Semasiographic aspects of glottographic writing systems

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Introduction

- The typological distinction between writing systems is usually based on their relation to spoken language. Graphic signs may strictly refer to the sounds of speech (**glottography**) or to non-linguistic ideas (**semasiography**) (Coulmas, 1996; Daniels & Bright, 1996; DeFrancis, 1989; Diringer, 1962; Sampson, 1985).
- Glottographic systems are defined as language-dependent, visually representing the linearity of speech and understandable regardless of the context or additional explanation.
- Semasiographic systems are often thought to be not the 'full writing' because they are strongly context-dependent and restricted to a narrow use, e.g. tallies, knotted cords, traffic signs or laundry symbols.
- But, in fact, semasiographic practices and strategies are much more common, even in seemingly purely phonographic systems (e.g. alphabetic systems):
    - phonetic signs, in specific contexts, can be used 'semasiographically', without referring to their phonetic values, e.g. letters of the alphabet as school grades or mathematical symbols.
    - pictures can play a crucial role in seemingly glottographic texts, as graphs, tables, figures, visual representations of molecular structures or musical notation.
- Moreover, due to the way of processing written messages by the human brain, the presence of the features typically attributed to the 'full writing' may be less common than one could assume.

Methodology

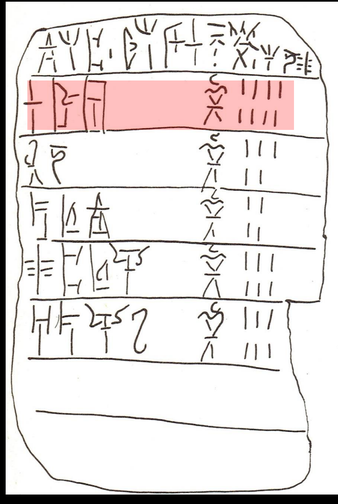
- This research compares the theoretical distinction between glottographic and semasiographic systems to the actual application of signs and their combinations.
- Text structure is analyzed with reference to findings of linguistics, psychology, and cognitive neuroscience.
- The research examines the presence of the three features, typically attributed to glottographic systems: linearity, context-dependence, and speech representation in Linear B logo-syllabic writing system (Crete, c. 16th – 13th BCE), representing Ancient Greek, and modern English examples written in Latin alphabet.

Results

LINEARITY VS. SPATIALITY

Information is better remembered and recalled when presented as text + image than as text or picture only (Eitel & Scheiter 2014; Levie & Lentz 1982). Such mixed texts were commonly used in the past, even despite the use of extensive phonographic apparatus. As texts without a clear separation between words and pictures present the multimodal information comprehensively, they have the spatial layout.

LINEAR B



.1 e-re-ta pe-re-u-ro-na-de/i-jo-te

.2 **ro-o-wa** VIR 8

.3 ri-jo VIR 5

.4 po-ra-pi VIR 4

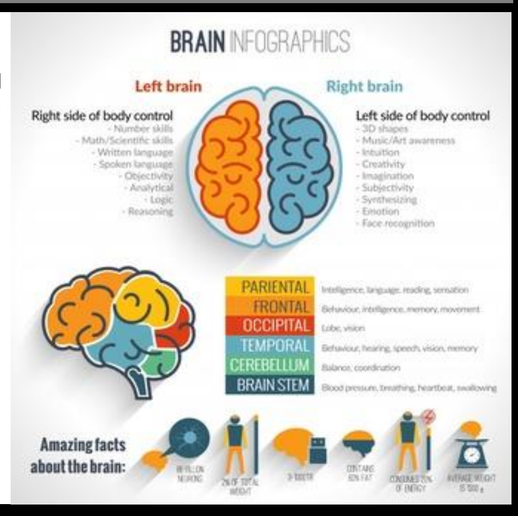
.5 te-ta-ra-ne VIR 6

.6 a-po-ne-we- VIR 7

(Tablet PY An 1. The picture from: PT II, 1)

- Semasiographic elements in Linear B are not only the additional facilitation to the phonographic basis but an integral part of the inscriptions.
- Although Linear B is often classified as a syllabary or a logo-syllabary, many inscriptions are not meant to be 'read' but rather 'interpreted': their structure is not linear and the message can be understood only by combining phonographic and semasiographic elements in the holistic spatial arrangement.
- In both ancient and modern texts, mixing different types of signs and using them in unprecedented combinations seems to result from searching the most precise and effective method of recording.

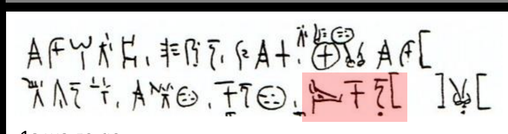
ALPHABETIC



CONTEXT DEPENDENCE

Non-linguistic context is crucial to establish proper word meaning – while reading, the semantic, syntactic and phonological information is processed simultaneously (Hagoort et al 2004; Vigliocco et al. 2014)

LINEAR B



.1a wo-ze-qe

.1b e-u-ru-wo-(ta) , te-o-jo , do-e-ro , ka-ma-e-u[ ]to-so-de , pe-mo GRA 1[

.2 a3-ti-jo-qo , e-ke-qe , to-jo-(ka) , **au-to-jo[](ka)-ma-e** [

(Tablet PY Eb 156. The picture from: PT II, 146)

ne-wo-pe-o , po-ti-ni-ja OVISm 100 **SUS** 190

(Tablet PY Cc 665, The pictuer from: PT II, 133)

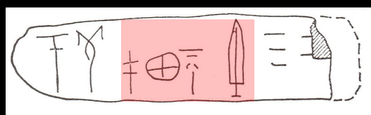
- World knowledge is retrieved in the very same time as word meaning.
- This procedure allows choosing the correct word meaning to make the coherent interpretation.
- Inappropriate and non-contextual word meanings are automatically eliminated.
- In Linear B a group of signs can be used both as logograms and syllabograms – only the context allows distinguishing which version is suitable in a particular place.

ALPHABETIC

SPEECH REPRESENTATION

Reading words engages brain regions responsible for visual, semantic and phonological processes. Words are perceived as whole objects, as well as simultaneously analyzed in terms of their components or any additional information (Potter et al. 2013; Vogel et al. 2014). For the brain, words are multimodal.

LINEAR B



.1 to-sa / pa-ka-na PUGio 50 [

(Tablet KN Ra(1) 1540. The picture from: CoMIK IV, 291)

- The Stroop effect, presented in the alphabetic example, demonstrates the phenomenon of slowing down the brain's reaction time when receiving two conflicting information from the stimulus.
- In a Stroop test, it took much longer the participants to name the color when the color of the text and the text were incoherent.
- In the Linear B inscription, syllabically written *to-sa pa-ka-na* 'so many daggers' is followed by a representation of a dagger *233 PUGio 'dagger' and the numeral '50'.
- The repetition does not bring new information but strengthen the message by indicating (and repeating) its crucial element.

ALPHABETIC

GREEN

vs.

GREEN

Conclusion

- The boundary between semasiographic and glottographic systems may be not as sharp, as it is commonly believed – it can also shift depending on the particular use of a system.
- Many texts, based on glottographic systems, are spatially arranged, context-dependent and multimodal.
- Non-linguistic context is necessary to choose the suitable meaning of a word in the process of semantic integration.

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