Drawing as Language

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Introduction

Drawing and graphic communication can be taken as equivalent concepts; in fact, drawing always aims to convey a message through an alternative language to the verbal one, and its communicative nature is implicit. Starting from the formulation of this position, theorized 25 years ago by Manfredo Massironi in support of his famous taxonomy of graphic production [Massironi 2002], it is possible to observe how the disciplinary area of Drawing has evolved over time to become today a field of research not only capable of proposing effective graphic representations and translations, but also of providing answers to the questions emerging from contemporary society through problem-driven research [Abbott 2001] and a plurality of projects and solutions in the form of graphic-visual artifacts. However, although this role has become central in relation to the changing demands coming from the community and although the multiple applications often identify answers of high specificity, the origins of drawing remain strongly rooted precisely in its primal nature as one of the most effective, versatile and widespread communication languages and, precisely because of this, capable of developing solutions for the most complex problems. Investigating the communicative matrix of drawing, understood as the common denominator of a wide and plural range of design declinations, is thus configured as a necessary act in the contemporary context of an increasingly diversified and specialized

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research, with the intention of recognizing its origins, acquiring renewed awareness of it and reverberating them in the daily practice of representation and design. Drawing means using a language made of graphic signs but also of relationships, communicative intentions and interpretations of reality. From this perspective, drawing is not merely an illustrative tool, but is instead an expressive, cognitive and critical medium capable of shaping thought and transforming it into shared communication. Recognizing the identity between drawing and language then means restoring to drawing its role as a bridge between perception and production, between representation and thought, between silence and communication.

Language

Drawing, from its earliest expressions, originated as a practice of communication. Even before specializing as a tool of ideation or representation, drawing thus responds to a communicative intention, consequently assuming the structure of a visual language, endowed with its own rules and functional modalities autonomous and distinct from those of verbal language: drawing must therefore be interpreted not only as a means of graphically reproducing reality –although every drawing is never to all intents and purposes just a reproduction of reality– but above all as a semiotic system, capable of conveying information, organizing content and generating meaning. Drawing does not merely show, but structures a visual discourse that is encoded and decoded according to specific cultural codes. The communicative nature of drawing emerges clearly in the processes of ideation and design; each graphic stroke is a carrier of information because it represents, describes, hypothesizes and orders. In this sense, drawing actively participates in the construction of knowledge, acting as a form of visual thinking [Arnheim 1969]. In the act of drawing, complex cognitive structures are activated that enable abstract concepts to be processed, visualized and transformed into graphic artifacts; these processes involve visuospatial skills and the integration of perception and imagination, as well argued by cognitive psychology studies [Kosslyn 1994]. The mutual identification between design and language is thus made evident not only in the stages of conception, elaboration and production of graphic-visual artifacts, but in general in all design processes that require norms of communication of designed forms, which always result in the definition of a system of signs codified in relation to specific needs. In 'shaping' the image of an artifact, choices are in fact involved concerning the graphic elements, their mutual relationships, the hierarchies established among them, the greater or lesser degree of iconicity, symbolic content, and morphological and expressive qualities. This system of choices actually involves the identification of all aspects that structure a linguistic system: an alphabet, interpreted as the range of producible and perceivable signs; a morphology, understood as the classification of signs into categories; a syntax, read as a system of rules pertaining to the structure and function of signs; and a semantics, defined as the association of meanings to signs and their aggregations.
The function of the graphic sign is thus to communicate a message; in intentional communication, the process requires at least two participants, an issuer and a receiver. The message is issued in a medium and is immersed in a set of shared conventions or codes, which will allow its encoding by the sender and decoding by the receiver or interpreter. This scheme is declined in the linguistic and semiotic context from the working model of the communicative process originally devised for signal transmission in telecommunications engineering [Shannon, Weaver 1949], according to which communication consists of the transmission of a message from a source to a receiver through a channel, considering the possible interference of 'noise' and the needs for encoding and decoding. It is therefore a process that involves a dynamic interaction between the production and interpretation of the sign, which are strongly conditioned by the specific communicative context.
Indeed, as a language, drawing is never universal, but is influenced by the cultural context in which it is generated and received; it thus conveys a vision of the world, synthesized and expressed through processes of selection, composition and signification that occur during the 'putting into form' of any graphic artifact. Drawing thus reveals its identity as a critical act and *modus interpretandi* of reality. In this sense, to speak of drawing as language is also to recognize its generative power and capacity to formulate hypotheses, models and alternative visions of reality.

In light of these considerations, the analysis of drawing as a complex system, in the context of which signs assume a conventional and codified role in relation to communicative intent, requires an interdisciplinary approach that interweaves semiotics, neuro-cognitive processes, psychology of vision and history of representation within an articulated framework capable of highlighting the functions that drawing itself plays within communication and the construction of visual thought.

Sign

Moving on from the intention of investigating the foundations of drawing as language, it is appropriate to recall the etymological derivation of the word 'drawing,' which, although now widely known and shared, is an indispensable starting point for undertaking any discourse on drawing as language. Drawing understood as a system of signs has, in fact, deep cultural origins that are reflected in its etymology. The relationship between the Italian words '*segno*' and '*disegno*' and the analogous ones between the corresponding German words '*zeichen*' and '*zeichnen*', English 'sign' and 'design', and French '*signe*' and '*dessin*' recalls the Latin etymological root that sees the union of '*de*' (separation) and '*signum*' (sign). Literally, therefore, to 'draw' means to separate, to scan signs. Over time, in all drawn languages, this process has been implemented following certain codes and rules, adopting particular alphabets and symbolic conventions, applying appropriate notational, descriptive, narrative and design strategies.
The rules defining the separation –and thus the association– of graphic signs are defined within the discipline of graphic semiotics, a specific declination in the field of graphics of the more general science of semiotics, which governs the relationships between signs and whose formalization in the modern era occurs by the Swiss theorist Ferdinand de Saussure and the American philosopher Charles Sanders Peirce.
Again, it seems necessary to recall the principles underlying the semiotics of graphic language, according to which a graphic sign can be interpreted as consisting of two elements: a signifier and a signified. Having defined this dyadic model, apparently elementary but rich in interpretative implications, de Saussure discusses the character of arbitrariness that distinguishes a sign: it results in fact from the 'arbitrary' association of a signifier (the form of the sign) and a signified (the concept that is made to correspond to that sign) [de Saussure 1931, pp. 100-102]. In this regard, however, it is necessary to speak of a relative, or in some respects constrained, arbitrariness, since many signs are 'guided' by their referent: in the case of a word, the referent is often the sound associated with the word itself (think of the emergence of onomatopoeic terms, which are very frequent in the manifestations of language); in the case of a graphic sign, the referent is often the form of the real object with which the sign establishes a correspondence relationship (this referent determines, for example, the character of iconicity of the sign itself). And, even in the case of signs that do not establish a direct correspondence with a real referent, the form may turn out to be related to or driven by symbolic associations that distinguish the cultural context in which that sign was born and developed.
The triadic semiotic model proposed by Peirce introduces a further level of complexity, defining the relationships between three entities: *representamen* (perceivable aspect of the sign, which has the task of conveying its meaning), object (concept or entity, concrete or abstract, to which the sign refers), and interpretant (effect generated by the sign in the mind of the person who interprets it) [Peirce 1906]. In this theoretical framework, Peirce classifies signs into three categories, each with numerous possible subdivisions. The 'index' is a sign that arises as a result of, or is placed in contiguity with, its meaning: classic examples are the imprint or the trace, understood as a sign of a previous presence in a certain place. The 'icon' is a sign that presents a similarity or an assonance with its denoted, as occurs in the case of some road signs that present a schematic image of a real referent. Finally, the 'symbol' is a sign that has no apparent resemblance to its meaning, but operates within a series of agreed conventions. According to this classification, the drawing as a result of the passage of a tool over a surface is classified as an 'index', but the product of this action can instead be classified as an 'icon' –if the aim is to depict a subject– or as a 'symbol' –if the aim is instead to use it to communicate meanings other than simple representation– [Ashwin 1984]. Translating the three categories within the disciplinary field of Drawing, it is possible to provide a specific reading of some terms that are often used indiscriminately, but

which contain important declinations of meaning. The term 'representation' is linked to the concept of drawing as an 'icon', as a recording of an object or a visible phenomenon, and is specific to the so-called artistic or figurative drawing. 'Visualization' is instead more closely linked to making 'visually material' a form, an idea or a concept that otherwise exists only in the mind of the designer, but always in an iconic form. The concept of 'notation', instead, is more closely linked to drawing as a 'symbol' and is typical of technical drawing (engineering, architectural or design in a broad sense), which respects shared standards and symbolic languages.

Structure

In the preamble to the taxonomy proposed in the early 2000s, Manfredo Massironi states that he uses the terms 'drawing' and 'graphic communication' as synonyms, to refer "to any set of marks, produced with any suitable instrument for the purpose of communication without words" [Massironi 2002, p. 1]. His theoretical reflection, summarized in his best-known publications such as *Vedere con il disegno* (Seeing with Drawing) [Massironi 1989] and *The Psychology of Graphic Images* [Massironi 2002], is deeply influenced by the artistic experience gained in the 1960s within Group N [Feierabend 2009; Bartorelli et al. 2022]. The artistic collective, composed of Alberto Biasi, Ennio Chiggio, and Toni Costa, among others, initiated an intense season of visual experimentation aimed at the systematic exploration of the relationship between perception, graphic structure, and observer involvement. Setting aside the aesthetic function of the work of art, the object of investigation becomes the cognitive function of the visual language, which is explored through optical and kinetic installations, modular works with a dynamic character to which a role of perceptive verification is entrusted; drawing is not limited to representation but becomes an agent factor, stimulating a dynamic observation, generating interpretative ambiguities, building cognitive relationships. By foregrounding the work as an instrument of communication and interaction on the perceptual plane, drawing concretely experiences.
The experiments of Group N matured from a series of earlier reflections on the linguistic role of sign. Firstly, a significant study is the one developed by René Magritte in *Les mots et les images* [Magritte 1929], which, by mocking the ambiguity that exists between image and word and the conventional nature of their relationship, shows how the two linguistic systems can interact in complementary or contradictory ways. On the operational and design level, Gyorgy Kepes, an artist and theorist of visual communication, describes in Language of Vision how visual forms are structured into language [Kepes 1944]: for Kepes, vision is an active process during which the eye organizes, interprets, and gives structure to an ever-evolving link between visual form and cognitive structure. A few years later, Rudolph Arnheim investigates in Art and Visual Perception the perceptual processes of artistic images by affirming the visual quality of thought and emphasizing the organizational activity of the mind that is activated by perceptual dynamics [Arnheim 1954]; the principles listed, borrowed from Gestalt psychology, act as a grammar that enables the observer to understand and interpret visual content.
Massironi selects the most relevant uses of drawing in human communication in different eras and for different purposes. These uses are represented in a diagram that visualizes the evolution of drawing languages as a river configuration in which different branches can meet, get lost or originate other branches. According to this diagram, the languages by which drawing declines are continuously subject to transformation, deformation, expansion, and reduction. Their flow is sometimes rapid and vigorous, other times slow and stagnant. The sources die out and then reappear. The flow proceeds ineluctably through two main tributaries: that of representational languages and that of nonrepresentational languages, both of which remain continuously active [Massironi 2002, pp. 2-4]. Beginning with Massironi's diagram, and consistent with its internal rules, an update of graphic production was then also hypothesized in light of the new graphic representations processed today with and for new digital technologies [Cicalò 2020]. The diagram thus drawn not only takes into account technological innovations but also complements and updates Massironi's taxonomy. This update, too, continues to highlight the possibilities of movement and exchange, as well as of new contributions, confluences and branches, within a liquid network and therefore in continuous transformation, in which the knowledge produced at one node passes through the various ramifications reaching all the others, almost pandering to the

principle of communicating vessels that restores unity to a system of nodes apparently unrelated but actually strongly connected.
The Saussurean approach first, and the classification of signs into icons, indices and symbols operated by Peirce in the American philosophical tradition [Peirce 1906], open the interpretative horizon towards a structuralist meaning of communication, which can also be applied to the visual sphere. In the Treatise on General Semiotics, Umberto Eco [1975] develops an extended vision of the sign, which includes not only verbal expressions, but also visual, plastic and graphic languages. According to Eco, images, drawings and visual configurations also participate in the 'universe of signs' and must be read in the light of the cultural codes that regulate them. In particular, Eco underlines the always conventional nature of the graphic image and highlights that its understanding depends on the existence of a code shared between sender and recipient [Eco 1975]. In the context outlined, the drawing is confirmed as a codified semiotic structure, which can be shaped on the basis of different levels of abstraction or iconicity [Moles 1972; Anceschi 1992; Wileman 1993] and that is capable of transmitting complex contents, even abstract and operational ones as in the contexts of design and science. The interpretation of such a structure requires skills, cognitive habits and knowledge belonging to the cultural system in which the drawing is produced; furthermore, the interpretation is dynamic, since the meaning changes according to the use and the specific function.

Code

Learning sign-based languages involves not only the processes of decoding perceived signs but also the complex process of encoding the signs themselves. Thus, learning drawing languages also requires the development of skills in both decoding and encoding visual information. It therefore makes sense to speak of graphic communication to refer to the component of coding messages that will then be decoded through the perceptual processes generally associated with visual communication.
The English language offers the possibility of declining literacy into at least four variants, 'literacy', 'oracy', 'numeracy', and 'graphicacy', referring respectively to education in the languages of the written word, the spoken word, numbers, and finally graphic signs. These are often referred to as 'the four aces' that are played in the 'game' of learning but, when the time comes to discard one of them, the one chosen is always graphicacy [Balchin, Coleman 1966].
Visual perception and graphic representation can thus be regarded as two sides of the same coin. The gaze performs a round trip into the territory of visual communication, by which in one sense the signs of graphic representation are encoded and in the reverse sense the same are decoded through visual perception.
It is that same journey that connects visual perception and graphic representation and that is undertaken daily and continually in the face of messages whose transmission is entrusted to visual communication. Indeed, perception can be likened to a process of 'decoding'external reality by the observer; it involves an attribution of meaning and an acquisition of meaning. Graphic representation, on the other hand, can be seen as 'coding,' that is, as a process through which graphic signs are chosen, constructed, and juxtaposed with the aim of conveying a given meaning [Massironi 1989].
Knowing the mechanisms of visual perception and the strategies of gaze allows one to strategically design graphic representation so as to consciously guide perception and make visual communication effective.

Design

Drawing also enables experimentation and exploration of alternative solutions, configuring itself as an autopoietic act: design takes shape in drawing, and drawing shapes design thinking.
The roots of drawing as a design code can be traced from the second half of the nineteenth century in the Anglo-Saxon context when, in conjunction with the Second Industrial Revolution, three different approaches to education in the field of drawing were emerging that would later characterize the English educational landscape of the second half of the nineteenth century: the first, linked to the tradition of the past, which saw the Royal Academy of Arts as the most representative institution; the second, linked to the new demands of industrial production, represented by the Schools of Design and the Department of

Science and Art; and finally, the third, non-institutional, which was recognized in the leadership of John Ruskin and focused on overcoming a utilitarian conception of drawing toward a recognition of its role as a means of refining vision, of acquiring and communicating knowledge on a par with reading, writing, and counting skills. Although different, these three conceptions have in common that they consider drawing as a language of form; however, it is to the second conception, linked to production, that we owe the first formalization of drawing as a design language, made necessary by the growing demand for skills in the field of reading and producing shared graphic codes capable of supporting new industrial production processes.
But drawing, in addition to being a useful design language, is itself a design.
The design of graphic languages is the area in which the communicative nature of drawing emerges most clearly, since it involves the definition of all the characteristics of a language: an alphabet (made up of lines, signs, symbols), a morphology (capable of organizing elements into categories), a syntax (consisting of a set of rules of usage) and a semantics (apt for the association of meanings). Examples include all the coded sign systems that find application in countless contexts, from architectural representation to road signs, from musical notation to cartographic applications.

Perspectives

In an age when digital technologies are profoundly transforming the way we design, communicate and represent, drawing maintains its centrality as a visual language. From digital twins to graphical interfaces, from concept maps to immersive representations, drawing continually reconfigures itself as a system of signs that can adapt, innovate and communicate. In the light of these technological developments, drawing languages have evolved and are continuously evolving, taking on new declinations and physiognomies that are sometimes difficult to trace back to the conventional forms of graphic languages, their generative methods, and traditional theories. Today, drawing languages are expressed through new digital tools that also force the redefinition of theoretical and cultural tools.
Graphic languages today are increasingly becoming graphic-digital languages, based on forms of coding and computer procedures that are increasingly moving away from manual procedures based on the trace, on that relationship of contiguity inherent in drawing as an 'index' defined by Peirce.
These languages are being developed in digital environments that bring representation closer to programming, which make drawing languages increasingly similar to computer languages, more or less mediated by interfaces that recall traditional tools, methods, codes and alphabets.
These are the new forms of contemporary drawing, a drawing that continues to take on the meaning of speaking a language made up of graphic signs, but also of relationships, communicative intentions and interpretations of reality. In this perspective, drawing continues to transcend the traditional conception of an illustrative tool, continuing to be an expressive, cognitive and critical medium, capable of shaping thought and transforming it into shared communication. Recognizing the new identities of drawing and its languages then means confirming and strengthening its nature and that role as a bridge between perception and production, between representation and thought, between silence and communication that has characterized its entire history.

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