

Visible grammatical structures?

Examples from German handwriting

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ungetragen



erstem



Nervenzelle



gleiche



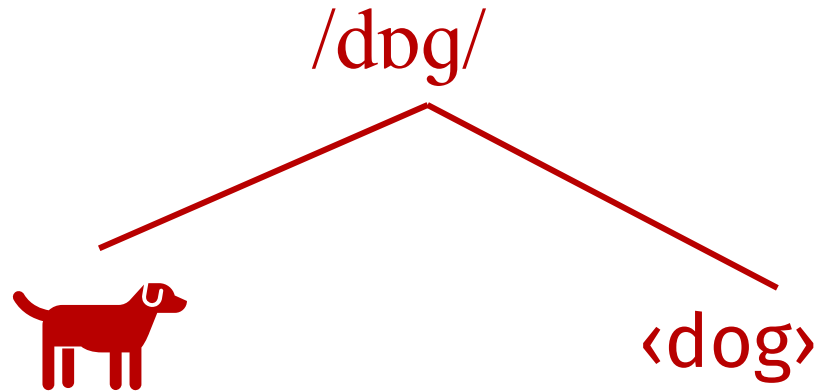
Wirkungen

Agenda

- › Visible Language
- › Writing process and grammar
- › Two examples of visible grammar in writing products
 - › Gaps
 - › <e>-shapes

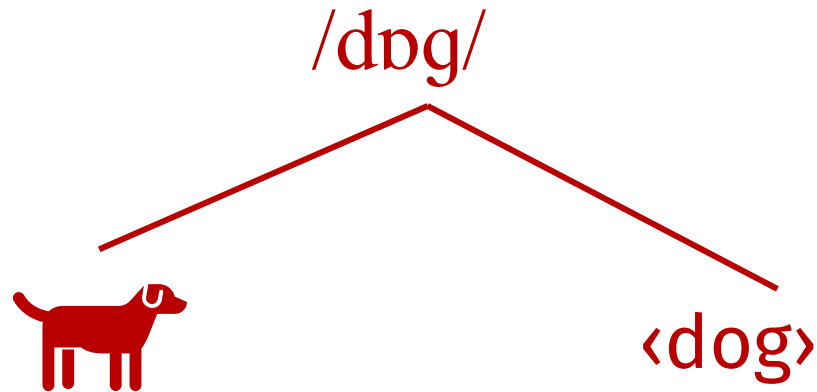
The idea: visible language

- › In alphabetic writing systems, writing is not (only) a record of meaning, but rather the record of language.



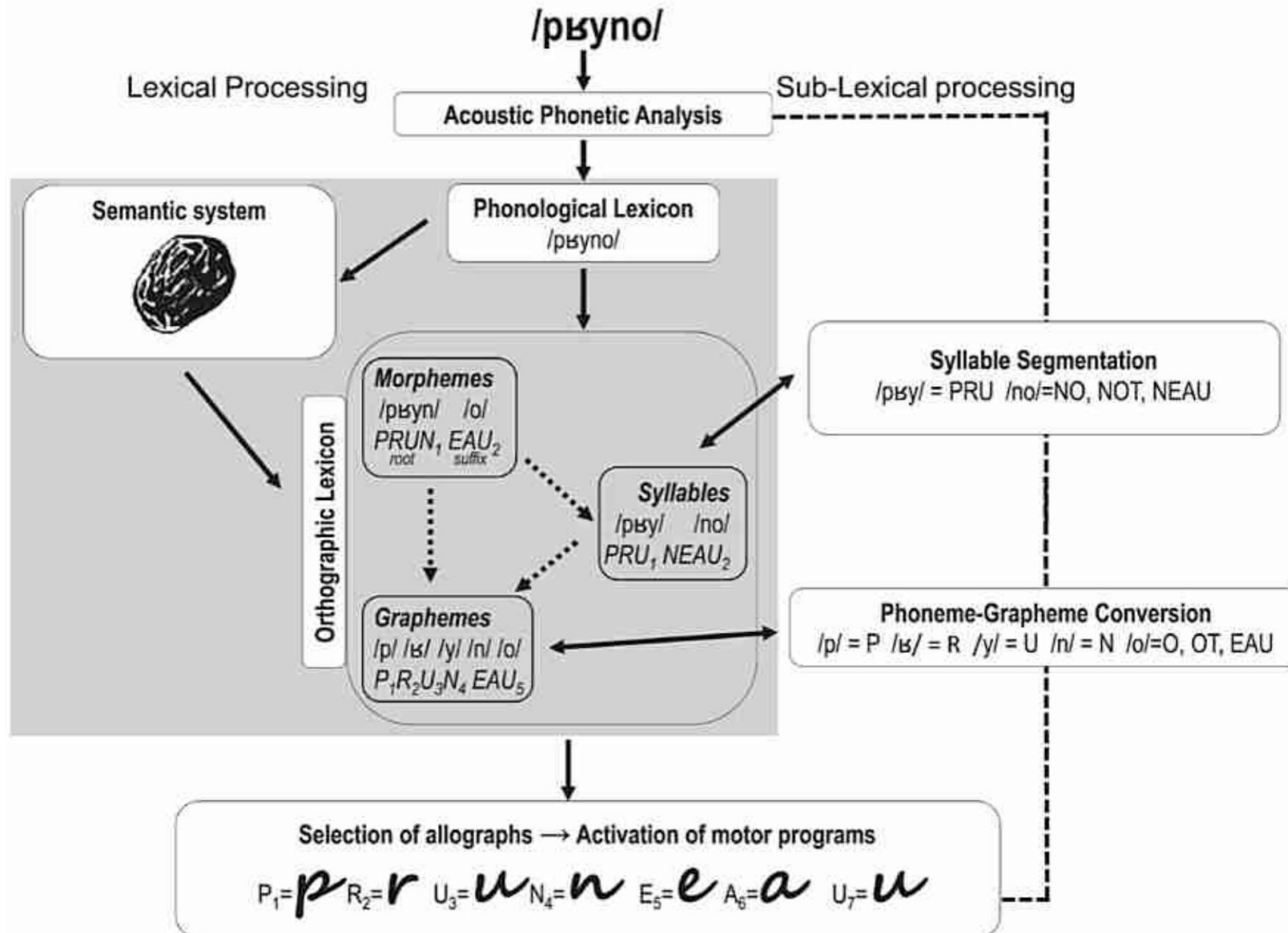
The idea: visible language

- › In alphabetic writing systems, writing is not (only) a record of meaning, but rather the record of language.



- › Writing is not only a medium of language, but also displays grammatical structures itself.

Some things we know about writing

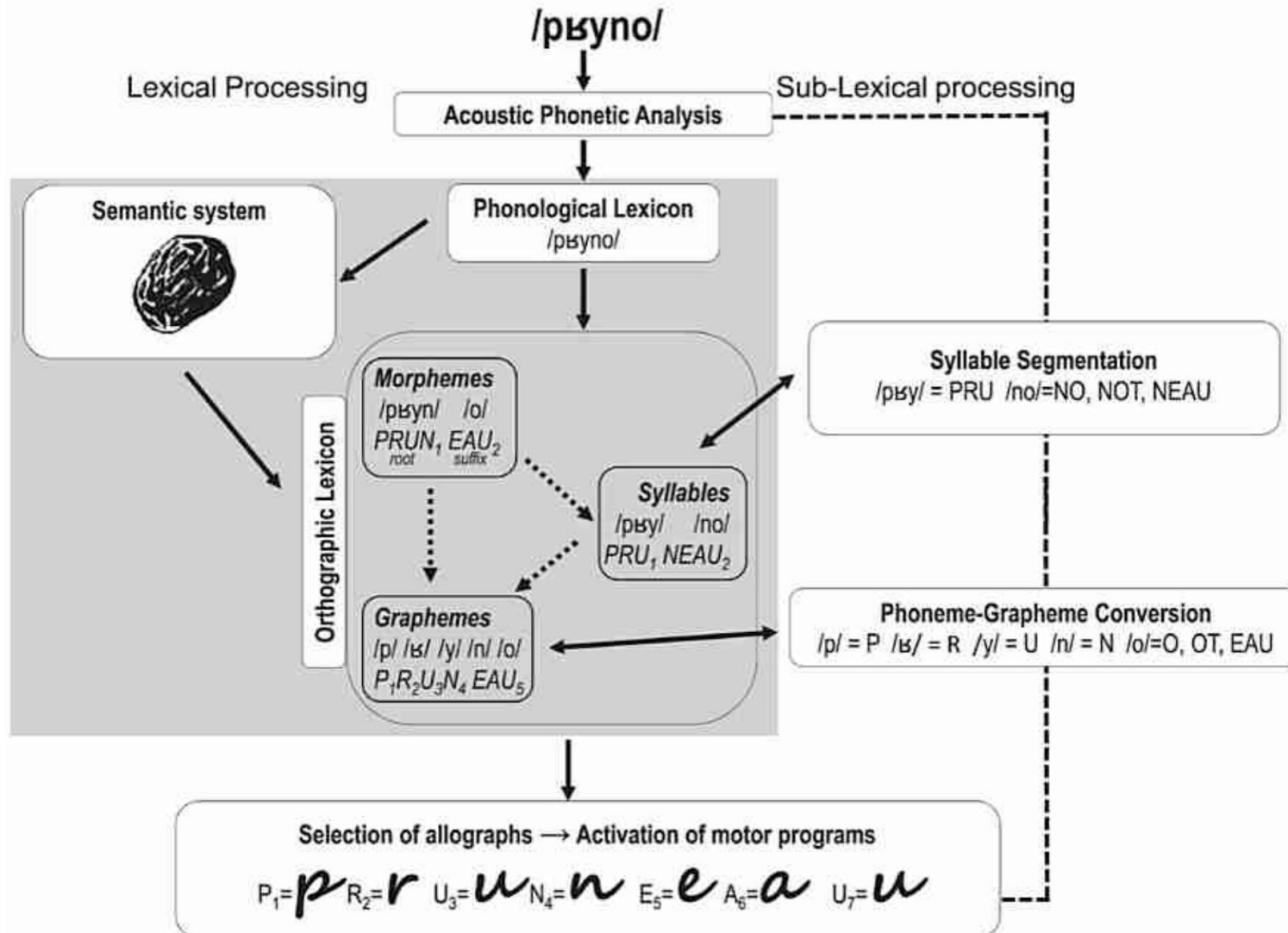


Some things we know about writing

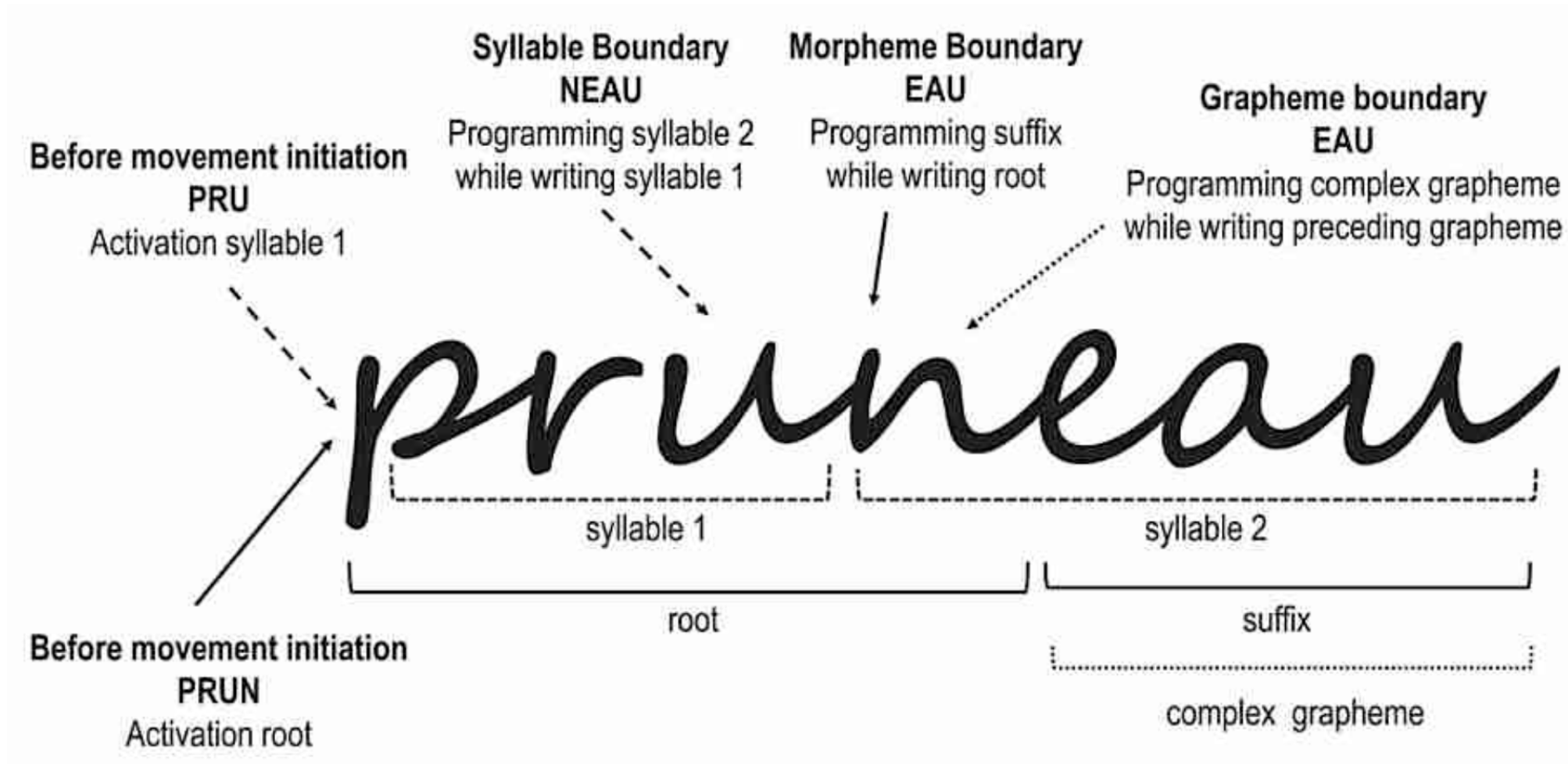
APOMI-Model

Selection of allographs is influenced by:

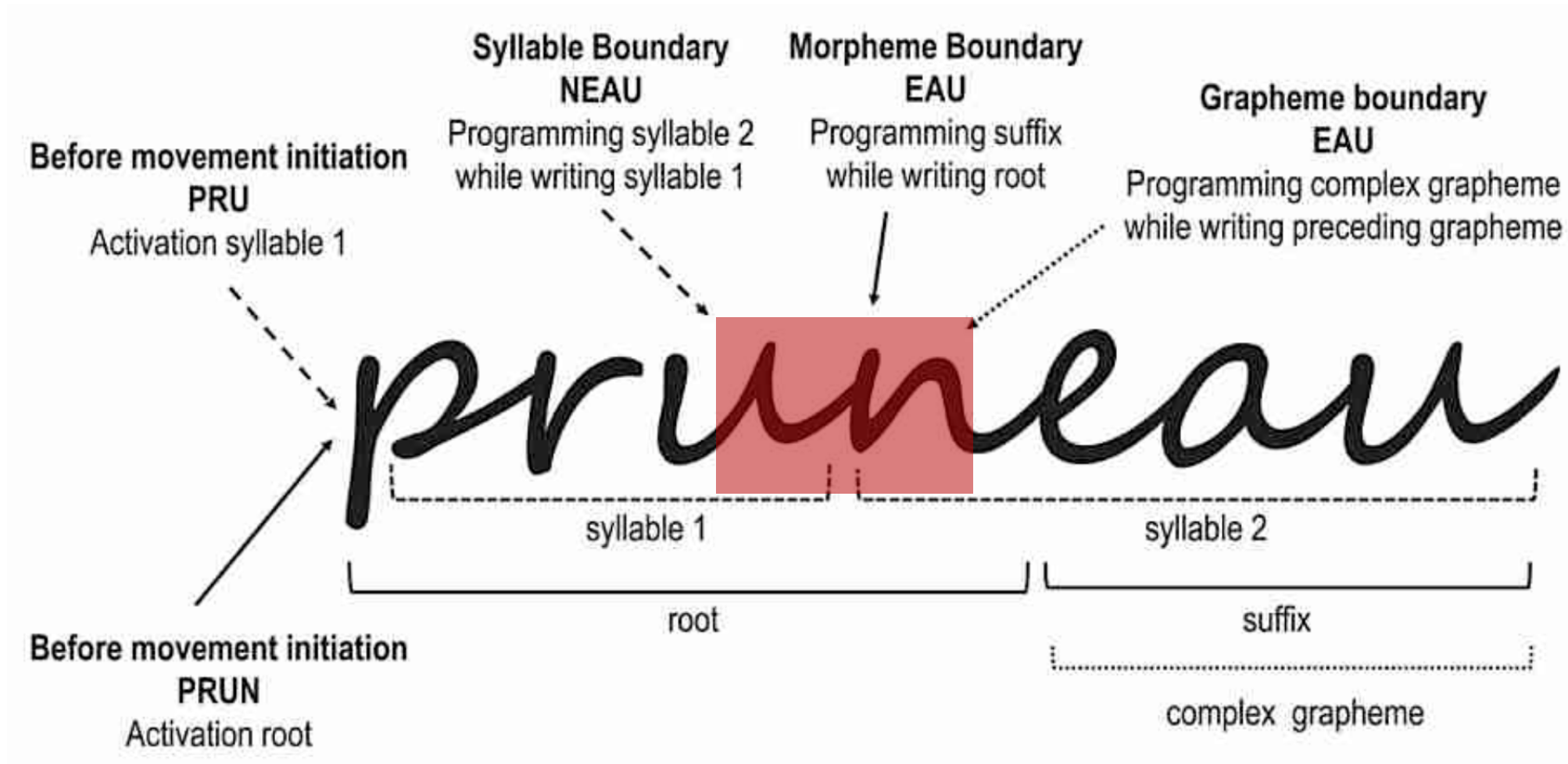
- › morpheme structure
- › syllable structure
- › graphemic structure



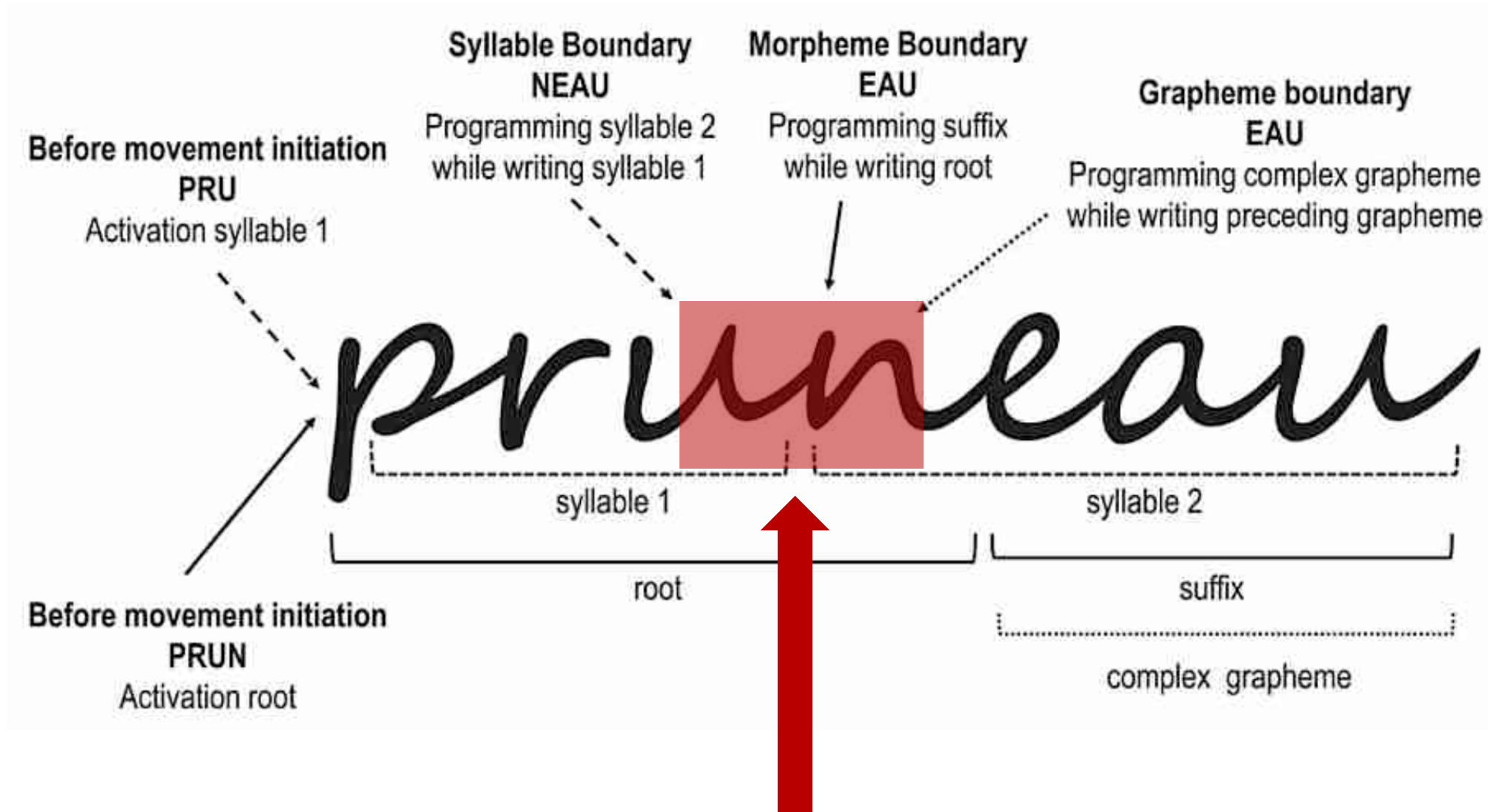
How do we know these things?



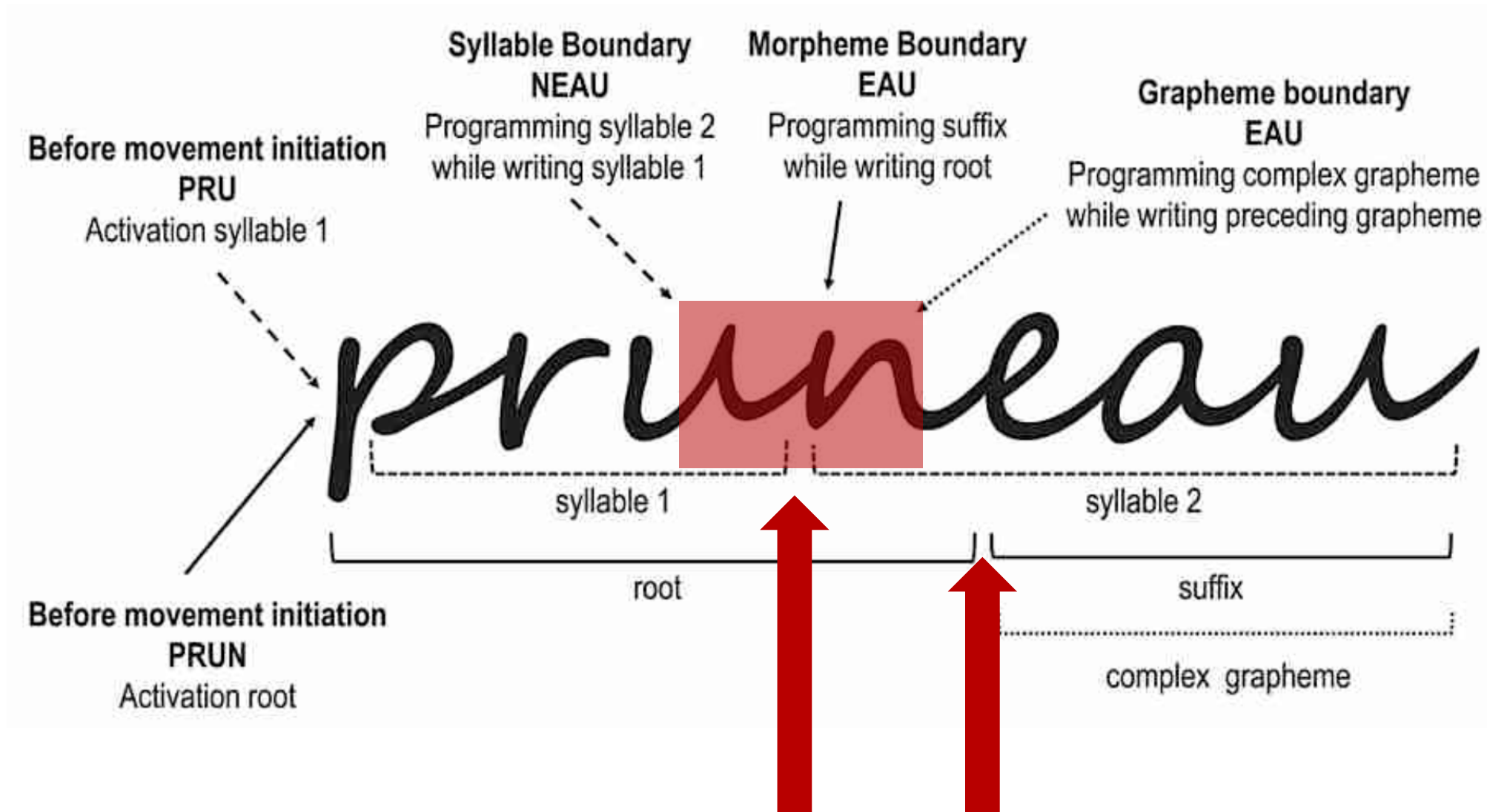
How do we know these things?



How do we know these things?



How do we know these things?



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 ...'*

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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 ein
Tintenfischaxon und eine Arm-
leuchtorganzelle dargestellt.

Hierbei ist A der Reizung des
Tintenfischaxons und B der
Reizung der Armleuchtorganzelle
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.



› Syllable boundary + gap

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

Gaps

first-AKK.SG.



'arrested'



› Syllable boundary + gap

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

Gaps

first-AKK.SG.

erstam

'arrested'

verhaftet

derivational prefix root inflectional suffix

> Syllable boundary + gap

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

Gaps

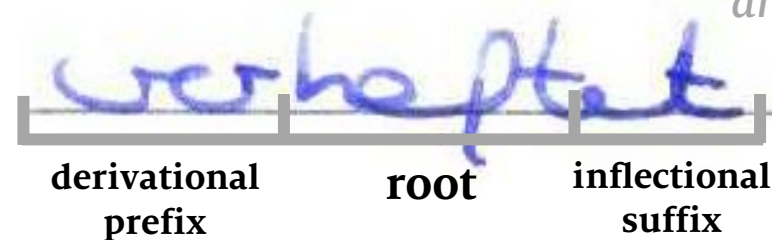
first-AKK.SG.



> Syllable boundary + gap

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

'arrested'



derivational prefix root inflectional suffix

■ Morpheme boundary + gap

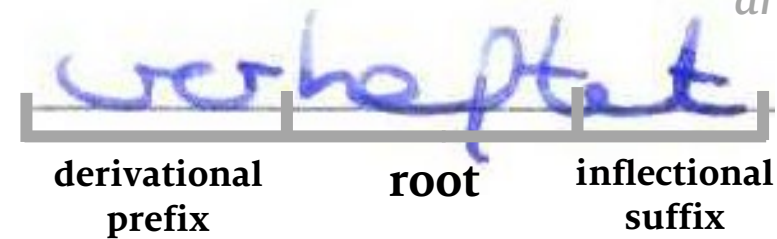
■ $\chi^2 = 3.9174$; $df = 1$; $p > .05$

Gaps

first-AKK.SG.



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Kandel et al. (2006):

syllable 👍

Kandel et al. (2008):

stem vs. suffix 👍

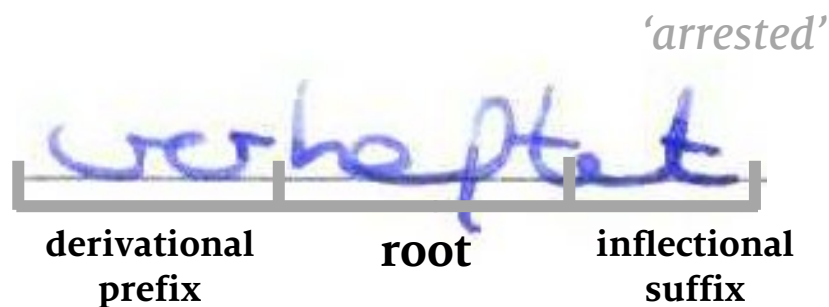
Afonso & Álvarez (2019):

composition 👍

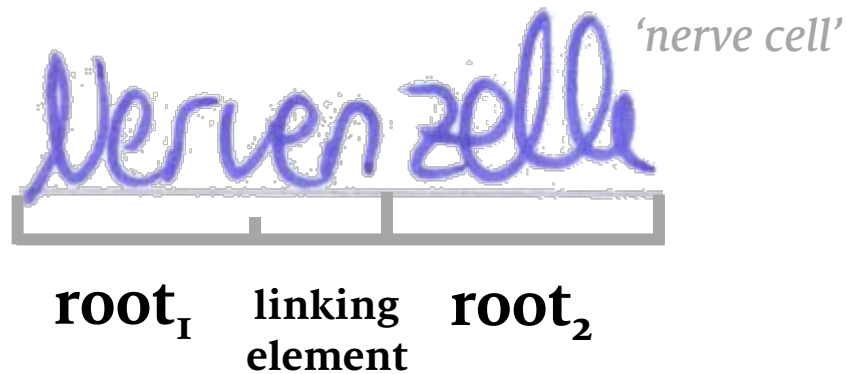
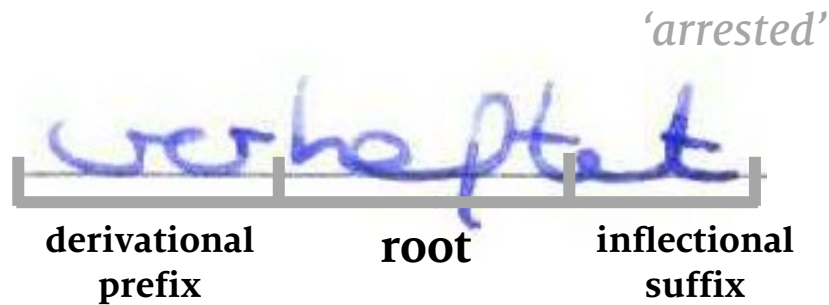
Nottbusch et al. (1998):

syllable 👍, morpheme 🖐️, morpheme + syllable 👍

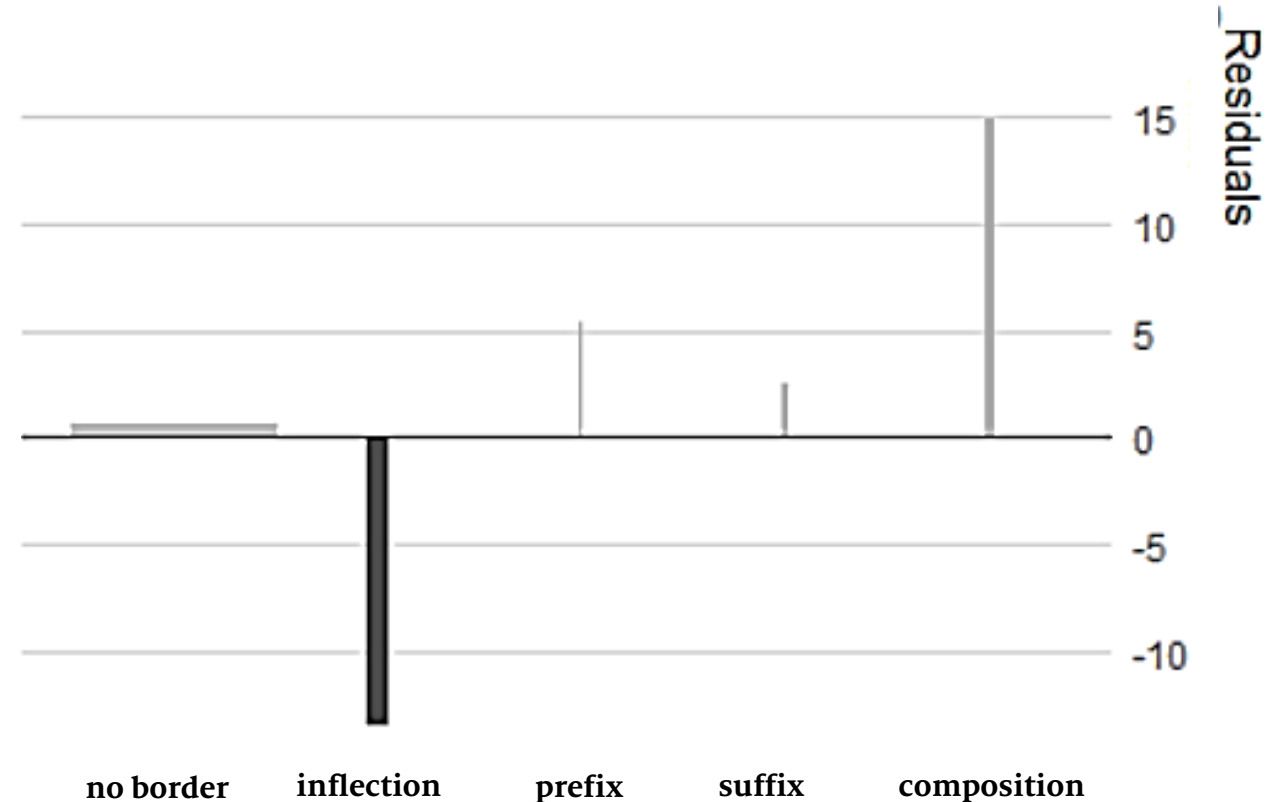
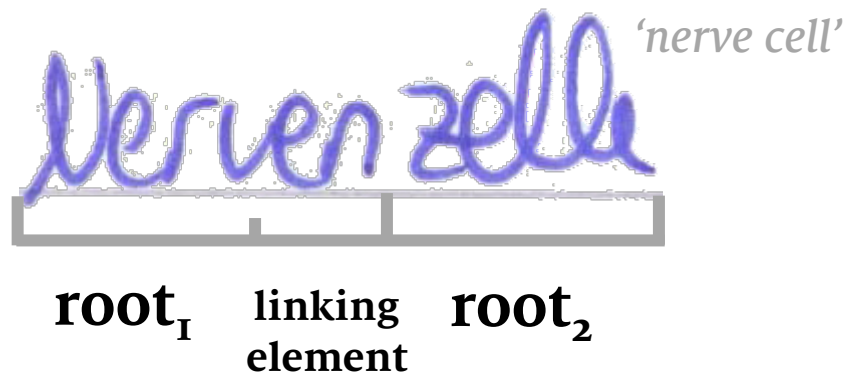
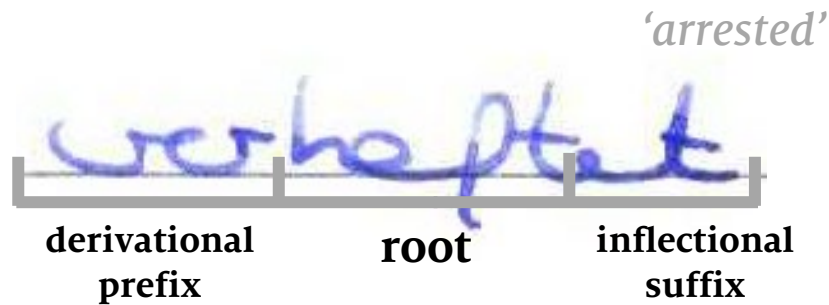
Morpheme boundaries and gaps



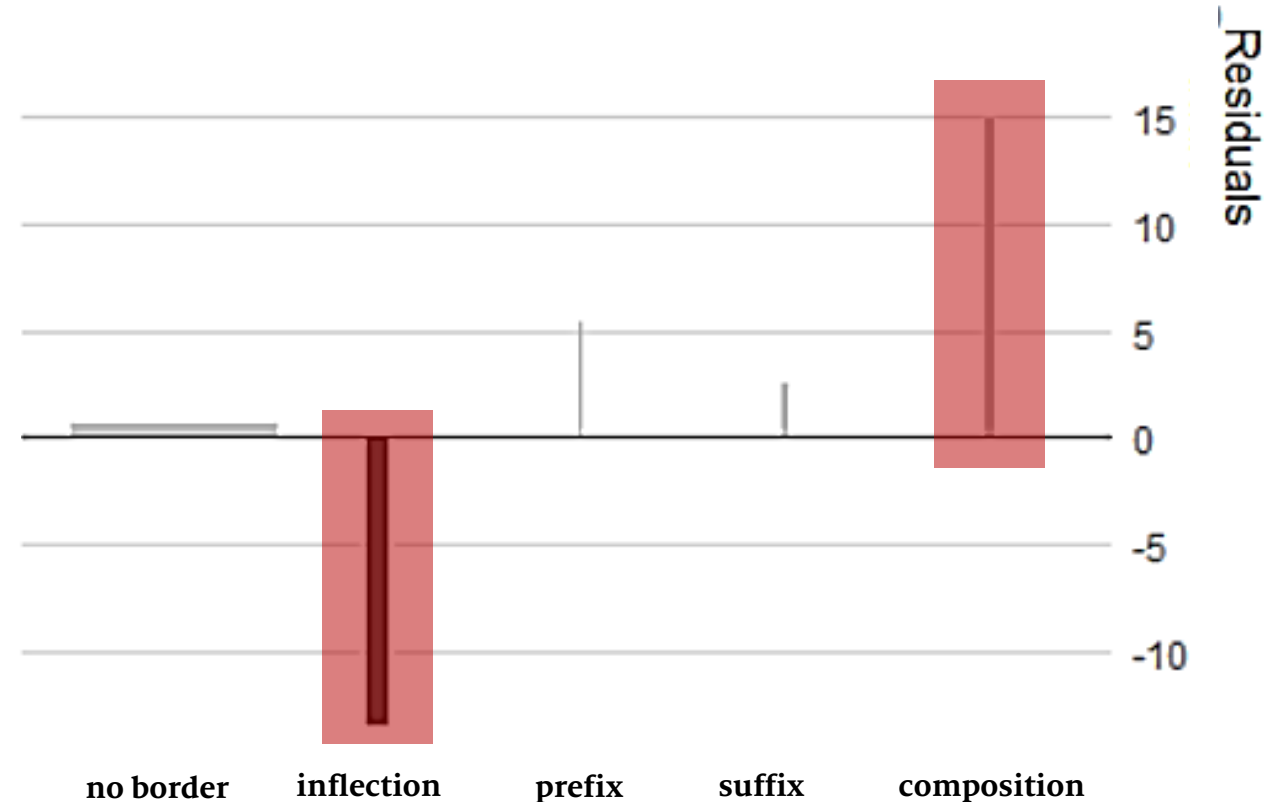
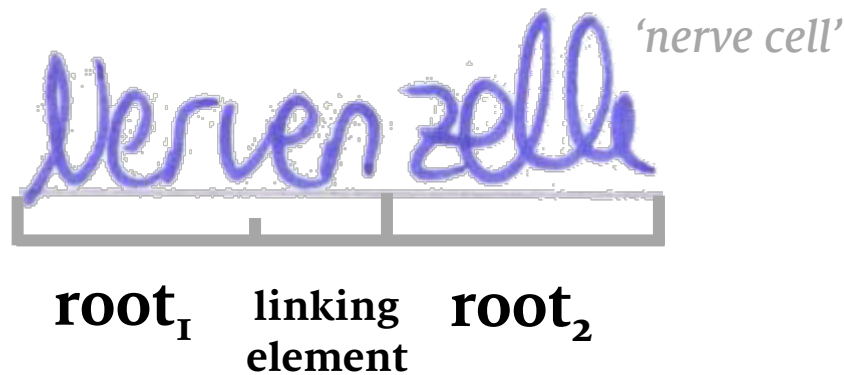
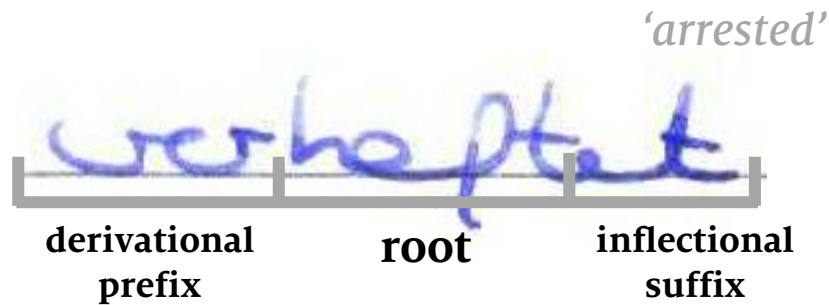
Morpheme boundaries and gaps



Morpheme boundaries and gaps



Morpheme boundaries and gaps



Morpheme boundaries and gaps

‘arrested’

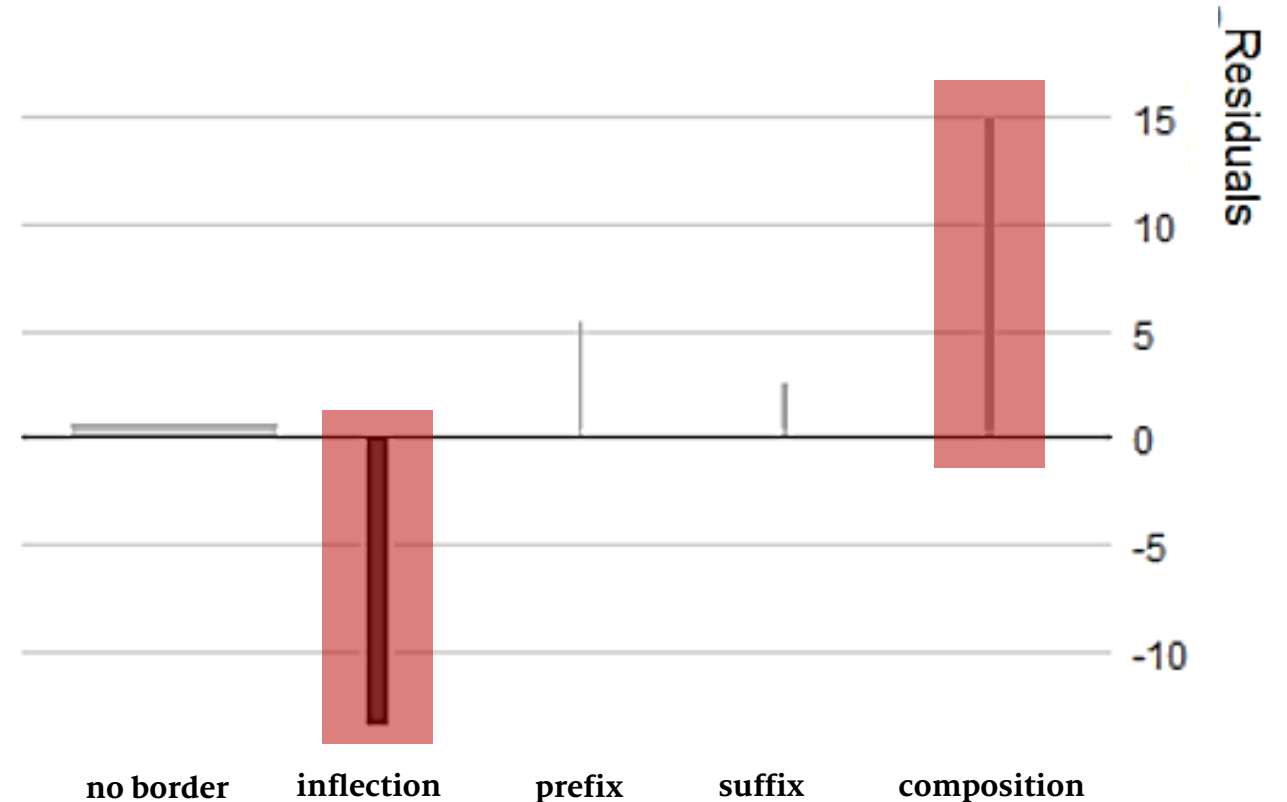
verhaftet

derivational prefix root inflectional suffix

‘nerve cell’

Nervenzelle

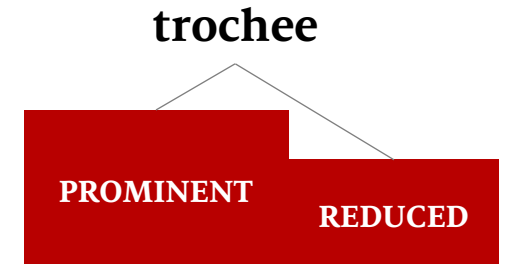
root₁ linking element root₂



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

⟨e⟩-shapes and syllable types

⟨e⟩-shapes and syllable types



⟨e⟩-shapes and syllable types

trochee

PROMINENT

REDUCED

call.INF



⟨e⟩-shapes and syllable types

trochee

PROMINENT

REDUCED

call.INF



root

INFLECTION

⟨e⟩-shapes and syllable types

trochee

PROMINENT

REDUCED

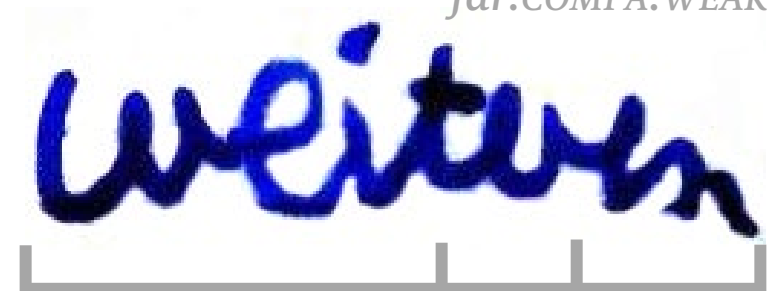
call.INF



root

INFLECTION

far.COMPA.WEAK



root

INFLECTION

‹e›-shapes and syllable types

e

@

<

trochee

PROMINENT

REDUCED

call.INF

callen

root

INFLECTION

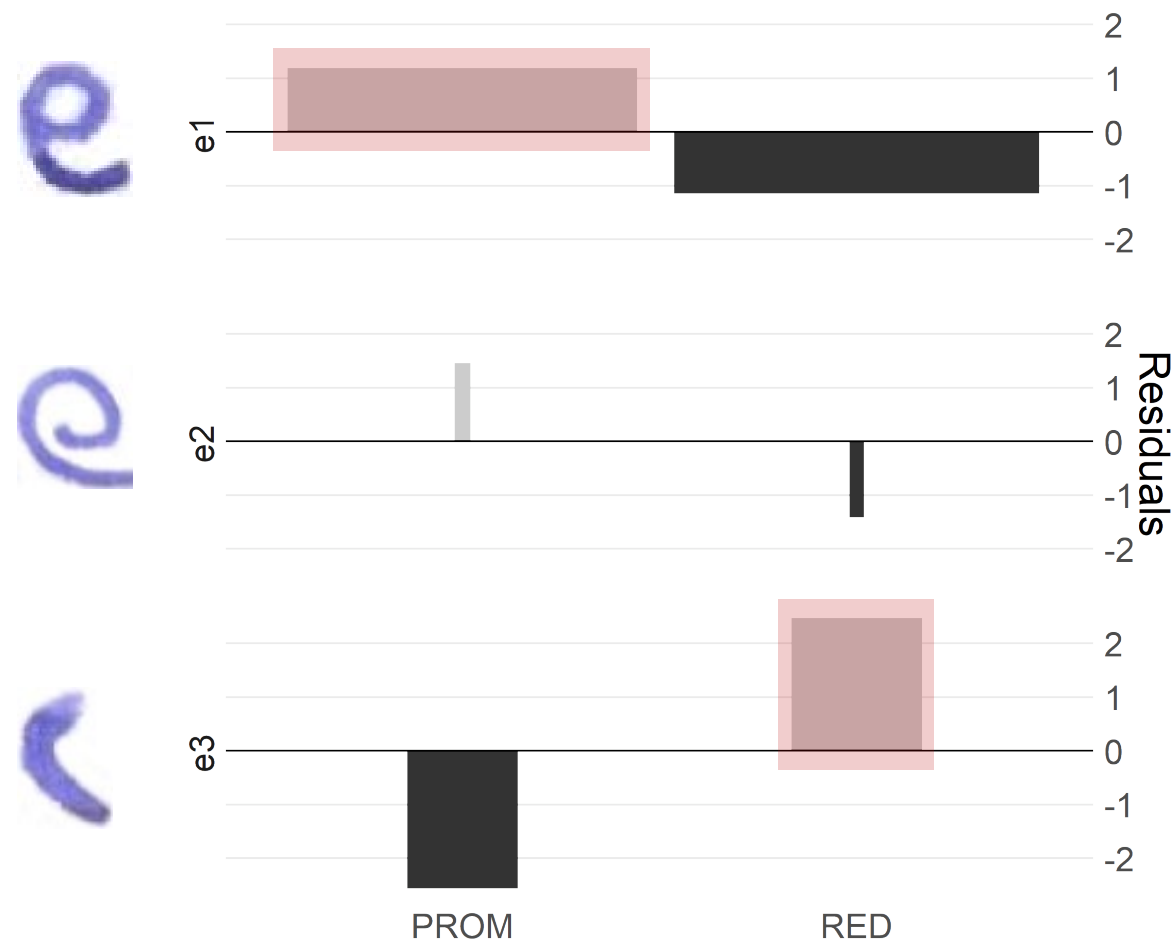
far.COMPA.WEAK

weiter

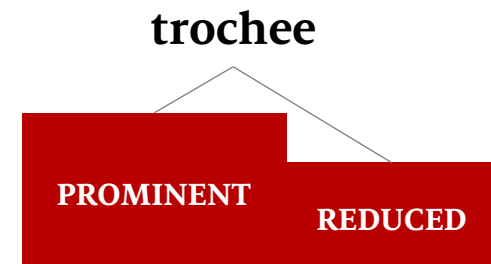
root

INFLECTION

‹e›-shapes and syllable types



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



call.INF

The word 'aennen' is shown in blue ink. A bracket under the first syllable 'aen' is labeled 'root', and a bracket under the second syllable 'nen' is labeled 'INFLECTION'.

far.COMPA.WEAK

The word 'weiteren' is shown in blue ink. A bracket under the first syllable 'wei' is labeled 'root', and a bracket under the second syllable 'teeren' is labeled 'INFLECTION'.

Conclusion: what can we see?

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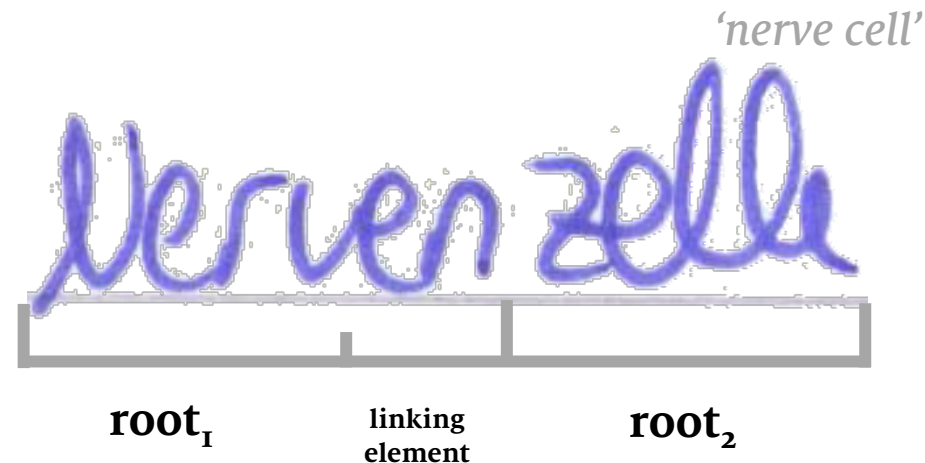
- › Grammar in handwriting

Conclusion: what can we see?

- › Grammar in handwriting
 - › Morphosyllabic structure: gaps

Conclusion: what can we see?

- › Grammar in handwriting
 - › Morphosyllabic structure: gaps



- › Morphoprosodic structure: <e>-shapes



Thank you!

- Afonso, Olivia; Álvarez, Carlos J. (2019): Constituent frequency effects in the written production of Spanish compound words. In: *Memory & Cognition* 47(7). 1284–1296. DOI: 10.3758/S13421-019-00933-5.
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