The Songe, the Kanagawa's *Great Wave* and ISOTYPE. Notes on Drawing as a Natural, Cultural and Universal Language

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Abstract

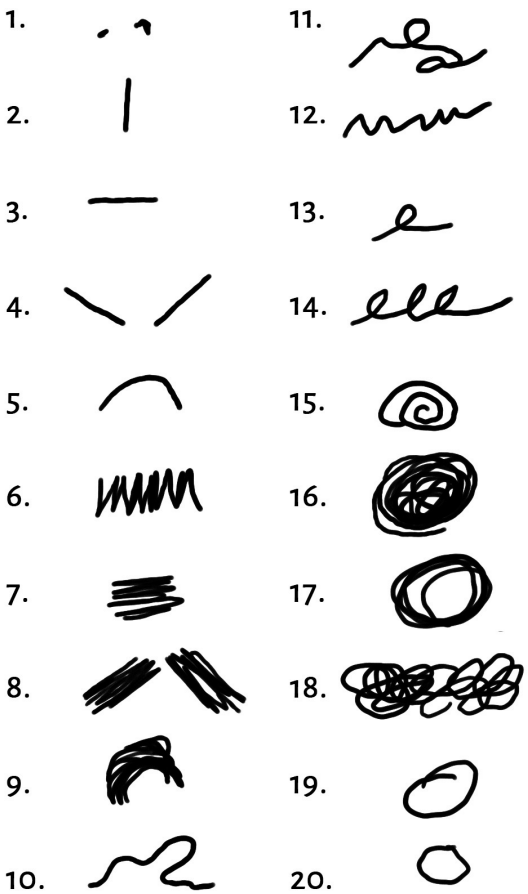
The contribution proposes a theoretical framework for the analysis of drawing, rooted within the studies of psychology and enriched by significant experiences of visual communication, both contemporary and historical. This approach is justified by considering architectural drawing as a specific declination of drawing understood as a broad language, thus allowing many fundamental observations on the nature, functions and processes of drawing already explored in general contexts to be transferred to the field of architecture.
Relevant examples will be shown that illustrate the three main dimensions of drawing as a natural, cultural and universal language, with particular attention to some studies from the 1960s and 1970s that, although partly outdated, are still fundamental in the study of images and drawings.
The overall theoretical framework will then be declined in the specific context of architectural drawing, highlighting how it incorporates and utilises the three linguistic dimensions outlined above in an integrated manner.
The contribution will conclude with an articulated definition of the distinctive features of drawing understood as a natural, cultural and universal language, laying the foundations for future theoretical and practical reflections on drawing understood as a language.

Keywords: natural language, cultural language, universal language, learning, communication.

Prologue

Gilbert Durand introduces his *The Anthropological Structures of the Imaginary* with a genealogy of the persistent ontological devaluation of the image and the psychological devaluation of imagination –defined as a "mistress of error and falsehood"– within Western philosophical tradition, and particularly within the French context [Durand 1972, p. 13]. It was only in the early 1970s, as noted by Lucia Pizzo Russo [Pizzo Russo 1997, p. 9], that the image regained scholarly legitimacy in psychological studies, thanks to Allan Paivio and his *Dual Coding Theory* (1971). It should also be acknowledged that this period saw the publication of other seminal studies, among which we may cite *Visual Thinking* (1969) by Rudolf Arnheim and *Analyzing Children's Art* (1969) by Rhoda Kellogg. These works demonstrate that the renewed interest of psychologists in the image reflects a convergence of perspectives among scholars operating in partially distinct fields – cognitivism, psychology of art, and early childhood education.
After several decades of renewed scholarly attention, however, other research domains have emerged, drawing the focus of the scientific community elsewhere. Nevertheless, the studies from the second half of the twentieth century, although in part superseded, remain a substantial and validated point of reference for contemporary research on drawing. This theoretical framework provides the fertile ground upon which further investigations into the fundamental features of drawing –as an act of imagination and as an act of imaging through graphic-visual language– may take root.

Fig. 1. The twenty basic graphemes identified by Rhoda Kellogg: 1. Dot; 2. Single vertical line; 3. Single horizontal line; 4. Single diagonal line; 5. Single curved line; 6. Multiple vertical line; 7. Multiple horizontal line; 8. Multiple diagonal line; 9. Multiple curved line; 10. Open wandering line; 11. Twisted wandering line; 12. Wavy or zigzag line; 13. Single loop line; 14. Multiple loop line; 15. Spiral line; 16. Circle with multiple overlapping lines; 17. Circumference with multiple lines; 18. Unfolding circular line; 19. Single crossed circle; 20. Irregular circle (Kellog 1969, p. 18, Tab. 2). Author's drawings.



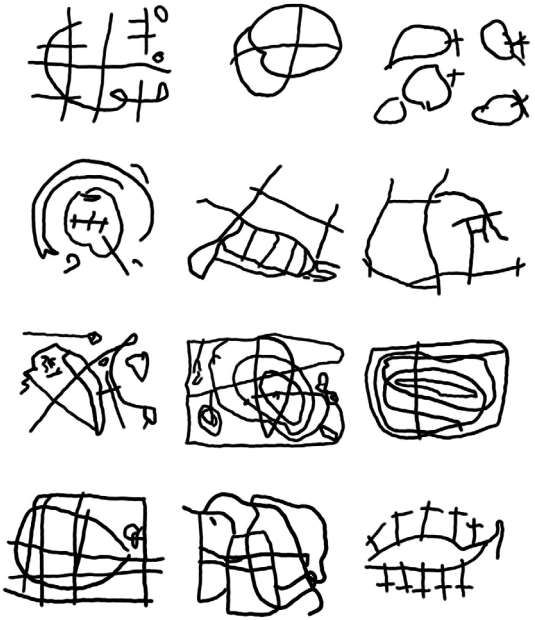
Finally, it is important to clarify that the reference to theories on children's drawing in the present discussion is underpinned by the conception of architectural drawing as a specialised and developed form of a basic graphic-visual language. While endowed with its own functional and disciplinary specificities, architectural drawing shares the same cognitive and perceptual dynamics that underpin the development of graphic competence from early childhood.

Drawing is a natural language

The pioneering contribution of Rhoda Kellogg (1898-1987) is primarily documented in *Analyzing Children's Art* (1969), the result of a systematic analysis of over one million children's drawings (ages 2-8). Kellogg identifies an evolutionary sequence in children's graphic marks: initially, they experiment with twenty basic graphemes, producing what are commonly referred to as scribbles (fig. 1). These should not be understood pejoratively –as in an evolutionist approach that prioritises the end product over the creative process– but rather as primary expressions of individual graphic activity. In this phase, the child explores the proximal space through visuomotor gestures, "knowing" and "measuring" objects while experiencing the intrinsic pleasure of leaving stable traces within their environment. Subsequently, these graphemes are combined into six diagrams, which are then paired and further aggregated into more complex structures [Kellogg 1969, pp. 17–80] (fig. 2). This developmental process, which typically takes place during the preschool years, leads to the production of figurative images, resulting from an increasing degree of sensorimotor control and expressive intentionality. These evolutionary dynamic forms a central element in support of our thesis.
Alongside Kellogg's work –which may be broadly characterised as adopting an aesthetic perspective– three further interpretative approaches to children's drawing can be identified [1]: Georges-Henry Luquet [Luquet 1969] investigates the relationship between drawing and reality from an evolutionary standpoint; Viktor Lowenfeld [Lowenfeld, Brittain 1967] analyses the development of graphic schemata from an artistic perspective; and Robbie Case [Case, Okamoto 1997] focuses on the spatial organisation of compositional elements. Each of these contributions enriches a complex understanding of drawing as a language in formation.

Among the more recent studies, the work of John Willats [Willats 2005] stands out for its formal analysis of graphic structures in children's drawings, privileging the description of graphic systems over inference about the underlying mental processes. While reaffirming the well-established idea that children tend to represent the world in a realistic and effective manner, Willats focuses on the projective models intuitively developed within their images.
His theory is articulated into two main categories: 1. *drawing systems*, which translate three-dimensional spatial relationships in the real world into two-dimensional relationships in the graphic representation; and 2. *denotation systems*, which concern what the lines in a drawing actually represent in the real world. Willats identifies a developmental progression of these systems, reflecting increasing complexity in the depiction of depth, which includes:
- Topology: a representational form in which spatial relationships between objects are inconsistent or indeterminate, lacking any hierarchical organisation of depth.
- Orthographic projection: a graphic mode that suppresses depth relationships, particularly the distinction between front and back, favouring instead the planar alignment of objects.
- Horizontal and vertical oblique projections: techniques that produce simplified two-dimensional views by flattening spatial relationships and diminishing the perception of three-dimensionality.
- Oblique projection: a system that introduces depth through the systematic use of inclined lines, while maintaining a conventional geometric structure.
- Perspective: a visual construction based on lines converging towards one or more vanishing points, used to simulate a spatial perception that is realistic and consistent with visual experience.
- Denotation systems describe what the lines in a drawing represent in the real world, and evolve from closed lines that indicate global volumes (e.g., head or body), to lines that represent distinct surfaces, and eventually to the use of compositional strategies –such as *threading* (connections between elements) or *line junctions* (linear joins in "L", "Y", or "T" formations)– which make edges and contours visible in a manner consistent with a perspectival viewpoint.
These theoretical models, summarised here in their main orientations, provide analytical tools for understanding the complex development of children's mark-making, which is characterised by spatial, schematic, artistic, linguistic, and projective codes, as well as by the autonomy of early phases from formal instruction.
Finally, it becomes evident that the developmental trajectories observed by Kellogg, Luquet, Lowenfeld, Case, and Willats reflect the ontogenesis of graphic language which – ranging from prehistoric times and rock carvings to the contemporary era– appears to replicate, on an individual level, the historical phylogenesis of the species. This notion was already noted by Freud and Haeckel, who stated that "each individual in his childhood in some way repeats in abbreviated form the entire development of the human species, […] the phylogenetic one" [Freud 2010, p. 186] (fig. 4).
Although the recapitulation theory has been discarded in biology, it remains a useful heuristic model for interpreting individual developmental processes within psychological and pedagogical frameworks. Kellogg devotes a specific chapter to the relationship between the development of

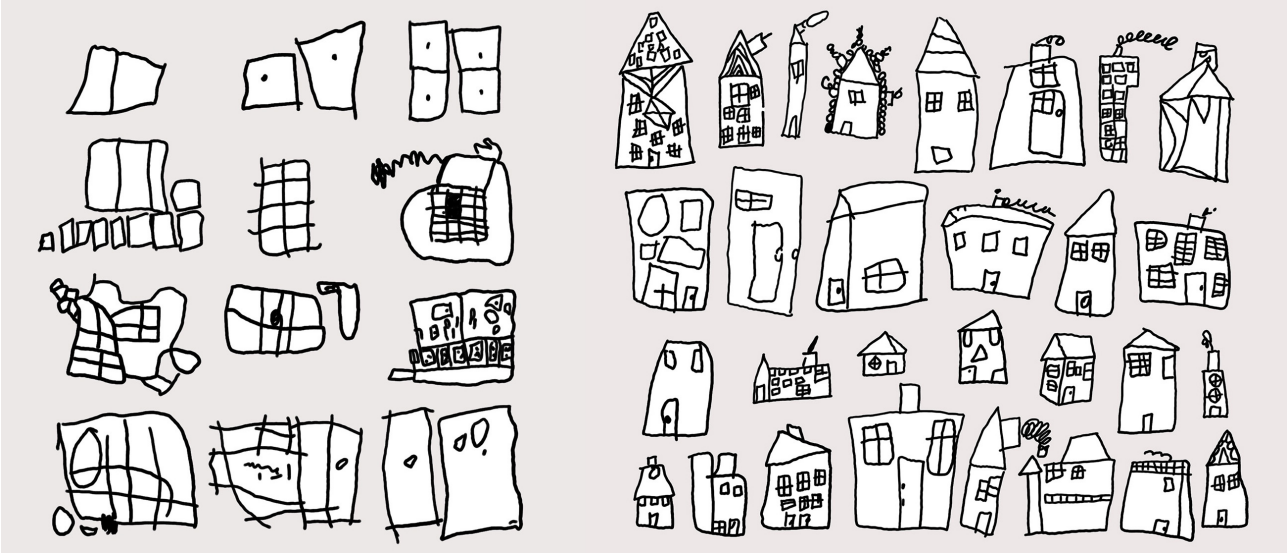
Fig. 2. Examples of aggregates generated by irregular shapes and Greek or diagonal crosses drawn by 3 or 4 year old children [from Kellogg 1969, p. 71, tab. 12]. Graphic elaboration by the author



children's mark-making and prehistoric graphic language, lamenting the fact that, at the time of her writing, many scholars had interpreted certain signs found in rock engravings through conceptually inadequate frameworks, such as symbolism or perspectival thinking. A particularly emblematic case is that of Giedion, who describes as "perspective torque" prehistoric depictions of animals with frontal horns and bodies in profile, whereas "this type of representation is commonly found in children's drawings without being linked to a perspectival conception of object and space representation" [Kellogg 1967, p. 256]. Kellogg further emphasises that assigning a necessarily symbolic or linguistic value to certain marks excludes the possibility that they may have been created purely for aesthetic reasons [Kellogg 1967, pp. 265 ff.].
The comparison between the graphic development of children and the historical evolution of visual language, while contested in certain contexts, allows for the integration of insights from diverse disciplines, offering an interpretative framework through which to recognise, in the early stages of individual drawing, some of the key transitions in the history of graphic language evolution.

In parallel, between the late 1960s and early 1970s, other studies developed systems of graphic analysis and classification that may be associated with that proposed by Kellogg. Notably, Jacques Bertin [Bertin 1967], in *Sémiologie graphique*, introduced a taxonomy of fundamental graphic variables and defined aggregations capable of articulating a complete system of signification, intended for the representation and communication of data, relationships, and spatial phenomena. As shown in Figure 5, his theoretical framework exhibits structural affinities with Kellogg's approach, particularly in the identification of recurrent graphic elements and the ways in which they are combined.
In the specific context of architectural drawing, the analysis of the reasons why we draw –derived from studies on the evolution of children's mark-making– proves particularly relevant. While it may appear self-evident that drawing is the privileged language for elaboration and communication in architecture, design, and the visual disciplines [de Rubertis 1994; Di Napoli 2020], it is nonetheless useful to investigate how the four fundamental functions of children's drawing –*to communicate*, *to represent*, *to express*, and to

Fig. 3. Representative case of associations and aggregates that are precursors of typical buildings in the art of 3- or 4-year-old children (left) and 5-year-old children (right) [from Kellogg 1969, p. 150, tab. 17 and p. 152, fig. 205]. Graphic elaboration by the author.



play– are reflected and specialised in architectural drawing, understood as an applied graphic-visual language.
Adapting this framework to architectural drawing –both design-oriented and survey-based– highlights how the original motivations observed in children's mark-making evolve within the specialised context of architectural graphic language. The elementary functions of children's drawing can be summarised as follows:

1. *To communicate*, in order to share experiences and interests with others;
2. *To express*, as a means of manifesting emotional states;
3. *To represent*, by reproducing significant objects from everyday reality;
4. *To play*, as an intermittent ludic activity.

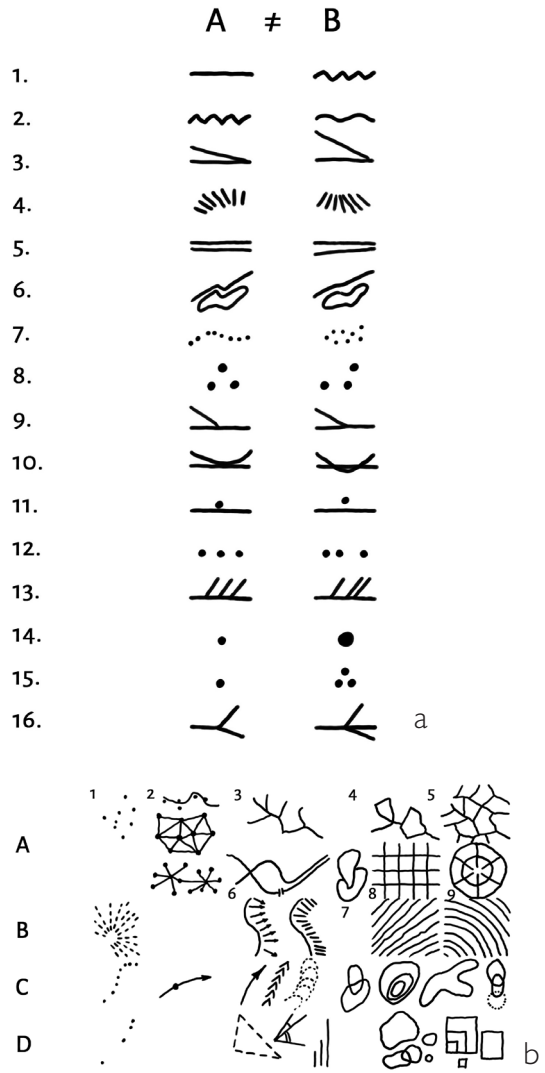
Similarly, within architectural drawing, these functions are rearticulated as:

1. *To communicate*, in order to convey complex and detailed information across diverse subjects and contexts –often without direct interaction– relying entirely on the graphic artefact itself;
2. *To represent*, to establish a direct and unambiguous relationship between sign and referent, whether a designed or existing object, with the aim of understanding proportions, architectural components, and design logic;
3. *To express*, through the use of signs, colours, and graphic solutions as a manifestation of authorship, thus distinguishing meaningful drawings from those that are purely functional;
4. *To play*, by preserving the intellectual and ludic pleasure of drawing, which often remains in adulthood as a primary motivation for engaging in graphic expression.

In the wake of the studies that, since the 1970s, have brought attention back to the image and, consequently, to drawing in the field of psychology, psychologist John Kennedy proposes the decidedly plausible hypothesis that drawing, unlike other forms of figural representation such as images or sculpture, was not 'invented', but rather 'discovered'. His research, conducted in Papua New Guinea and published in 1975, shows that indigenous peoples with a limited visual tradition such as the Songe do not produce graphic or visual artefacts –with the exception of some totemic structures and abstract geometric jewellery– but show a greater capacity to comprehend silhouette drawings of common objects (human body parts, huts, animals, etc.) than indigenous peoples with a more pronounced propensity to produce visual artefacts. Kennedy attributes this capacity to the 'naturalness' of representation through

Fig. 4. Examples attributable to evolved aggregates from different Continents in prehistoric times [Kellogg 1969]. 1. Aboriginal art exhibited at the Australian Museum in Sydney. 2. Mayan (top) and Peruvian motifs. 3. Compositions found in the Altamira caves (E). 4. American Indian motifs [from Kellogg 1969, p. 256, tab. 27; p. 257, tab. 28; p. 262, tab. 34; p. 264, tab. 37]. Graphic elaboration by the author.

Fig. 5. a) Main planar relations; b) Main planar figures and their standard graphical meanings [from Bertin 1967, pp. 303 and 421]. Graphic elaboration by the author.

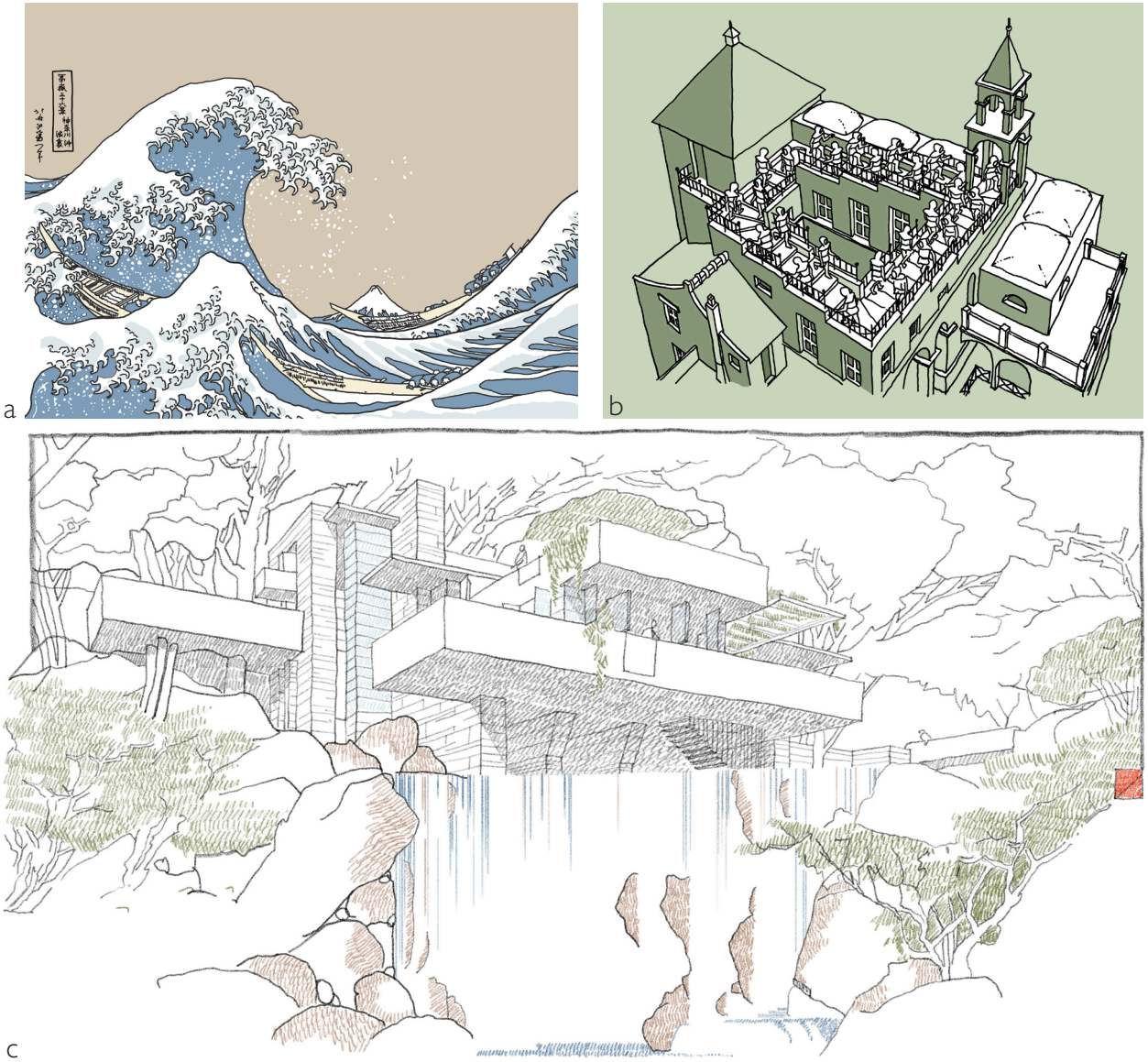


silhouettes: in nature, in fact, the mark left by an element –animal, vegetable or mineral– often takes the form of its silhouette. For example, the trace left by an animal walking on bare earth reproduces the shape of its paw and thanks to this, our ancestors learnt to recognise the presence of prey or a predator. An immediate analogy is that with the projected shadow, which makes it plausible to assume a very remote time when man recognised his own shadow, or silhouette, as an image of himself.
The analysis of the development of the infant sign, the persistence of the fundamental functions of drawing from infancy to creative activities in architecture and design, together with Kennedy's studies supporting the idea of a "discovered" drawing in nature, lead to the consideration of drawing, in some of its forms, as a natural language, which develops coherently in multiple contexts independently of formal learning processes.

Drawing is a cultural language

Drawing, as we have considered it thus far through stadial theories, the fundamental instances of drawing and primitive forms of visual perception, undoubtedly represents an essential but not exhaustive component of the vast and articulated graphic language that our civilisation has elaborated over time. If these primary forms constitute a sort of original and intuitive grammar of drawing, they are nevertheless insufficient to explain the complexity of the systems of signification that characterise the most stratified graphic images of our visual culture. Works such as *Kanagawa oki nami ura* (fig. 6a) –Hokusai's renowned *Great Wave– Ascending and Descending* by Maurits Cornelis Escher (fig. 6b), or one of the architectural perspectives of *Fallingwater House* by Frank Lloyd Wright (fig. 6c), embody levels of signification that transcend mere formal recognisability in relation to their referents. Similarly, even a simple graffito drawn with an unsteady hand, the sketch of a tree made by an amateur, or the icon of an application on our smartphone, all carry meanings rooted in specific cultural, aesthetic, symbolic, and communicative contexts that have been consolidated over time. In each of these examples, the graphic image is not only what it appears to be: it is also –and above all– what it evokes, recalls, and connects.
The evolution of the child's sign –which we have already used as a field of study that can provide useful scientific references for understanding drawing in all its forms– is

Fig. 6. Level of semantic stratification that can be acquired from graphic and visual language beyond the simple recognisability of the represented or communicated subject. a. Katsushika Hokusai, Kanagawa okinami ura (A Great Wave off Kanagawa), 1830-1831 ca. b. Maurits Cornelis Escher, Ascending and Descending, 1960. c. Frank Lloyd Wright, Fallingwater (Kaufmann House), Mill Run, Pennsylvania. 1934-1937. Graphic elaboration by the author.

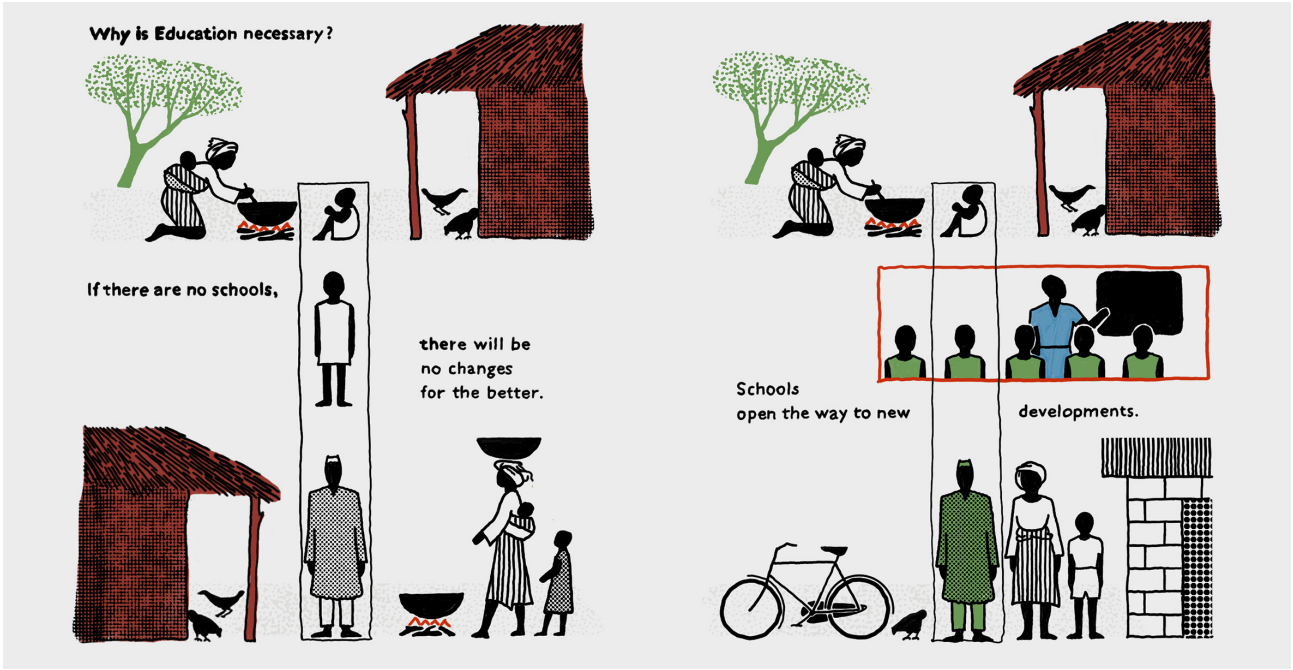


initially a spontaneous and natural expression, but is soon influenced by environmental stimuli, interaction with other individuals and observation of the surrounding world. These factors reflect the cultural context in which the child grows up, determine significant differences between distinct communities and generate divergent modes of graphic-visual approach. Growing up in Italy, Japan or Papua New Guinea decisively changes the path of development of one's graphic language. Drawing, from a certain age onwards, therefore does not develop as a neutral form of language but as a product of a specific visual culture that also conditions the emergence of individual authorship.
Even children's drawing, often considered to be free of external influences, is therefore the result of a collective construction: every stroke reflects a culture, every form is loaded with references. Authorship, in both children and adults –and therefore architects– emerges when the individual more or less consciously reworks the shared visual repertoire, transforming it into his or her own language. Drawing, therefore, is not only representation and communication, but also interpretation and rewriting – hence expression– of visual culture.

Drawing is a universal language

In 1925, Otto Neurath founded the *Gesellschafts und Wirtschaftsmuseum* (Museum of Society and Economy) in Vienna with the aim of making the complexity of the contemporary world accessible to a broader audience, including the less literate social classes. In a Europe marked by the First World War and characterised by profound political and economic tensions, the project of "knowledge democratisation" assumed a strategic function in the pursuit of a

Fig. 7. The graphic-visual equipment is able to transmit a communicative content that could be difficult to convey through written language, which is little or not at all widespread in the territories for which the book is intended [from Neurath 1955, pp. 2, 3]. Graphic elaboration by the author.



more equitable, informed, and participatory society. Neurath identified graphic-visual communication as an effective alternative to verbal transmission, which was hindered by the inaccessibility of written language for a significant portion of the population. With an explicit educational intent, he formulated the need for a graphic language capable of conveying complex content through simple, standardised, and immediately comprehensible forms.

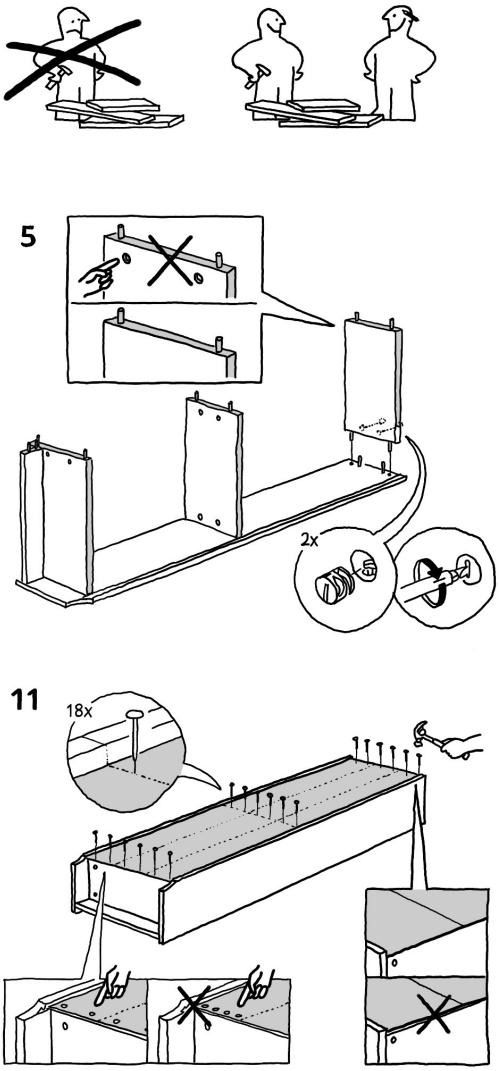
In the following decades, in collaboration with the artist and engraver Gerd Arntz and an interdisciplinary team, Neurath developed the ISOTYPE system (International System of Typographic Picture Education), a pictographic code designed for the visual representation of quantitative and qualitative information using minimal written text. ISOTYPE did not constitute a mere collection of standardised illustrative images; rather, it emerged as an autonomous language endowed with its own syntax and semantics: each symbol held a univocal, defined, and systematised meaning, and could be combined with others according to precise rules to construct complex messages. Unlike narrative illustrations or decorative schemes, ISOTYPE pictograms adhered to principles of standardisation, comparability, and reproducibility. The principle of "the visualisation of numbers" – that is, the proportional correspondence between the number of symbols and the magnitude of the phenomenon represented – anticipates many current practices in data visualisation and infographics [Menchetelli, 2013; Luigini, Moretti 2019].

In the 1960s, under the direction of Marie Reidemeister –Neurath's collaborator and wife, who played a pivotal role in the development of ISOTYPE– the Neurath Foundation participated in initiatives promoted by supranational organisations. Between 1961 and 1962, Reidemeister collaborated with UNESCO in the production of educational booklets aimed at rural communities in sub-Saharan Africa, characterised by high illiteracy rates (fig. 7). This application demonstrates the flexibility and intercultural effectiveness of the ISOTYPE language, capable of overcoming linguistic, alphabetic, and geographical barriers by providing immediate communicative tools to individuals otherwise excluded from access to knowledge.

The adoption of a systemic and non-verbal graphic-visual language thus emerges as a strategy of epistemological inclusion, consistent with the principles of universal education and collective emancipation that constituted Neurath's primary objectives.

Within the context of high-iconicity and functionally operative graphic-visual languages, the instruction manuals for

Fig. 8. Some phases taken from the assembly instructions of the Billy bookcase by IKEA®. Elements of the graphic repertoire developed by the company are evident: circular balloons for detailed operating instructions and rectangular ones to signal potential errors, hands pointing to highlight critical points, grey areas to indicate unfinished surfaces. Graphic elaboration by the author.



IKEA© furniture (fig. 8) and LEGO© construction sets represent paradigmatic examples of what Abraham Moles defines as "constructive drawing" in his taxonomy of levels of iconicity [Anceschi 1992, pp. 26-38]. These graphic systems are conceived as action-oriented languages, designed to translate spatial and operational concepts into visual sequences that are easily interpretable by a heterogeneous user base, regardless of geographical location, educational background, or age. Their primary communicative function is to provide clear, direct, and universally comprehensible instructions, while minimising any potential interpretative ambiguity.
A particularly significant aspect of these designs is their ability to completely exclude the use of written text, relying exclusively on the communicative and functional power of graphic signs. The IKEA© instructions, in particular, have over time developed a minimalist and strict graphic code that even dispenses with the use of colour. Most of the assembly boards are presented as an orderly series of black line drawings on a white background, with occasional grey backgrounds to indicate unfinished surfaces or elements to be distinguished within the structure (see fig. 7). The absence of colour, far from being a limitation, becomes a strategic resource, as it allows attention to be focused on the essential operation and prevents misunderstandings due to print variability or visual perception.
It is a graphic system placed at a high level of iconicity, adopting projective models that are clear in their allusion to three-dimensionality and independent of the subjective position of the observer. This methodological choice aims to avoid discrepancies between the graphic representation –in particular the perspective one– and the actual visual experience of the user during editing, who may observe the model from different angles than the projection centre adopted. If a perspective model is adopted, the representation tends to maintain a wide main distance in order to minimise aberrations and ambiguities.
The success and effectiveness of these constructive designs attest to how graphic language can take on a strongly pragmatic value, performing a linguistic function in the Saussurian sense of the term, i.e. as a system of signs capable of conveying meaning, structured on shared and recognisable rules.
In their apparent simplicity, the IKEA© and Lego© assembly instructions represent some of the most advanced forms of universal graphic language, capable of facilitating the realisation of complex actions without resorting to words, confirming the potential of drawing as a direct vehicle of instructions, contents and three-dimensional spatial relations. In this sense, they stand alongside systems such as ISOTYPE, with its syntactic and semantic rules, capable of making knowledge accessible across geographical, linguistic and cultural boundaries.

Fig. 9. Visual elaborations developed for the final version in competitive bidding process of the design of Project of the New Hospital in San Gavino Monreale, Medio Campidano (now Provincia del Sud Sardegna), 2015. Credits: Imprese: Paolo Beltrami spa, Simic spa; architectural design: AISE progetti (Ing. M. Rossi, Archh. A. Luigini, F. Cipriani, E. D'Amico); plant design: Quality Engineering (Ing. A. Santalucia); technical design: Insight (Arch. R. Di Ramio). Architectural co-designer and coordination of 3D modeling and BIM are by the author.

Architectural design between nature, culture and universality

Architectural drawing, in the plurality of its operative forms, simultaneously activates –but from time to time with different intensities– the three fundamental dimensions of drawing understood as language, namely: natural, cultural and universal. This co-presence is particularly evident in figurative representations that can be traced back to the iconic

code, in which visual similarity with elements of reality constitutes a central parameter of comprehension, as occurs in photorealistic representations –whether from renderings of three-dimensional models or generative processing in AI is indifferent– or in certain project sketches (fig. 9). In these representations, the natural dimension manifests itself in the ability to recognise iconic forms on the basis of spontaneously acquired perceptive skills, which can be partially traced back to the development of the infantile sign up to adulthood and are substantially devoid of formal didactic mediation. Contextually, the cultural dimension emerges in the activation of visual repertoires, prior knowledge and symbolic references belonging to the imagination of the author and his techno-cultural community of reference. Finally, the universal dimension is observable in the possibility of transversal decoding of these representations, generally accessible by both expert and non-specialised users, thanks to the high degree of iconicity, often almost mimetic.

In the case of the drawing of architecture in the codified representations of plan, elevation and section –and all the variants or combinations with which we are familiar– the linguistic configuration is defined, according to Abraham Moles' terminology, as a "normalised constructive scheme", since it is founded on codified rules, symbols and projections –in fact, normalised– that require specific literacy (fig. 10). In this sphere, the natural component tends to be progressively marginalised, while the cultural and universal dimensions are pre-eminent. Indeed, normalised architectural drawing comes close to functioning as a true formal language, based on shared graphic conventions. In particular, architectural

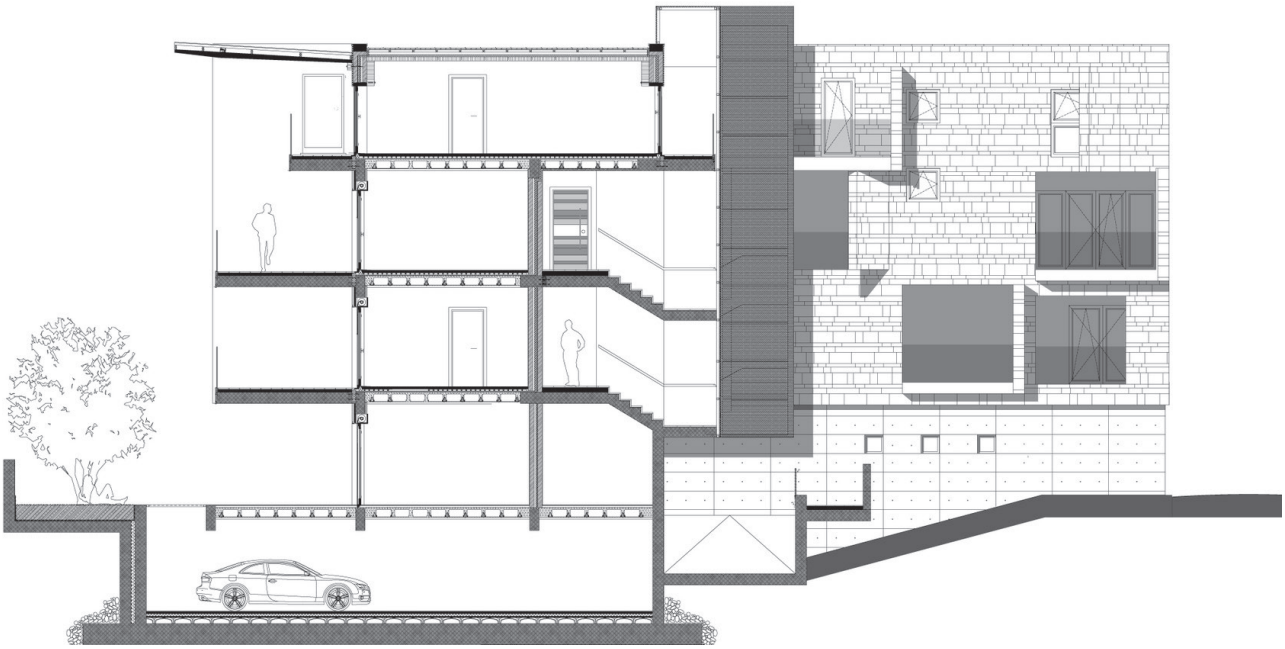


Fig. 10. Detail composition of cross-section and elevation, originally drawn at 1:50 scale, of a residential building in Pescara (2009-2012). Detail drawing by the author.

representation through two-dimensional drawings requires knowledge of the main projective models –mongial projections, axonometry, perspective, etc.– that allow us to allude, through two-dimensional signs, to three-dimensional objects and spaces. These models, as formalised cultural constructs, have a decisive influence on the comprehension at the mental stage of the represented space. Therefore, the decoding of normalised architectural drawing presupposes the acquisition, to a greater or lesser degree, of such models and conventions, without which graphic communication would be impracticable or partially inaccessible. Nevertheless, it is evident how, thanks to the co-presence of elements that refer both to the symbolic code and to the iconic code, these drawings are in part comprehensible –and therefore universal– beyond the cultural context of reference.
In the case of information modelling (BIM, HBIM, etc.) and integrated digital systems, the notion of universality takes on a further technical meaning, which can be traced back to the principle of interoperability (fig. 11). While three-dimensional and superficial modelling software operate mainly on the basis of the processing of geometric data, BIM systems require the sharing of a more articulated set of information - functional, temporal, descriptive, performance, etc. –that must be structured according to widely accepted standards– which must be structured according to widely standardised standards. In this context, universality is not based on perception or iconicity, but on a capacity for procedural integration between different information environments, aimed at multidisciplinary collaboration and a direct relationship between information model and, for example, designed or constructed building. Digital representation is thus configured as a complex language, in which graphic communication merges with the structured transmission of data, confirming the hybrid and multi-level nature of contemporary architectural design.

Epilogue

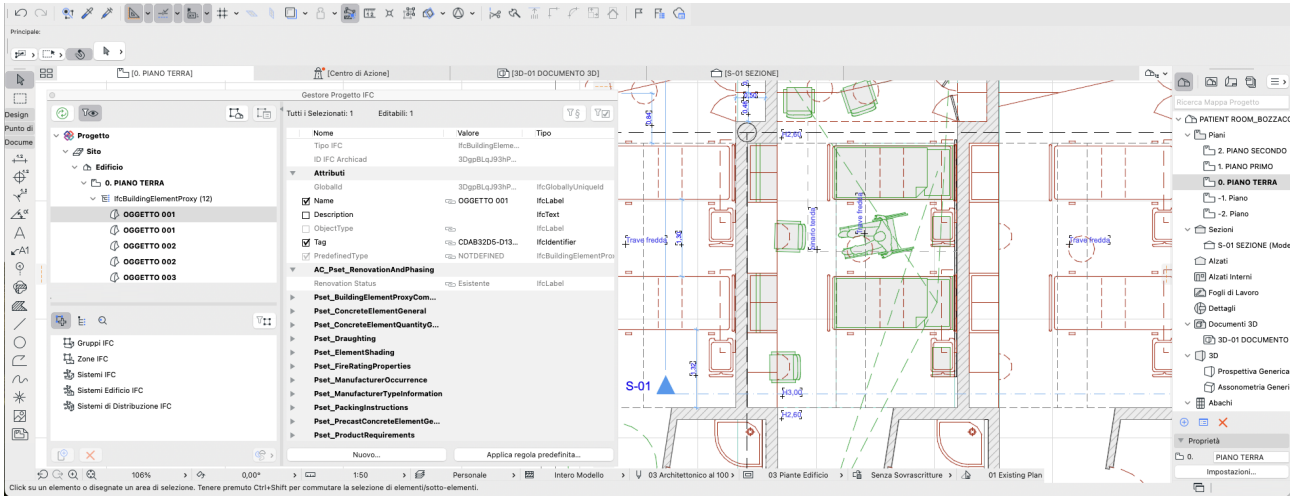
The theoretical and analytical path outlined here aims to demonstrate the validity of extending the psycho-pedagogical interpretative framework –traditionally applied to the analysis of drawing in its original and evolutionary forms– to the specific field of architectural drawing. This interdisciplinary openness not only allows for a deeper understanding of architectural drawing as a complex and specific form of a language that begins to form in the first years of life but also encourages a more structured and conscious reading of its functions and articulations. In particular, the recognition of the co-presence of several linguistic modalities in the same graphic artefact, as well as the possibility of modulating their use in relation to the different graphic codes that can be used, is configured as a useful methodological tool for orienting both the production and the critical interpretation of drawing in architecture.
The considerations developed allow, finally, to draw a further and transversal synthesis regarding the origin of graphic languages, the rules governing their use and the forms of learning necessary for their acquisition, reinforcing the idea of drawing as a stratified and interdisciplinary field of study,

Drawing as Language	NATURAL	CULTURAL	UNIVERSAL
Origin	Innate, rooted in perception and motor skills	Learned, derived from social practices and cultural codes	Based on forms and symbols recognisable across cultures
Rules	Implicit, guided by perceptual principles and spontaneous gestures	Explicit, defined by historical, aesthetic, and technical conventions	Semi-standardised, designed to be interpretable in diverse contexts
Learning	Implicit, guided by perceptual principles and spontaneous gestures	Mediated, transmitted through education, training, and visual tradition	Hybrid: requires intentional design but aims for immediate understanding

Tab 1 - The table summarises the distinctive features of the three declinations of design as language.

a language at the crossroads between nature, culture and universality, according to the following declinations:
- Drawing as a natural language emerges spontaneously in childhood, prior to graphic-visual literacy and formal instruction. It has an innate origin, rooted in visual perception and the motor skills of the graphic gesture, follows implicit rules based on common perceptual mechanisms, and is acquired automatically as part of the human evolutionary process in the forms we have previously outlined;
- Drawing as a cultural language relies on codes learned within a community, arising from social practices. It is structured around explicit rules –graphic conventions, styles, and systems of representation rooted in centuries of tradition– and requires a mediated learning process through education and the transmission of a graphic and visual culture;
- Drawing as a universal language lies between the two aforementioned poles and is a language designed to be understood trans-culturally by using forms and symbols that, while requiring intentional coding, aim at immediate and shared comprehension. Its rules are semi-standardised, often derived from shared graphic-visual systems such as pictograms or graphical user interfaces. Learning in this case is hybrid: it involves conscious design by the author but relies on an instinctive and rapid reception by the recipient, who thus interprets the drawings in a substantially immediate manner, without the need for mediation.

Fig. 11. Screenshot of a BIM software and IFC parameters management. For credits see the caption to figure 9. Architectural BIM model by the author.



Note

[1] One of the themes on which Kellogg underline in several points in the book is the need for a purely aesthetic interpretation of child drawings as much as of rock engravings, as we shall see later in our discussion.

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