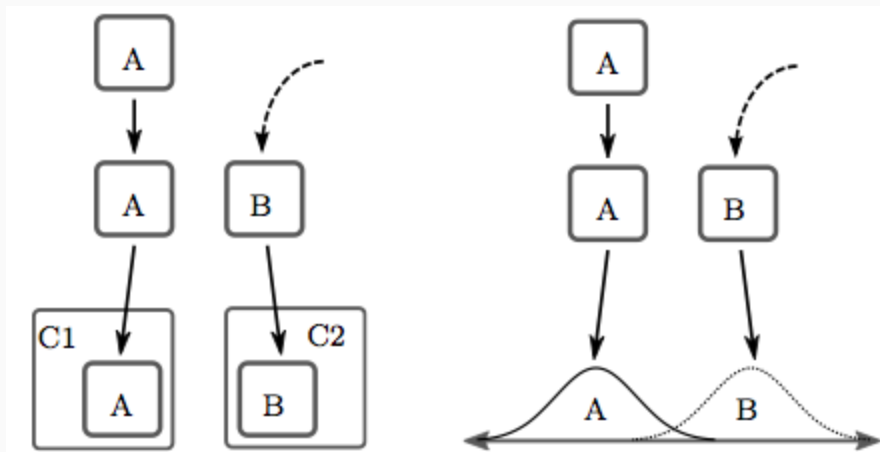
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We can measure how uniform an information distribution is with Deviation of the Rolling Mean (DORM) (Cuskley et al., 2021).

Hypothesis: specialization along continuous dimension



(figure courtesy of J. Fruehwald)

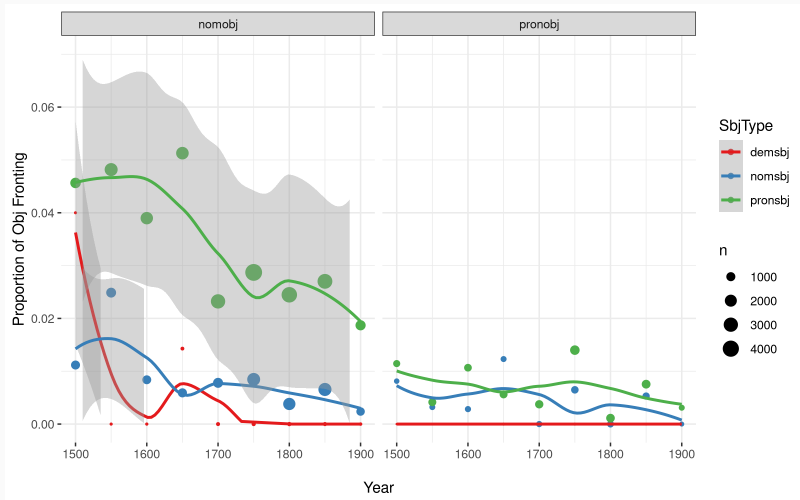
Predictions:

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.
4. Topicalizations should lead to better DORMs.
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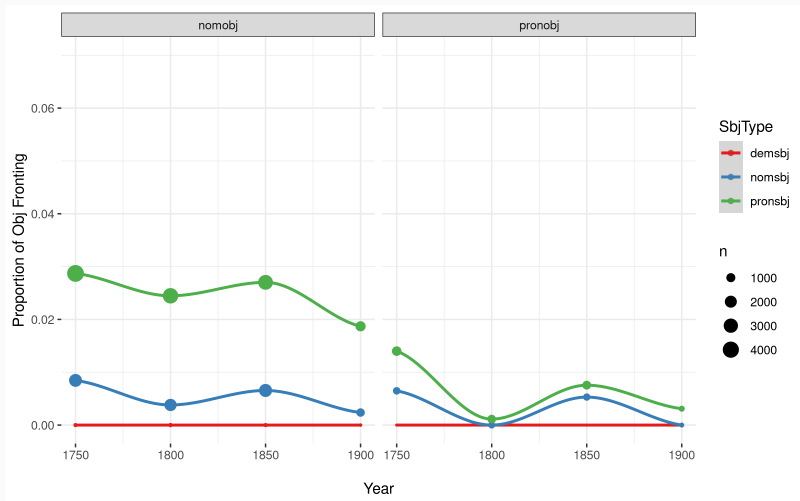
Object Topicalization, PPCEME/MBE, non-V2 clauses



(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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- Appended Calibrated DORMs to output of CS coding queries.

DORM: Deviation of the Rolling Mean

en	eg	skal	sjá	yður	aftur
6.79	6.15	10.1	9.25	6.15	10.4

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en	eg	skal	sjá	yður	aftur
6.79	6.15	10.1	9.25	6.15	10.4
6.47	8.12				

DORM: Deviation of the Rolling Mean

en	eg	skal	sjá	yður	aftur
6.79	6.15	10.1	9.25	6.15	10.4
6.47	8.12	9.67			

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en	eg	skal	sjá	yður	aftur
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Sample variance of rolling means = 1.33 bits²

low DORM → more uniform

high DORM → 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**.







languages



Article

Smooth Signals and Syntactic Change

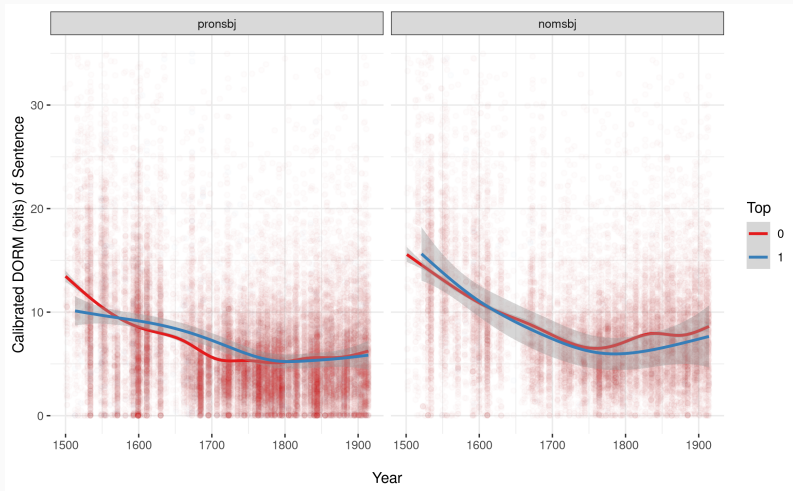
Joel C. Wallenberg ^{1,*} , Rachael Bailes ¹ , Christine Cuskley ¹  and Anton Karl Ingason ^{2,*} 

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

...but not super great this time: Results

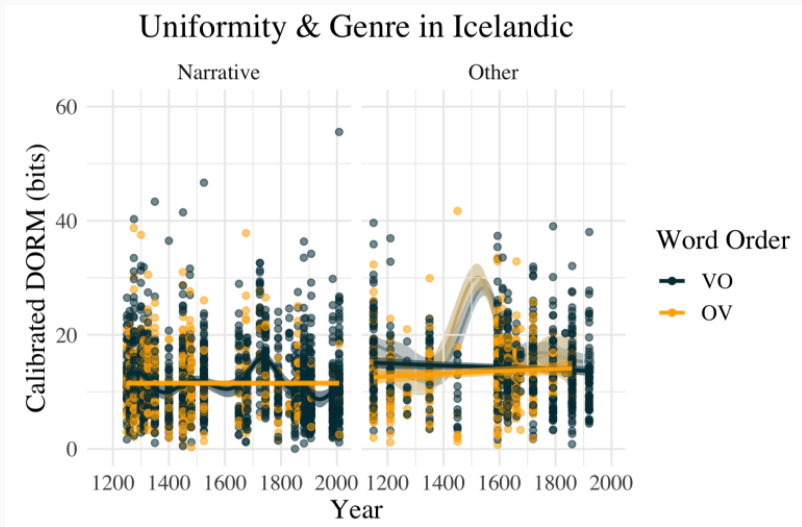
- Mixed-effects logistic regression predicting Top with SbjType, ObjType, Year, SbjType:ObjType, and calDORM showed **no significant main effect of calDORM**.
- Predicting Top with calDORM alone was borderline ($p = 0.06$).
- The SbjType:ObjType interaction **disfavors Top when both Sbj and Obj are pronouns**,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

Results: Calibrated DORMs over Time



- Possible specialization in the nomsubj 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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- Perhaps there is too much noise in the frequency estimates or DORMs, or perhaps I need to compare to alternative orders directly (Voigtmann & Speyer, 2023).
- Could prosodic cost be the selectional pressure driving the change?
- **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, audiences at NYU, Saarbrücken, Manchester, Konstanz, Edinburgh, and the late great Anthony Kroch.

Questions?

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