

# Modeling *Constraints* in Writing Systems

## Toward an explanatory grapholinguistics

Dimitrios Meletis, University of Vienna / 30.04.2026 / University of Helsinki

# *Schriftlinguistik: Areas of study*

Dürscheid 2016: Einführung in die Schriftlinguistik

1. Gesprochene und geschriebene Sprache
2. Schrifttypen und Schriftsysteme
3. Schriftgeschichte
4. Graphematik
5. Orthographie
6. Typographie
7. Schriftspracherwerb

Meletis/Dürscheid 2022

1. Introduction
2. Language, speech, and writing (+ Anthropology)
3. Graphetics (+ Literacy acquisition)
4. Graphematics (+ Psycholinguistics/Cognitive Linguistics)
5. Orthography (+ Sociolinguistics)
6. Writing system typology (+ Diachronic Linguistics)

# *Schriftlinguistik*: A possible definition

SO FAR

ONGOING

OPEN

label for efforts of gaining consistent descriptions  
and analyses of the written form of language and  
of developing them to a general theory of writing  
as a constitutive part of a general theory of  
language

Glück 2016: 596, my translation

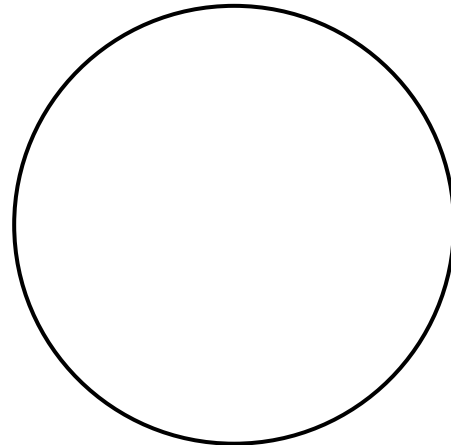
(already exactly the same in the first edn. of 1993 : 533–534)

# *Grapholinguistics*: An international, interdisciplinary field

## German structuralist Schriftlinguistik

focused on German, interested in fundamental theoretical aspects (e.g., relation between speech and writing) and descriptive concepts (e.g., grapheme)

existing research community (e.g., research groups)



- Berg, Kristian. 2019. *Die Graphematik der Morpheme im Deutschen und Englischen*. Berlin/Boston: De Gruyter. <https://doi.org/10.1515/9783110604856>
- Bredel, Ursula. i.E. *Das Schriftsystem des Deutschen. Graphetik – Graphematik – Orthographie. Eine Einführung*. (Grundlagen der Germanistik 67). Berlin: Erich Schmidt Verlag.
- Dürscheid, Christa. 2016. *Einführung in die Schriftlinguistik*, 5th edn. (UTB 3740). Göttingen: Vandenhoeck & Ruprecht.
- Fuhrhop, Nanna & Jörg Peters. [2013] 2023. *Einführung in die Phonologie und Graphematik*, 2nd edn. Stuttgart: Metzler. <https://doi.org/10.1007/978-3-476-05940-6>
- Günther, Hartmut. 1988. *Schriftliche Sprache: Strukturen geschriebener Wörter und ihre Verarbeitung beim Lesen* (Konzepte der Sprach- und Literaturwissenschaft 40). Berlin/Boston: De Gruyter. <https://doi.org/10.1515/9783110935851>
- Maas, Utz. 1992. *Grundzüge der deutschen Orthographie*. (Reihe Germanistische Linguistik 120). Tübingen: Niemeyer. <https://doi.org/10.1515/9783111376974>
- Neef, Martin. 2005. *Die Graphematik des Deutschen*. (Linguistische Arbeiten 500). Berlin/Boston: De Gruyter. <https://doi.org/10.1515/9783110914856>
- Primus, Beatrice. 2010. Strukturelle Grundlagen des deutschen Schriftsystems. In Ursula Bredel & Astrid Müller & Gabriele Hinney (eds.), *Schriftsystem und Schriffterwerb: linguistisch – didaktisch – empirisch*, 9–46. (Reihe Germanistische Linguistik 289). Berlin/Boston: De Gruyter. [https://doi.org/10.1515/9783110232257\\_9](https://doi.org/10.1515/9783110232257_9)

# *Grapholinguistics*: An international, interdisciplinary field

Coulmas, Florian. 2003. *Writing systems: An introduction to their linguistic analysis*. (Cambridge Textbooks in Linguistics). Cambridge: Cambridge University Press. <https://doi.org/10.1017/CB09781139164597>

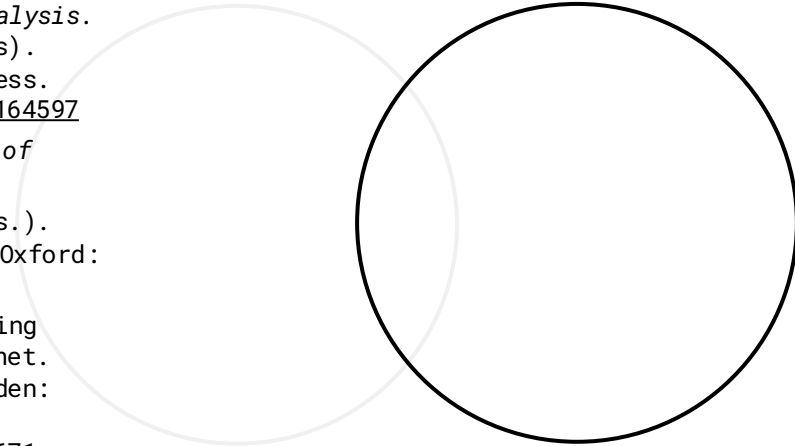
Daniels, Peter T. 2018. *An exploration of writing*. Bristol: Equinox.

Daniels, Peter T. & William Bright (eds.). 1996. *The world's writing systems*. Oxford: Oxford University Press.

Gnanadesikan, Amalia E. 2009. *The writing revolution: Cuneiform to the internet*. (The Language Library). Oxford/Malden: Wiley-Blackwell. <https://doi.org/10.1002/9781444304671>

Rogers, Henry. 2005. *Writing systems: A linguistic approach*. Oxford: Wiley-Blackwell.

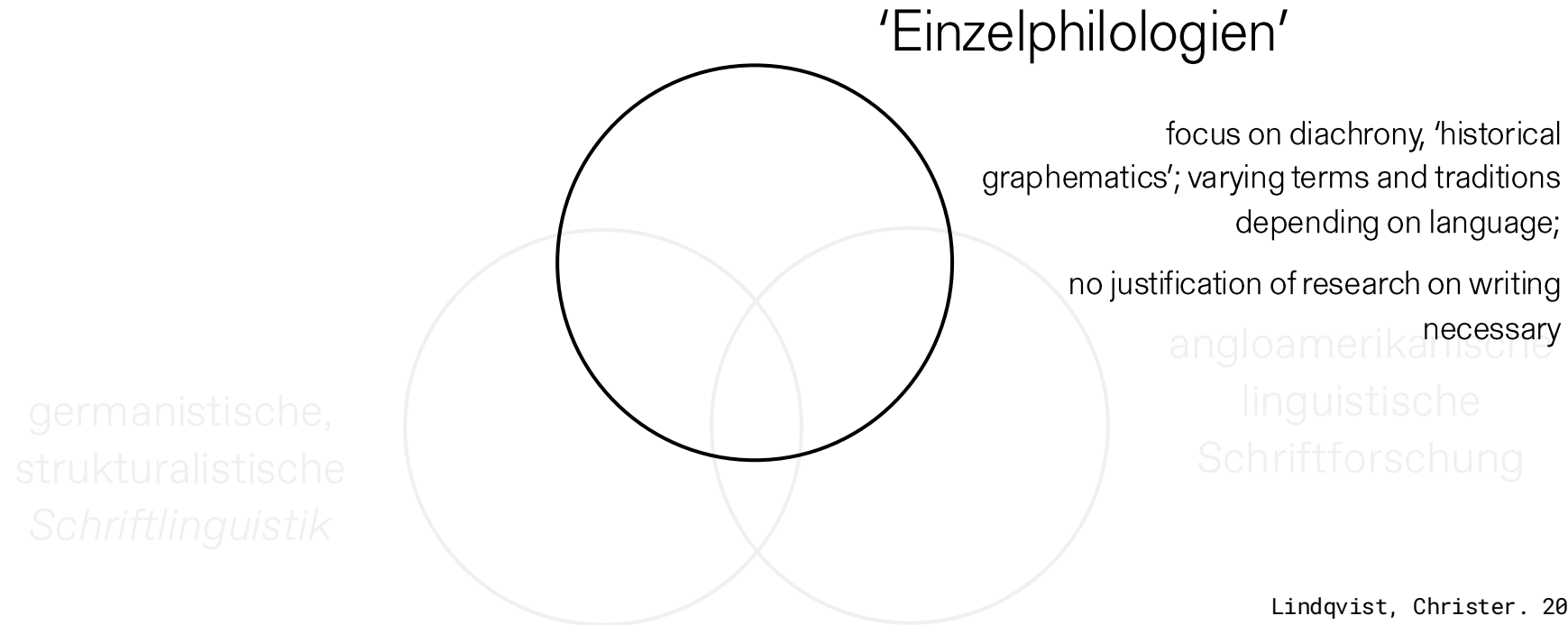
Sampson, Geoffrey. [1985] 2015. *Writing systems. A linguistic introduction*, 2nd edn. Sheffield/Bristol: Equinox.



Angloamerican  
linguistic research  
on writing

overview monographs by individual scholars (i.e., no community) focused on typological and diachronic aspects; multiple writing systems are being analyzed, but in juxtaposition and not relation to each other

# *Grapholinguistics*: An international, interdisciplinary field



Lindqvist, Christer. 2001. *Skandinavische Schriftsysteme im Vergleich*. (Linguistische Arbeiten 430). Tübingen: Niemeyer. <https://doi.org/10.1515/9783110927085>

Meisenburg, Trudel. 1996. *Romanische Schriftsysteme im Vergleich: Eine diachrone Studie* (ScriptOra 82). Tübingen: Narr.

# Grapholinguistics: An international, interdisciplinary field

Dietrich, Nikolaus, Ludger Lieb & Nele Schneiderei. 2023. *Theorie und Systematik materialer Textkulturen. Abschlussband des SFB 933. (Materiale Textkulturen 46.1)*. Berlin/Boston: De Gruyter.  
<https://doi.org/10.1515/9783111292229>

Neef, Sonja. 2008. *Abdruck und Spur. Handschrift im Zeitalter ihrer technischen Reproduzierbarkeit*. Berlin: Kulturverlag Kadmos.

Nottbusch, Guido. 2008. *Handschriftliche Sprachproduktion: Sprachstrukturelle und ontogenetische Aspekte*. (Linguistische Arbeiten 524). Tübingen: Niemeyer.  
<https://doi.org/10.1515/9783484970717>

Ulrich, Winfried, Tilo Reißig & Ursula Bredel (eds.). 2022. *Weiterführender Orthographieerwerb*. (Deutschunterricht in Theorie und Praxis). Baltmannsweiler: Schneider Hohengehren.

Verhoeven, Ludo, Charles Perfetti & Kenneth Pugh (eds.). 2019. *Developmental dyslexia across languages and writing systems*. Cambridge: Cambridge University Press.

Wittner, Ben, Sascha Thoma & Timm Hartmann (eds.). 2019. *Bi-Scriptual: Typography and graphic design with multiple script systems*. Salenstein: Niggli.

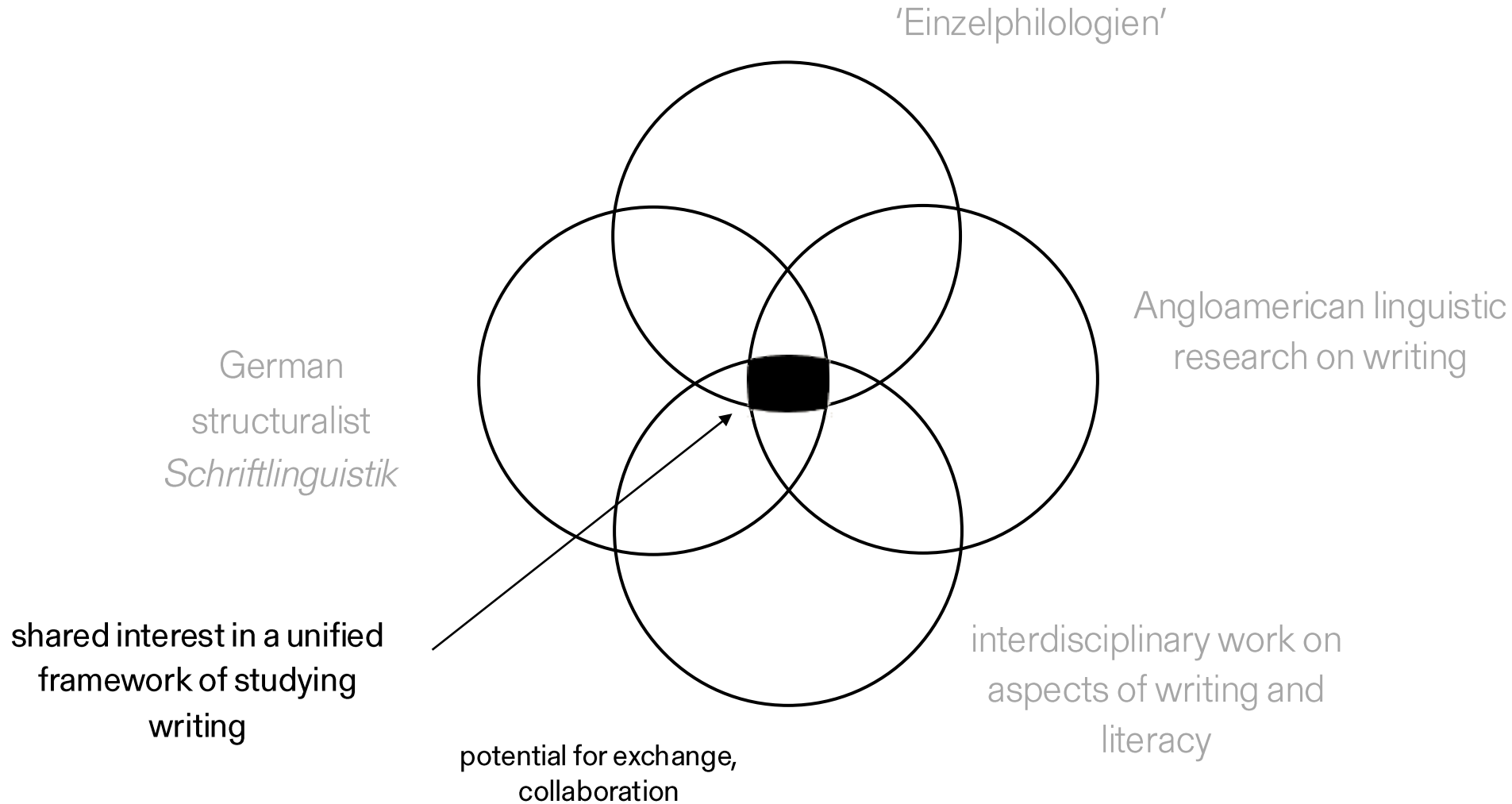
‘Einzelphilologien’

angloamerikanische  
linguistische  
Schriftforschung

interdisciplinary work on  
aspects of writing and literacy

scattered research in diverse  
disciplines interested in writing  
(cognitive sciences, anthropology,  
etc.): different methodology,  
terminology, publication venues,  
practices

# *Grapholinguistics*: An international, interdisciplinary field



# *Schriftlinguistik*: Challenges so far

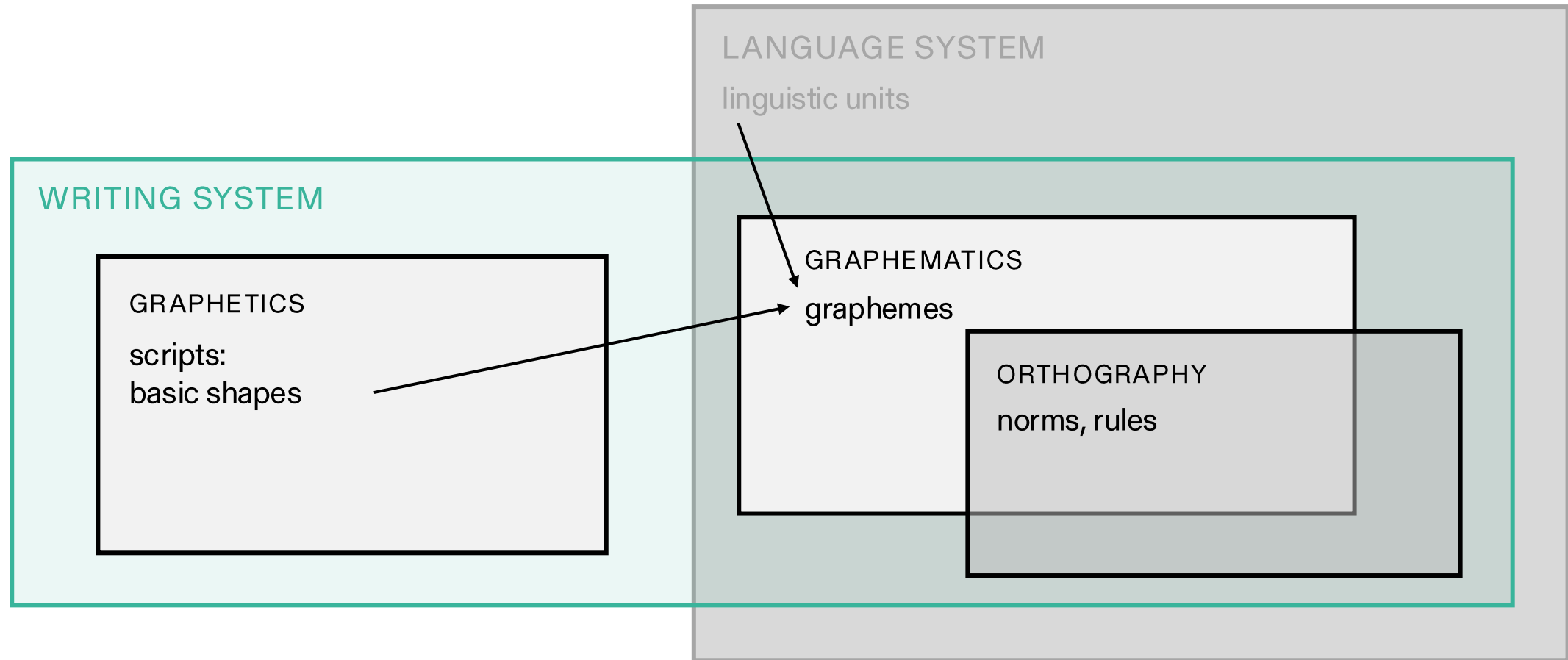
- field and topic are still marginalized
- there is barely any institutionalization (i.e., no chairs, no integration in curricula)
- very limited interdisciplinary exchange
- no consensus also within linguistics
  - this is highlighted by the many co-existing alternatives in English that label the study of writing: graphology, grammatology, graphonomy, graphem(at)ics, grapholinguistics, script(ur)ology, philography, writing systems research [Meletis 2024]
- reception of grapholinguistic works from other academic cultures is very limited (pressing example: lacking reception of German-language works in Angloamerican research)
  - this makes possible work like *Is a structural graphemics possible?* [Daniels 1991]
- limited comparison of studies on specific writing systems → no descriptive categories/comparative concepts, i.e., no descriptive framework for description and comparison

# Opportunities for exchange (aside from this theme group)

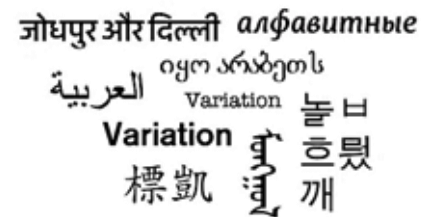
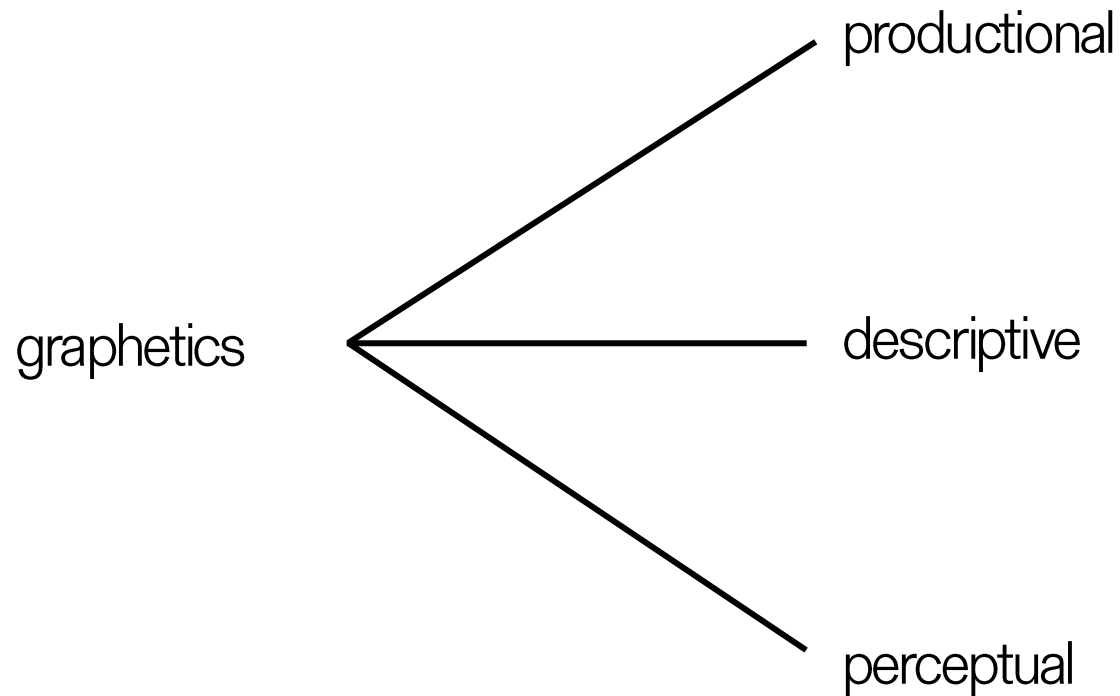
- workshops of the Association for Written Language and Literacy
  - 15 biennial workshops since 1997
  - eponymous journal and book series Studies of Written Language & Literacy at John Benjamins
- conference series LautSchriftSprache / ScriptandSound
  - 6 conferences since 2011
  - eponymous book series at Reichert Verlag
- conference series The Idea of Writing
  - eponymous book series at Brill (seemingly dormant)
- conference series Grapholinguistics in the 21st Century
  - four biennial workshops since 2018 (/gɹafematik/ 2018, 2020, 2022, 2024; next one: June 2026, Reading)
  - proceedings published in the related open-access book series Grapholinguistics and Its Applications (Fluxus Editions)

# Description

# Modular model of writing systems



# Graphetic subfields

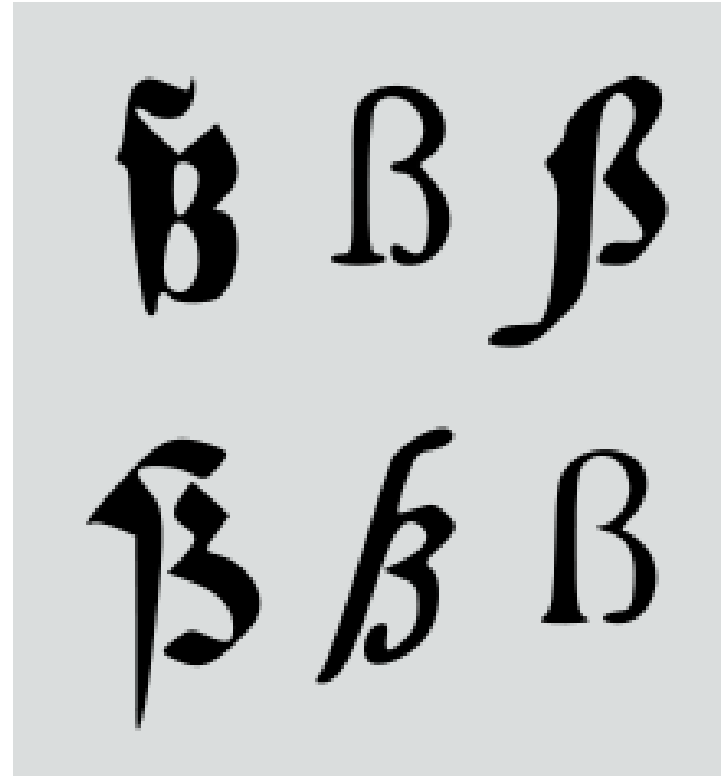


- How do scribes/designers make use of resources of graphetic variation in order to constitute and convey a specific meaning in a given communicational situation?
- Are there universals in the manual production process (e.g., hand movements that occur in the production of all scripts)?
- How can typographic variation that exists among type families be adequately described?
- How can basic shapes be segmented? What are the minimal distinctive segments?
- How do the graphetic features of a text influence the constitution of meaning that occurs during the perception (i.e., reading) process?
- Which are the units that are most relevant during the reading process?

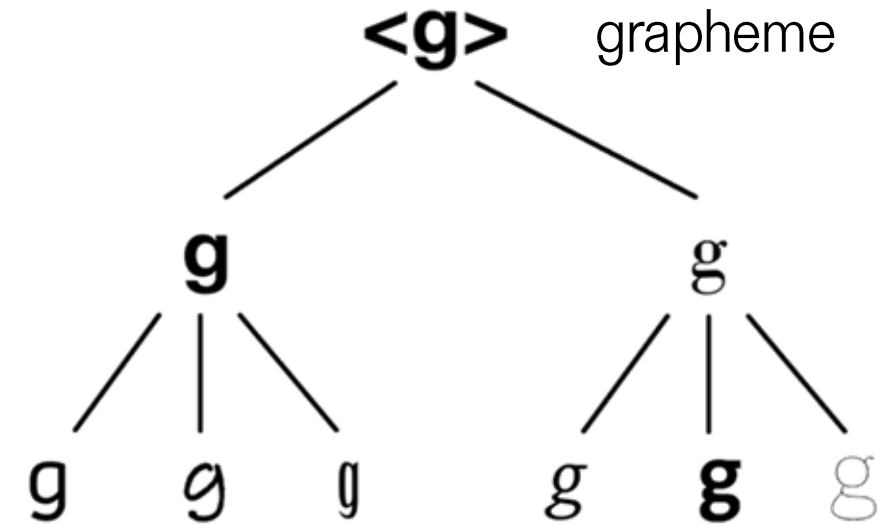
# Graphetics: Basic units



elementary form  
(segment of a basic shape)



graph  
(concrete manifestation of basic shape)



basic shape

# Graphetics: Spatial division

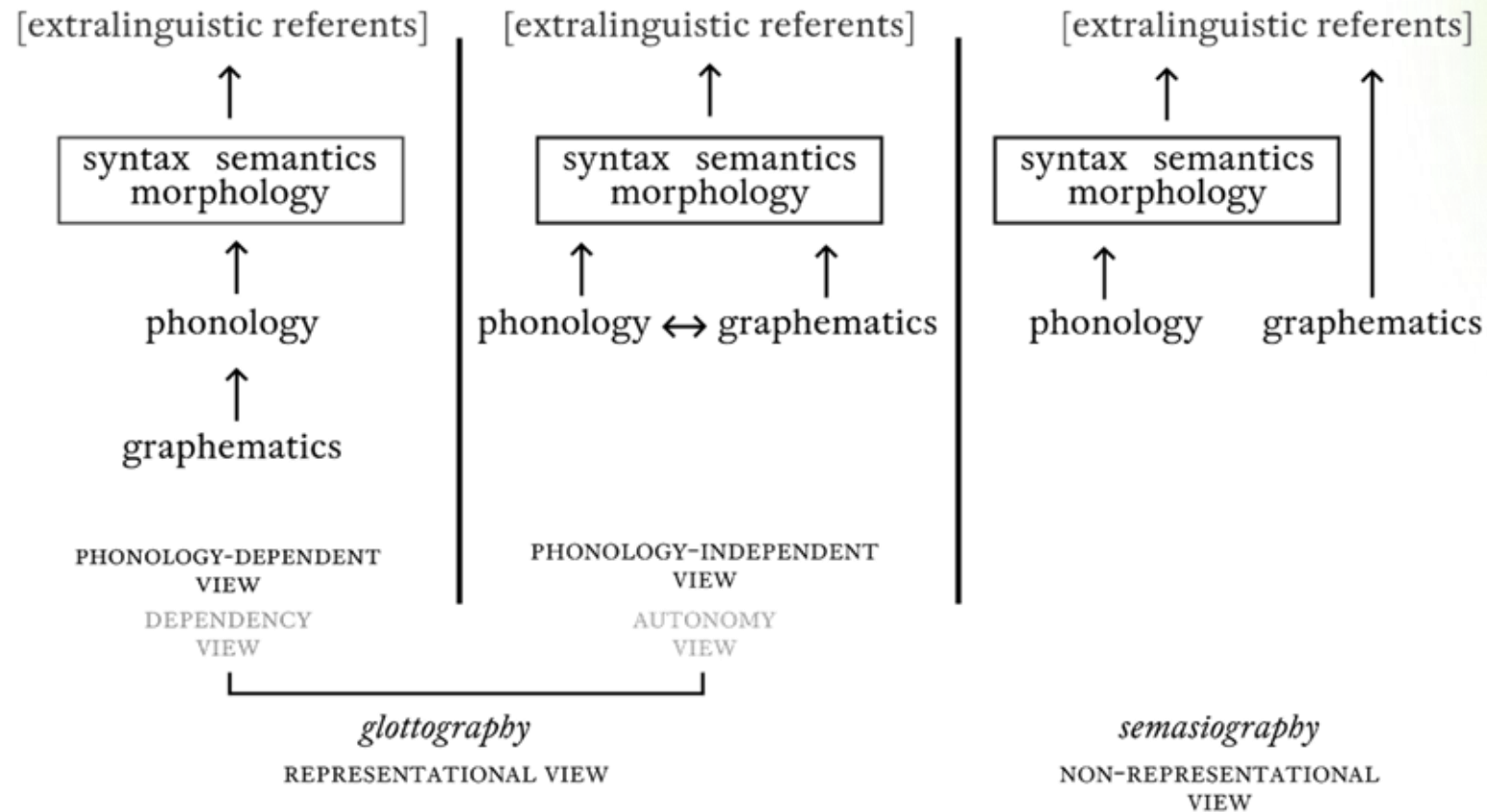
 <p><b>SEGMENTAL SPACE</b> Unit: <i>basic shape</i> (abstract), <i>graph</i> (concrete)</p>	<p>Writing is an invention and a cultural technology that altered humankind and continues to exert a massive influence on it. This is true to such a degree that it is almost impossible to overstate the</p> <p><b>LINEAR SPACE</b> Unit: <i>one-dimensional graphetic sequence</i></p>	<p>Writing is an invention and a cultural technology that altered humankind and continues to exert a massive influence on it. This is true to such a degree that it is almost impossible to overstate the</p> <p><b>LINEAR SPACE</b> Unit: <i>line</i></p>
<p>Writing is an invention and a cultural technology that changed humankind and continues to exert a massive influence on it. This is true to such a degree that it is almost impossible to overstate the relevance of writing in modern societies.</p> <p>When, in one of my classes on grapholinguistics, I asked students to imagine what their everyday lives would look like without writing, they simply couldn't. In literate communities, a life without writing appears almost unthinkable. As a mode of communication fundamentally</p> <p><b>AREAL SPACE</b> Unit: <i>two-dimensional graphetic sequence</i></p>	<p><b>HOLISTIC SPACE</b> Unit: <i>writing/reading surface</i></p>	<p><b>LEVELS OF DESCRIPTION</b></p> <p><i>micrographetics</i> (segmental) <i>mesographetics</i> (linear) <i>macrographetics</i> (areal, holistic) <i>paragraphetics</i> (holistic, physical properties)</p>

spatiality (and not visuality) as the constitutive feature of writing

# *Graphetics: Material*



# *Graphematics*: Language, speech, and writing



Meletis 2020: 68

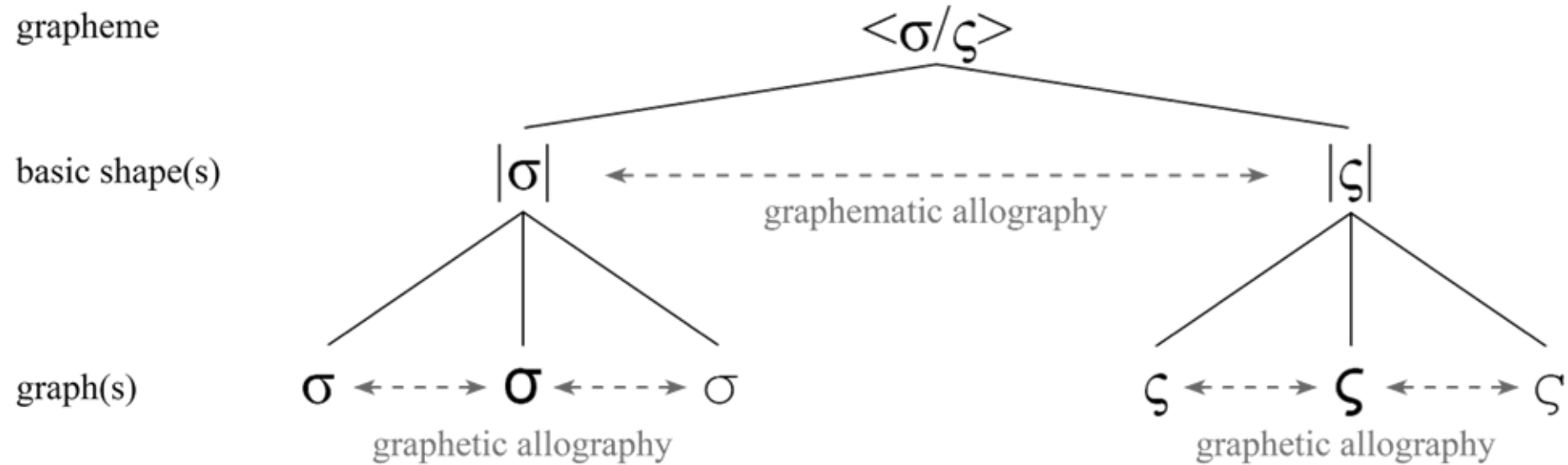
# *Graphematics: The 'grapheme'*

1. distinguishes meaning (= distinctiveness criterion)
  - minimal pairs of existing words of a language (not pseudo- or non-words): German <Farbe> 'color' vs. <Narbe> 'scar'
2. relates to a linguistic unit / feature (= linguistic value criterion)
  - German <denukt> vs. <deukt>, but |c| does not refer (at least in a native context) to a linguistic unit on its own, only in combinations; |c| is no grapheme, <ch> is (= complex grapheme)
3. is minimal (= minimality criterion)
  - <ng> is no grapheme, since <n> and <g> are already graphemes themselves; in complex graphemes (such as <ch>, at least one component cannot be a grapheme itself)

# *Graphematics*: The ‘grapheme’

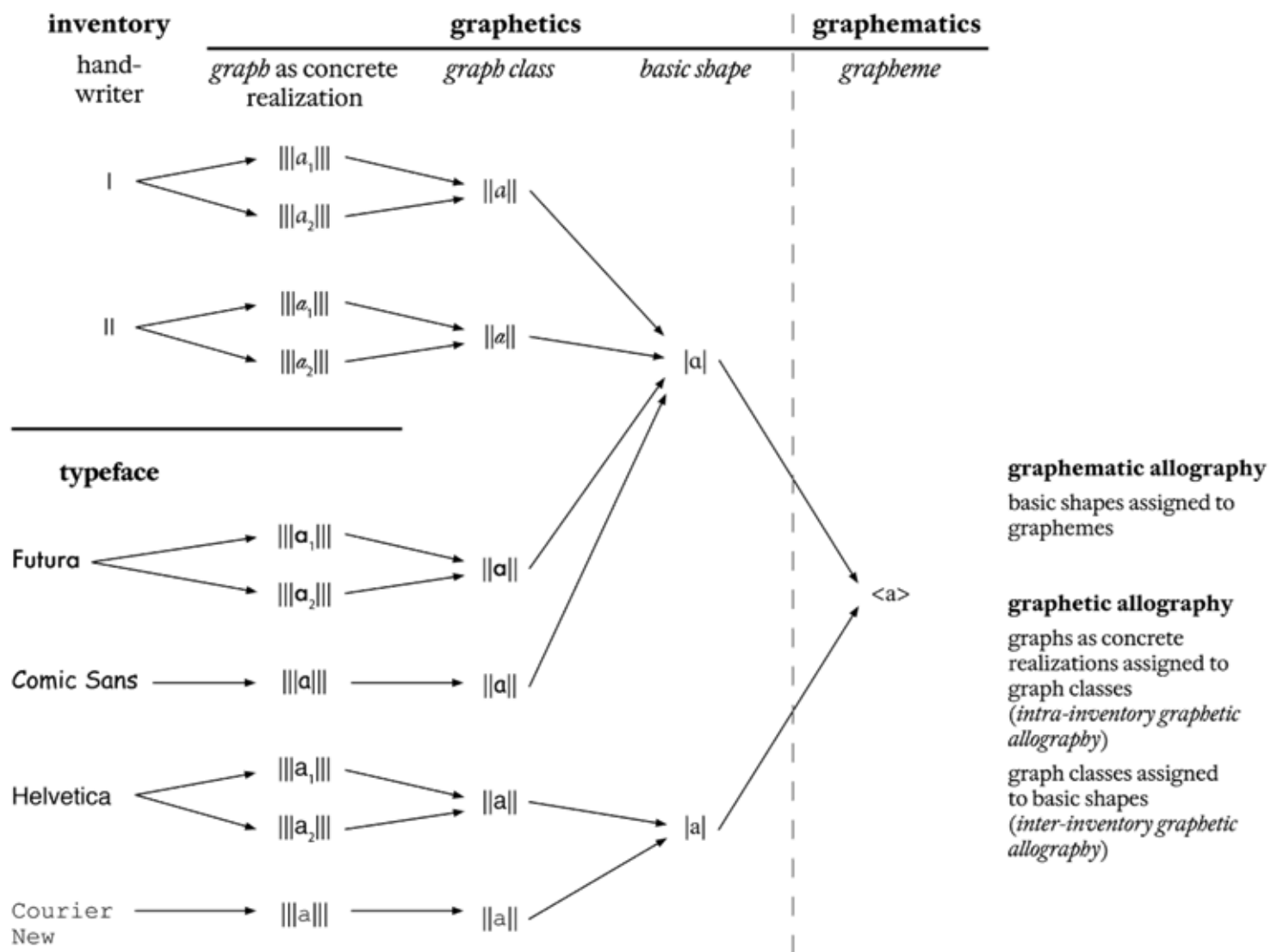
	crit <sup>erion</sup> (1)	crit <sup>erion</sup> (2)	crit <sup>erion</sup> (3)
German <ng>	+	+ phoneme /ŋ/	- both <n> and <g> are already graphemes
German <ch>	+	+ phoneme /ç/	+
German <sch>	+	+	- both <s> and <ch> are already graphemes
German  c	+ <denkt> vs. <deckt>	-	+
German  l  (has- ta) in <p> vs. <b>	+	-	+
Chinese <河> 'river'	+	+ morpheme {river}	+
Chinese  氵	+	- semantic component 'water', which itself rep- resents no linguistic unit	+
Thai <ด>	+	+ phoneme /d/	+
Thai <อิ>	+	+ phoneme /i/	+
Korean <ㄱ>	+	+ phoneme /k/	+
Korean <각>	+	+ syllable /kak/	- is made up of three graphemes that repre- sent phonemes, respec- tively
Japanese <き>	+	+ mora /ki/	+

# *Graphematics: Allography*



Meletis/Dürscheid in press

# Graphematics: Allography





# *Graphematics: Allography*

oo oo oo oo oo

Wong, Kimberly, Frempongma Wadee, Gali Ellenblum & Michael McCloskey. 2018. The devil's in the g-tails: Deficient letter-shape knowledge and awareness despite massive visual experience. *Journal of Experimental Psychology: Human Perception and Performance* 44(9). 1324–1335. <https://doi.org/10.1037/xhp0000532>

# *Graphematics: Allography*

Variant characters (yìtǐzì 異體字) are alternate forms of the same character:

峰/峯 fēng 'mountain top',

群/羣 qún 'group, flock',

册/冊 cè,

裏/裡 lǐ 'inside'.

Galambos 2017

# Graphematics: Typology

level	writing systems	Korean (FEATURAL) ALPHABET	German ALPHABET	Thai ABUGIDA	Arabic ABJAD	Japanese (kana) SYLLABARY	Chinese MORPHO-GRAPHIC
<i>linguistic units</i>							
phono-logical	<i>feature</i>	[x]	[x]				
	<i>phoneme consonant</i>	[X]	X	X	X		
	<i>vowel</i>	[X]	X	X, x	(x), X:		
	<i>syllable</i>	X	[X]	[X]	[X]	X	X
morpho-logical	<i>morpheme</i>	[X]	[X]	[X]	[X]	[X]	
	<i>word</i>	X	X	[X]	X	[X]	[X]
syntactic	<i>phrase, sentence</i>	X	X	X	X	X	X
textual	<i>larger units</i>	X	X	X	X	X	X

Meletis/Dürscheid 2022: 213

# Orthography

“So, it’s about someone writing something that can be read by others, and about adhering to the specified conventions that most language communities have now agreed upon with varying degrees of bindingness.”

Karg 2015: 5, my translation

# *Orthography*: Features

- external, (doubly) codified norm
- social bindingness
- (small) degree of variation
- changeability

Nerius 2007: 34–40, 2020: 369–370

# *Orthography*: Areas of regulation

"[...] the aspects most commonly codified by means of orthographic rules are grapheme-phoneme correspondence, word division, hyphenation, capitalization, and the spelling of loan words."

Coulmas 1996: 379

# *Orthography: Areas of regulation*

	phonographic correspondences	word separation	capitalization	integration of loanwords
Chinese	-	-	-	+
Japanese	+	-	-	+
Korean	+	+	-	+
Thai	+	-	-	+
Arabic	+	+	-	+
Hebrew	+	+	-	+

# *Orthography*: Criteria for a typology

- **origin**: natural development vs. artificial implementation
- **regulation**: (How) is an orthography regulated? By who?
- **modification**: Has the orthography been changed or reformed?
- **codification**: (How) are the conventions/rules codified?
- **community involvement**: Were/are the actual users of the orthography involved in its design?
- **variability**: How much possibility is there for (un)licensed variation?
- **linguistic motivation**: Are the rules/correct spellings linguistically motivated, i.e., do they conform to the graphematics of the system?

# Explanation

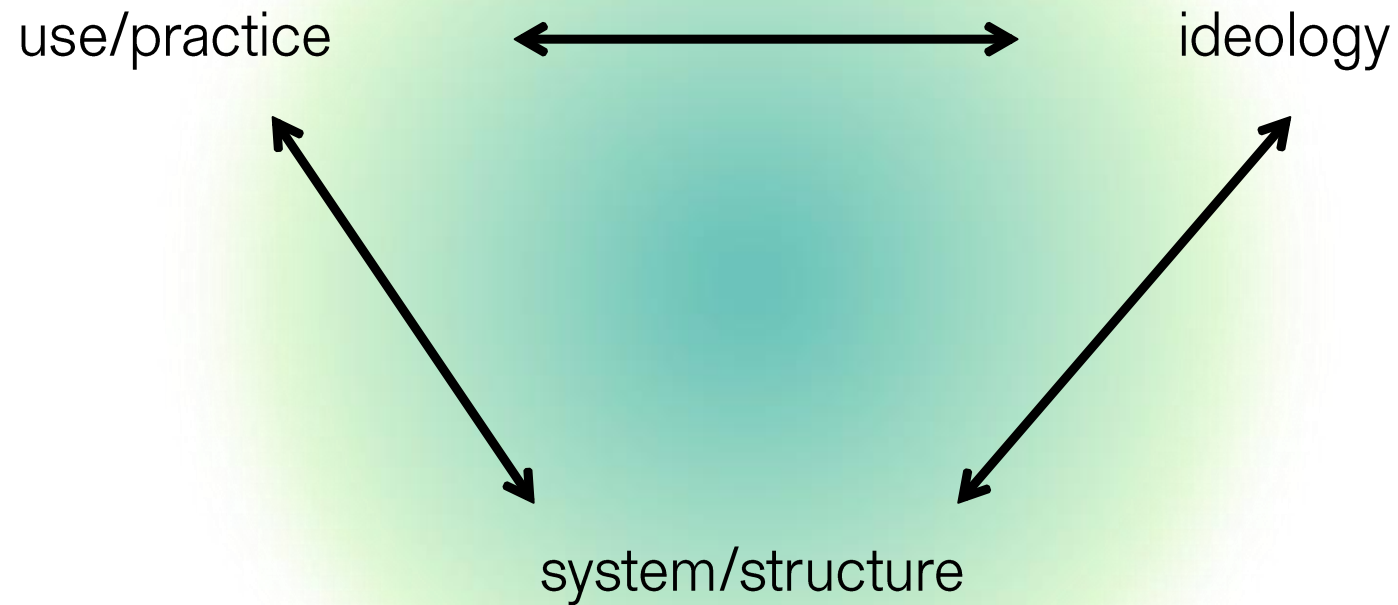
# Prologue: Epistemological interest

“‘More’ would constitute, or at least contribute to, a semiotic theory of writing systems: a theory that would explain, to put it pithily, why each such writing system is the way it is, instead of some other way, and why all such systems have in common what they have in common.”

Watt 1998: 118

Context: taken from a review of an important collected volume on writing, Daniels/Bright 1996

# Explanation: The total (grapho)linguistic fact

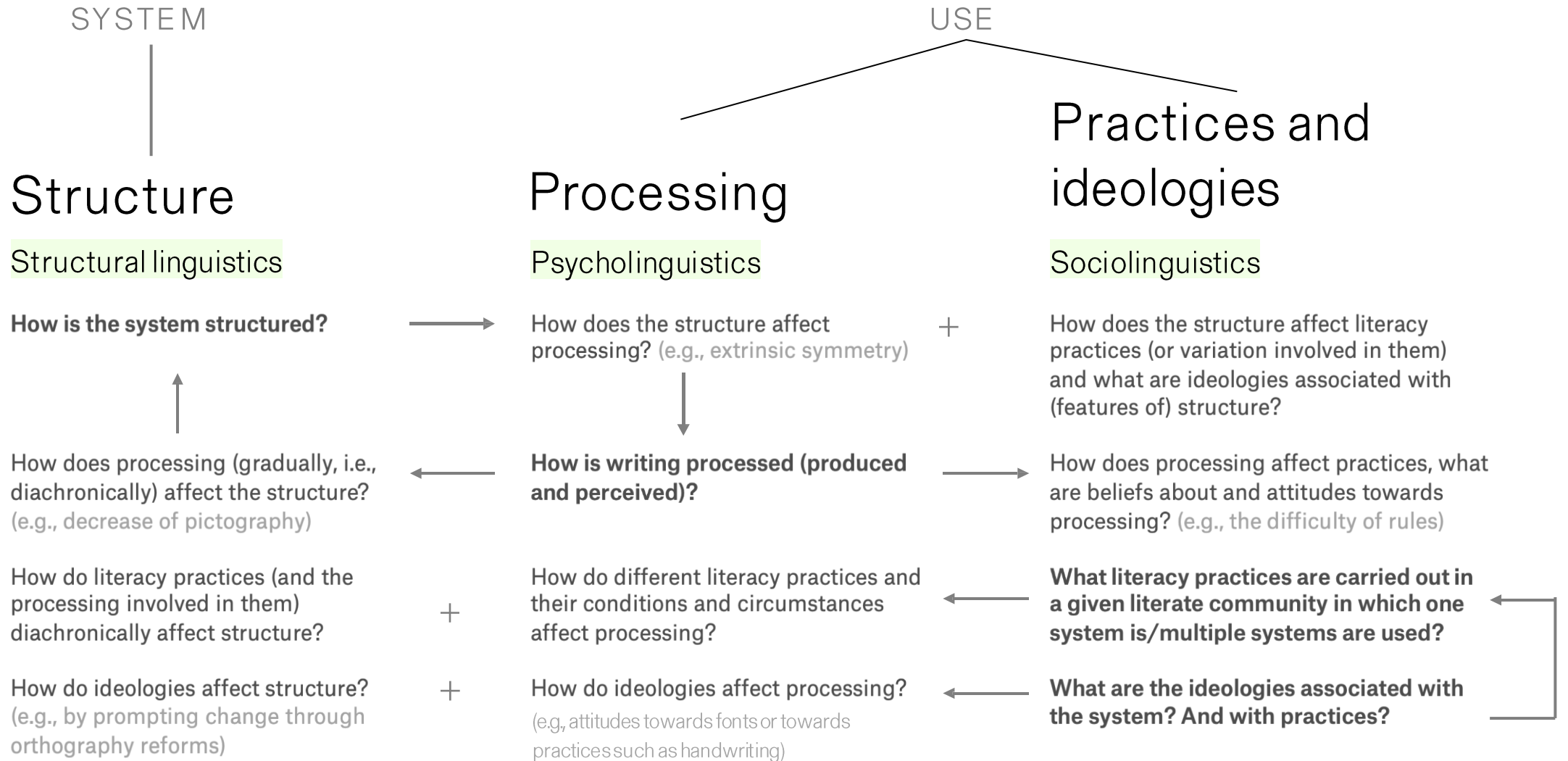


'the total linguistic fact' following [Silverstein 1985](#)

# From evaluation to explanation

Venezky (1977)	Coulmas (2009)	Cahill (2014)
<ul style="list-style-type: none"> <li>– mechanically suited for the language it is to reflect (2)</li> <li>– compatible with [...] its social-cultural setting (4)</li> <li>– psychologically/pedagogically appropriate for its speakers (3)</li> </ul>	<ul style="list-style-type: none"> <li>– convenience (3)</li> <li>– tools (3, 4)</li> <li>– general applicability and linguistic fit (2)</li> <li>– expressive power (1, 2)</li> <li>– simplicity (1, 2, 3)</li> <li>– stability through time (2)</li> <li>– monochrome coding (2, 3)</li> </ul>	<ul style="list-style-type: none"> <li>– linguistically sound (2)</li> <li>– acceptable to all stakeholders (4)</li> <li>– usable (3, 4)</li> </ul>
Baroni (2011)	Daniels & Share (2018)	Bauernschmidt (1980)
<ul style="list-style-type: none"> <li>– maximum distinctiveness (1, 2, 3)</li> <li>– size of the graph(em)ic inventory (1, 2, 3)</li> <li>– cognitive saliency (3)</li> <li>– maximum naturalness (1, 2, 3, 4)</li> <li>– inner consistency (1, 2)</li> </ul>	<ul style="list-style-type: none"> <li>– linguistic distance (2)</li> <li>– spatial arrangement and non-linearity (1, 2, 3)</li> <li>– visual uniformity and complexity (1, 3)</li> <li>– historical change (2)</li> <li>– spelling constancy despite morphophonemic alternation (2)</li> <li>– omission of phonological elements (2)</li> <li>– allography (1, 2)</li> <li>– dual purpose letters (1, 2)</li> <li>– ligaturing (1, 2)</li> <li>– inventory size (1, 2, 3)</li> </ul>	<ul style="list-style-type: none"> <li>– linguistic factors (2)</li> <li>– psycholinguistic factors (3) <ul style="list-style-type: none"> <li>– „magic of written language“</li> <li>– native speaker reaction</li> <li>– optimal inventory of symbols</li> <li>– overuse of symbols</li> </ul> </li> <li>– sociolinguistic factors (4) <ul style="list-style-type: none"> <li>– symbol value</li> <li>– adjustments for dialects</li> <li>– unity of language families</li> <li>– prestige, numbers, and so forth</li> <li>– established alphabets</li> <li>– government agencies</li> <li>– transfer value</li> </ul> </li> <li>– practical factors (4)</li> </ul>
Rogers (1995)	Smalley (1964)	
<ul style="list-style-type: none"> <li>– linguistic (2)</li> <li>– psychological (3)</li> <li>– cultural (4)</li> <li>– technical (4)</li> </ul>	<ul style="list-style-type: none"> <li>– motivation for the learner (3, 4)</li> <li>– representation of speech (2)</li> <li>– ease of learning (3)</li> <li>– transfer (2, 4)</li> <li>– ease of reproduction (3, 4)</li> </ul>	<ol style="list-style-type: none"> <li>1. systematic fit</li> <li>2. linguistic fit</li> <li>3. processing fit</li> <li>4. sociocultural fit</li> </ol>

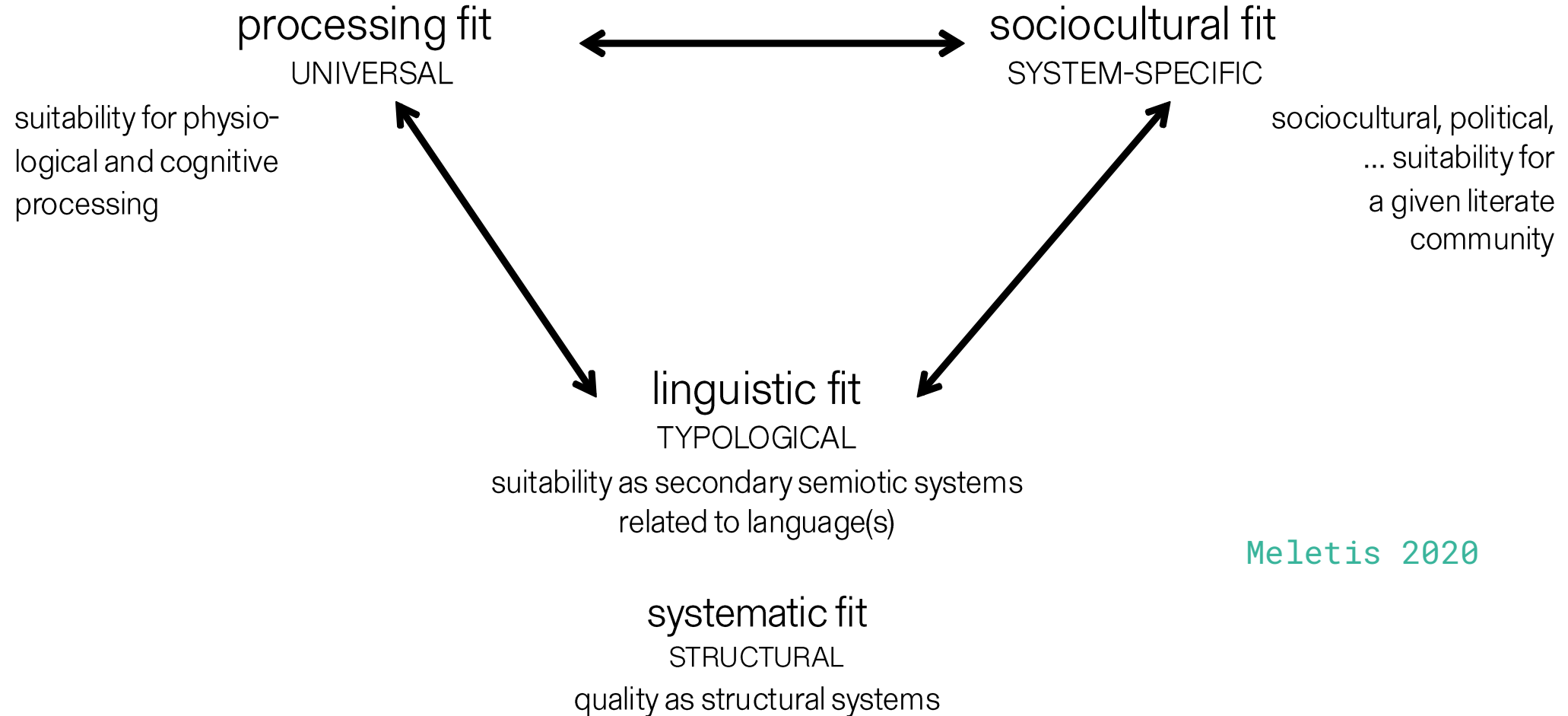
# A comprehensive study of writing



“The study of writing is  
like the study of language  
– but in a microcosm.”

Meletis 2020: 398

# Explanation: Multiple perspectives



Meletis 2020

“Every language gets the  
writing system it  
*deserves.*”

Frost 2012: 266, my emphasis

Frost, Ram. 2012. Towards a Universal Model of Reading. *Behavioral and Brain Sciences* 35, 263–329. <https://doi.org/10.1017/S0140525X11001841>

# Chinese as an alphabet?

《施氏食狮史》

石室诗士施氏，嗜狮，誓食十狮。

氏时时适市视狮。

十时，适十狮适市。

是时，适施氏适市。

氏视是十狮，恃矢势，使是十狮逝世。

氏拾是十狮尸，适石室。

石室湿，氏使侍拭石室。

石室拭，氏始试食是十狮。

食时，始识是十狮尸，实十石狮尸。

试释是事。

<https://www.youtube.com/watch?v=9jtiw721RAg>

# Chinese as an alphabet?

《施氏食狮史》

石室诗士施氏，嗜狮，誓食十狮。

氏时时适市视狮。

十时，适十狮适市。

是时，适施氏适市。

氏视是十狮，恃矢势，使是十狮逝世。

氏拾是十狮尸，适石室。

石室湿，氏使侍拭石室。

石室拭，氏始试食是十狮。

食时，始识是十狮尸，实十石狮尸。

试释是事。

« Shī Shì shí shī shǐ »

Shíshì shīshì Shī Shì, shì shī, shì shí shí shī.

Shì shíshí shì shì shì shī.

Shí shí, shì shí shī shì shì.

Shì shí, shì Shī Shì shì shì.

Shì shì shì shí shī, shì shǐ shì, shǐ shì shí shī shìshì.

Shì shí shì shí shī shī, shì shíshì.

Shíshì shī, Shì shǐ shì shì shíshì.

Shíshì shì, Shì shǐ shì shí shì shí shī.

Shí shí, shǐ shí shì shí shī shī, shí shí shí shī shī.

Shì shì shì shì.

# Chinese as an alphabet?

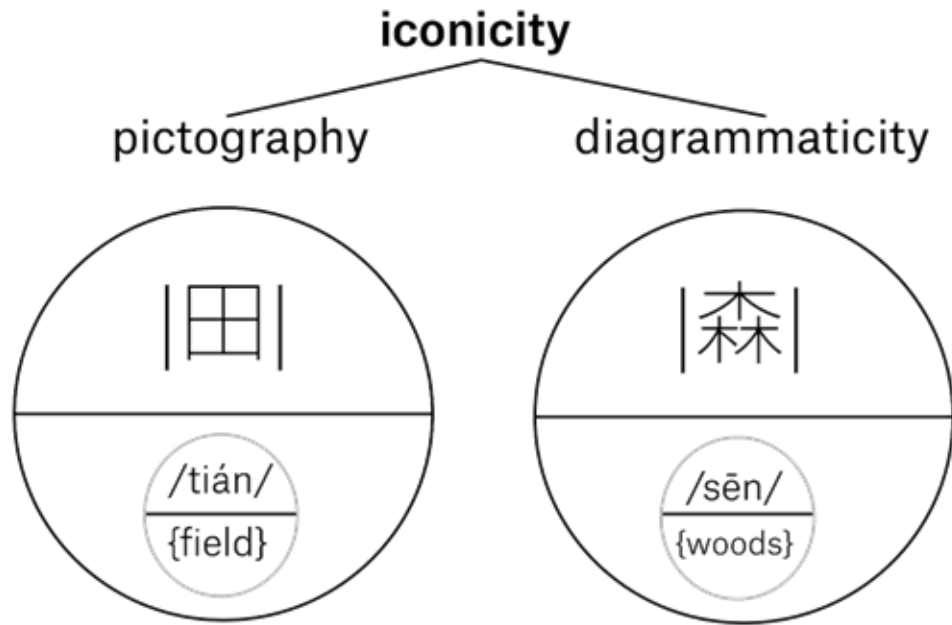
## Lion-Eating Poet in the Stone Den

Living in a stone den is a poet-scholar named Shi, addicted to pork. Having lost his official post, he vowed to eat 10 lions. The lions seemed inclined to interfere. Mr. Shi set up an office, and used his master's influence to dispatch a messenger named Shi to fetch lion corpses, awaiting his time to eat. Only upon eating did he begin to understand the ways of the world. Mr. Shi sent his envoy to the market to observe another man named Shi. Try to explain this matter.

# English as an abjad?

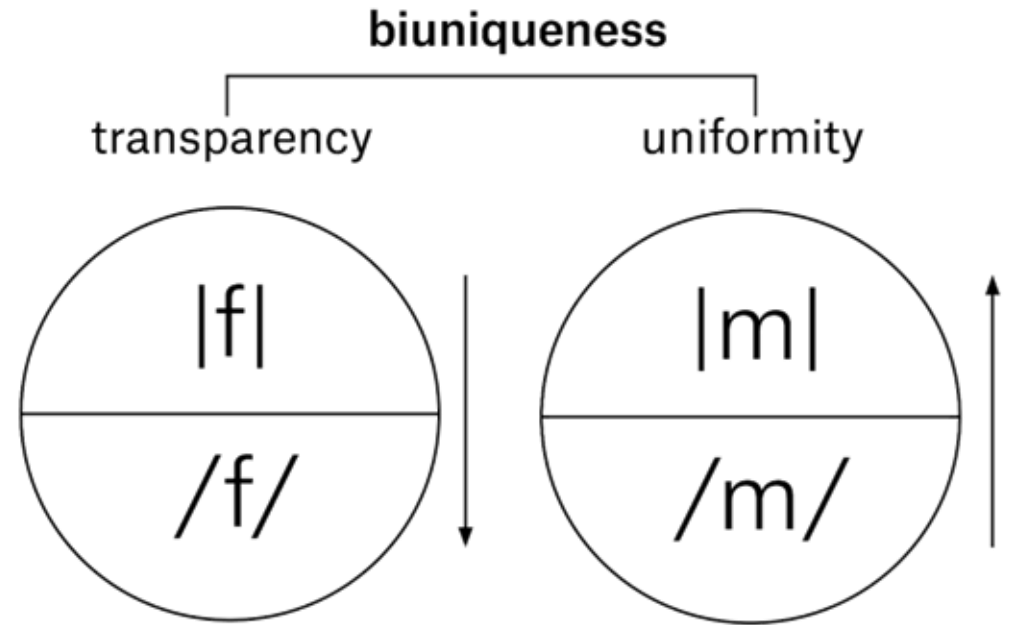
Wrtng sstms r vrwhr n r dl lvs. Th llw s t  
rcrd ds, shr nfrmtn, nd cmmnct crss tm  
nd spc. vn wtht vwls, mch f th mnng cn  
stll b ndrstd bcs cntxt fls n th gps.

# Linguistic and processing fits



signans visually resembles meaning of the signatum (not the signatum itself, which is a morpheme)

a visual change in the signans structurally reflects a change in the signatum (e.g., plurality)

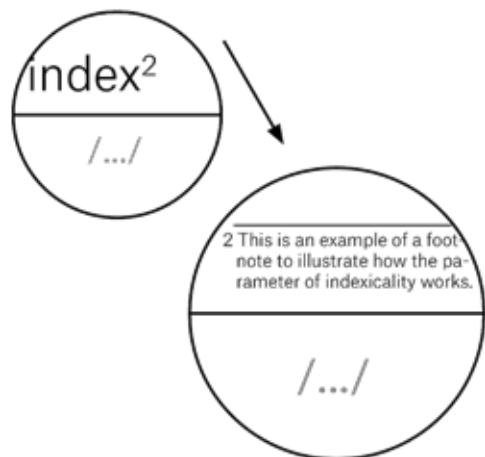


a signans is in a graphematic relation with only one signatum

a signatum is in a graphematic relation only with one signans

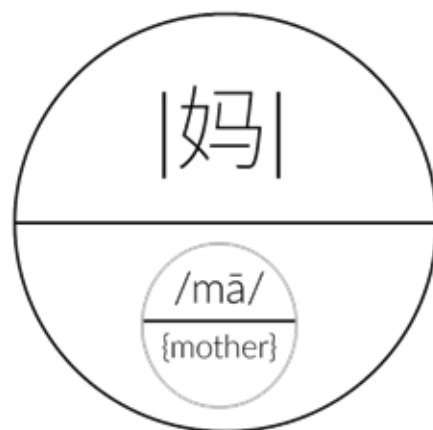
# Linguistic and processing fits

indexicality



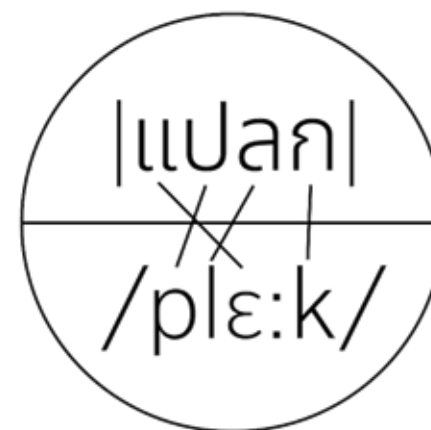
an indexing signans is in spatial contiguity with an indexed signatum

compositional transparency



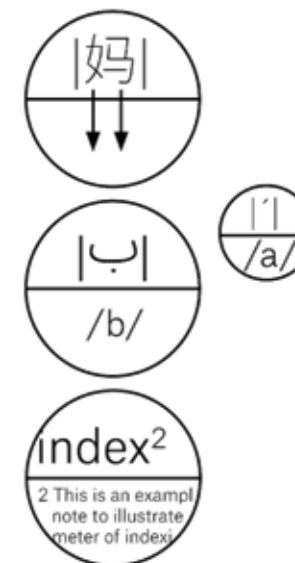
the sum of the graphematic value of the grapheme equals the graphematic value of the whole grapheme

positional transparency



the order of the basic shapes in the signans of a graphematic string corresponds with the order of corresponding linguistic units in the signatum

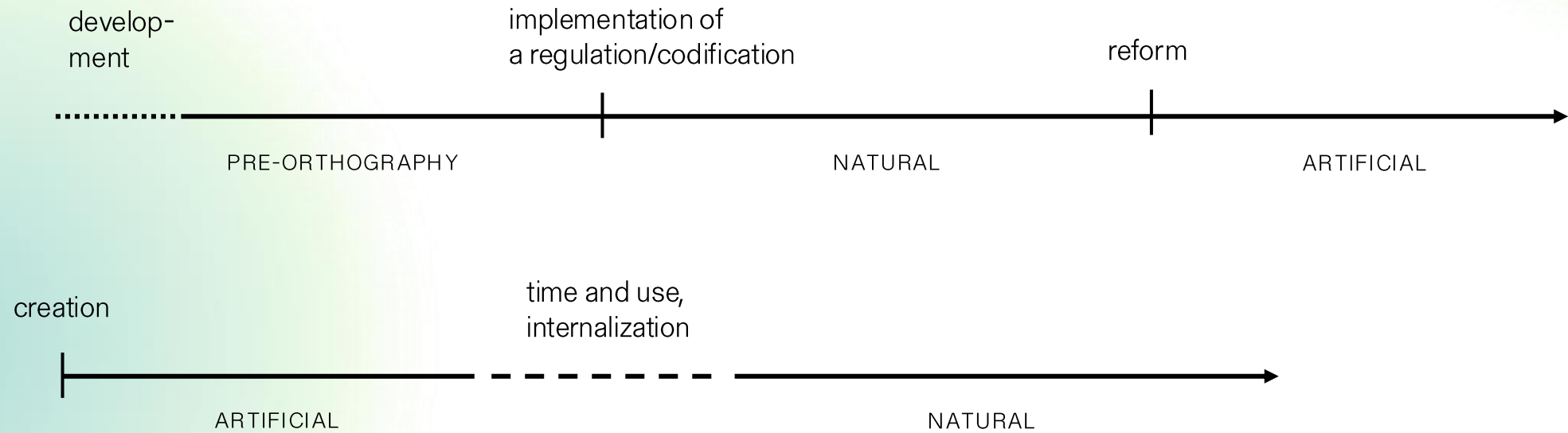
figure—ground



# Sociocultural fit

- (non-)integration of foreign material, i.e., purism
- visual and/or functional cultural (un)specificity (e.g., Roman script as unspecific)
  - not only how a system is structured but also who created it (social hierarchies, hegemonies, dominance and subordination)
- technological affordances (e.g., Unicode encoding for scripts)
- pluricentricity vs. monocentricity
- qualitative and quantitative breadth of literacy practices
- attitudes towards standard language (and orthography) and authorities of linguistic policy
- amount of history, i.e., age of a writing system and literacy practices in a given culture
- biscriptality [Bunčić 2016] and contact phenomena [Coulmas 2014]
- types of orthographic regulation (community involvement, natural/artificial, codification, variability)
- status (alive, moribund, dead)

# Time and use



# Levels and fits: a two-dimensional model

Research tradition	Primary descriptive focus	Primary explanatory fit	Graphetics materiality	Graphematics linguisticality	Orthography normativity	Systematic fit	Linguistic fit	Processing fit	Socio-cultural fit
<b>New Literacy Studies</b>	orthography	sociocultural	○	○	●	○	○	○	●
<b>Orthographic Depth Hypothesis</b>	graphematics	processing	—	●	—	○	○	●	—
<b>Writing system typology</b>	graphematics	linguistic	○	●	○	○	●	—	—
<b>Contextual character similarity</b>	graphetics	processing	●	○	—	○	—	●	○

Legend: ● = central focus   ○ = secondary / implicit   — = largely absent

# The constraint gradient

linguistic constraints operate as a gradient across the architecture of writing systems, exerting strong pressure on graphematics, variable pressure on orthography, and weak pressure on graphetics

Dimension	Graphetics	Graphematics	Orthography
Primary focus	Material form and spatial organization	Linguistic functionalization	Normative regulation
Relation to language	Indirect	Direct and structural	Mediated and institutional
Constraint strength	Weak	Strong	Variable
Dominant pressures	Perceptual, technological, cultural	Representational and linguistic	Ideological, educational, political
Typical phenomena	Typeface, layout, visual variation	Grapheme inventories, graphotactics, unit mapping	Spelling rules, reforms, standardization

# Reciprocal constraints: Writing shapes language

Language constrains → writing.

Writing systems adapt to linguistic structure.

- phoneme inventories shape grapheme systems
- syllable structure shapes representational units
- morphology shapes spelling stability

Writing constrains → language.

Literacy reshapes how language is perceived and used.

- phonemes become cognitively salient units
- word boundaries become discrete categories
- complex syntax becomes more common in use

## Conclusion

Writing systems are not passive reflections of language.

They are active technologies that reshape linguistic structure.

# Conclusion

# Writing systems as optimization problems

Writing systems balance:

- linguistic structure
- processing constraints
- social stability

Perfect fit is *impossible*.

Trade-offs are *inevitable*.

Thank you!  
Kiitos!

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