Factorial typology and language change

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OVERVIEW

I. Two models of language change
II. Synchronic typology and history
III. Convergent drift in Germanic: the claim
IV. A factorial typology of quantity adjustments
V. Convergent drift in Germanic? The facts
VI. Conclusion

I. TWO MODELS OF LANGUAGE CHANGE

(1) The framework of comparison: the grammar lattice
(see Greenberg 1978, 1995; Anttila & Cho 1997)

<table>
<thead>
<tr>
<th></th>
<th>*CODA » FAITH</th>
<th>FAITH » *CODA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONSET » FAITH</td>
<td>CV (System A)</td>
<td>CV, CVC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(System B)</td>
</tr>
<tr>
<td>FAITH » ONSET</td>
<td>CV, V (System C)</td>
<td>CV, CVC, V, VC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(System D)</td>
</tr>
</tbody>
</table>

A ⇔ B
C ⇔ D

- *Nodes* = Set of permissible grammatical states
  (defined by a finite number of cross-cutting typological dimensions).
- *Arrows* = Set of permissible transitions between grammatical states
  The history of a language consists of a series of transitions.
- Specific transitions are characterized by a probability index.

(2) Language change as a Random Walk

[...T]here is no more reason for languages to change than there is for automobiles to
add fins one year and remove them the next, for jackets to have three buttons one
year and two the next, etc. That is, it seems evident within the framework of sound
change as grammar change that the ‘causes’ of sound change without language contact
lie in the general tendency of human cultural products to undergo ‘nonfunctional’
stylistic change. (Postal 1968: 283)

- The selection of linguistic variants is exclusively determined by social factors.
- All available transitions between permissible states are equally probable.
(3) Random Walk Hypothesis
The diachronic trajectory of a linguistic system is equivalent to a random walk in the grammar lattice.

(4) Language change as a Game of Chess

[...D]e même qu'au jeu d'échecs la perte d'une pièce provoque souvent toute une série de déplacements de la part du joueur menacé en vue de rétablir l'équilibre, de même, dans une langue donnée, on a besoin de toute une série d'innovations visant à redonner au système phonologique sa stabilité et son équilibre.
(Jakobson 1929[1962]: 18)

- The selection of linguistic variants is partly determined by intralinguistic factors (e.g. architecture of the grammar, production/perception mechanisms).
- Transitions between states have inherently weighted probabilities; hence, diachronic trajectories are non-random.

(5) Diachronic evidence against the Random Walk Hypothesis (Lass 1987)
- Conspiracy. A long-term sequence of changes appearing to be directed to a common goal: e.g. changes resulting in the neutralization of vowel length distinctions in the history of English, but see Bermúdez-Otero (1997).
- Centre of gravity. A preferred grammatical state to which a language continually returns: e.g. recurrence of [æ] in the history of Southern British English since Germanic.
- Convergent drift. Parallel innovation in genetically-related but non-contacting languages: e.g. Prokosch's Law in Germanic (see III to V below).

II. SYNCHRONIC TYPOLOGY AND HISTORY

(6) Impicational universals and Trigger-Chain models of language change

Jakobson's (1929) 'Trigger-Chain' scenario:
- Impicational universal: \( P \rightarrow Q \)
- Diachronic chain: \(-P\&Q > P\&Q > P\&Q\)

Trigger-Chain scenarios are logically inconsistent (Hawkins 1979, 1983, 1990):

(7) • If \( P \rightarrow Q \) is an absolute universal, then change will never create a \( *P\&Q \) system in the first place (Uniformitarian Principle).
• Transition from \(-P\&Q\) to \(P\&Q\) may follow paths (a) and (b), but not (c):

\[
\begin{align*}
(a) & \quad -P\&Q > P\&Q \\
(b) & \quad -P\&Q > -P\&Q > P\&Q \\
& *\text{c)} \quad -P\&Q > P\&Q > P\&Q
\end{align*}
\]

Yet this constraint is trivially compatible with the Random Walk Hypothesis.
(8)  • If $P \rightarrow Q$ is a mere statistical tendency, then the unstable system $P \& -Q$ may indeed arise.
    • $-P \& -Q > P \& -Q$ violates $-Q \rightarrow P$ (the contrapositive of $P \rightarrow Q$).

(9)  **Distributional universals and the Relative Time Hypothesis** *(Hawkins 1983, 1990)*

    *Relative Time Hypothesis*
    The historical stability of a grammatical type is directly proportional to its synchronic frequency, as predicted by ‘distributional universals’.

    • Distributional asymmetry:  SOV&Postp =93\% vs. SOV&Prep =7\%
    • Diachronic prediction:  SOV&Prep is unstable
    • Empirical evidence:  elimination of SOV&Prep in 5 IE families: Baltic, Slavic, Greek, Romance, Germanic (except German).

(10)  Frequency ≠ stability *(Lass 1975)*
    ‘Family universals’: Segment types with restricted distribution but high stability. E.g. retroflex stops in the Indian subcontinent, clicks in Southern Africa.

(11)  **Frequency and geographical scattering as historically emergent typological features** *(Greenberg 1978: 75-6, 1995: 151-2)*

    • *Scattering*: probability that any pair of T-type languages will belong in different genetic or areal groups, e.g. high scattering: vowel nasalization
      low scattering: lexical tone

    • Greenberg's proposal: frequency and scattering are diachronically emergent typological features, arising from the dynamics of language change
      — *incidence*: probability of ingress into type $T$, i.e. $p(\neg T \rightarrow T)$.
      — *stability*: probability of non-egress from type $T$, i.e. $1-p(T \rightarrow \neg T)$
    High incidence + low stability $\rightarrow$ high scattering
    Low incidence + high stability $\rightarrow$ low scattering.

(12)  **Summary**

    • In some empirical cases, the evidence of history dovetails with that of synchronic typology: e.g. shift away from SOV&Prep in IE (see 9 above).
      Ideally, a (functional) explanation can then be specified: e.g. parsing preference for rapid attachment of constituents to their mother nodes *(Hawkins 1990)*.

    • However, there is no reliable theoretical principle allowing one to derive constraints on the direction of language change from synchronic distributional evidence.

    • Allegations of non-random diachronic development have to be judged on their own merits.
III. CONVERGENT DRIFT IN GERMANIC: THE CLAIM

(13) ‘Prokosch’s Law’

The Germanic stress accent led to the weakening or loss of unstressed syllables [...]. A continuation of this effect is seen in a standardization of the quantity of accented syllables that took place in all Germanic languages during the 13th and 14th centuries. The details differ considerably in the several languages, but the principle is the same everywhere: short accented vowels in open syllables are lengthened. (Prokosch 1938: 140)


PKPROM: If a syllable is stressed, then it is bimoric.

(14) Why suspect Prokosch’s Law?

- Flaws in traditional handbook reconstruction:
  e.g. Middle English Open Syllable Lengthening (MEOSL) is a misnomer for a compensatory lengthening process (Minkova 1982, Bermúdez-Otero 1997)
- Focus on standard languages, at the expense of dialectal evidence:
  e.g. High Alemannic, Scandinavian ‘balance’ dialects, etc.

(15) Empirical problems

- Contact between dialects
- Influence of the standard national languages (e.g. German Hochsprache)
- PKPROM was already active in Proto-Gmc: e.g. Sievers’s Law in Gothic (Riad 1992)

<table>
<thead>
<tr>
<th>Onset</th>
<th>PKPROM</th>
<th>*CODA</th>
<th>*COMPLX</th>
</tr>
</thead>
<tbody>
<tr>
<td>/sookIIs/</td>
<td>/you seek/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>soo.kiis</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sook.iis</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>sook.jis</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>soo.kjis</td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>/nasIIs/</th>
<th>/you save/</th>
</tr>
</thead>
<tbody>
<tr>
<td>na.siis</td>
<td></td>
</tr>
<tr>
<td>nas.iis</td>
<td></td>
</tr>
<tr>
<td>nas.jis</td>
<td></td>
</tr>
<tr>
<td>na.sjis</td>
<td></td>
</tr>
</tbody>
</table>

(16) Evaluation

- The claim of convergent drift is hard to verify (15).
- Typological analysis may falsify it (IV and V).
IV. A FACTORIAL TYPOLOGY OF QUANTITY ADJUSTMENTS

(17) The North-West Germanic inheritance
• Fixed root-initial non-iterative trochaic stress: ALL-FT-L \rightarrow PARSE	extsuperscript{a}.
  [The evidence of secondary stress in Old English, Old Icelandic and Old High German is
difficult to interpret, and does not affect the matter at hand.]
• Strict ban on monomoric lexical items: FTBIN, L\textsuperscript{a}PR \rightarrow DEP	extsuperscript{a}.
• Vowel shortening in unstressed (=non-root) syllables: MAX\textsuperscript{Seg} \rightarrow WSP \rightarrow MAX\textsuperscript{a}.
  [Preliterary Old English, Proto-Nordic, but later in Old High German.]

(18) Sharpening the focus
I disregard the following phenomena:
• compensatory lengthening, which does not affect mora-count;
• closed syllable shortening and other processes where stress does not play a rôle;
• sensitivity to structure below the root node (e.g. vowel lengthening hierarchy low \rightarrow mid > high).

(19) The constraints
• PKPROM (Prince & Smolensky 1993: 39): If a syllable is stressed, then it is bimoric.
• RHHRM (Prince & Smolensky 1993: 59): Unbalanced trochees (HL) are forbidden.
WEAKEDGE (Spaelti 1994)
  • WEAKC: Word-final consonants are not syllabified.
  • NONFIN: Word-final syllables are not footed.
• PARSE\textsuperscript{Seg} (Prince & Smolensky 1993: 85): All segments are syllabified.
• PARSE\textsuperscript{a} (Prince & Smolensky 1993: 61): All syllables are footed.
• DEP\textsuperscript{a} (McCarthy & Prince 1995): Every output mora has an input correspondent.
• MAX\textsuperscript{a} (McCarthy & Prince 1995): Every input mora has an output correspondent.

(20) The rankings (I): lengthening

Lengthening in -VC Monosyllables (VCMonL)
WEAKC \rightarrow PARSE\textsuperscript{Seg}, DEP\textsuperscript{a}

<table>
<thead>
<tr>
<th>/CVC/</th>
<th>FtBIN</th>
<th>WEAKC</th>
<th>PARSE\textsuperscript{Seg}</th>
<th>DEP\textsuperscript{a}</th>
</tr>
</thead>
<tbody>
<tr>
<td>σ(CV)\textsubscript{a}C</td>
<td>*!</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>σ(CVC)\textsubscript{a}</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>σ(CVV)\textsubscript{a}C</td>
<td>#\textsuperscript{a}</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

(21) General Open Syllable Lengthening (GenOSL)
PKPROM \rightarrow DEP\textsuperscript{a}
(22) **Open Penult Lengthening (OPenL)**

\[ \text{NONFIN} \gg \text{PARSE}^\sigma, \text{DEP}^\mu \gg \text{PKPROM} \]

<table>
<thead>
<tr>
<th>(/L\sigma/)</th>
<th>FtBIN</th>
<th>NONFIN</th>
<th>PARSE(^\sigma)</th>
<th>DEP(^\mu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(R(L)_R\sigma)</td>
<td>∗!</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>(R(L\sigma)_R)</td>
<td></td>
<td>∗!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(R(+L)_R\sigma)</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Note: +L = underlying L surfacing as H

(23) **The rankings (II): shortening**

**General Trochaic Shortening (GenTrochS)**

\[ \text{RHHRM, PARSE}^\sigma \gg \text{MAX}^\mu, \text{NONFIN} \]

<table>
<thead>
<tr>
<th>(/HL/)</th>
<th>RHHRM</th>
<th>PARSE(^\sigma)</th>
<th>MAX(^\mu)</th>
<th>NONFIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>(R(HL)_R)</td>
<td>∗!</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>(R(HL)_R)</td>
<td></td>
<td>∗!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(R(-HL)_R)</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Note: -H = underlying H surfacing as L

(24) **Trisyllabic Shortening (TSS)**

\[ \text{RHHRM, NONFIN} \gg \text{PARSE}^\sigma \gg \text{MAX}^\mu \]

<table>
<thead>
<tr>
<th>(/HL/)</th>
<th>RHHRM</th>
<th>NONFIN</th>
<th>PARSE(^\sigma)</th>
<th>MAX(^\mu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(HL)_R)</td>
<td>∗!</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HL)_R)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HL)_R)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>(/HL/)</th>
<th>RHHRM</th>
<th>NONFIN</th>
<th>PARSE(^\sigma)</th>
<th>MAX(^\mu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(HL)_R)</td>
<td>∗!</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HL)_R)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HL)_R)</td>
<td></td>
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</tbody>
</table>

(25) **Implications**

PKPROM is *not* a crucial participant in either Open Penult Lengthening or Lengthening in -VC Monosyllables. These lengthening processes are structurally and logically independent from General Open Syllable Lengthening.
V. CONVERGENT DRIFT IN GERMANIC? THE FACTS

(26) Monosyllables vs. polysyllables

<table>
<thead>
<tr>
<th></th>
<th>OSL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>VCMonL</td>
<td>✗</td>
</tr>
<tr>
<td>English</td>
<td></td>
</tr>
<tr>
<td>Nord-Gudbrandsdalen</td>
<td></td>
</tr>
<tr>
<td>Thurgau, Schaffhausen</td>
<td></td>
</tr>
<tr>
<td>Danish</td>
<td></td>
</tr>
<tr>
<td>Dutch</td>
<td></td>
</tr>
<tr>
<td>Low German</td>
<td></td>
</tr>
<tr>
<td>High Alemannic dialects</td>
<td></td>
</tr>
<tr>
<td>Scandinavian ‘balance’ dialects</td>
<td></td>
</tr>
<tr>
<td>Icelandic</td>
<td></td>
</tr>
<tr>
<td>Std. Swedish &amp; Norwegian Central Bavarian</td>
<td></td>
</tr>
</tbody>
</table>

Examples (morphologically related words with etymologically short root-vowels):

(27) • Canton Thurgau (High Alemannic, Switzerland):

  * gras *gräs* ‘grass’/‘to graze’
  * grab *greːbər* ‘grave’ (sg/pl) (Handschu et al. 1965).

(28) • Glarnertüütsch, Canton Glarus (High Alemannic, Switzerland):

  * haas *haso* ‘rabbit’ (sg/pl)
  * graab *greːbər* ‘grave’ (sg/pl) (Spaelti 1994).

• Älvdalen (a ‘balance’ dialect of Swedish):

  * daal *daːlir* ‘valley’ (sg/pl)

(29) • Danish:

  * fred *freed* ‘peace’ (indef/def)
  * gud *guud* ‘god’ (indef/def) (Hansen 1962).

• Dutch:

  * schip *scheepen* ‘ship’ (sg/pl)
  * dakk *daaken* ‘roof’ (sg/pl).

(30) • Swedish:

  * veet *veeta* ‘wit’/‘to know’
  * vääv *vääva* ‘weave’/‘to weave’
  * stiig *stiiga* ‘path’/‘to step’ (Riad 1992).
(31) **East Upper German dialects: Penult Lengthening + Trisyllabic Shortening**

- Sieben Gemeinden German (Kranzmayr 1925, 1935):

<table>
<thead>
<tr>
<th>Etymologically short root-vowels:</th>
<th>Etymologically long root-vowels:</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPenL</td>
<td>TSS</td>
</tr>
<tr>
<td><code>nagel</code> (sg.) <code>negel</code> (pl.) ‘nail’</td>
<td><code>adorn</code> (pl.) <code>adora</code> (sg.) ‘vein’</td>
</tr>
<tr>
<td><code>vater</code> (nom.) <code>vater</code> (dat.) ‘father’</td>
<td><code>atom</code> (n.) <code>atoman</code> (vb.) ‘breath(e)’</td>
</tr>
<tr>
<td><code>ve’dern</code> (pl.) <code>vedra</code> (sg.) ‘feather’</td>
<td><code>lew’rxa</code> ‘lark’</td>
</tr>
<tr>
<td><code>wagen</code> (sg.) <code>wegene</code> (pl.) ‘wain’</td>
<td><code>muter</code> (sg.) <code>mutere</code> (pl.) ‘mother’</td>
</tr>
</tbody>
</table>

[The original transcription has been retained]

- According to Kranzmayr (1935), this pattern was once fully productive in a large group of East Upper German dialects. Subsequent developments, notably syncope, have considerably obscured its effects.

(32) **General Trochaic Shortening**

- Zürich Oberland; Rigi area and Amt Entlebuch (Canton Lucerne)

  Words with etymologically short root-vowels display the length alternation characteristic of the main High Alemannic area: *gраab / grebər*, see (28).

  The pattern has been irregularly extended to items with etymologically long vowels:
  
  e.g. Zürich Oberland (Weber 1923: 86)
  
<table>
<thead>
<tr>
<th>Shortening</th>
<th>Stems</th>
<th>OHG</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>moos</em></td>
<td><em>mos</em></td>
<td><em>māsa</em></td>
<td>‘speck of dirt’ (sg/pl)</td>
</tr>
<tr>
<td><em>stuad</em></td>
<td><em>stude</em></td>
<td><em>stūda</em></td>
<td>‘shrub’ (sg/pl)</td>
</tr>
<tr>
<td><em>surd</em></td>
<td><em>surde</em></td>
<td><em>krīda</em></td>
<td>‘chalk’ (sg/pl)</td>
</tr>
</tbody>
</table>

  For the Rigi area and the Amt Entlebuch, see Fischer (1960: 34), Schmid (1915: 120).

(33) **Middle English**

  Shortening has affected well over a third of surviving OE long-vowelled disyllables:
  
  e.g. *cūcn* > *chicken*
  | *dēafol* | *deil* |
  | *sērig* | *saro* |

  Traditional account (Luick 1964: §387): analogical levelling from inflected forms subject to TSS, e.g. pl. *cīcem* > *cīene*, whence *chicken*.

  Problems:
  
  (i) no independent evidence of regular TSS in the native vocabulary (Minkova & Stockwell 1996)
  (ii) inadequacy of analogical accounts in related cases: e.g. the notorious ‘exceptions to MEOSL’ (Bermúdez-Otero 1997, in prep.).

(34) **Summary**

- The Germanic languages display the full (or near-full) range of lengthenings and shortenings predicted by factorial typology.
- No significant correlations between processes can be observed: see e.g. (26).
- There is therefore insufficient evidence for the claim of convergent drift as made in the literature: see (13).
VI. CONCLUSION

- Current proposals of a link between synchronic typological distribution and diachrony (e.g. Hawkins's) are only partially successful: synchronic frequency ≠ diachronic stability.

- There is at present no general paradigm capable of explaining apparently non-random diachronic trajectories.

- Typology remains an indispensable tool for assessing claims of non-random diachronic developments (e.g. convergent drift).

- The assumption of convergent drift embodied in ‘Prokosch's Law’ underestimates the typological diversity of quantity adjustments in the Germanic languages.

REFERENCES


Joseph H. Greenberg on his 75th birthday. Amsterdam/Philadelphia: John Benjamins. 93-128.


