Naturalness of scripts and writing systems

Prolegomena to a Natural Grapholinguistics

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Structure

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Evaluations

“I have taken it as given that some writing systems are better than others. This question could certainly be debated.” (Rogers 1995: 31)

“In the course of this long evolution, a language usually got the sort of writing system it deserved.” (Halliday 1977, 2010: 103), sometimes cited as “Every language gets the writing system it deserves” (Frost 2012: 266)
1. Motivation

- Alleged supremacy of the alphabet due to phonocentric and Eurocentric views (Ehlich 2007; Yan 2002) has led to the often unchallenged assumption that the alphabet is the “best” type of writing system.

- Political hegemonies and technological advances still clearly favor alphabets, so does theorizing within research on writing systems.
2. Relevance

- An interdisciplinary field of research titled *grapholinguistics* is emerging.

- There exists little research on the universals of writing (systems).
  - First findings in this area suggest that scripts share salient features (Changizi/Shimojo 2005; Changizi et al. 2006).

- *Naturalness Theory* (also *Naturalism* or *Naturalness Program*) has not yet been systematically applied to writing (vs. *Optimality Theory*).
3. Naturalness

Two most prominent sub-branches:

1. *Natural Phonology* (Stampe, Donegan)
   - physiologically motivated (articulation/perception)
   - natural processes/unnatural rules
   - fortitions/lenitions

2. *Natural Morphology* (Dressler, Mayerthaler, Wurzel)
   - semiotically motivated (cognitive processing)
   - naturalness parameters based on extralinguistic evidence (esp. language acquisition, language disorders, language history/change)
   - three levels: (1) system-independent, (2) typological, and (3) system-dependent naturalness
   - central concept: naturalness conflicts
## Criteria for a practical/optimal script/writing system

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<tbody>
<tr>
<td>1. mechanically suited for the language it is to reflect</td>
<td>1. convenience</td>
<td>1. linguistically sound</td>
<td>1. maximum distinctiveness</td>
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<td>2. compatible with [...] its social-cultural setting</td>
<td>2. tools</td>
<td>2. acceptable to all stakeholders</td>
<td>2. size of the graph(emic) inventory</td>
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<td>3. psychologically/ pedagogically appropriate for its speakers</td>
<td>3. general applicability and linguistic fit</td>
<td>3. usable</td>
<td>3. cognitive salience</td>
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<td>4. expressive power</td>
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<td>4. maximum naturalness</td>
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<td>5. simplicity</td>
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<td>5. inner consistency</td>
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<td>6. stability through time</td>
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<td>6. other criteria</td>
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<td>7. monochrome coding</td>
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<td>Smalley et al. (1963)</td>
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<td>maximum</td>
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<td>1. motivation for the learner</td>
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<td>2. representation of speech</td>
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<td>3. ease of learning</td>
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<td>4. transfer</td>
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<td>5. ease of reproduction</td>
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4. Proposal of Natural Grapholinguistics

1) Graphetics
   - system-independent naturalness: physiologically and semiotically motivated
   - complexity (macro-level: size of inventory, distinctiveness, variability of graphs, direction of writing; micro-level: type and quantity of segments, topological configuration)

2) Graphemics (at)ics
   - typological adequacy, system-dependent naturalness: semiotically motivated
   - How does a writing system cater for the needs of a language and its features?
   - biuniqueness, iconicity/iconism, optimal shape, depth ...

3) Extralinguistic parameters
   - social/cultural fit, political factors, (technological) availability, operability, adaptability/transferability
5. Method

- *Comparative Graphematics* (Weingarten 2011)
- Gradual analysis of (initially maximally) *diverse* writing systems (e.g. Chinese, Arabic, Thai, German)
- External (extralinguistic) evidence
  - Reading and writing acquisition
  - Disorders of reading and written expression
  - Development and diachronic change of scripts and writing systems (as a result of the former two)

1. **What are the naturalness parameters of writing?**
2. **What are the type- and writing system-specific naturalness conflicts?**
3. **How are they dealt with?**
6. Example: Symmetry

- extrinsical symmetry (<b>, <d>) as a difficulty of visual recognition due to cognitive factors (object constancy, “mirror invariance” phenomenon)

- macro-level: reduces perceptual distinctiveness within an inventory, increases economy of production (polyfunctionality of shapes = reduced size of inventory)
6. Example: Symmetry

- Reading/writing acquisition: many children initially make mirror errors (Pegado et al. 2011)
- Disorders: readers/writers with impairments show difficulty in discriminating symmetric letters (Lachmann/Geyer 2003)
- Diachronic change: Extensive study by Wiebelt (2004): 41 scripts analyzed, “perfect” symmetry abandoned after 350 years in use; only 3% extrinsical left-right-symmetry
- Remaining symmetry results in avoidance strategies in font design (serifs, stroke thickness ...
7. Conclusions and outlook

- The principles and methods developed in *Natural Phonology* and *Natural Morphology* can be used analogously to uncover naturalness parameters (and possibly universal preferences thereof) of scripts and writing systems and generally offer a framework for theory construction (and/or modification).

- One of the goals is to find/build/explore a *tertium comparationis* for further comparative analyses within grapholinguistics.
8. References


thank you