Three-way grammar competition during the Scots anglicisation: Insights from the *Parsed Corpus of Scottish Correspondence*

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Big Questions

- How does three-way variation/competition differ from two-way?
- Does three-way competition lead to more innovation, or longer survival of innovations (cf. *threshold problem*, Nettle 1999)?
- Does the presence of a 3rd variant increase the chances of stable variation (Kauhanen 2019) and long-term but unstable variation?
- Can we predict the direction of change based on the conditions of acquisition?

Proposal

Contact between Scots and English verb-agreement systems led to the innovation of a new system, resulting in three-way variation. Though the English system had a relative advantage in acquisition, three-way competition slowed its advance.

Case study: Subject-Verb agreement in Scots-English contact

- The nature of Scots-English contact in 16th-18th century lends itself to contact-induced syntactic change (Gotthard 2019, 2022, 2023)
- Scots had a distinct subject-verb (S-V) agreement system to the Southern English system pre-16th century; the *Northern Subject Rule* (NSR; e.g., Montgomery 1994; Rodríguez Ledesma 2013, 2017)
- A new parsed corpus, the *Parsed Corpus of Scottish Correspondence*, provides opportunity for novel insights into syntactic change in Scots in this period of intense contact with English

Outline

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- *18th century until today*:
  - Limited written usage in 18th-19th century
  - Present-Day Scots is predominantly a spoken variety on a dialect continuum with English
  - Usage often stylistically and socially conditioned

(e.g., Agutter 1990; Murison 1979; Macafee and Aitken 2002; Aitken 1984; Maguire 2012)

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  "minor phonological, syntactic, and lexical features [...] that cause little to no typological disruption."
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- *After mid-16th century*: the social context is such that contact-induced change is more plausible – particularly change towards prestigious English norms; a substratum/superstratum relationship.
  - Major syntactic change in Scots towards English patterns (Gotthard 2022).

The *Parsed Corpus of Scottish Correspondence* (PCSC; Gotthard 2022)

Genre: Correspondence

Period: 1543-1747

Size: ca. 270,000 words

Annotation: Orthographic/extralinguistic, **morpho-syntactic**; parsed according to the *Penn Parsed Corpora of Historical English* format (Kroch and Taylor 2000; Kroch et al. 2004, 2016).

Metadata: Author, addressee, gender (author + adresee), location, rank, script, etc.

Description of the NSR

- A distinctively Scots morpho-syntactic feature; a present tense, subject-verb agreement pattern originating in Northumbrian Old English
- The 'ideal' version of the NSR (Pietsch 2005, 6):
  "**The Northern Subject Rule (A):**
  Every agreement verb takes the *-s* form, except when it is directly adjacent to one of the personal pronouns *I*, *we*, *you* or *they* as its subject."
  - This system is only recorded for Northern ME and Older Scots (Montgomery 1994; Rodríguez Ledesma 2013, 2017)

NSR vs. Standard English (StE)

Subject type	*Agreeing verb*	*Predicted in StE?*
	S-V adjacent clauses	
He/she/it/the girl	sing-is	✓
I/we/they/you	sing-∅	✓
The girls	sing-is	✗

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	Non-adjacent clauses		
He/she/it/the girl,	while dancing furiously,	sing-is	✓
He/she/it/the girl	sing-is and	dance-s	✓
I/we/they/you,	while dancing furiously,	sing-is	✗
I/we/they/you	sing-∅ and	dance-s	✗
The girls,	while dancing furiously,	sing-is	✗
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The girls,	while dancing furiously,	sing-is	✗
The girls	sing-is and	dance-s	✗

Henceforth:
The girls = plDP
I/we/they/you = ø-subjects (< ø-agreeing subjects)
He/she/it/the girl = 3sg

Examples from the PCSC

plDPs with *s*-inflection

(1) for **all his freyndis thynkis** it suld be sa
Hew Campbell of Loudoun (sheriff of Ayr), 1548

(2) **zour frendis** yat ar heyr' **consellis** yow all to hald furht zour purposs and' keip zour daye affixit to zow
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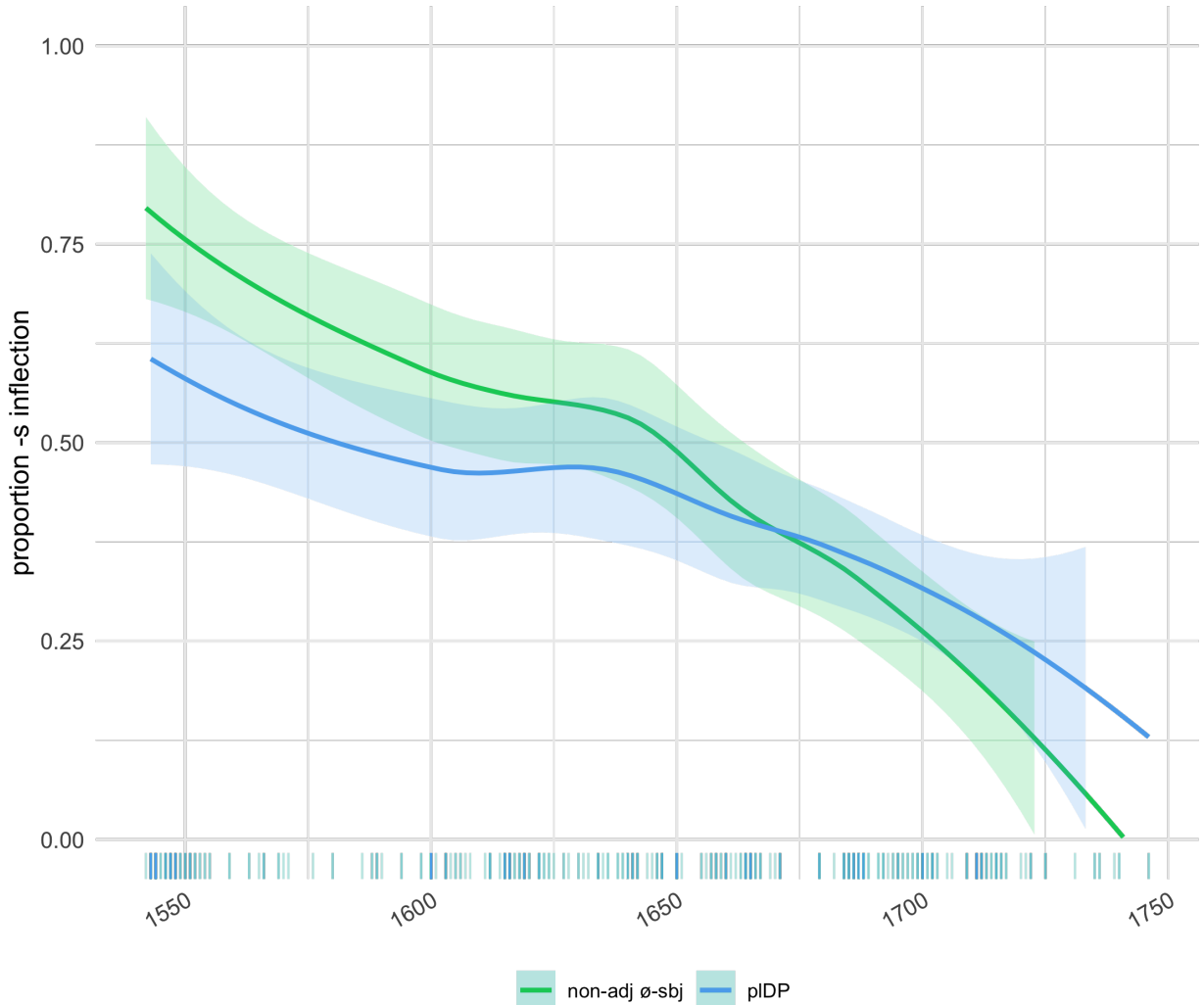
Ø-subjects with *s*-inflection

(7) **I** being young and hauing little experience **knows** little how to doe in so criticall a time
John Murray (Duke of Atholl) 1700

(8) **I se** na help bot be zowr grace & **hoppis** na vdyr [...]
Alexander Gordon (Postulate of Caithness), 1549

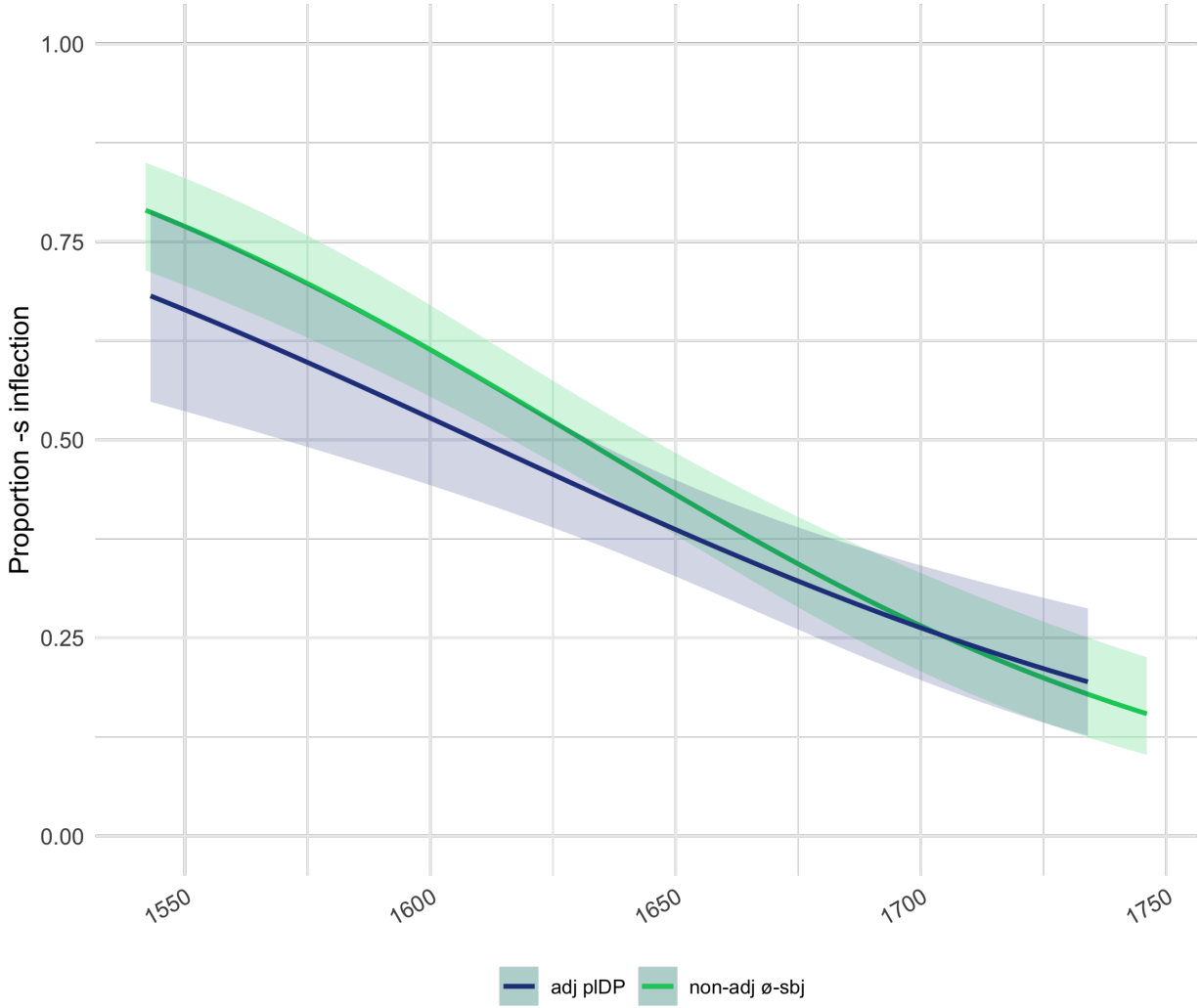
The decline of the NSR pattern (LOESS curves)



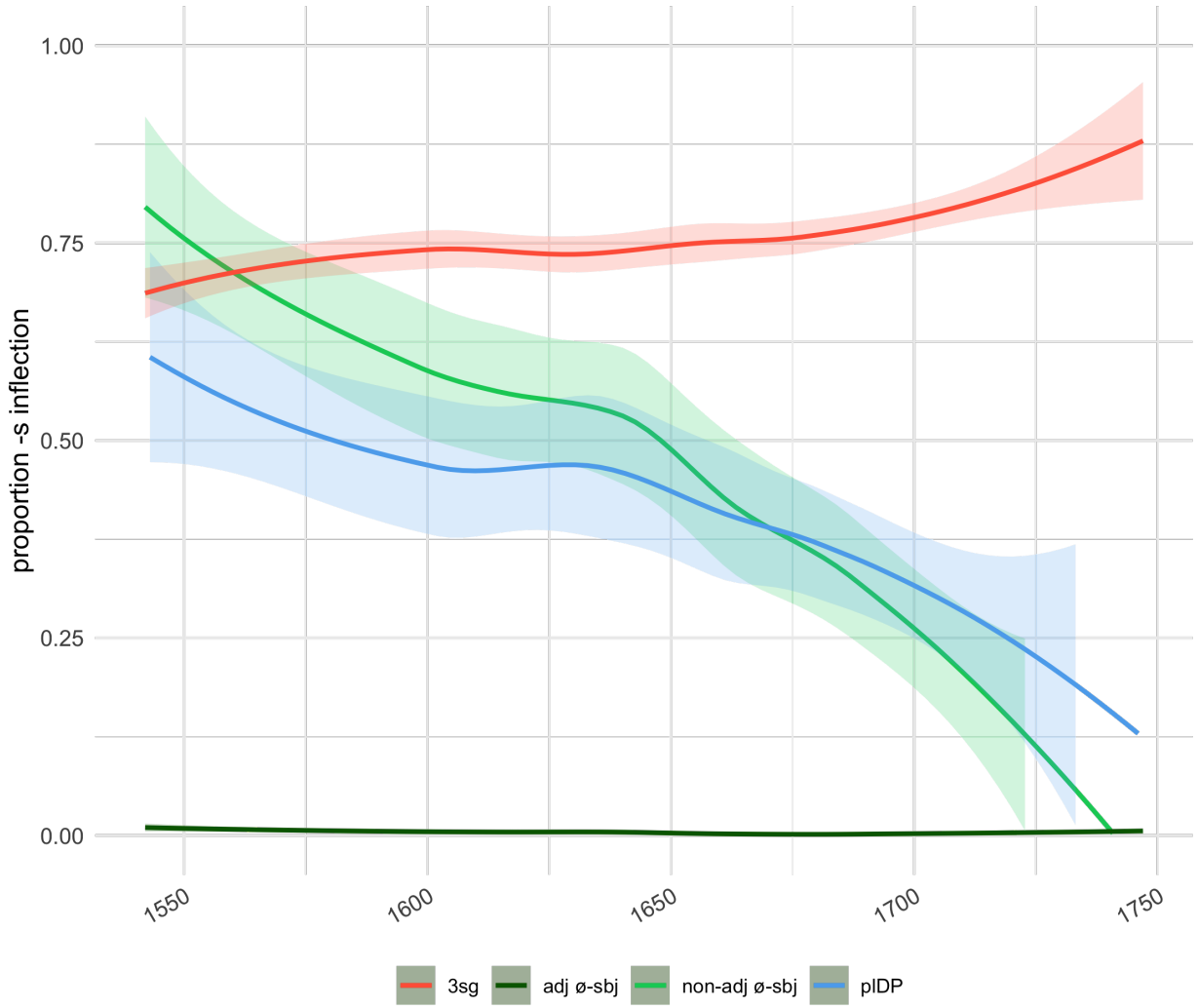
Unitary Syntactic Analysis for NSR

- The trajectory of the NSR during the period of *anglicisation* is only beginning to be studied (Gotthard 2022, 2023).
- There is also no consensus as to the syntactic analysis of NSR; non-unitary, or unitary but partly a Spell-Out phenomenon (de Haas 2011), or a unitary narrow syntactic phenomenon (e.g. Henry 1995).
- In modern dialects, the *adjacency* constraint is not operating as consistently as the *subject type* constraint

Evidence: A Constant Rate Effect



The proportion of -s inflection across subject types, over time (LOESS curves)



A Zero-Agreement Grammar?

Would the increase of contexts allowing ∅-inflection on the verb, introduced by contact with StE agreement, result in some child language learners positing the existence of a third grammar in their primary linguistic input: categorical present tense -∅ marking?

(9) and **my dochteris tocher** quham' I haue mariit laitlie **except** yat det

Adam Otterburn, 1544

(10) for as **he jnform** me he denays that he owes him any thing

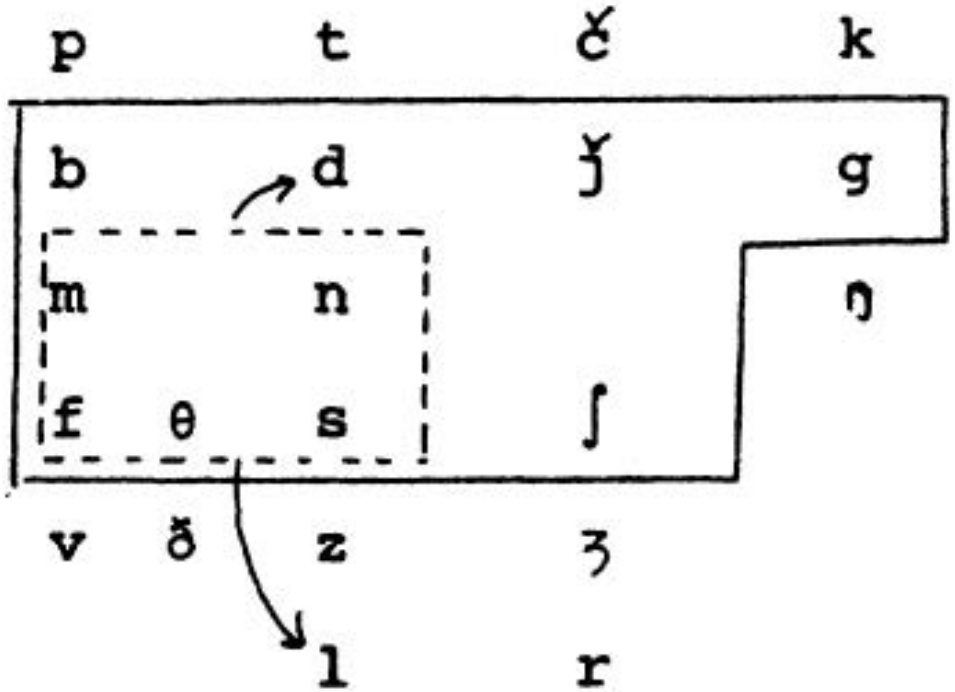
Clara Bramford, 1657

A Three-way Competition

Proposal: Innovation of *Zero* in Acquisition

- Dialect contact between NSR and StE systems lead to a difficult acquisition problem, particularly given the disjunct nature of the NSR rule.
- Similar to Labov (2007, 373)'s proposal for the innovation of /æ/ > [ɛə] beginning Northern Cities Shift from contact between:
  1. New York short-a-tensing system (not obviously a phonological natural class)
  2. Philadelphia short-a-tensing system (ditto)
  3. Nasal short-a-tensing system (in conflict with above at syllable boundaries)

Short-a Competition



(Labov 1981)

- Plus: coda constraint; *mad*, *bad*, *glad* in Philly only
- vs. /æ/ → [ɛə] / _[+*nasal*]

Proposal: Innovation of *Zero* in Acquisition

- Dialect contact between NSR and StE systems lead to a difficult acquisition problem, particularly given the disjunct nature of the NSR rule.
- Adjacency constraint must be learned so that NSR does not itself appear to be competing Zero and -s grammars.
- StE does not have the adjacency constraint, and has ø-agreement in different places (plDP), both adjacent and non-adjacent.
- Role of "neutral learning": if acquirers consider a Zero-agreement system, there may not be frequent enough evidence against it before the end of the critical period (Kauhanen et al. 2017, Kauhanen, Heycock & Wallenberg *in prep*).

Yang (2000)'s Variational Learning

- Given a mixture of 2 grammars in the input, G_1 and G_2, a child is expected to learn both, assign some probability (weight) to each (p,q), and then update these weights throughout the learning process.
- Selectional advantage of a grammar is based on the ability of children to acquire it (i.e. reproductive advantage, in the sense of natural selection).
  - Adapts a classic computational model of learning from Bush and Mosteller (1951), Bush and Mosteller (1958) to syntactic acquisition in a state of grammar variation/change.

Variational Learning

- If an **ambiguous** input is encountered, i.e. either G_1 or G_2 can analyze it, then the child will reward whichever grammar he/she happened to be using at the time.
- If an **unambiguous** input in encountered, e.g. only G_1 could have produced the sentence, then either G_1 will be rewarded, or G_2 will be punished. Either way, G_1 ends up with an augmented weight.
- Therefore, the grammar which generates more unambiguous sentences of its own type will have its weight augmented more often.
    - And over generations as well.

Variational Learning

$$Advantage(G_i) = \frac{UnambiguousClauses_{G_i}}{AllClauses_{G_i}} \quad (1)$$

- RelativeAdvantage(G_1 over G_2) = Advantage(G_1) − Advantage(G_2)
- If Advantage(G_1) > Advantage(G_2), then G_1 must win in the long run (and vice-versa).
  - The outcome of the change is entirely fixed, once it begins.
  - Yang shows that this is true independently of the initial weights of G_1 and G_2.
  - So the initial frequencies of G_1 and G_2 in the population do not matter.
  - This assumes that Advantage is entirely dependent on how well the child can perceive G_1 and G_2 in the input.

A Three-way Competition

	S-V-adjacent			*Non-adjacent*		
Subject	*StE*	*NSR*	*Zero*	*StE*	*NSR*	*Zero*
1sg: *I* 1/3pl: *we/they*	ø	ø	ø	ø	-s	ø
2sg: *thou*	-st	-s	ø	-st	-s	ø
2sg/pl: *you*	ø	ø	ø	ø	-s	ø
3sg: *he, she, it, the girl*	-s	-s	ø	-s	-s	ø
plDP: *the girls*	ø	-s	ø	ø	-s	ø

Importance of 2sg *-st*

- The main context where StE signals itself is in the 2sg *-st* inflection.
- Additionally, the existence of *t/d-deletion* means that StE can parse NSR's 2sg *-s* output as *-st*.
- On EME t/d-deletion: see Romaine 1984, and critique in Denison 1986 who thinks variable lack of <t> in *-st* is a different process. (See also Roberts 1997 and Smith et al. 2009 for t/d-deletion in acquisition and children under 3.)

Estimating Advantages

From PCSC sample of 100 *you* sentences:

	Adjacent	Non-adjacent
2sg	95	1
2pl	3	1

- Estimated probability of t/d-retention after sibilants = 0.51 (Guy and Boberg 1997), in past tense morpheme = 0.84 (Guy 1991); these are 0.58 and 0.82 in Smith et al. (2009) for adults in Buckie, Scotland.

What are the Advantages and Relative Advantages of the Grammars?

Advantage of → with respect to ↓	NSR	StE	Zero
NSR	0	0.1240	0.5316
StE	0.1240	0	0.4859
Zero	0.5324	0.4859	0

- Symmetrical, i.e. no pairwise relative advantages.
- "Babelian system" (Kauhanen 2019): attractor of stable variation at $p_{G_i} = \frac{1}{3}$.

Advantages with t/d-deletion as a possibility

Advantage of → with respect to ↓	NSR	StE	Zero
NSR	0	0.0829	0.5316
StE	0.0456	0	0.4859
Zero	0.5324	0.4859	0

- RelativeAdvantage(StE over NSR) = 0.0373.
- No longer quite symmetrical, so no longer Babelian.
- Conjecture: should result in eventual win for StE, perhaps after long co-existence.

Advantages with t/d-deletion as a possibility

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Discussion

- Kauhanen (2019) shows that a symmetrical 3-way, i.e. Babelian system has an asymptotically stable rest point where there probability of each grammars is $\frac{1}{3}$, i.e. it tends to stable variation.
- t/d-deletion in the 2sg environment gives a relatve advantage of StE over NSR, though not over Zero.
- Since Zero and NSR must split whatever probability space remains when StE gains ground, StE should eventually win, though it will take longer than in a 2-grammar system.
- A consequence of Kauhanen's 1st Conjecture: if a 3-grammar system does not have an interior rest point in probability space (i.e. stable variation), the stable rest points involve 1 grammar winning.

Discussion

- If our case were actually Babelian, the rise of StE could be explained by sociolinguistic advantage...if such advantage does more than shift starting frequencies of the grammars.
- Or, sociolinguistic advantage shifts the starting frequencies, and drift does the rest.

Conclusions

- We have demonstrated a Constant Rate Effect across adjacent and non-adjacent NSR contexts, providing evidence that the NSR is a unitary phenomenon even in its unusual adjacency condition.
- Nevertheless, the adjacency condition presents a challenge for learners, especially in a context of grammatical variation at the population level.
- We suggest that grammar competition between NSR and StE led to learners innovating a Zero-agreement grammar, leading to 3-way competition.
- Based on pairwise advantages in variational learning, StE should increase over time, but perhaps very slowly.
- If not for the effect of t/d-deletion, we have a "Babelian system" which should tend to stable variation.

Further Research

A remaining question: 1 vs 2 advantages with t/d-deletion:

$$\textbf{NSR} = 0.0457$$
$$\textbf{StE} = 0.0336$$
$$\textbf{Zero} = 0.4859$$

Future Research

- Some modals work differently: *willt*, *shallt* vs *wouldst*, *couldst*.
- Work out detailed dynamics of not-quite-Babelian system.
- Status of sociolinguistic variation as frequency shifting, or really contributing advantage.
- Subjunctives and innovation, threshold problem.

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