

Product or process?

Identifying linguistic structures in handwritten products

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ungetragen

erstem

Nervenzelle

gauche

Wirkungen

Agenda

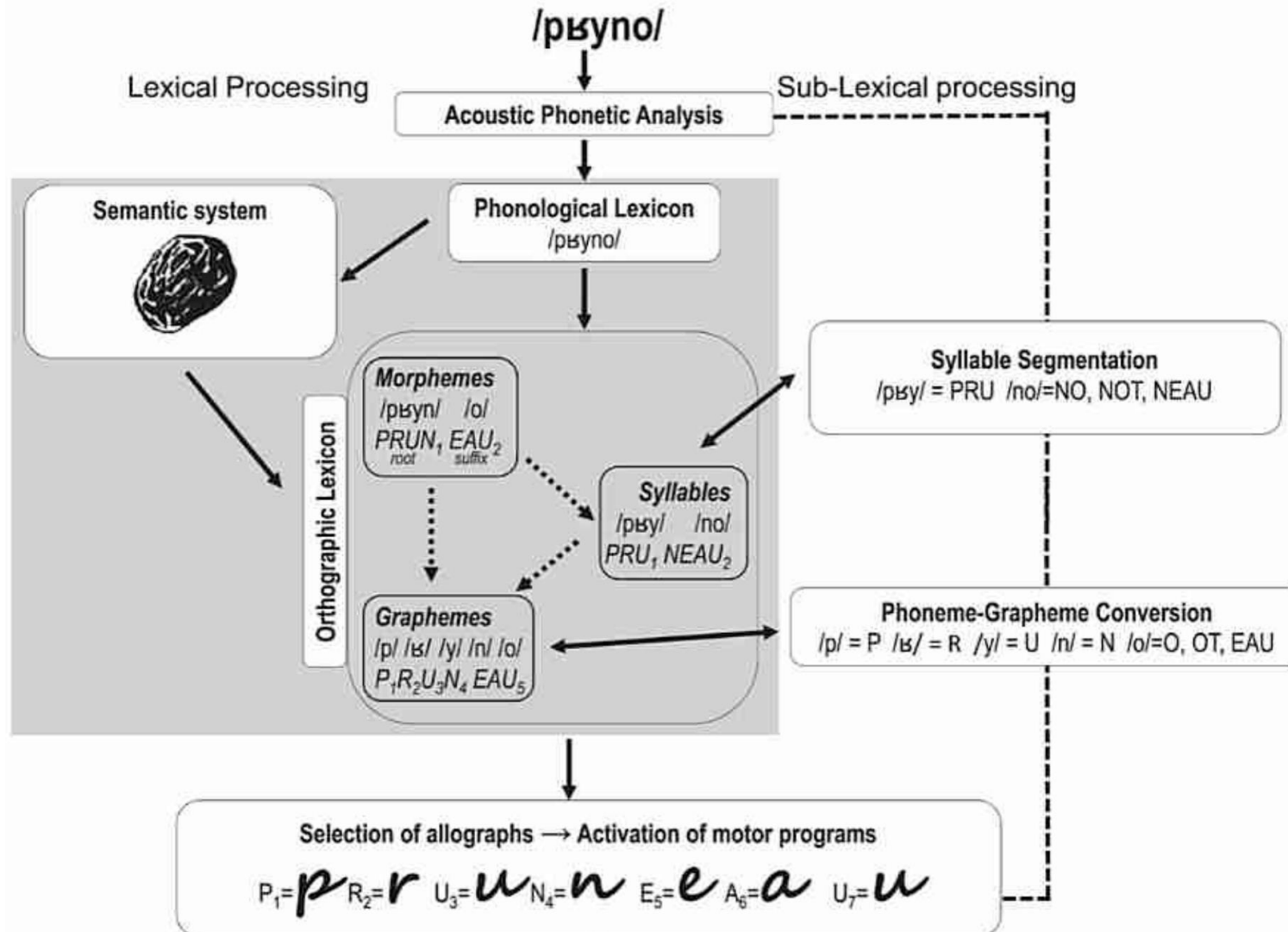
1. Research approaches in handwriting research
 - I. process-based
 - II. product-based
2. Examples of product-based research
linguistic structures in handwritten words
 - I. Gaps
 - II. <e>-shapes
3. Implications

Some things we know about writing

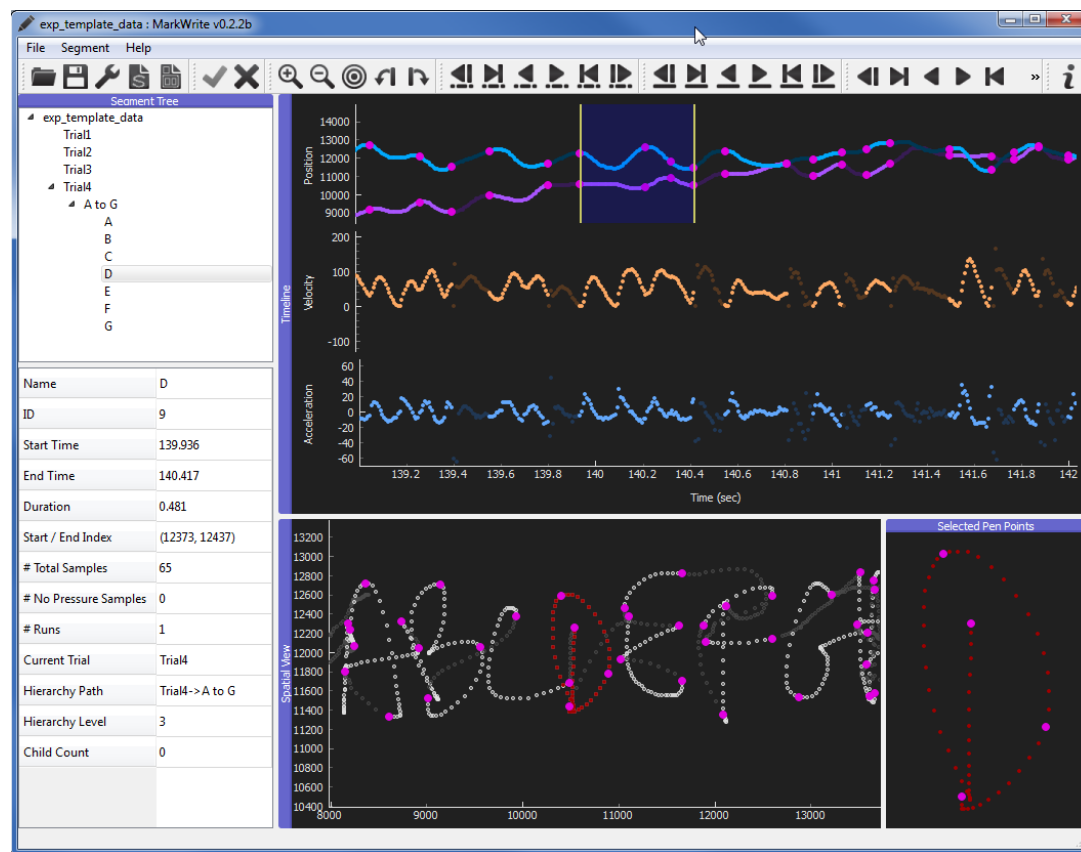
APOMI-Model

Selection of allographs is influenced by:

- morpheme structure
- syllable structure
- graphemic structure

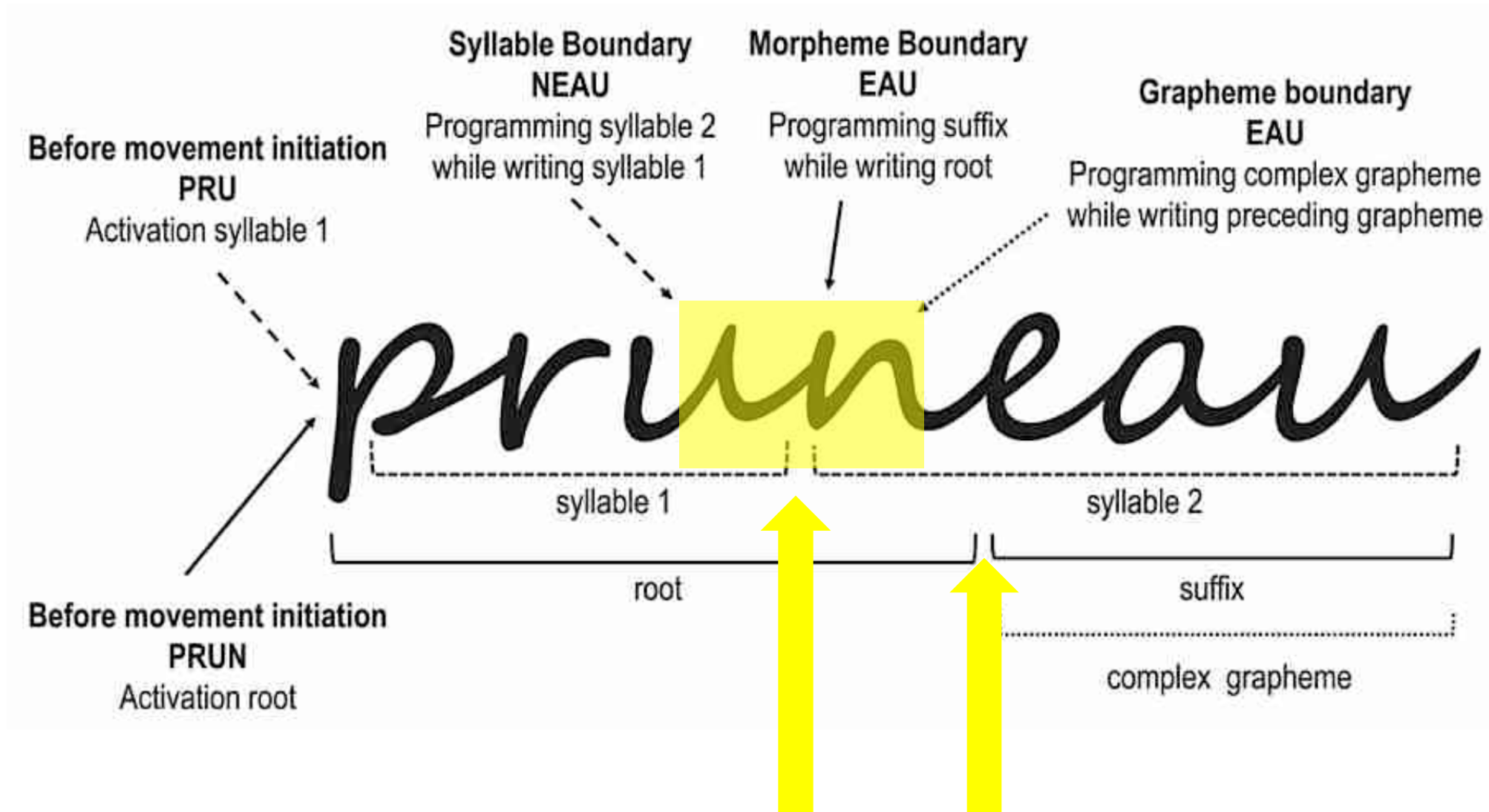


How do we know these things?



<https://github.com/isolver/OpenHandWrite/wiki/MarkWrite-Walkthrough>

How do we know these things?



Another way: product-based research

im Irak-Krieg. Die Philosophie ist
also auch heute noch aktuell und
sollte deswegen berücksichtigt werden.
(Zu der These, dass solche Sekundär-

*'... in the Iraq war. The philosophy is
thus still relevant today and
should therefore be taken into account.
On the thesis that such secondary ...'*

1 auch heute

2 deswegen

3 werden

'still today'

'therefore'

AUX.PRS.PASS

The corpus

- Corpus of 100 German school-leaving exams
- Subjects German Literature, Biology, History
- Years 2003, 2008, 2013
- 144,667 letters

Abiturprüfungsklausur im
Prüfungsfach Biologie

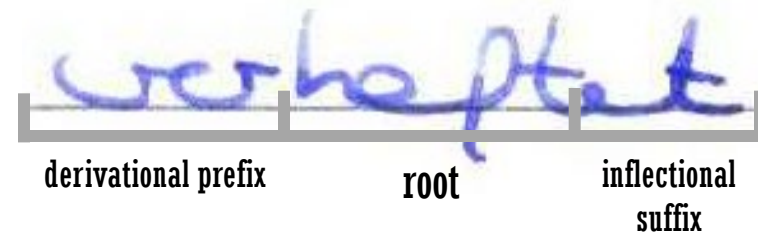
1.1.)

Im der Abbildung 1 werden die Wirkungen einer Reizung auf eine Tintenfischaxon und eine Armleuchteralgenzelle dargestellt. Hierbei ist A der Reizung des Tintenfischaxons und B der Reizung der Armleuchteralgenzelle zuzuordnen.

Abbildung 1 zeigt den Verlauf eines Aktionspotentials. Der ausgeübte Reiz führt zu einer kurzzeitigem Spannungsumpolung, so daß die positive Ladung im Gegensatz zum Ruhepotential nun innen liegt. Diese Spannungsumpolung entsteht, da das AP über dem

Gaps

first-AKK.SG.


'arrested'


■ Syllable boundary + gap

- $\chi^2 = 1792, df = 1, p < .001, \phi = .122$

■ Morpheme boundary + gap

- $\chi^2 = 3.9174; df = 1; p > .05$

Kandel et al. (2006):

syllable 👍

Kandel et al. (2008):

stem vs. suffix 👍

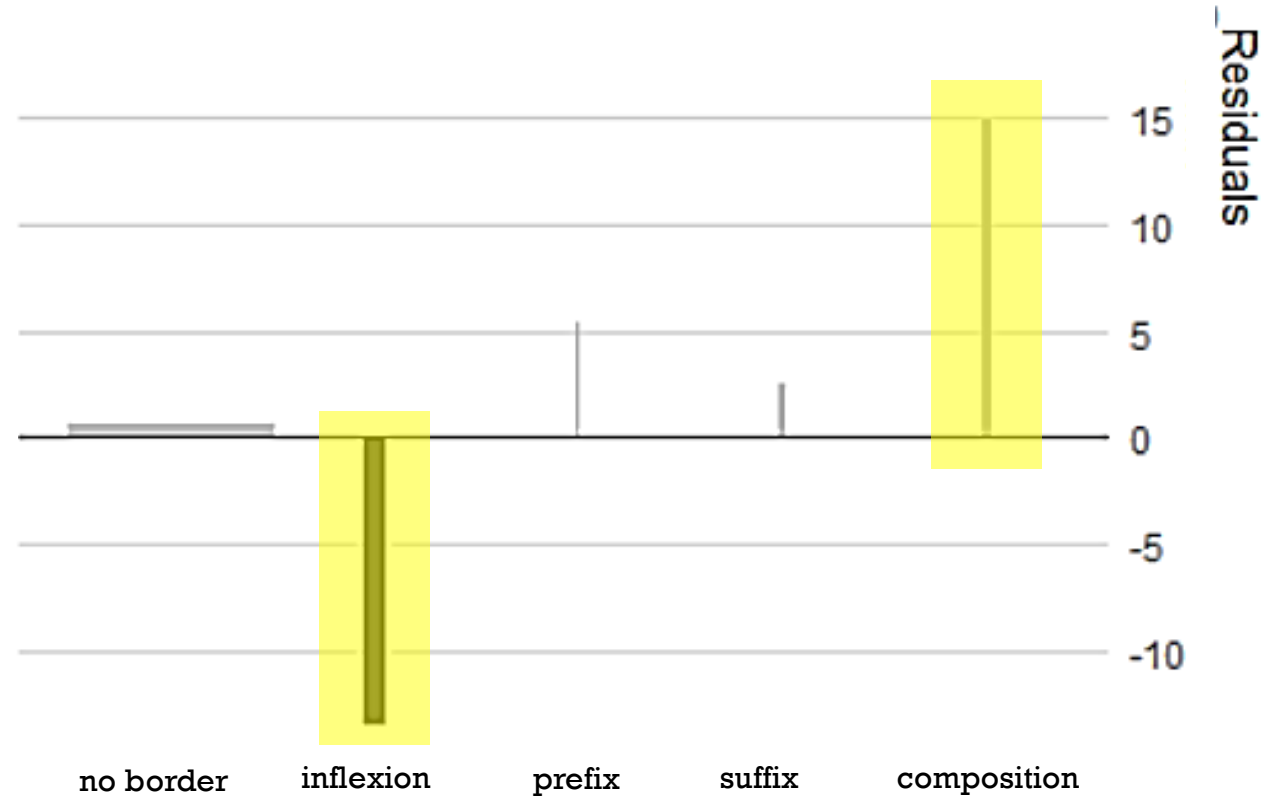
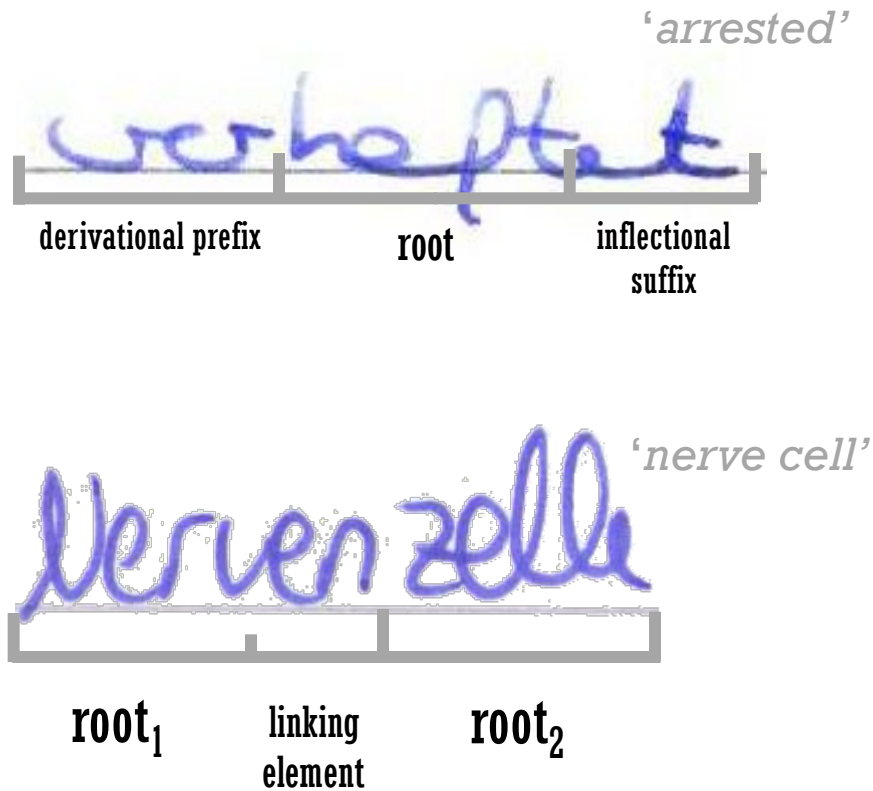
Afonso & Álvarez (2019):

composition 👍

Nottbusch et al. (1998):

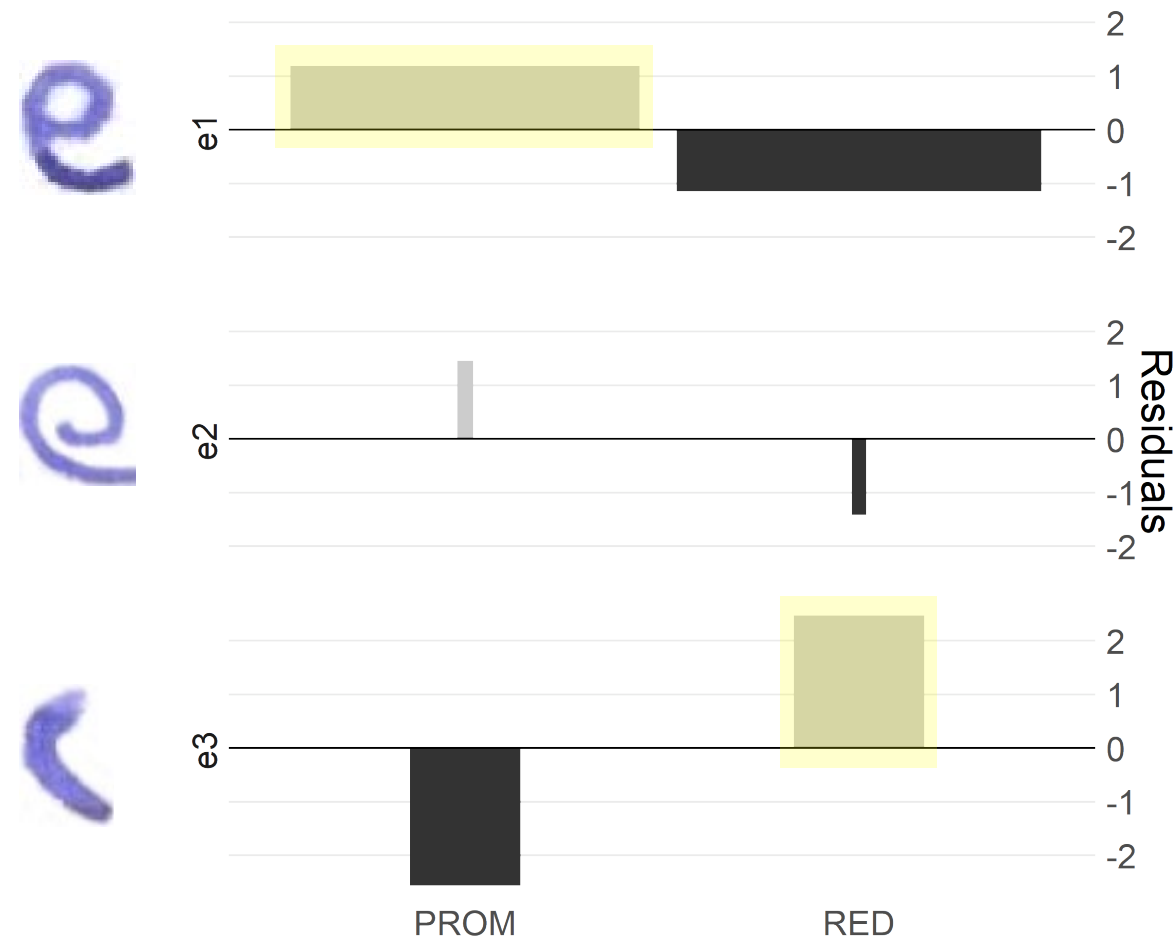
syllable 👍, morpheme 🙅, morpheme + syllable 👍

Morpheme boundaries and gaps

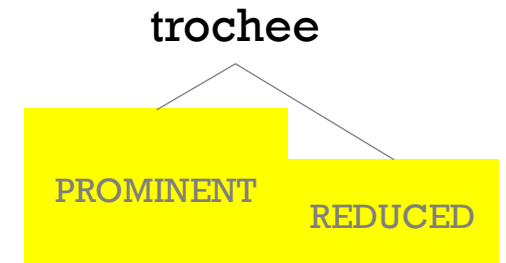


$$\chi^2 = 736.62, df = 4, p < .001, \text{Cramer's } V = .079$$

⟨e⟩-shapes and syllable types

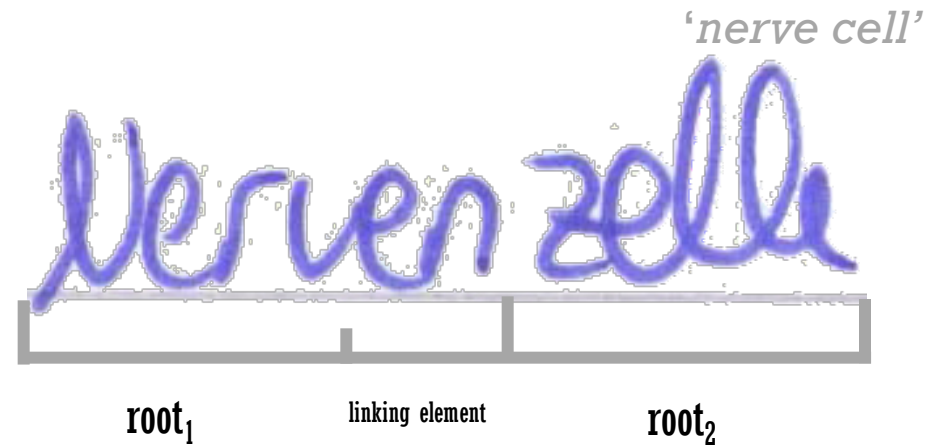


$\chi^2 = 19.548; df = 2; p < .001, \text{Cramer's } V = .029$



What can we see?

- Grammar in handwriting
 - Morphosyllabic structure: gaps



- Morphoprosodic structure: <e>-shapes



Product-based vs. process-based

product $\neq$ process

But ... we can see a lot in the products as well!

Advantages of a product-based approach:

- no special equipment needed
- large corpora can be used
- enables retrospective analyses (found data, historical texts)

Thank you!

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