

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 (and perhaps stopped it).

## 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

## Background

Historical context: Scots-English contact  
The PCSC

## The Northern Subject Rule

NSR as a unitary grammar

## A Puzzle in Decline of NSR

## A Solution: Three-way Competition

Variational Learning  
No Relative Advantage or Small Relative Advantage?

## Conclusions and Directions for Further Research

## Scots-English contact – a brief history

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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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- *Before mid-16th century:*
  - Borrowed features imply that the contact ranks low, e.g., level 2 on Thomason and Kaufman's borrowing scale:  
"minor phonological, syntactic, and lexical features [...] that cause little to no typological disruption."  
(Thomason and Kaufman 1988, 74-5)
  - "Congruent lexicalisation" (Muysken 2012, 714)



# 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 +  
adreseee), 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)
  - The trajectory of the NSR during the period of *anglicisation* is only beginning to be studied (Gotthard 2022, 2023).

# NSR vs. Standard English (StE)

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

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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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## Henceforth:

The girls = plDP

I/we/they/you = ∅-subjects (< ∅-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  
*Richard Kincaid, 1543*

## Examples from the PCSC

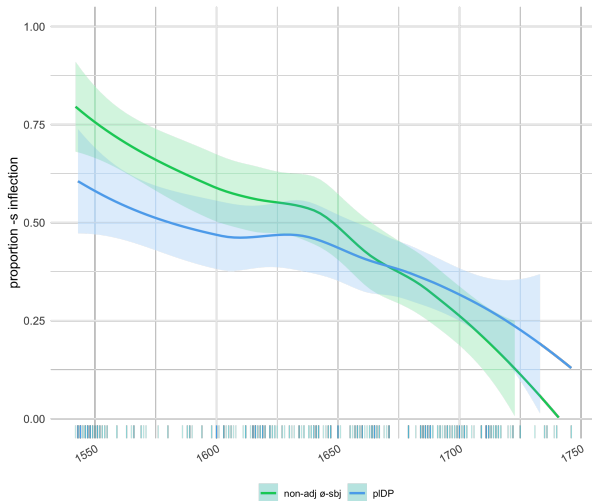
### plDPs with *s*-inflection

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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*

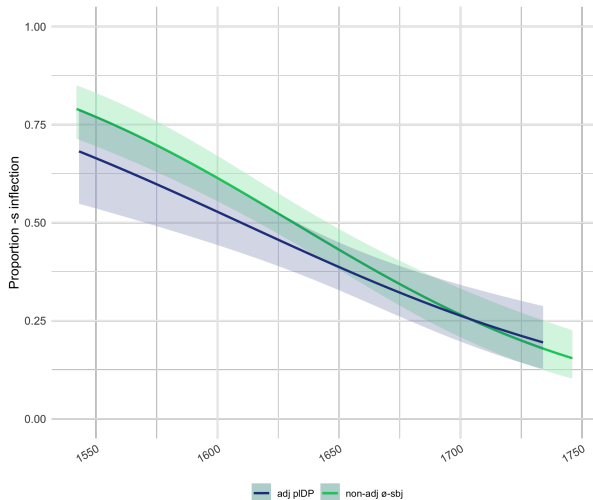
# The decline of the NSR pattern (LOESS curves)



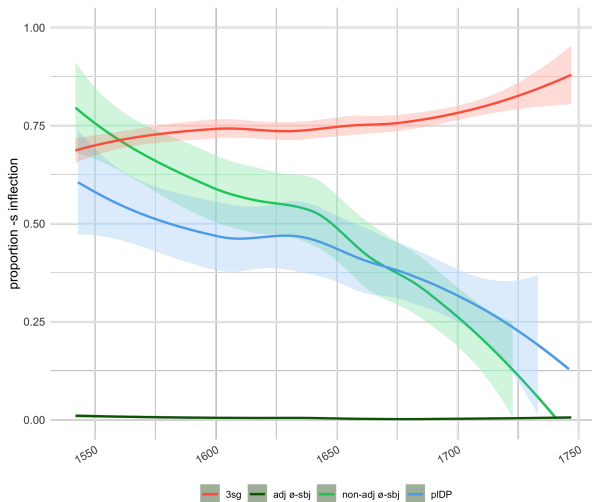
## Unitary Syntactic Analysis for NSR

- There is 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  $\emptyset$ -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 - $\emptyset$  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*

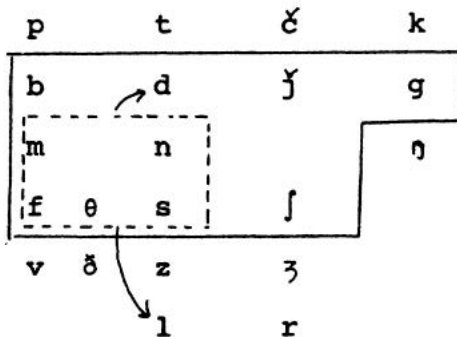




## Proposal: Innovation of *Zero* in Acquisition

- 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  $\emptyset$ -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, 2002)'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 is 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

$$\textit{Advantage}(G_i) = \frac{\textit{UnambiguousClauses}_{G_i}}{\textit{AllClauses}_{G_i}} \quad (1)$$

- $\text{RelativeAdvantage}(G_1 \text{ over } G_2) = \text{Advantage}(G_1) - \text{Advantage}(G_2)$
- If  $\text{Advantage}(G_1) > \text{Advantage}(G_2)$ , 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

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

We estimate the proportions of these contexts from  
**12081 present tense verbs** from the PCSC.

## 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 $\rightarrow$ with respect to $\downarrow$	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.
- “Symmetric system” (Kauhanen 2019): attractor of stable variation at  $\frac{a_1}{a_1+a_2+a_3}, \frac{a_2}{a_1+a_2+a_3}, \frac{a_3}{a_1+a_2+a_3}$

$$= \{0.11, 0.47, 0.42\}$$

## 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

- $\text{RelativeAdvantage}(\text{StE over NSR}) = 0.0373$ .
- No longer quite Symmetric.
- Question: Should this result in eventual win for StE, perhaps after long co-existence?

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## Discussion

- Kauhanen (2019) shows that a Symmetric 3-way system has an asymptotically stable rest point in probability space where the  $p$  of each grammar is non-zero, i.e. it tends to stable variation.
- t/d-deletion in the 2sg environment gives a relative advantage of StE over NSR, though not over Zero.
- A consequence of Kauhanen's 1st Conjecture: if a 3-grammar system does not have an interior rest point, the stable rest points involve 1 grammar winning.
- Iteratively calculating  $p$ s using t/d advantages (10,000×):

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- Iteratively calculating  $p$ s using t/d advantages (10,000×):
  - StE increases, until..
  - The system stabilizes = 0.32, 0.63, 0.05 for NSR, StE, Zero, respectively.

## Discussion: possibilities

1. Perhaps the rise of StE could be explained by sociolinguistic advantage...if such advantage does more than shift starting frequencies of the grammars.
2. Or, sociolinguistic advantage shifts the starting frequencies, and drift does the rest.
3. **A more satisfying hypothesis:** the modern spoken situation reflects the predicted stable variation.



## 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 stop, leading to stable variation.

## Further Research

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

$$\mathbf{NSR} = 0.0457$$

$$\mathbf{StE} = 0.0336$$

$$\mathbf{Zero} = 0.4859$$

## Future Research

- Some modals work differently: *willt, shallt* vs *wouldst, couldst*.
- How much of this data is due to a written prescription?
- Work out detailed dynamics of not-quite-Symmetric system.
- Status of sociolinguistic variation as frequency shifting, or really contributing advantage.
- Subjunctives and innovation, threshold problem.

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