Why is Inflectional Morphology Difficult to Borrow? - Distributing and Lexicalizing Plural Allomorphy in Pennsylvania Dutch

SyntaxLab @ Cambridge

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The general consensus in the extant contact linguistics literature (from various theoretical persuasions) is that inflectional morphology is difficult to borrow (Thomason, 2001; Matras, 2009, 2014; Arkadiev & Amiridze, 2014)

Inflectional morphology is applied at the sentence level, not at the word level, and so within the framework of the utterance of the recipient language [...] This is the major difference between derivational and inflectional morphology, and the main reason why the borrowing of inflectional morphology is rare compared to that of derivational morphology. (Matras, 2009: 212)
PD plural allomorphy

(1) a. Kissi → Kissi-s ‘pillow/pillows’
b. Gall → Galli-s ‘horse/horsie-pl’
c. Schnuppi → Schnuppi-s ‘hankie/hankies’
d. Hammer → Hammer-s ‘hammer/hammers’

(2) a. Mick → Mick-e ‘fly/flies’
b. Schtick → Schtick-er ‘piece/pieces’
c. Haus → Heis-er ‘house/houses’
d. Hand → Hend ‘hand/hands’
e. Frein → Frein ‘friend/friends’
Research questions

- **RQ₁**: How does this general restriction inform us about the underlying nature of an ‘integrated’ bi/multilingual mental lexicon (Kroll & Dussias, 2014; Putnam, Carlson, & Reitter, 2018; López, 2020)?
- **RQ₂**: Are there any *representational* reasons why the borrowing of inflectional morphology is so difficult in contact situations?
- **RQ₃**: What sorts of insights might the contact situation surrounding Pennsylvania Dutch (PD) offer us in better understanding the limits of borrowing of inflectional morphology?
I approach this puzzle from the perspective of a **late-insertion, realizational** model of the syntax-lexicon interface (Borer 2005a,b,2013; Marantz, 2013; Baunaz et al., 2018)

**Key architectural desiderata:**
- One Feature-One Head (OFOH) Architecture
- Distributed approach to NUM(ber) (Wiltschko, 2021)
- The need for both C-I-motivated features *and* ‘purely’ morphological F-features

**Key claim:** Our analysis of syntactic objects as *(lexical) spans* illustrates how the underlying representation of *{s}* is unique in both English and Penn Dutch

**Collaborative (ongoing!) research with Rose Fisher (PSU), David Natvig (U Stavanger), Erin Pretorius (UWC), & Katharina Schuhmann (Uni-Oldenburg)**
What is *Pennsylvania Dutch*?

- PD is a language that has "outgrown its name" (Keiser, 2012:1).
  - +300 years spoken on North American soil (and now in South America!)
  - Started in SE Pennsylvania, now spoken throughout the Midwest and Ontario (and other areas!)
  - $\approx 400,000$ L1 speakers of PD today
  - Predominantly spoken as the L1 of the Old Order Amish (OOA) and other conservative Mennonite groups
  - NB: For an easily accessible history of the language, see Louden (2016)
- PD ain’t going nowhere anytime soon...
  - The Amish population doubles in every generation (average family size 8.6 members)
  - If they keep this pace, by 2315 there will be more Amish in the US than any other ethnic or religious group!
The language contact situation surrounding *Penn Dutch*

- There are no exclusively monolingual speakers of PD
- The OOA exist in a state of **diglossic bilingualism** (Grosjean, 2001, 2008)
  - Although the vast majority of OOA are sequential bilinguals (acquiring PD first), English is omnipresent in their daily lives
  - Bifurcation of modes and sociolinguistic domains:
    - **PD:** home, family, church, local community
    - **English:** non-Amish neighbors, work (outside of the home), ‘worldly’ topics
- Thus, PD speakers are "deep bilinguals" (to quote López, 2020)
  - It makes little sense to attempt to distinguish between *loanwords* and *borrowings* (a la Poplack (2018) and related work) in PD
  - Their lexicon is truly **hybrid**
- **Assessment:** PD represents an ideal language dyad and sustained contact situation to learn more about (the lack of) borrowing of inflectional morphology
## Pennsylvania Dutch Plural Forms

<table>
<thead>
<tr>
<th>{e}</th>
<th>Katz</th>
<th>Katz-e</th>
<th>'cat-pl'</th>
</tr>
</thead>
<tbody>
<tr>
<td>{r}</td>
<td>Hemm</td>
<td>Hemm-r</td>
<td>'shirt-pl'</td>
</tr>
<tr>
<td>{n}</td>
<td>Leffli</td>
<td>Leffli-n</td>
<td>'spoon-pl'</td>
</tr>
<tr>
<td>{s}</td>
<td>Baller</td>
<td>Baller-s</td>
<td>'ball-pl'</td>
</tr>
<tr>
<td>{∅}</td>
<td>Frein</td>
<td>Frein-∅</td>
<td>'friend-pl'</td>
</tr>
<tr>
<td>umlaut</td>
<td>Hand</td>
<td>Hend</td>
<td>'hand-pl'</td>
</tr>
<tr>
<td>umlaut-{r}</td>
<td>Haus</td>
<td>Heis-r</td>
<td>'house-pl'</td>
</tr>
</tbody>
</table>
Table 1. Overview of German nominal plural exponency (in orthographic form) for all plural exponents except -s. All examples show nominal plural with a word-final trochee (marked as \[\text{syllable1}.\text{syllable2}\]), indicating the prosodic form: (...)\[\sigma \, \sigma\]^\#, independent of the corresponding nominal singular form and the specific plural exponent used.

<table>
<thead>
<tr>
<th>Singular: (...)[\sigma , \sigma]^#</th>
<th>Plural: (...)[\sigma , \sigma]^#</th>
<th>Singular: (...)[\sigma ]^#</th>
<th>Plural: (...)[\sigma , \sigma]^#</th>
</tr>
</thead>
<tbody>
<tr>
<td>['\text{Tas}.\text{se}+n] 'cups'</td>
<td>['Frau.+en] 'women'</td>
<td>['Stif.+e] 'pens'</td>
<td>['\text{Kin}.d+er] 'children'</td>
</tr>
<tr>
<td>['\text{Win}.\text{del}+n] 'diapers'</td>
<td>['\text{Stif}.t+e] 'pens'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>['Wä.gen+\text{Ø}] 'cars'</td>
<td>['\text{Kin}.d+er] 'children'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vio['\text{ti}.\text{ne}+n] 'violins'</td>
<td>Bäcke['\text{rei}.+en] 'bakeries'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apo['\text{the}.\text{ke}+n] 'pharmacies'</td>
<td>Pro['\text{ban}.d+en] 'subjects'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Com['\text{pu}.\text{ter}+\text{Ø}] 'computers'</td>
<td>Dia['\text{gram}.m+e] 'diagrams'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(from Schuhmann & Putnam, 2021: 4)

Preliminary results from Fisher et al. (2022):

- AJT & Wug-text with 10 native-PD speakers
- Trochaic template still present (to a much lesser degree) in PD plurals, except for:
  - s-plurals
  - zero plurals
  - umlauted-stems
Let’s focus on 4 different classes of PD-nominal plurals (not based on step shape, but rather on suffix/exponent selection):

- Umlauting & zero plurals
- Plurals ending in \{r\}
- \{s\}-plurals
- \{e\}-plurals
### Potential syllabification patterns in consonant-liquid coda clusters

<table>
<thead>
<tr>
<th>Root</th>
<th>Singular</th>
<th>Plural</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>* /messer/</td>
<td>messer</td>
<td><strong>messr-e</strong></td>
<td>*Syncope</td>
</tr>
<tr>
<td>* /hiwwel/</td>
<td>hiwwel</td>
<td>hiwwl-e</td>
<td></td>
</tr>
<tr>
<td>/messr/</td>
<td>messr</td>
<td>messr-e</td>
<td>Liquid syllabification</td>
</tr>
<tr>
<td>/hiwwl/</td>
<td>hiwwl</td>
<td>hiwwl-e</td>
<td></td>
</tr>
<tr>
<td>/hemm/</td>
<td>hemm</td>
<td>hemm.r</td>
<td></td>
</tr>
</tbody>
</table>
### Pennsylvania Dutch plural exponent classes

<table>
<thead>
<tr>
<th>Exponent</th>
<th>√root</th>
<th>Singular</th>
<th>Plural</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>{s}</td>
<td>√Baller</td>
<td>Baller</td>
<td>Ballers</td>
<td>ball(pl)</td>
</tr>
<tr>
<td></td>
<td>√Frog</td>
<td>Frog</td>
<td>Frogs</td>
<td>frog(pl)</td>
</tr>
<tr>
<td>{e}</td>
<td>√Katz</td>
<td>Katz</td>
<td>Katze</td>
<td>cat(pl)</td>
</tr>
<tr>
<td></td>
<td>√Hiwwl</td>
<td>Hiwwel</td>
<td>Hiwwle</td>
<td>hill(pl)</td>
</tr>
<tr>
<td>{r}</td>
<td>√Hemm</td>
<td>Hemm</td>
<td>Hemmer</td>
<td>shirt(pl)</td>
</tr>
<tr>
<td></td>
<td>√Haus</td>
<td>Haus</td>
<td>Heiser</td>
<td>house(pl)</td>
</tr>
<tr>
<td>{∅}</td>
<td>√Frein</td>
<td>Frein</td>
<td>Frein</td>
<td>friend(pl)</td>
</tr>
<tr>
<td></td>
<td>√Hand</td>
<td>Hand</td>
<td>Hend</td>
<td>hand(pl)</td>
</tr>
</tbody>
</table>
Architectural assumptions: One Feature-One Head (OFOH)

- Feature inventories may differ cross-linguistically due to their primary role in representing language-specific contrasts (Cowper & Hall, 2014; Hall, 2020)

- Contrastivist hypothesis (Cowper & Hall, 2014; Hall, 2007)

- C-I & F-feature
  - F-features are not phonological in nature!

- (Morpho)syntactic features mediate between exponents and structure.
  - Feature trees that are specified on exponents (L(exical)-spans) are matched against feature trees that are generated in syntax (S(yntactic)-spans)

- The challenging domain of bilingualism:
  - New possible asymmetric form-to-feature relationships among exponents
  - Exponents may map to new syntactic configurations (S-spans) due to (sustained) contact
The distributed syntax of NUM(ber) (Wiltschko, 2021)

```
DP → anchoring
   /\    
D   #P → counting
   /\    
#    CIP → dividing
   /\    
Cl   nP → classifying
   /\    
n   \√   
```

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Syntactic representation for PD & English plural L-spans

PD plurals

F₂
  /  \
F₁
  /  \
  #  √

English plurals

F₁
  /  \
  #  √

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(3) **Span:** An n-tuple of heads $< X_n, ..., X_1 >$ is a span in a syntactic structure $S$, iff $X_{n-1}P$ is the complement of $X_n$ in $S$.  
(Blix 2021, 7)

(4) **Exhaustive Lexicalization Principle:** Every syntactic feature must be lexicalized.  
(Fábregas 2007, 167)

(5) **Superset Principle:** In case a syntactic span does not have an identical match in the lexical repertoire, select an exponent which contains a superset of the features present in the syntactic span.  
(adapted from Fábregas & Putnam 2020, 40)
(6) **Subsect S-span:** In case no exponent contains a superset of the features present in the S-span,

a. select the exponent whose L-span contains as many features present in the S-span as possible, then

b. apply (a) until the Exhaustive Lexicalization Principle is satisfied.

(7) **Insertion Heuristic:** When an S-span is spelled out, exponents are inserted according to (a). If (a) cannot obtain, exponents are inserted according to (b). If (b) cannot obtain, then (c) applies:

a. Superset Principle
b. Subsect S-span
c. No insertion
Exponents competing for insertion

<table>
<thead>
<tr>
<th>S-span</th>
<th>L-span (exponents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Sa) [F_4] [F_3] √A</td>
<td>(La) [F_4] [F_3] [F_2] √A</td>
</tr>
<tr>
<td>(Sb) [F_4] [F_3] √B</td>
<td>(Lb) [F_4] [F_3] [F_2] [F_1] √A</td>
</tr>
<tr>
<td></td>
<td>(Lc) [√B]</td>
</tr>
<tr>
<td></td>
<td>(Ld) [F_4] [F_3]</td>
</tr>
</tbody>
</table>
Spellout: English regular & irregular plurals

<table>
<thead>
<tr>
<th>S-span</th>
<th>L-span (exponents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(S)</td>
<td></td>
</tr>
<tr>
<td>#P</td>
<td>car ←</td>
</tr>
<tr>
<td>#</td>
<td>√car</td>
</tr>
<tr>
<td>-s</td>
<td>mouse ←</td>
</tr>
<tr>
<td></td>
<td>√mouse</td>
</tr>
<tr>
<td>mice</td>
<td>#</td>
</tr>
<tr>
<td></td>
<td>√mouse</td>
</tr>
</tbody>
</table>
Tree representations for English regular & irregular plurals

(8) #P
    #
    # #√car
    |  |  |
   {s} car

(9) #P
    # #√mouse
    |  |
    | mice
S-span representing PD distributed plurality

\[
\begin{array}{c}
F_2 \\
F_1 \\
\# \quad \sqrt{-} \\
\end{array}
\]
PD ‘zero’ & umlaut plurals

<table>
<thead>
<tr>
<th>S-span</th>
<th>L-span (exponents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(S)</td>
<td></td>
</tr>
<tr>
<td>F₂</td>
<td>Hand ←</td>
</tr>
<tr>
<td>F₁</td>
<td>√Hand</td>
</tr>
<tr>
<td>#</td>
<td>Hend ←</td>
</tr>
<tr>
<td>√</td>
<td>F₂</td>
</tr>
<tr>
<td></td>
<td>F₁</td>
</tr>
<tr>
<td></td>
<td>#</td>
</tr>
<tr>
<td></td>
<td>√Hand</td>
</tr>
<tr>
<td></td>
<td>Frein ←</td>
</tr>
<tr>
<td></td>
<td>F₂</td>
</tr>
<tr>
<td></td>
<td>F₁</td>
</tr>
<tr>
<td></td>
<td>#</td>
</tr>
<tr>
<td></td>
<td>√Frein</td>
</tr>
</tbody>
</table>
L-spans

(10)

\[
\begin{array}{c}
\text{F}_2 \\
\text{F}_1 \\
\# \\
\text{Hend}
\end{array}
\]

(11)

\[
\begin{array}{c}
\text{Hand} \\
\sqrt{\text{Hand}} \\
\text{Hand}
\end{array}
\]
Spellout of PD \{s\}- plurals

\[
\begin{array}{|c|c|}
\hline
\text{S-span} & \text{L-span (exponents)} \\
\hline
(S) & \text{Baller} \leftrightarrow \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\sqrt{\text{Baller}} \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\text{Baller} \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\sqrt{\text{Baller}} \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\text{Baller} \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\sqrt{\text{Baller}} \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\text{Baller} \\
\hline
\end{array}
\]

(12)  (13)
## Spellout of PD \{e\}-plurals

<table>
<thead>
<tr>
<th>S-span</th>
<th>L-span (exponents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(S)</td>
<td>Katz ↔</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>#</td>
</tr>
<tr>
<td></td>
<td>√Katz</td>
</tr>
<tr>
<td></td>
<td>-e ↔</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>F₂</td>
</tr>
<tr>
<td></td>
<td>F₁</td>
</tr>
</tbody>
</table>

(14)

(15)

\[
\begin{array}{c}
F₂ \\
\hline
\{e\} \\
\hline
F₁ \\
\hline
\hline
Katz \}
\end{array}
\]

\[
\begin{array}{c}
\hline
\# \\
\hline
√Katz \\
\hline
Katz \\
\hline
\hline
\hline
\end{array}
\]

\[
\begin{array}{c}
\hline
\sqrt{Katz} \\
\hline
Katz \\
\hline
\hline
\end{array}
\]
Spellout of $\{r\}$-plurals

<table>
<thead>
<tr>
<th>S-span</th>
<th>L-span (exponents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$(S)$</td>
<td></td>
</tr>
</tbody>
</table>
| $\begin{array}{c}
F_2 \\
F_1
\end{array}$ | $\begin{array}{c}
Haus \\
\sqrt{\text{Haus}}
\end{array}$ |
| $\begin{array}{c}
\# \\
\sqrt{}
\end{array}$ | $\begin{array}{c}
\text{Heis} \\
F_1
\end{array}$ |
| $\begin{array}{c}
\# \\
\sqrt{\text{Haus}}
\end{array}$ | $\begin{array}{c}
\text{Hemm} \\
F_1
\end{array}$ |
| $\begin{array}{c}
\# \\
\sqrt{\text{Hemm}}
\end{array}$ | $\begin{array}{c}
- \text{r} \\
F_2
\end{array}$ |
L-spans

(16)
\[
\begin{array}{c}
F_2 \\
\{r\} \\
F_1 \\
# \\
\sqrt{\text{Haus}} \\
\text{Heis}
\end{array}
\]

(17)
\[
\begin{array}{c}
F_2 \\
\{r\} \\
F_1 \\
# \\
\sqrt{\text{Hemm}} \\
\text{Hemm}
\end{array}
\]

(18)
\[
\begin{array}{c}
\sqrt{\text{Haus}} \\
\text{Haus}
\end{array}
\]

(19)
\[
\begin{array}{c}
\sqrt{\text{Hemm}} \\
\text{Hemm}
\end{array}
\]
### L-spans associated with PD $\sqrt{\text{root}}$ and plural exponents

<table>
<thead>
<tr>
<th>Singular L-span</th>
<th>Plural L-span</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\sqrt{\text{root}}$</td>
<td>$\sqrt{\text{root}}$</td>
</tr>
<tr>
<td>Baller</td>
<td>s</td>
</tr>
<tr>
<td>Frog</td>
<td>s</td>
</tr>
<tr>
<td>Hiwwl</td>
<td>e</td>
</tr>
<tr>
<td>Katz</td>
<td>e</td>
</tr>
<tr>
<td>Haus</td>
<td>r</td>
</tr>
<tr>
<td>Heis</td>
<td></td>
</tr>
<tr>
<td>Hemm</td>
<td>r</td>
</tr>
<tr>
<td>Frein</td>
<td></td>
</tr>
<tr>
<td>Hand</td>
<td>Hend</td>
</tr>
</tbody>
</table>
(20) **English distributed plural S-span**

![Diagram](image)

<table>
<thead>
<tr>
<th>Singular L-span</th>
<th>Plural L-span</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\sqrt{\text{root}}$</td>
<td>$\sqrt{\text{root}}$ # $F_1$</td>
</tr>
<tr>
<td>Car</td>
<td>s</td>
</tr>
<tr>
<td>Ox</td>
<td>en</td>
</tr>
<tr>
<td>Child</td>
<td>Childr</td>
</tr>
<tr>
<td>Moose</td>
<td></td>
</tr>
<tr>
<td>Mouse</td>
<td>Mice</td>
</tr>
</tbody>
</table>

**Important point:** English does not contain $F_2$ in its S-span, the $\{s\}$ exponent will *for PD-English bilinguals*
This analysis captures two important aspects regarding an integrated English-PD grammar:

- **Aspect 1:** Due to its smaller S-span, English only requires the lexicalization of the \{#F_1\} span (e.g., oxen)
  - This means that \{en\} can remain distinct from the PD forms through the specification of F_1
  - There are no PD exponents with an L-span composed of only F_1 - while mapping to English √roots that contain # in their L-spans

- **Aspect 2:** Like PD, English s-plurals are stored as ‘bare’ √roots
  - Wrt to s-plurals both English & PD lexicalize √roots with the smallest L-spans (along with the fact that English √roots occur with the s-exponent in PD) - supports the assumption that \{s\} is a ‘shared exponent’
  - Although the English S-span does not project a second abstract feature (F_2) like PD, the Superset Principle renders \{s\} the best match for simple English √roots
Q: Why does the s-exponent appear on the overwhelming majority of English-based loanwords in PD lexicalized as {s}?  
- Additional knowledge of English will not technically *add* features to the PD plural S-spans  
- L-spans are stored in the mental lexicon (since they don’t inherit any sort of strange leftover F-features)  
- There is no evidence that English √roots will contain the requisite F-feature(s), and as a result, e-plurals should have larger √roots-spans than PD s-plurals  
- *(span) size matters*: So long as speakers generate smaller S-spans while speaking English, the competing PD exponents won’t be viable for insertion (Superset Principle)  
  - **Testable prediction re: mixing**: Plural marking, i.e., PD suffixes on English √roots, will occur through the generation of the PD S-span in ‘English mode’ and be constrained to {e} for English en-plurals and {r} for English r-plurals
Q: What might this approach have to offer?

- The size of the $\sqrt{\text{roots}}$ - with their accompanying L-span - and the distributed nature of PLURAL offers a working explanation to the limited nature of inflectional borrowing.

- Wrt to PD-English bilinguals, if English has smaller plural S-spans than the recipient language (PD), the exponent associated with the largest L-span in the recipient language will lexicalize as PLURAL due to the distributed nature of the lexicon.

- ‘borrowed’ $\sqrt{\text{roots}}$ - with their allomorphic variation (F-features in their L-spans) - accompany them.

- If this proposal is on the right track, it adds further support to the Superset Principle.
Conclusions

Return to original RQs:

- **RQ₁**: How does this general restriction inform us about the underlying nature of an ‘integrated’ bi/multilingual mental lexicon (Kroll & Dussias, 2014; Putnam, Carlson, & Reitter, 2018; López, 2020)?
  - The (bilingual) lexicon/grammar is distributed; lexicalization is conditioned by syntax

- **RQ₂**: Are there any representational reasons why the borrowing of inflectional morphology is so difficult in contact situations?
  - The matching algorithm of (stored) L-spans to S-spans mediated by the Superset Principle makes testable predictions

- **RQ₃**: What sorts of insights might the contact situation surrounding Pennsylvania Dutch (PD) offer us in better understanding the limits of borrowing of inflectional morphology?
  - Active borrowings continue; we also need to test plural allomorphy in connection with gender, case, diminutive suffixes, etc.
Thanks!