

Per oculos ad loculos? – what can we learn from eye tracking about emblem art perception?¹

Artur PilacinskiRuhr-University Bochum  **Filipa Araújo**University of Coimbra, CIEC  **Zohar Tal**University of Coimbra, CINEICC  **Patrícia Fernandes**University of Coimbra, CINEICC <https://dx.doi.org/10.5209/eiko.99780>

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Abstract: Emblems are depictions of concepts, composed of texts and images. Scholars dispute whether it is the emblematic image or the text that contributes more to making the viewer appreciate the emblem and better understand its message. Are images and texts of equal importance? Which element - image or text- attracts attention in the first place? What are the dynamics of attentional processing of text-image structure of emblems? We have applied eye-tracking techniques to study where and how people look when presented emblems. We mapped participants' eye gaze locations and dynamics (order) of their scan paths to uncover the relationship between the text and the image aspects of emblems. Moreover, we also used internet 'meme' images containing a similar text-image structure to emblems in order to test for similarities between these two classes of bimedial compositions. We present and discuss the preliminary findings of the study, showing that in perception of such multi-modal messages like emblems, the text and the picture are both critical for a dynamic process of understanding. We will further suggest an experimental framework aiming to explore the cognitive processing underlying the perception and interpretation of emblems.

Keywords: eye-tracking; emblems; perception; text and image

ENG *¿Per oculos ad loculos? ¿Qué podemos aprender del seguimiento ocular sobre la percepción del arte emblemático?*

Resumen: Los emblemas son representaciones de conceptos, compuestos por textos e imágenes. Los estudiosos discuten si es la imagen emblemática o el texto lo que contribuye más a que el espectador aprecie el emblema y comprenda mejor su mensaje. ¿Tienen las imágenes y los textos la misma importancia? ¿Qué elemento, la imagen o el texto, atrae la atención en primer lugar? ¿Cuál es la dinámica del procesamiento atencional de la estructura texto-imagen de los emblemas? Hemos aplicado técnicas de seguimiento ocular para estudiar dónde y cómo miran las personas cuando se les presentan emblemas. Hemos mapeado las ubicaciones de la mirada de los participantes y la dinámica (orden) de sus trayectorias de exploración para descubrir la relación entre los aspectos textuales y visuales de los emblemas. Además, también utilizamos imágenes «memes» de Internet que contienen una estructura de texto e imágenes similar a la de los emblemas para comprobar las similitudes entre estas dos clases de composiciones bimedias. Presentamos y discutimos los resultados preliminares del estudio, que muestran que en la percepción de mensajes multimodales como los emblemas, tanto el texto como la imagen son fundamentales para un proceso dinámico de comprensión. Además, sugeriremos un marco experimental con el objetivo de explorar el procesamiento cognitivo que subyace a la percepción e interpretación de los emblemas.

Palabras clave: seguimiento ocular; emblemas; percepción; texto e imagen

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Summary: 1. Introduction. 2. Methods. 3. Results. 4. Conclusions. 5. Sources and bibliographical references

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1. Introduction

The way we interpret works of art depends on how we look at them. This applies to understanding concepts, social scenes, spatial composition of scenes and hidden details that allow us to construct meaning behind the visual layer of the work.

The ancient proverb *Per oculos ad loculos* claims that the eyes lead men into dangerous and narrow places, suggesting that they do not provide reliable information to the brain. The invention of emblems and their successful use in the Early Modern Period show, however, that visual language can effectively convey complex levels of meaning and that our eyes contribute actively to the perception and interpretation of complex logo-iconic messages.

Interpretation becomes particularly challenging when dealing with the combination of visual and linguistic elements in a semantic interplay, as happens with emblems. After the publication of Alciato's *Emblematum liber* in 1531, this type of composition widely circulated among erudite elites, providing inspiration for many followers². Based on recent research, Peter Daly estimates the size of the corpus at around 100 million printed emblems and perhaps over 6,500 printed books of emblems and devices (*imprese*)³. This is a remarkable number, especially considering the editorial costs of such volumes. Emblematic models were also an inspiring source for painters and artists working in the decoration of ephemeral art, buildings, furniture, household items and many other materials, settling a common symbolic language throughout Europe, and later in the New World⁴. It is also important to note that emblems played a pioneering role as a vehicle of cultural and scientific knowledge during the Early Modern Period, because of their efficient capacity to express complex ideas in concise and impacting forms, easy to memorize⁵.

David Graham "conveniently" divides the history of emblem studies into four phases⁶. The first period

includes fragmentary and enigmatic hints dropped by authors of emblem books, mostly in the prefaces to their own works or within other paratextual documentation. The second is characterized by the appearance of the first treatises on emblems and devices in the 17th century and culminates in the writings of Henry Green at the end of the 19th century. The third phase is associated with pioneering studies discussing the concept of emblem and emblem book, along with the publication of fundamental bibliographical catalogues. The fourth phase began in the final decade of the last century with the systematic application of digital technologies that provide access to very useful databases⁷. In the last decades, emblem scholars have been focused on the reception of emblematic models in the print or material culture, and "relatively little seems to have been published on what might be called emblem theory", recognising that the huge diversity of books of emblems and *imprese* makes it very difficult to formulate one theory that would encompass them all⁸.

Among many issues that remain unsolved, one of the most controversial topics is the discussion on what may be considered primary in the emblem: the visual picture or the verbal texts. Different perspectives about this subject must be taken into account. Seeking to reconstruct the process of invention that gave birth to the *Emblematum liber*, researchers initially looked for information in Alciato's correspondence and legal works. In a famous letter to his friend Francesco Calvi (dated 9 December 1522), Alciato mentioned "a small book of epigrams" to which he had given the title "*emblemata*", providing a strong argument to suggest that emblems were essentially poetic texts⁹. On the contrary, in his dedicatory letter to Conrad Peutinger, later published by Steyner, the author confesses: "During the holiday season, I fashioned these emblems, with devices created by the celebrated hand of craftsmen, so that any person may be enabled to fasten cameos on clothes, badges on hats, and write with wordless tokens"¹⁰. It remains unclear whether the dedicatory epistle was written before or after the decision to combine the poetic texts with woodcuts, but the note to the readers, in the 1531 edition, suggests that the images were made to assist the comprehension of the "less learned".

² To know more about the editorial history of the *Emblemata*, see *Alciato at Glasgow Project*, by the Stirling Maxwell Centre for the Study of Text/Image Cultures, at the University of Glasgow. Accessed 13 Dec 2024. <https://www.emblems.arts.gla.ac.uk/alcia/>

³ Peter Daly, *The Emblem in Early Modern Europe: Contributions to the Theory of the Emblem* (London: Ashgate, 2014), 152.

⁴ Pedro Germano Leal, "Global emblems and transmission and intermediality: the impact of the emblematic culture on the early Americas", *NORBA. Revista de Arte* 40 (2020): 113-128, <https://doi.org/10.17398/2660-714X.40.113>.

⁵ Karl Enenkel, *The Invention of the Emblem Book and the Transmission of Knowledge, ca. 1510-1610* (Leiden: Brill, 2019), 327.

⁶ Graham, David. "Preface, Prescription, and Principle: The Early Development of Vernacular Emblem Proto-theory in France," *Janus*, no. 6 (2017), 3. <https://www.janusdigital.es/articulo.htm?id=79>

⁷ Digital sources related to emblem studies were recently analysed in a specific volume edited by Pedro Germano Leal and Mara Wade, "Digital Emblematika". *Early Modern Digital Review*, 5, no. 2 (2022), <https://doi.org/10.33137/rr.v45i3.40432>.

⁸ Daly, *The Emblem*, xiii.

⁹ Hessel Miedema, "The Term Emblema in Alciati", *Journal of the Warburg and Courtauld Institutes*, no. 31 (1968): 234-250, at 238.

¹⁰ Andrea Alciato, *Emblemata*, Lyons, 1550. Translated and annotated by Betty I. Knott, with an introduction by John Manning (Aldershot: Scolar Press, 1996), 11.

Alciato's words were widely discussed by scholars that agree at least on one argument: even if he did not think of emblems as bimedial compositions, he accepted and adopted the logo-iconic format in later editions. From the analysis of the cultural context, the author's humanistic erudition, but also the visual and textual sources that might have influenced the conception of the *Emblematum liber*, Agnes Kusler claims that "the concept of the emblem, for Alciato, incorporates the presence of the pictures, those kinds of pictures that are equally symbolic in their nature, as the epigrams"¹¹. In fact, Alciato's *Emblemata* have been used as reference to establish the pattern commonly associated with the emblem, combining a brief motto (*inscriptio*), a picture (*pictura*) and a verse text or epigram (*subscriptio*). The practice shows, however, that this canonical structure was not a rigid norm, not even in the 16th century. Many emblem authors soon started to adapt the template with variations that implicate a different perspective on the role played by text and image. There was a very fluid conception of emblem and we must also take into consideration that commercial reasons were usually paramount, knowing that printers and publishers chose the format by their appreciation of what would sell.

The primacy of picture or words in what concerns intention or creation has been widely explored, but we argue that it can be particularly relevant to analyse the text/image interplay in the context of reception. What is the contribution of verbal and visual elements to emblem perception? To answer that question, it is relevant to cite some clues left by emblem authors and editors. The preface to Alciato's *Emblemata* explains the role played by each component:

Emblems provide pleasure and gratification because of their charming novelty which lifts weariness of spirit, their sententious sharpness which penetrates the mind, the agreeable rhythm of the verse which charms the ears, and the meaningful design of the images which provides food for the eyes¹².

The motto is addressed to the mind and the images feed the eyes, which means that they are expected to catch the attention in the first place. Gilles Corrozet, in his *Hecatomographie*, seems to confirm the use of images to provide pleasure: "Et pour autant que l'esprit s'esjouit / Quand avecq luy de son bien l'oeil jouit / Chascune hystoire est d'image illustrée / Affin que soit plus clairement monstrée"¹³. Some years later, Georgette de Montenay's *Emblèmes ou devises chrestiennes* seemed to claim that image and text had equal status in her conception of the emblem, knowing that some readers would be attracted by the *picturae* and other by the poetry¹⁴. Emblems perfectly

illustrate the connection between poetry and painting, commonly called "sister arts", which was in the centre of discussion within the Republic of Letters during the 16th century.

In his theoretical writings on *ars poetica*, the Jesuit Jacobus Pontanus states that the emblem is composed of body (image) and soul (poetic text), assuming that the verses please the ears and *pictura* entertains the eyes¹⁵. This perspective was later developed by the famous Claude François Ménestrier, who published the manual entitled *L'Art des Emblèmes*, in which he elaborates on the two essential constituents of emblems: "Tout Emblème de quelque nature qu'il puisse estre, a essentiellement deux parties; l'une pour les yeux, & l'autre pour l'esprit; c'est à dire, une peinture pour le plaisir des yeux, & un sens mystique pour l'instruction"¹⁶. The Jesuit priest then presented his arguments to defend the supremacy of visual rhetoric, claiming that images were more able to catch someone's attention than words, and consequently, more efficient in conveying ideas¹⁷.

The perception of emblems has generally been neglected by emblem theoreticians. German scholars of the last century discussed the tripartite structure of the emblem, mainly focused on intention. It must be said, however, that Schöne tended to view the emblem from the point of view of a reader and not exclusively in the perspective of the author¹⁸. He was aware that the emblem involves a dual function of representation and interpretation. That was a starting point to finally recognise the importance of the reading process, as well as formal characteristics, in order to understand the essence of emblematic compositions.

Reading emblems definitely raises many issues to people not acquainted with symbolic language. Should we start with the picture and return to the text or vice versa? Early modern manuals do not offer clear instructions about the recommended procedure and we have little - if any - information from readers in that period. Can we learn how to read emblems? Is there any evidence of a "proper way" to do it? What evidence do we have of the right way to do it? Although the definition of the emblem is still not absolutely consensual, it has been accepted that "the emblem as a printed whole produces a meaning, sense, significance (call it what one will) through the interaction of texts and graphic image"¹⁹. Since the beginning of emblem studies, some scholars have privileged the visual elements, while others stood for the primacy of the word in emblematic rhetoric, depending on the *corpus* of emblem books that they were studying²⁰. Most recent approaches adopt a synthetic position:

¹¹ Agnes Kusler, "Marginalia to the Reconstruction of the Emblem-Concept of Alciato – The Legitimation of the *Picturae*," in *Emblems and Impact Volume: Von Zentrum und Peripherie der Emblematik*, ed. Ingrid Hoepel and Simon McKeown (Newcastle-upon-Tyne: Cambridge Scholars Publishing, 2017), 321-376, at 363.

¹² Alciato, *Emblemata*, 5.

¹³ Gilles Corrozet, *Hecatomographie* (Paris: Denis Janot, 1540), A3v.

¹⁴ Georgette Montenay, *Emblèmes ou devises chrestiennes* (Lyons: Jean Marcorelle, 1571), A4v.

¹⁵ Jacobus Pontanus, *Poeticarum institutionum libri tres. Tyrocinium poeticum* (Ingolstadt: David Sartorius, 1594), 200.

¹⁶ Claude-François Ménestrier, *L' Art des Emblèmes* (Paris: chez R.J.B. de la Caille, 1684), 207. This later version is substantially different from the first edition of the work published in 1662.

¹⁷ Ménestrier, *L' Art des Emblèmes*, 211.

¹⁸ Albert Schöne, *Emblematik und Drama im Zeitalter des Barock* (Munich: Beck'sche Verlagsbuchhandlung, 1964).

¹⁹ Daly, *The Emblem*, 6.

²⁰ John Manning, *The Emblem* (London: Reaktion, 2002), 82-100.

[The] emblem must be seen as a “unique bimodal (hybrid) moralizing polyform combining (usually more than one) text and (usually one) image into a coherent whole in which a superficially enigmatic and fluid visual image is progressively deciphered through iterative reading of a series of cross-references between the textual fragments and the image to create a generally applicable lesson that individual readers then apply to themselves in the context of their own circumstances as a logical conclusion to their reading²¹.

Seeking to contribute to a more comprehensive understanding of emblematic language, instead of discussing theoretical theses, this study aims to demonstrate empirically the role played by image and text in the “emblematic reading process”, through the identification of which of those elements attracts attention, for how long, and in which order. Our experiment thus focuses on the dynamic interplay between texts and images, considering the compositions as a whole, even if words and pictures were generally made by different authors. Printers usually assigned woodcut images after the poems arrived at the printing house in manuscript and sometimes the engravings were reused, giving origin to a “highly complex pattern of transmission and production of material within emblem books”²².

The process of reciprocal reading of logo-ico-nic elements, moving back and forth between the words and the pictures, creates meanings. Here, we applied eye tracking to study where and how people look when presented emblems. Claiming that it is probably impossible to determine which part of the emblem is responsible for introducing the semiosis, Daly affirms: “It seems to me that in many emblems the *inscriptio* suggests a direction of interpretation for the emblem as a whole”²³. Do experiments confirm or refute that thesis? Do they corroborate prior theoretical approaches, or suggest new avenues of exploration? What is the order of processing of emblem elements (image/ title)? Can those data be relevant to propose a method to interpret emblems today? Is there a significant difference between the attention paid to image or text? Are images really more efficient than words in attracting eyes, as Jesuit manuals suggested?

We decided to answer these questions empirically, using eye tracking, a technique allowing us to measure in real time where people look when perceiving a complex visual object or a scene and how their visual attention shifts in time.

2. Methods

We measured eye fixations (that is, the time when the eye is stationary while gazing at a specific element of a visual scene). Eye fixations represent the locus of visual attention while scanning an image and

their order and duration at specific elements inform us about visual and cognitive processing²⁴. First, we compared durations of how people look at text and images in emblem art (visit duration). Then, most importantly, we scrutinized the timeline of how people gaze at the image-text structure of emblems (fixation order). To delineate general rules of perception of bimodal (image-text) art we compared these metrics for emblems with internet memes: culture elements containing image and text distributed primarily through social media²⁵. We considered memes to be a modern equivalent of bimodal emblems in the sense that they contain image and text together with a meaning extracted from both components²⁶. We assumed that the gaze duration and the temporal order of gaze points (fixations) on emblems will lend empirical support to the discussion of image-text primacy in perception of emblem art by comparing which elements are looked at for longer and as first and last when people perceive emblems.

Participants: Twenty-six participants (16 females; mean age: 26 years (range: 19-64)) took part in the study. The participants provided informed consent prior to the study participation. The study obtained ethical approval from the Faculty of Psychology and Educational Sciences of the University of Coimbra and was performed according to the relevant laws and guidelines.

Stimuli

Emblems (see Figure 1) were taken from the following source: *Festas que se fizerão pelo Cazamento del Rey D. Affonso VI*, manuscript XCVIII, dated 1666, from the library of the Foundation House of Bragança, located at the Palace of Vila Viçosa. The emblems were printed in a fac-simile edition by Xavier and Cardim²⁷. Those compositions were selected to match two important criteria: the mottoes are written in Portuguese; and they were designed to communicate with the wider public (not only readers of erudite emblem books). This means that those emblems were design to be displayed on triumphal arches, set up on the streets in the context of a royal festival, and aimed to convey a message to all, including a large number of people not acquainted with emblem books²⁸. The participants in the pilot experiment are likewise unfamiliar with *ars emblematica*.

²⁴ Keith Rayner, “Eye movements and attention in reading, Scene perception and visual search”. *Quarterly Journal of Experimental Psychology*, 62 (2009): 1457-1506, <http://dx.doi.org/10.1080/17470210902816461>

²⁵ Limor Shifman “Memes in a Digital World: Reconciling with a Conceptual Troublemaker,” *Journal of Computer-Mediated Communication*, 18, no. 13 (2013): 362-377, at 364, <https://doi.org/10.1111/jcc4.12013>

²⁶ David Graham, “Memes as potential emblematic survivals: virality, mobility, morality”, in *En la senda de Alciato: práctica y teoría emblemática*, ed. Alejandro Martínez Sobrino, Jesús Bartolomé Gómez, Cirilo García Román, Pedro Redondo Sánchez (Valencia: Universitat de València, 2022), 479- 492.

²⁷ Ângela Xavier and Pedro Cardim, *Festas que se fizeram pelo casamento do Rei D. Afonso VI* (Lisboa: Quetzal, 1996).

²⁸ “The emblems, in stark contrast, compelled the viewer to take a pause in order to decode their meaning, a process that involved careful analysis and reflection. The use of emblems seems thus to represent a distinct interest and disposition, which appears to contradict the dynamic nature of the triumphal procession”, as discussed by Tamar Cholzman, “The

²¹ David Graham, “‘Piece out our imperfections with your thoughts’: Lessons from the History of Emblem Studies,” *Emblematica*, no. 22 (2016): 1-42, at 31.

²² Taylor Clement, “Broadcast networks and the Early Modern emblem”. *Word & Image*, no. 35:4 (2019): 437-455, at 437, <https://doi.org/10.1080/02666286.2019.1631737>.

²³ Daly, *The Emblem*, 95.

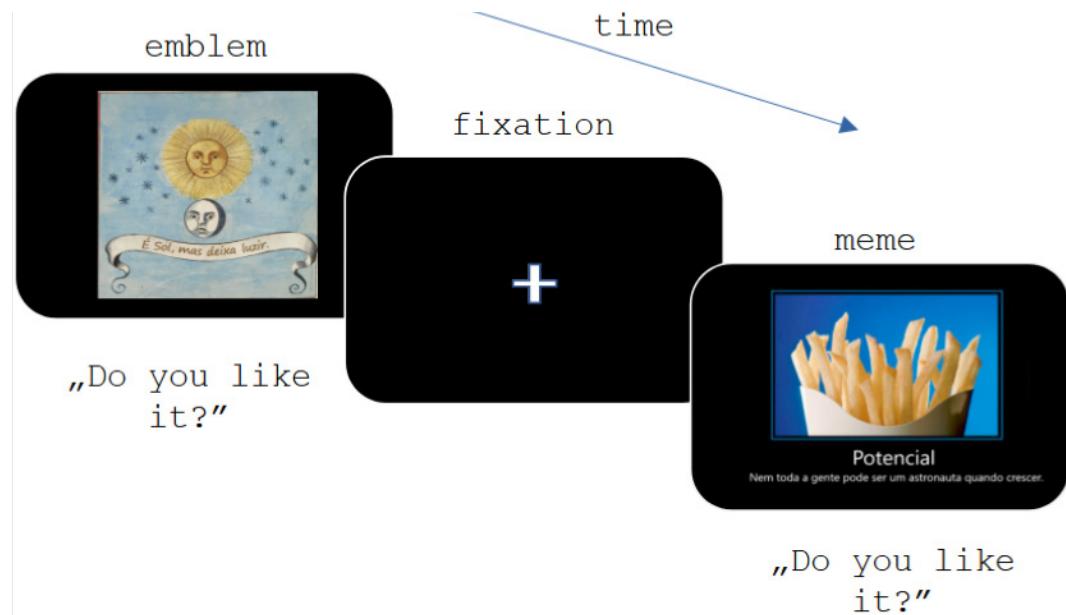


Figure 1: Illustration of the exercises during the experience held in July 2022. Coimbra. Source: Authors

Memes Demotivational poster-style images were taken from publicly available resources at the website <https://knowyourmeme.com/>. English captions were then translated to Portuguese (see Figure 1) to guarantee that all subjects (native speakers or fluent in that language) would be able to understand them.

Procedure

All participants completed a 5-to-15-minute experimental session in a quiet room. They received a clear explanation of the experimental procedure.

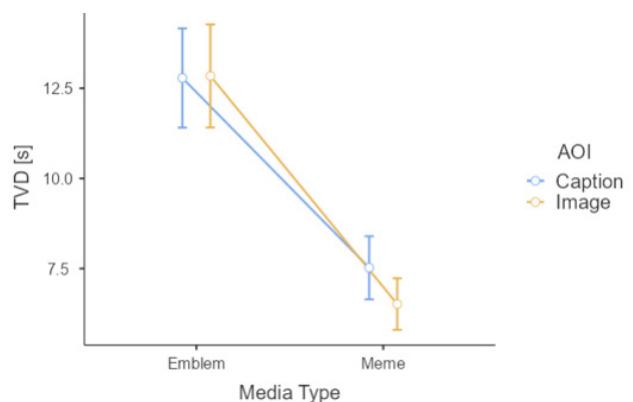
Data was acquired using the eye-tracking system Tobi TX300 with integrated cameras. Participants used a chin rest, adjusted to each individual, for comfort and movement control. Standard calibration procedure of the eye-tracker was done for each participant before starting the experimental task.

The experimental task consisted of one task, implemented in Tobi Studio 3.3.1, in which participants saw a series of emblem and meme images, displayed in a random order, and were asked to press the keyboard key *A* if they did not like the image they were seeing or the key *L* if they liked the image they were seeing. They had unlimited time to answer, during which the image was being shown. After the answer, in-between images a fixation cross was displayed for 1 second (see Figure 1). For each image two Areas Of Interest (AOI) were defined – AOI Image (i.e., image/figure area) and AOI Caption (i.e. caption area). From each participant recording were extracted: all fixations, fixations index, total visit duration (i.e., total time spent visualizing an image), time to first fixation (i.e., time spent between the beginning of image display and first fixation) and AOI Hit (i.e., indication if the fixation is located on an AOI and if so, in which). The first, the middle and the last fixations were used. Figure 1 shows a schematic transition between emblem and

meme stimuli. Each image was displayed until participants pressed a button corresponding to their decision “like/don’t like”.

3. Results

Total visit duration. To test the influence of image-text structure on duration of the viewing of the stimulus, we performed a $2 \times 2 \times 2$ ANOVA (Media type: Emblem/meme; Area: Image/Text; Text location: Top/Bottom). We found that emblem images were gazed at significantly longer than memes ($F_{(1,23)}=62$; $p<0.001$; $M_{\text{diff}}=5.8$). Moreover, post-hoc tests revealed that emblems with caption on the bottom were gazed significantly longer than those with caption on the top ($T_{(23)}=2.8$; $p_{\text{Tukey}}<0.43$; $M_{\text{diff}}=1.9$). No other main and interaction effects were significant. Most importantly, there was no difference between the time subjects spent gazing captions and images in both emblems and memes.



Graphic 1. Total visit duration (TVD). Source: Authors

Fixation order. Next, we tested the order of eye fixations to determine in which part of the emblems/memes the first, the middle and the last fixation were located. These results were clear: first fixations were mainly aimed at the center of the image, middle fixations were on the text, last fixations were back on the image (see

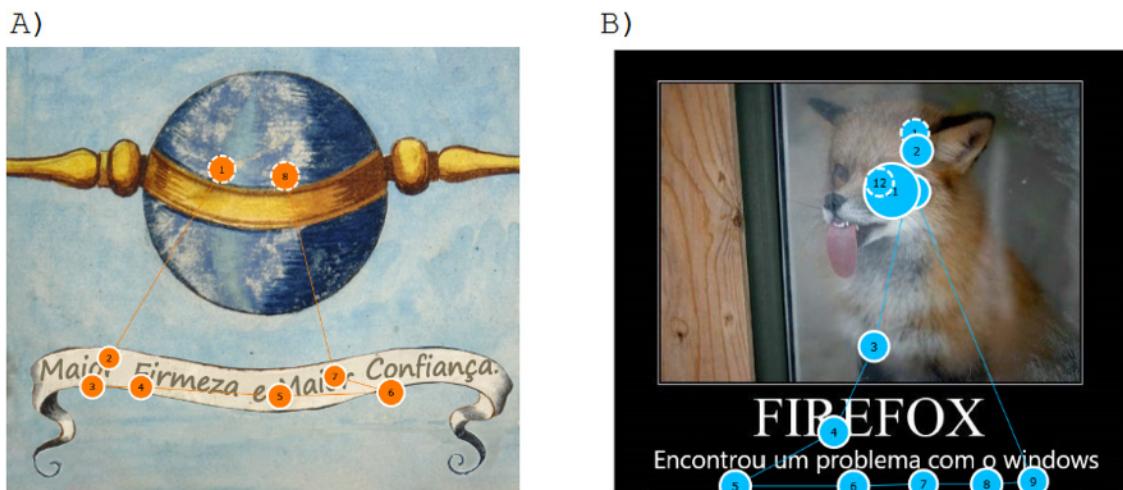
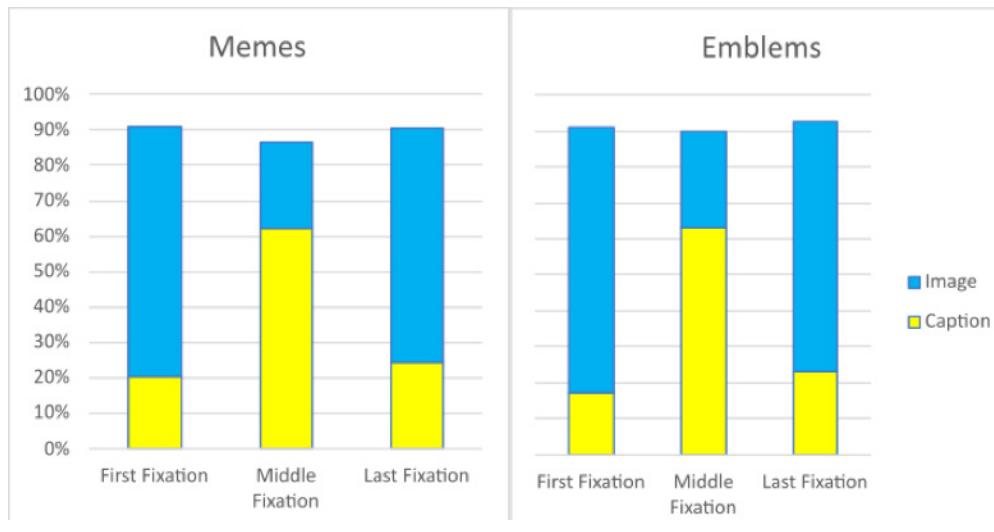


Figure 2: Illustration of the exercises during the experience held in July 2022. Coimbra. Source: Authors



Graphic 2. *Temporal order of gaze fixations*. Source: Authors

figure 2 and graphic 2). We confirmed these results additionally through proportion tests that confirmed highly significant ($p<0.001$) differences in proportion of fixations per element, as described before (compare: figure 2 and graphic 2). This order was true for both emblems and memes, indicating a similar processing scheme [Insert figure 2 and graphic 2 about here]

Subjects spent a similar amount of time gazing at images and captions in both memes and emblems.

Figure 2 examples orders of fixations in an individual subject viewing an emblem (A) and a meme (B). Graphic 2 shows group proportion statistics for first, middle and last fixation.

The next figure illustrates schematic temporal order of fixations as per experimental data collected here. First fixation lands on the image, middle fixations scan the motto, last fixations are on the image. This is true for both emblems and memes. [Insert figure 3 about here]

4. Conclusions

Eye tracking allowed us to test the order in which subjects allocate their perception when looking at emblems. In particular, we show that the viewer's attention first lands briefly on the image, then shifts to the text and after reading it, returns to the image to give a more thorough, cognitive scan of the whole. This

image-text-image gaze pattern was preserved for modern text and image objects (memes). This overall finding shows that, while it's the image that attracts attention first, the caption serves the subsequent cognitive processing (understanding) of the image. In sum, our empirical findings yield support to the theory that images are more able to catch someone's attention than words, as Ménestrier argued²⁹.

Eye tracking allows us to study the cognitive processing of meaning across texts and images. It exploits the connections between specific parts of emblems. In general terms, recent theory claims that an emblem is more than the sum of its textual and visual parts, involving an interpretative practice that produces a new meaning from the combination of words and images. Our experiment demonstrates it, corroborating the theoretical considerations advocated by Graham³⁰ and weakening Peter Daly's hypothesis about the leading role of the *inscriptio*³¹. But it raises many other questions. Is this a specific characteristic of emblems? Is it a functional point of differentiation from other related genres, also bimedial? Can we say that it is different from similar bimedial compositions, like memes? Or does it work for every

²⁹ Ménestrier, *L'Art des Emblèmes*, 211.

³⁰ See note 19.

³¹ See note 21.



Figure 3: Illustration of the exercises during the experience held in July 2022. Coimbra. Source: Authors

logo-iconic composition? If it does, what makes emblems different? Does it make sense to define emblems based on a “special kind of play on meaning among its parts to create significance”? This contributes to reinforce the impossibility of *emblemata nuda*³².

To conclude, it is noteworthy that emblems not only open a window on the attitudes and mentalities of the early modern world, but also train our skills to interpret logo-iconic compositions that are created today. The use of these devices in political propaganda has been extremely widespread over the centuries, and specially in recent decades with social media, in spite of being so poorly comprehended, making so many people vulnerable to publicity. That is one of the reasons why it is so important to better understand emblems, and empirical research methods can provide substantial support to this understanding. Our study opens therefore an innovative way by developing tools to allow us to do it, presenting experimental evidence of how we do read bimedial compositions.

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³² See Graham, “Memes as potential emblematic survivals”, 481.

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