

Wege zur Konfiguration der Zeichen-Phonem-Beziehung

herausgegeben von

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On ‘Grapheme’: Recurrent Problems and New Reflections

Alfredo Rizza

Abstract. The paper aims to review some problems connected to the term/concept ‘grapheme’. The major point concerns the question of the dependency of writing on the spoken language. We distinguish between semiotic and epistemological dependency. A writing system is a code, most of which, in glottographic systems, re-codes the code of a given language (mainly the phonological one): in this sense, we accept the concept of dependency of writing systems (especially glottographic). The relation between grapheme and phoneme, however, is shown to be more epistemological than semiotic. We attempt to overcome this. The anthropological model offers solutions that are particularly interesting for ancient scripts. We introduce a concept of grapheme that covers different areas of function, from the core glottographic to the visual one.

Keywords: Glottographic area, grammatology, grapheme, semiotic, visuographic area, writing system

The literature on writing systems is immense.¹ We will limit this paper to a restricted set of reflections, starting with a rather plain observation: looking at any written document, depending on how familiar we are with the writing system in use, we should easily recognize minimal units. These units may be referred to using terms such as grapheme, sign, letter, character and so on.

The possibility, in certain conditions, to mutually substitute these terms implies that we can use them to establish the same referent, but it does not imply that these terms actually mean the same thing. A trivial example would be the following: “das Wort *Schicht* [besteht] zwar aus sieben Buchstaben, aber aus nur vier Graphemen, <sch>, <i>, <ch> und <t>”, i.e., ‘The word *Schicht* consists of seven letters, but only of four graphemes <sch>, <i>, <ch> und <t>’ (Dürscheid 2106: 133). In this example, we see cases in which grapheme and letter (G. *Buchstabe*) refer to the same entity (as with <i> and <t> above) and cases in which they do not (as with <sch> and <ch>). Despite the clear example just given, ‘grapheme’ is not a limpid concept.² One of the most elegant definitions of the grapheme describes it as a “distinctive unit of a writing system. [...] In general, graphemes are considered the smallest

¹ For a starting reference to the history of the reflection about writing cf. Harris 1994; Ludwig 1994; Schlieben-Lange 1994; Coulmas 1994 (all in HSK 10.1).

² Günther – Ludwig (1994: x [= xxxii]): „Wie der Begriff Phonem, so ist auch der Begriff Graphem ein theoretisches Konstrukt, abhängig von der jeweiligen Theorie. Dabei stehen sich zwei Konzeptionen gegenüber. In der ersten, älteren Kennzeichnung versteht man unter Graphem diejenigen Schriftzeichen(kombinationen), durch die Phoneme der Lautsprache schriftlich wiedergegeben werden. Die jüngere Konzeption definiert das Graphem rein distributionell als die kleinste bedeutungsunterscheidende Einheit der schriftlichen Sprachform ohne Bezug auf die Phonologie. — Außerhalb der Sprachwissenschaft kann beim Gebrauch des Ausdrucks Graphem nicht davon ausgegangen werden, daß eine bestimmte Lesart intendiert ist; häufig genug bezeichnet man mit dem Begriff einfach ein Schriftzeichen oder einen Buchstaben“. The remark “ohne Bezug auf die Phonologie” is problematic, as long as it appears to oppose the previous view in which writing was seen as reproducing the “Lautsprache”. Phonology and *Lautsprache* need not mean the same (cf. *infra*).

distinctive units of a writing system”.³ This actually implies that, depending on what one understands under ‘writing system’, the understanding of ‘grapheme’ will change substantially. First of all, we have to remember that with ‘grapheme’ we may refer to a notion, to a unit, or both. In the history of grammatology writing systems were mainly defined as glottographic systems (so-called ‘proper writing’), i.e., a system taking speech and converting it into some visual apparatus (DeFrancis 1989, w/ref.). In anthropological approaches, however, the definition of ‘writing’ is open to other types of graphic phenomena and related functions, like communicative, social, ideological ones, etc. (Marazzi 2014, w/ref.). In the first case writing is somehow secondary to speech or language, and the notion, or the unit ‘grapheme’ may naturally be understood as secondary to some speech or language notion or unit.

The secondariness of the grapheme can be of two kinds: semiological or epistemological. Roughly speaking, it will be semiotically secondary if the grapheme substantially works as a visual representation of a linguistic sound (and perhaps also a linguistic meaning, or both); it will be epistemologically secondary to the extent that whatever we may denote with grapheme is dependent on a notion built upon that of phoneme (and perhaps other notions). One rather strange result of this consideration may be that what was conceived after the model of phoneme (epistemological dependency) actually works, in some interpretations, in a much more similar way to that of a morpheme. In simple words: nobody intuitively denies that a letter is a symbol. Sometimes, with ‘grapheme’ and ‘letter’ we may refer to the same entity (cf. supra). Thus, one may think that the grapheme is also a symbol. Phonemes, however, are not symbols. Morphemes, on the other hand, are linguistic signs, a more similar concept to that of symbol; morphemes are indeed minimal units of first articulation, consisting of units of second articulation, but bearing meaning of two different kinds: ‘content meaning’ (lexical morphemes) or ‘structural meaning’ (grammatical ones). If the grapheme is defined as a sign for the phoneme (cf. infra), it should follow that it is a sign, i.e., something of the same nature as a morpheme, not the phoneme: a thing that rarely is considered.

The term itself goes back at least to the works of J. N. Baudouin de Courtenay (1845–1929), A. Penttilä (1899–1971)⁴ and is considered also by F. de Saussure (1857–1913).⁵

Let us now consider the status of ‘grapheme’ in relation to the concept of ‘phoneme’. This has probably been the major definitional problem, and has a role in the querelle of the dependency or secondariness of writing in respect to language or speech. Concerning this last point, it is frequent practice to cite Saussure’s *Cours de linguistique*, but for the ideas of Saussure about the relation between language, speech and writing we can now refer to Harris 2000 and especially to Vallini 1983 (both with references).

According to Kohrt (1986: 80), the ‘grapheme’ depends on “some previous understanding of the notion ‘phoneme’”, but in two different ways: the referential and the analogical one. In the former, it is considered to be a sign for a phoneme. In the latter “graphemes are set up

³ Cf. RDLL, s.v.; problems with ‘distinctive’ cf. Waxenberger 2016.

⁴ Cf. Kohrt 1986: 82–84.

⁵ Letter to Max van Berchen (Louca 1974/1975, no. 6: 33–34. Dated “2 juin”, sine anno). Cf. Vallini 1983: 59 fn. 110. For the sake of curiosity, Saussure specifies that this term, which he himself is suggesting, among others, would be a rather barbaric construction, as the original Ancient Greek verb γράφω, as opposed to the case of φωνέω, would not allow a derivative in *-ema*: “et je préférerais certainement graphème quoique d'un degré plus barbare [puisque le verbe grec n'est pas en éω]”.

in the same way as phonemes, i.e., by commutation tests".⁶ It is important to notice that Kohrt states that 'grapheme' has been conceived on some interpretations of a previous concept, that of 'phoneme', thus the secondariness of the grapheme is more epistemological than semiological. Commenting on the earlier understanding of 'grapheme', Kohrt (1986: 83) concludes:

Note, however, that Baudouin's and Penttilä's ideas of the 'grapheme' prototypically exemplify what has been said above: that from the outset this term was some kind of 'secondary' category which is modelled after some specific previous interpretation of the notion 'phoneme'.

Now, according to Kohrt, as the concept of 'phoneme' developed, so too did that of 'grapheme', but, as mentioned, in two different ways: the referential and the analogical. In the former, graphemes stand for phonemes; in the latter, graphemes should be established as "unreducible distinctive units in the system of written language" (Kohrt 1986: 84). In one case they are symbols, or signs, as said before; in the other they functionally reflect phonemes, because they would work as distinctive units, not as signs. It is clear that in this latter case there is no conceptual overlap with the notion of letter (as defined by the ancient grammarians, see *infra*) It is again important, I think, to notice that Kohrt explicitly defines the grapheme in the referential view as "sign", specifically as "phoneme sign". Now, defining the grapheme as a sign would set it in analogy, as said, to the morpheme or morph, i.e., to a minimal content/expression correlation, where the content should be in this case some phonological property or set of properties.⁷ This latter notion overlaps with that of the traditional definition of letter. For the ancient Roman grammarians the notion of letter (Lat. *littera*) explicitly describes the letter as a correlation of shapes and values, and, in our analysis, shape is to value as expression is to content.⁸ Yet Kohrt is convinced that "the term 'grapheme' can never really be on par with the notion 'phoneme'" (p. 90): "written units are taken as basic entities, independent of any specific phonological value" (p. 91). Accordingly, clusters of letters should not be accepted as single graphemic units (e.g., <sch> in the example taken from Dürscheid 2016 above), but, notwithstanding this important stance, Kohrt still thinks that graphemes should be set up "at least approximately in the same size as phonemes". Finally, and most important for the fate of the grapheme in the analysis of non-alphabetic writing, in Kohrt (1986: 91) 'logogram', 'morphogram' or 'phonogram' should not be considered species of the grapheme. But in ancient and present-day logo-syllabographic systems, we do find units that can be taken as minimal in the respective writing systems or sub-systems. In some context these written basic entities have syllabic values, in other lexical, or grammatical. If one notation unit has the value of a word, it can meet the condition of

⁶ Kohrt (1986: 80) immediately states that both notions of grapheme are not well founded, but the former (the referential) should not be completely dismissed.

⁷ Phonological properties must not be confused, obviously, with phonetic ones. Phonology is now often understood as a system of knowledge (mainly implicit).

⁸ E.g., Dositheus, de litteris: "accidunt uni cuique litterae nomen figura potestas. nomen est quo appellatur, figura qua notatur, potestas qua ualet." Under each denomination of letter (*nomen*) there is a set of correlations between shapes (*figurae*) and values (*potestates*) specific for that letter in particular, and different from all others. So under the denomination 'A', there are certain shapes with the appropriate values, under the denomination 'Be', other associations, and so on.

being a basic graphemic unit, but it would ‘stand for’ (or ‘reflect’) a word, i.e., first articulation units.⁹ The problem, as Kohrt (1986: 92) attempts to explain, is the analysis of the ‘grapheme’ as some “abbreviations of statements of rules that connect items of written language with those of spoken language”. Apart from the problem of the dichotomy written-spoken (cf. *infra*) language, which is quite problematic if taken as an opposition of semiological systems, the observation is extremely important because in this case, the definition of the grapheme as an abbreviation for a statement of rules turns the grapheme into something context-dependent rather than context-free:

What we shall need in the future [...] are careful examinations of the ways in which spoken and written language are connected by the orthographies of certain languages. From the outset such an endeavor should take into account that the relations between the minimal elements on both sides are determined by their respective contexts and by virtue of such a contextual dependence we cannot expect there to be a simple, bidirectional ‘correspondence’ between the levels of spoken and written language (Kohrt 1986: 92–93).

It is somehow not totally clear to me why this view should exclude, for example, logograms or morphograms from the realm of such contextually dependent relations. Take cuneiform in, e.g., Hittite: the value of a certain letter (cuneiform basic notation) as a syllabic or lexical structure (traditionally ‘syllabogram’ and ‘logogram’, respectively) can be guessed, or even predicted from the context, at least in many instances. Contextual relations in orthography must certainly be considered on a par with educational methods, where lists of basic units, with sets of values connected to sets of shapes, are known to be taught and learned. Apart from the rather complicated nature of scribal education in the “cuneiform realm”, many of us have learned a list of letters in a sequence, using the names of the letters (Ay [ei], Bee [bi:], Cee [si:], Dee [di:], etc.), thus reading them with a logographic value (the names of the letters are words, not letters), and attaching to them some basic phonological values (/a/, /b/, /k/ etc.), values that are in turn negotiated in the writing and in the reading. Therefore, I personally think that both types of correspondences, context-free and context-dependent, are indeed relevant for writing systems. Perhaps this may appear more rational (if needed) if one separates, for the sake of the analysis, the notational system from the orthographic one. We may consider the list of letters as a notational (sub-)system, serving other systems, one of which is typically the orthographic one, and somehow influencing the whole in various terms (conditions on carriers, layout, spatial organization, linear distribution and the like).¹⁰ The Latin grammarian Scaurus (ca. 200 AD) wrote “orthographia igitur est ratio recte syllabis scribendi”. Till not many years ago the syllabic method was still *in fashion*. This method has rules, some of them are contextual.¹¹

⁹ I would like to point out again that Kohrt does not totally dismiss the referential analysis of the ‘grapheme’.

¹⁰ Rizza 2012 (w/ref.).

¹¹ Contextual rules may be the product of history. Still, they are an existing fact characterizing orthographies. They may arise from the fact that writing systems are more conservative than language; in Italian, for example, the letter <c> is read /k/ if not followed by front vowels. The sequence <ci>, instead, is read [ʃi] due to an original allophonic variant consisting in the affrication of /k/ before front vowels. On the other hand Latin labiovelars before front vowels (e.g., *qui*) became velar, producing again the context /k/ plus front vowel, so now in Italian we need to write the sequence of phonemes /ki/ as <chi> (note that unaccented <i> in the context of <ci> before

If you use letters as segmental units¹² building syllables in writing, contextual rules are, in my opinion, as natural as basic memorized values attached to shapes.¹³

Nonetheless, I am not certain that the ‘rule’ approach is plain and acceptable without comment, especially if this is intended as connecting concepts such as spoken language and written language, which often seem to be treated as independent semiological systems, but look very like variations within a system.¹⁴

The spoken-written dichotomy may be left aside. Not only has there been a clear description of “writing without words” (Boone and Mignolo 1994), but also, glottographic writing systems generally show, to a different degree, both quantitatively and qualitatively, significant visual structures and solutions that have little to do with language, at any level (phonemic, morphemic, syntactic, etc.).¹⁵ The question of written language may be understood in different ways. One way is to refer, more or less consciously, to a (socio-)linguistic axis of variation, another is to use ‘language’ in the general meaning of ‘code’, ‘semiotic system’, ‘communication’ or the like. Attempting to establish the independence of a writing system from speech (first case) is not the same as observing a level of independence from natural historical human language as a whole. One could also consider writing as a different substance (form and matter) of expression, independent from phonology, but accessing the same contents,¹⁶ or observe that there are significant ways to select notational variants and to organize them in the available space according to a given cultural context for all kinds of purposes (cf. *infra* for some example).¹⁷ In this latter framework it makes no more sense to speak of ‘written language’. And, again, this dichotomy would be far too deterministic if reified into a model to be applied to any historical manifestation of writing. There will always be some role played by language, but we can easily consider a number of functionalities to describe and understand written documents and writing systems according to a dynamic

a vowel is by now completely silent: <ciò> = [ʰɔ] and, most remarkably, even <ci ho> = [ʰɔ], where <h> is purely a determinative disambiguating lexical values).

¹² In our classical tradition segmental and linear: cf. the Ancient Greek term στοιχεῖον (“a simple sound of speech, as the first component of the syllable”, cf. LSJ, s.v.), from στοιχέω (“to be drawn up in a line or row”, LSJ, s.v.). στοιχεῖα are frequently confused with or actually identified with γράμματα.

¹³ For the relevance of the syllable in orthography and in glottographic systems in general cf. Gelb 1963; Prosdocimi 1990; Daniels 1992.

¹⁴ For a brief and critical assessment of the distinction between vocal and written language, cf. Dürscheid (2016: 35–42).

¹⁵ For a recent overview, with a rich list of previous works in the field, see Marazzi 2014; 2016a.

¹⁶ A rather problematic hypothesis, in my view. I cannot believe that a phonological representation like /home/ and a graphic realization like <home> really access independently the same content. I assume that the formal properties of phonology are not the same as those of a writing system. Contrary to this, if the written <home> makes the reader think of /home/, then it is easier to understand why it is possible to reach the same content. With this I do not deny that there are concepts emerging from the dynamics within the interactive spoken modality and others within the written one (cf. Ong 1982, e.g. for the role of the technology of writing in the development of the very concept of ‘study’), but mental sound representation should not be confused with what we call physical-acoustic waves.

¹⁷ To illustrate with concrete examples the cultural-anthropological framework we may cite (among many others): Perri 2007; Marazzi 2016b (for Linear B, w/ref.); Perri 1996 (general model and Aztec writing); Balza 2016 (w/ref.); Waldspühl 2013 (w/ref.).

historical and cultural environment. This is why we would like to think of a concept such as ‘grapheme’ as a *quantum* or *quale* of knowledge.

If we take the grapheme to be a minimal unit, but just distinctive, it cannot be a sign assigning an expression to some form of content. Only combining graphemes, we could write proper signs (with content). A writing system with graphemes understood in this way should be characterized by double articulation (like natural historical human languages). Thanks to a relatively small repertoire of meaningless shapes we can construct meaningful expressions. This conception of writing is completely dependent on how human languages have been understood.¹⁸ It is evident that this view may work only for certain phonographic systems, like alphabets. Logograms or the like are indeed minimal notations (only one written sign, not a combination), but bear meaning, therefore they are excluded from being a grapheme. In this view, being a minimal unit within a notational system is not enough to be a grapheme, because only second-articulation elements are meaningless. But how can we determine if a given written shape is a second articulation or first articulation unit? This information cannot be found in the notation system, because it is to be found in human language. Or, again, how can we recognize that a letter is a grapheme, i.e., is meaningless, while certain (and not just all possible) combinations of letters are meaningful, if we do not compare them with language? This conception of grapheme is totally dependent on language. It is a written unit representing a language unit, and specifically a second articulation unit. This is, probably, one of the reasons why Kohrt refused the analogical notion of grapheme. Saying that writing is independent from speech (not just a symbolic relation with spoken utterances) does not imply that it must be completely independent from phonological, morphological and lexical structures of a given language. In my point of view, notation units providing some minimal value (be it phonological, morphological, or even non-linguistic) must have to do with the concept of grapheme, if we wish to recognize something that is primarily in the writing itself. Otherwise, writing would be conceived as strongly dependent on some model of language, like for the analogical conception of grapheme as identified in Kohrt 1986. My conclusion regarding this question is that the problem of the dependence of writing on speech is sometimes semiological, but more often it is epistemological. Once we can conceive of writing with its own epistemological independence (e.g., with the anthropological-cultural approach), the semiological one will not be a problem anymore. Sometimes, as in glottographic systems, orthographies provide rules of transformation between ‘codepoints of script’ and ‘language codepoints’ (glottographic systems are code of the second-order because they encode a code). As long as human languages are double articulation codes, the script may relate to units of first or second articulation, or both. On some other occasions written signs encode, or evoke, suggest some sort of message, but not one single proper and precise linguistic expression, as in semasiographic systems. Some other times again they offer some significant visual structure not linked to language.

What follows is a brief account of what emerged about ‘grapheme’ in this reflection. ‘Grapheme’ relates to the concept of ‘minimal unit’. It may represent minimal shapes (expression) and/or minimal values. The idea of the grapheme is epistemologically dependent on that of the phoneme, but it could be conceived more independently and need not to be

¹⁸ The question of double articulation and productivity needs careful examination, especially when one considers that ‘double articulation’ is often taken as ‘duality of patterning’, cf. Ladd 2012 and *infra*.

dependent semiologically. We can get minimal shapes and minimal values, both linguistically meaningless or meaningful, thus including logograms and the like. For many scholars, however, the grapheme is minimal if it is conceived as merely distinctive, thus rejecting the referential option (the “modern” solution in Günther and Ludwig 1994: x). The referential option however seems to be still alive, as we can see in Dürscheid (2016: 133) mentioned at the beginning of this article. Personally, I see in both these options, but especially in the merely distinctive conception, a strong epistemological dependency on the semiotic model of language characterized by double articulation or duality of patterning.

As a matter of fact, the notion of ‘grapheme’ is not of much use in the historical and epigraphical approach to ancient writings (Olsen 2017; McGillivray 2017; Rizza 2012 and 2014); sometimes it overlaps with the notion of ‘letter’ or that of ‘character’, due to the intuitive force of the referential approach (Rizza 2014). The main question surrounding ‘grapheme’ is the ‘phoneme-grapheme-correspondence’ in graphematical studies oriented specifically to orthography, or in psychological studies about the reading/writing competence. This problem may cause difficulties in the understanding of writing systems that survive only in historical monuments. For example, in the last two decades of the 20th century, there was a reaction against the idea that writing systems are often imperfect or incomplete and that they must develop according to an evolutionary scale towards completeness and perfection. I can cite here, e.g., some works on Linear B (Consani 2016, Marazzi 2016b), but in particular I refer to Prosdocimi 1990, a contribution that states clearly that scripts are always ‘total’ and tend to be optimal. Being ‘total’ is based on the very fact of being a system. Being optimal depends on the aims culturally determined in their history.¹⁹ So any research about a ‘perfect fit’ may profit from these theoretical frames. As recently summed up in Mancini 2014, going back to the work of Prosdocimi and Cardona,²⁰ the cultural-anthropological approach, integrated with the functional one, excludes the notion that imperfect script may exist. Any imperfection is most probably an error of perspective, due to expectations coming from cultural environments less pertinent and distant in time. Once observed that the main aim of a script might not have been the reproduction of the spoken realization of the segmental phonology of a language, the problem of an optimally fitting grapheme should change in perspective.²¹

Considering its theoretical relevance in general, I shall now attempt to put forward a further possible path of reflection on the concept ‘grapheme’.

Let us now consider an ordinary definition of ‘writing’. We consulted a popular Italian dictionary and found three main definitions for “scrittura” (‘writing’).²²

¹⁹ Cf., e.g., Marinetti – Solinas 2016.

²⁰ E.g., Prosdocimi 1990; Cardona 1981.

²¹ Cf. Mancini (2014 : 27): “L’approccio antropologico e, assieme, funzionale esclude che si possa parlare di scritture “imperfette”. Tutte adempiono in ogni momento alle funzioni per le quali sono state create o adottate. Non esistono residui o spazi vuoti in una scrittura. Parlare, dunque, di una grafia micenea imprecisa nei confronti della varietà greca che essa manifesta o di una scrittura consonantica che resta ambigua per quel che le concerne la notazione della morfofonologia di una lingua semitica è semplicemente un errore di prospettiva. Non si giudica una scrittura rispetto alla presunta adeguatezza [...] nei confronti dei segmenti fonologici; si deve solamente prendere atto del suo funzionamento nell’ambito di un contesto d’uso specifico con le proprie regole strutturali e pragmatiche.”

²² Devoto – Oli 2007 (s.v. *scrittura*).

1. The process of writing (“operazione dello scrivere”)
2. The way one writes (“il modo di scrivere”)
3. The knowledge of the technique and the usage of writing as a cultural fact (“la conoscenza della tecnica e dell'uso di scrivere come fatto culturale”).

None of these three common sense definitions make explicit reference to writing as a system, especially in structuralist terms. The grapheme is a pertinent concept mainly in 1. and in 3. Let us see in what way.

In the first definition, the grapheme would be a minimal element functional to the process of writing. This conception implies some differences with respect to the structuralist one, which sees in the grapheme a minimal unit in a code (be it defined in the referential or in the analogical approach, as seen supra; cf. Kohrt 1986). Being functional to a *process* of writing does not necessarily imply having differential values or determine distinction.

The second definition concerns the notation system, the instruments of writing, the carrier, and involves different aspects of writing, like typography, ductus, graphology and so on. Here, the grapheme, at least in the traditional definition, does not seem to be a pertinent and useful concept.

In the third definition the grapheme would be an element of knowledge within a system of knowledge.

We can take ‘system of knowledge’ either in a cognitive-cultural (external) approach, or in a cognitive-mentalist (internal) one, or both (and the latter is the case here). The ‘grapheme’ as an element of internal knowledge²³ may be represented as a function that takes values from a notational domain (a set of notation units) and returns a value interpretable to another system of knowledge. A glottic writing system (glottography) would be characterized by such a system of knowledge, where graphemes are functions returning linguistic values. In non-glottic aspects of writing systems, graphemes would have other kind of values. Notation units must be organized in systematic repertoires (e.g., a repertoire of ‘letters’, *litterae*, each defined by a name under which shapes are associated to values). A notation unit can function in different ways not only across, but also within a system (of knowledge), i.e., it may feed the argument of a function that will return another value, say a phonemic value, but it can also operate on the result of a function, say determining or disambiguating legitimate values.²⁴ In this sense, we can refer to orthographic knowledge as a subsystem of a glottic writing system extending to layered linguistic levels such as phonology, morphology, lexicon, and responding to syntagmatic environments.

A notational system is functional to a glottic writing system if it comes, as said, with already established basic or default (mnemonic) shape-value associations and it will probably be increasingly functional if it includes or determines a set of rules that condition the process and the way of writing, such as the script direction, the continuity or discontinuity of the script or the like. The core of the required knowledge, however, is represented by the specific interface where notations morphologically and syntactically

²³ This internal knowledge is, however, highly explicit. Scripts are “learned”, not “acquired” like languages.

²⁴ E.g., the Italian letter <h>: <cina> – /ʧina/ – ‘China’ vs. <china> – /ʧina/ – ‘slope’; <anno> – /an:o/ – ‘year’ vs. <hanno> – /an:o/ – ‘(they) have’.

organized can be read as linguistic objects and vice-versa. An attempt is made to illustrate this theory in the table below.

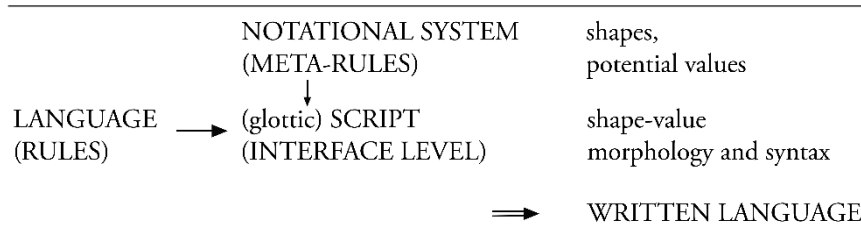


Table 1: connections among levels of pertinence of a glottic writing system
(adapted from Rizza 2012)

From the theoretical point of view, glottography, as a system of knowledge, is a sort of knowledge of knowledge. If we were to characterize this interface in a fashion as similar as possible to the concept of ‘code’, it would be a ‘functional simplified metalanguage’ for re-encoding.²⁵ This observation at once captures the core economic factor in glottographic systems and those aspects of writing that are dependent on language. A code of the second order, because it re-encodes a natural language into a new channel with additional conditions brought by the materiality of the types of carrier where notations are laid out.

The core economic factor lies in the relation among sensory systems, i.e., the auditory and the visual, accessing phonology via a visual system instead of an acoustic one. Phonology is not to be confused with speech or phonetics. We refer to phonology as a system of (internal, mostly implicit) knowledge regarding sound representation functional to the human faculty of language. A glottographic system is intended as a system of knowledge, i.e., an experience-built interface with phonology with a visual notation system. In this paper we represent it with functions taking visual notational values and returning phonological linguistic values, like in fig. 1.

The neurolinguistic experiments reported in Magrassi et al. 2015²⁶ may suggest (but caution should be exerted) a stronger correlation between sound representation and linguistic expression than previously thought:

Our results suggest that [...] sound representation is at the heart of language and not simply a vehicle for expressing [...] symbolic activity in our brain (Magrassi et al. 2015: 1872).

These findings challenge the theory of direct access to the content plane by written expressions. If we take phonology to lie at the second level of articulation,²⁷ this means that through the second level we access the first one (the second is functional to the first), i.e., morphological

²⁵ Cf. Barbera bmanuel.org/corling, §1.6.

²⁶ Cf. etiam Moro 2016 (“sound of thought”).

²⁷ On the difference between ‘double articulation’ and ‘duality of patterning’ cf. Ladd 2012. The two concepts consistently overlap in the literature thus, I cannot assure that no overlapping takes place here. In particular, I treat syllables and more complex phonological structures as second-articulation complex units/structures. This may imply an overlapping of ‘double articulation’ and ‘duality of patterning’; I will come back to this problem in the future.

units (morphemes or, perhaps better, morphs and words).²⁸

Basic notation units graphemically returning first-level linguistic units will do so, in our theory, thanks to double articulation, thus always implying phonology. This resembles the principle of the ‘logogram’ as in Gelb 1963,²⁹ a graphemic unit in which sound and meaning are both present.³⁰

As long as rebus writing causes the explosion of polysemy and homophony, the linguistic interpretation of writing units may be canalized by notation units with determinative function (the so called ‘determinatives’, e.g. in Sumerian cuneiform script,³¹ but they are present also in alphabets). Adding first articulation and determinatives to the schema in fig. 1 leads us to a rough representation of what we will call the ‘core glottographic area’ (see fig. 2).

The definition of a core glottographic area is adapted from Cárdenas 2001³² and Perri 2007. The aim is to think of ‘writing’ and ‘grapheme’ considering different zones or areas of the written product: the glottographic, the visuographic and the semasiographic.

Both Cárdenas 2001 and Perri 2007 underline that writing is a visual activity. In all kinds of script, even in alphabets, there are aspects which are intrinsically visual, starting from the very core differential potential, i.e., shapes, but let us think about the dimensions, the colours of the letters/characters, the choices among alternative shapes of the same letter or among alternative graphemic realizations for linguistic units (homophony, alternative spellings), or the choices in the distribution of the letters, in the direction of the script and so on.³³

These intrinsically visual aspects, far from disturbing the glottographic area, allow far more than linguistic re-encoding. They not only make available a more or less wide array of solutions for the organization of the writing surface, they specifically allow a writing system to be optimal for given cultural, social, or personal ends and outcomes, which may be multiple but simultaneously present in a written object.

The notion of ‘grapheme’, as it is conceived of here, covers these areas. I consequently suggest keeping ‘grapheme’ as a predicate, and avoiding to reify it into a substance, so that ‘grapheme’ should mean ‘graphemic’ (in the sense here proposed, knowledge regarding some minimal graphic-notational solution) at each level of pertinence.³⁴

²⁸ The theoretical status of ‘word’ is much weaker than that of ‘morpheme’ or ‘morph’, but it is far more intuitive.

²⁹ Cf. etiam DeFrancis 1989.

³⁰ Logograms allow rebus writing and, in principle, are not limited to ‘words’ or lexemes. Agglutinative morphology may favour morphemic values, while fusional inflectional (and intraflexional) morphology may favour lexical values.

³¹ The example in fig. 2: ^uzu^{ti} “rib”; ^gis^{ti} “a part of a boat, cart or chariot”.

³² Defined as “zona fonografica” by Cárdenas (2001: 123).

³³ Perri (2007: 152f): “[...] è vero, ci sono aspetti della scrittura alfabetica [...] che sono intrinsecamente e non solo funzionalmente legati alla testualizzazione visiva — corpi dei caratteri, colori, disposizioni topologiche e più in generale sistemi di mise en page —; ma in certo senso li si è continuati a tenere in disparte e a considerare come componenti “secondarie” [...] perché mostravano chiaramente di “non fare sistema”, ossia di non ubbidire alla ferrea logica dell’organizzazione linguistico-analitica [...] basata su alcuni imperativi assai noti: linearità e discretezza, anzitutto.”

³⁴ Cf. Rizza 2012 and 2014.

Appendix: Some examples

In fig. 4 we see a page of an edition of the *Amorum Libri*, by the Italian poet Matteo Maria Boiardo (the author of *Orlando Innamorato*). The visuographic area here has a prominent role.

The characters used at the beginning of each of the first 14 poems do not have merely an aesthetic function. They highlight the spelling of the name of his ‘beloved’ (“amata”) Antonia Caprara. The 14th poem then is a classical acrostic with the same name. There are many more examples of this kind. In this case, the graphemic value remains glottic, but is distributed along different axes of reading (vertical – horizontal) and organized according to different topological (i.e., concerning and regulating spatial structures and distribution) layers (the first letters of the first lines of the poems build a vertical overlaid line).

Above the visuographic area we suggested another area, the semasiographic one. As an attempt to illustrate this area, let us look at fig. 5 and 6, reproducing two seal impressions of the ancient Hittite kings Tuthalia IV (left) and his successor Arnuwanda III (right). Hittite kings used mainly circular stamp seals, a distinctive feature when compared to contemporary Mesopotamia, where we find mainly cylinder seals (rolling seals). Hittite seals of the Empire Period were inscribed using two different scripts. the so-called “Anatolian Hieroglyphs” and cuneiform.³⁵

The hieroglyphs convey visuographic and semasiographic values in a quite apparent way if compared with cuneiform. Hieroglyphs have glottographic values (see the transcriptions beneath the reproduction of the seal impressions), basically, the name of the king (MONS₂-tu = Tuthalia; AVIS₃-nú-tá = Arnuwanda) and some ‘titles’ (SOL₂; MAGNUS.REX; IUDEX-la), but their function does not end in the glottographic area. In the central field, we see a mountain-god. The mountain-god is also a hieroglyph, MONS₂, a highly iconic variant of MONS. The titles are distributed in the field following precise iconic and diagrammatic values (MAGNUS.REX and IUDEX-la are repeated on both sides of the mountain god; SOL₂ embraces the entire name and titular with its wings). Both *Tuthalia* and *Arnuwanda* are, besides being anthroponyms, oronyms. In seal 97.1, the name of Tuthalia is written with the logogram MONS₂, disambiguated by the TU sign beneath.³⁶ We see then glottographic values integrated with visuo-semasiographic ones referring to some shared knowledge of the time (the so-called “encyclopedia”). In the seal of Arnuwanda (138.2), the name is written with the signs AVIS₃-nú-tá, but at the centre of the seal there is again the sign MONS₂. We do not need this sign to read (linguistically) the name Arnuwanda, but we know (and more important, they knew) that there is a mountain called Arnuwanda as well as a mountain called Tuthalia. It is almost certain that the MONS₂ sign in Arnuwanda’s seal is a symbol of continuity with the predecessor. Moreover, looking at the diagrammatic values in the two seals, the mountain-god of the second can be read “Arnuwanda” and the explicit glottic writing on the right may be considered as a caption³⁷ or as a gloss revealing the linguistic reading of the sign. Here, the borders between semasiography and glottography are blurred, or, better, open to the interpretation of the writer/reader.

³⁵ Cf. Payne 2015; 2016; Balza 2016; Bolatti Guzzo 2004; Marazzi 2010; 2016a.

³⁶ The spelling MONS-tu is ordinary for the name Tuthalia.

³⁷ In Hittite monuments, representations of gods are often accompanied by such captions.

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Figures

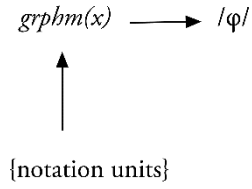


Fig. 1: The core graphemic function

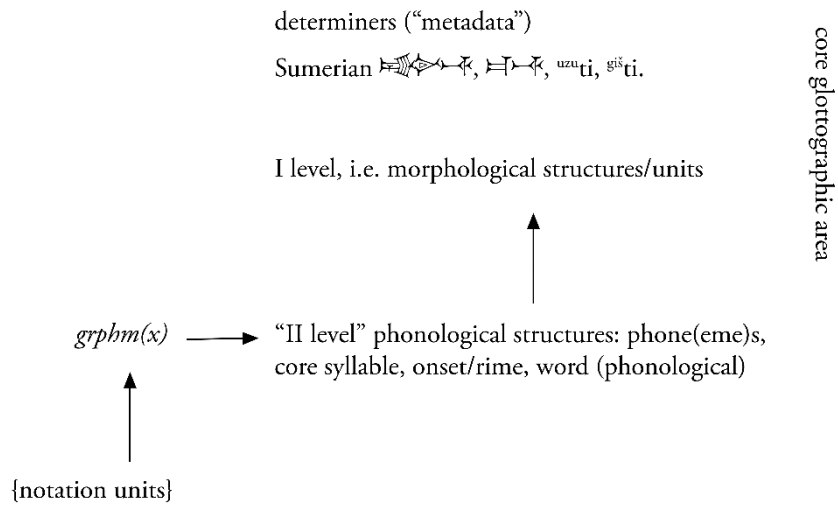


Fig. 2: The graphemic function within the glottographic area

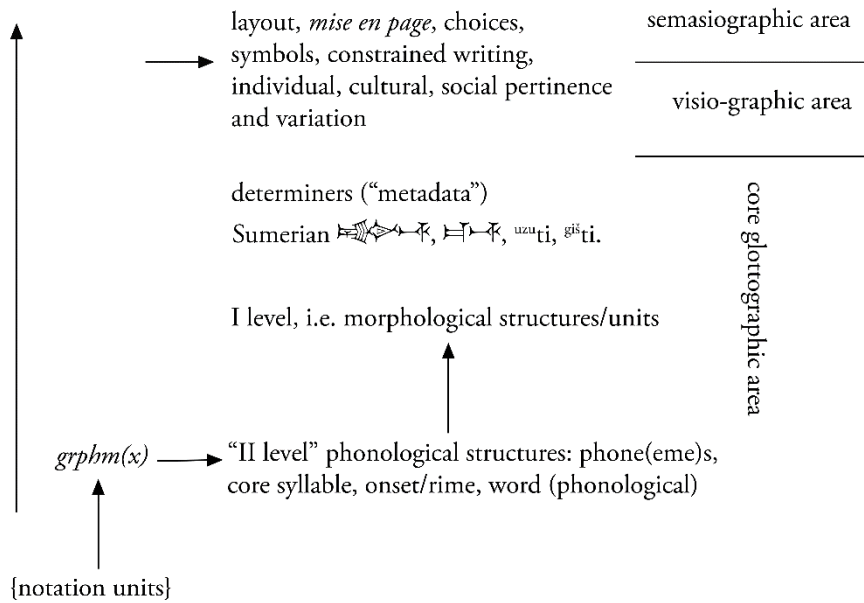


Fig. 3: The graphemic function extending to the visio- and semasiographic areas

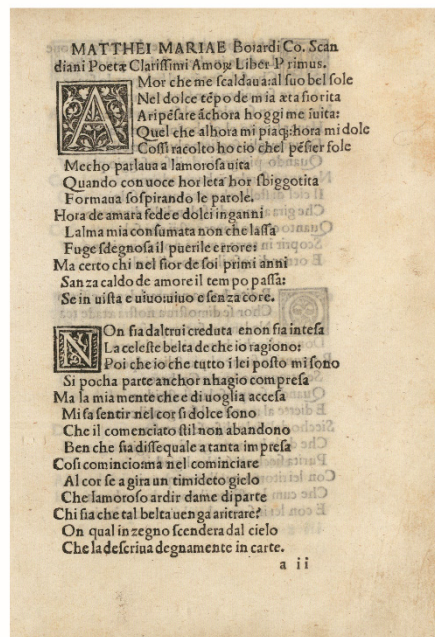


Fig. 4: The first two sonnets of Boiardo's *Amorum Libri* (ed. Reggio 1499)

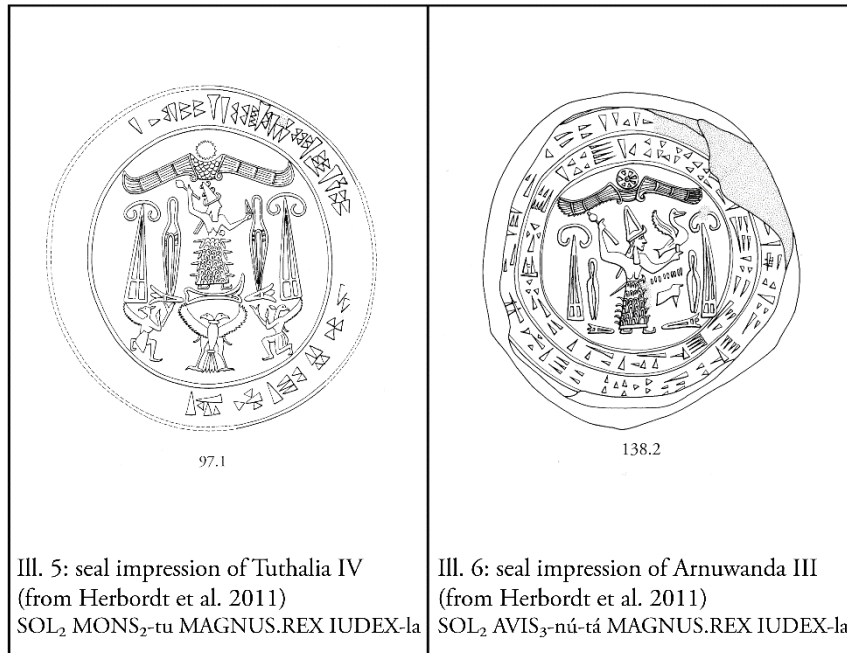


Fig. 5: Seal impression of Tuthaila IV. Fig. 6: Seal impression of Arnuwanda III