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Abstract

Reading pictograms and signs – the need for visual literacy is a study of the impact pictorial signs have on the social and physical environment, and, by extension, on media and visual culture. From the many possibilities that the field of visual representation has to offer, the pictogram – an iconic sign that represents complex facts without resorting to words – is singled out for its distinctive characteristics. Indeed, the pictogram is a unique type of sign for being omnipresent, claiming universal comprehensibility and for declaring absolute neutrality in relation to subjects like religion, politics and gender issues. In order to demonstrate a pictorial sign's capacity to communicate messages that are accepted and observed in any given community, this thesis provides a number of examples from traffic signs to other signs of public information, and gives special emphasis to the ubiquitous stick figure, whose design has more or less crystallized since the 1970s, and has now become paradigmatic.

The study traces the evolution of pictorial signs from the earliest cave paintings to the 21st century computer icons, that with simple algorithms can even be animated. Each reference to pictorial signs is contextualized, for a clearer perception of their weight and relevance both in the panoramas of visual representation and of social phenomena.

Parallel to the historical continuity in sign-making that it demonstrates, the study investigates the relationship between visual signs and universal languages. Conscientiously, it presents an account of defining projects of artificial languages, such as that by John Wilkins, Descartes and Leibniz in the 17th century, before introducing the picture language conceived by Otto Neurath, called Isotype, which is viewed as a breakthrough in pictogram design and use. Other examples of contemporary picture languages are also provided, namely with the cases of PCS, Icon-language and Elephant's Memory.

A purpose that suffuses the whole study is that of advocating the need for visual literacy, as it is understood as a skill that allows us to appreciate and ascertain the use commonly given to pictorial signs, either from a production or reception perspective. In today's world, meanings circulate visually, and not just verbally. The

necessity of a critical look into the interdisciplinary and still emergent field of visual culture is argued and endorsed.

Table of Contents

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Table of illustrations

Introduction

Reading visual signs is a complex task that most of the times seems easy. The fun of it, the effortlessness and the immediate sense of accomplishment it produces are some of the reasons that account for its apparent simplicity. It takes much more time to read a book than to see a painting. And books can be so complicated!, heavy, badly translated, too erudite... Pictures, on the other hand, are brief and to the point, no matter how big or small they are. Or so we think.

Like reading verbal signs, reading pictorial signs is a practice that can produce knowledge, lead to the discovery of new realities, guide us through life, provoke aesthetic pleasure, or simply help to kill time. Although we traditionally and almost automatically associate visual signs to the universe of Art, just a glance at the landscape that surrounds us will show how there are hundreds of signs that escape that sphere, and, in doing so, we discover their immense capacity of expressing the most diverse things.

Let us consider the following situations: A traveller arrives at an unfamiliar airport; to collect his checked-in luggage, he looks for guidance in the sign with a little suitcase. A person in need of medical assistance swerves at the sight of a capital H by the roadside. A smoker sighs in resignation after spotting a notice of a cigarette with a red slash across it posted on the wall in the waiting room where he sits impatiently. A quick check for a triangle on a garment's tag tells the laundry personnel if it is ok to bleach while loading the washing machine. The same shape, (isosceles, although with the base on the vertical left), is found on increasingly smaller buttons on increasingly smaller electronic devices teenagers brag about to indicate where to press for Play…

This is merely a minuscule sample of everyday situations in which we are required to interpret a sign for something else than it is. Generally, we pay little attention to the hundreds of little signs, pictograms and symbols that surround us in our daily routines. But imagine taking them away, and the chaos that would ensue: a country with no road signs, no wayfinding systems, no weather forecast, no safety information. Imagine a multi-cultural urban environment today where all the information provided either by the authorities or by civil services comes solely in a

written form – what if you don't know the language? What if you're not a good reader? The time consumed at getting a task done would be significantly more. One might get lost, damage things, put life at risk – because when we don't see; we don't know. A picture, however small, at the right place makes a lot of difference.

But who is there to teach us how to read them? The case of traffic signs excepted, it is surprising there is no thorough theoretical work, no manuals, no sign compilations available to help us decipher pictorial signs' exact meaning, since, on the one hand, they are designed as sources of vital information, and, on the other hand, there are just so many of them. Why is it so? Are pictograms so self-evident that no complementary explanation is necessary? Are they really the ultimate signs of universal communication? Even assuming they are universally understood – which, as we shall see, they are not, there is nevertheless a need to describe how they function – for they remain, after all, a product of social concern that reflects the age-old desire of communicating without linguistic restrictions.

The environment where we find most pictorial signs is urban. And urban life requires that information circulate freely, unattached from speech, which is limitative. To communicate without words in a logical system is something we observe with music or mathematics. In the same measure these are languages outside the word, so are pictograms and symbols, whenever inscribed within a structure that aims to convey messages, which are socially recognized, their meanings shared and decoded with a more or less equal validity. To the sum of all these signs, the collections from the fields of traffic control, travel and transport, safety or hazard, recreation and electronic technology, visual culture addresses the concept of visual literacy. Indeed, it serves the purpose of mediating perceptions of images, their meanings, their social implications. Metaphorically speaking, it is a tool to combat visual dyslexia.

"Visual culture is not just a part of your everyday life, it *is* your everyday life", stated Nicholas Mirzoeff (1998, p. 3) in his sagacious introduction/provocation to the interdisciplinary field of visual culture, whose creation and development is critically and historically analysed in the volume *The Visual Culture Reader*. There is no doubt that to investigate visual phenomena in contemporary culture will bring us valuable insights into the ways we relate to the world and to each other; it helps to demystify what has been called the digital era, and to understand the skills it entails. Literacy is one of those skills.

An authority on literacy studies, David Barton (1994, p. 101) wrote: “Literacy is so much more than encoding spoken language into writing”. However, despite mentioning a number of notations or notational systems other than scripts, he deals with pictorial signs rather brief and dismissively. In parallel, visual literacy is a subject sometimes found in connection with picture books, as a support to emergent literacy (Fletcher & Reese, 2004; Nikolajeva & Scott, 2006). In effect, a number of studies prove the benefits of picture book reading and endorse the positive influence on children’s literacy skills (Hu & Comeyras, 2008; Cornell, Sénéchal, & Broda, 1988; Ninio, 1983).

But to justify the urgency of visual literacy, this thesis will take on a different approach. Without prejudice to the potential of the interplay of text and pictures as something that engages the reader or viewer on both intellectual and aesthetic/emotional levels (which will be referred at any rate in connection to signage systems), it will focus on the importance not of traditional literacy development (or the proficiency of reading and writing), but on how visuality claims a field of its own.

The present thesis is organized in four chapters:

Chapter I is a first and general approach to the universe of pictorial signs. It gives an historical overview of visual representations that have an affinity to the pictures we today call pictograms, symbols or icons. By pointing out examples of picture-signs, a selection of their features already suggests the requirements for a paradigmatic visual sign.

Chapter II discusses methods and theories for analyzing visual phenomena, the interrelation of seeing and saying, and the ways of interpreting visual signs, namely via semiotics. It places picture signs within the field of visual culture, and introduces the concept of visual literacy. Moreover, it presents the study on visual semiotics by Fernande Saint-Martin and Kress & van Leeuwen’s grammar of visual design. Finally, it provides some definitions of key terms used throughout the study.

Chapter III looks into projects of universal languages, starting in the seventeenth century, with the works of John Wilkins, Descartes and Leibniz, with the intent of signalizing the specific quality in a system that makes its signs reasonable and understandable to anyone on earth. It analyses aspects of Isotype, the international picture language conceived by Otto Neurath in the 1930s, before introducing three contemporary systems of communication with pictures: PCS, Icon-language and Elephant’s Memory.

In chapter IV, we put forward the problematics of pictograms, icons and signs; i.e., we raise a number of questions about pictorial signs, arguing that the apparent quality of being commonsensical remains nevertheless open to interpretation. Matters of universality, abstraction and style are debated separately with examples from traffic signs, public signage and washing symbols.

The conclusion summarizes the main ideas that gravitate the concept of visual literacy. After condensing the main arguments in the four previous chapters, it restates the need for further investigation in visuality so to understand the relevance of pictorial signs in our culture.

It is not the intention of this study to produce the final word on visual signs, on how to create, modify, improve and behave in front of them. It would take a graphic design handbook, a few theses on cognitive and behavioural psychology and a social etiquette course to achieve that end – and even so, it might not be sufficient to appease the demands of all social groups that are affected by pictorial messages. Instead, this thesis is a defence of the development of strategies that allow us to look at signs critically, and feel there is rigour in the analysis.

This educated criticism is another name for visual literacy.

Already in the 1930s, Otto Neurath (1936, p. 24) sensed “the new feeling that today the eye is all-important”. Within the context of this particular thesis, and of visual culture in general, that observation has never been more true.

Chapter I.

Cues for visual literacy – looking at pictures from the earliest sign paintings to 20th century pictograms

A pictogram is an iconic sign that represents complex facts without resorting to words or sounds. We all know them, from the little stick figure that tells us where the restrooms are to traffic signs, airport orientation plates, safety instructions, care labels, weather information or Olympic sports. They serve to inform, to guide, to caution, to prohibit or to clarify, cutting across language barriers, in the most universal way possible. But despite being useful in so many circumstances, pictograms have yet to leave the sphere of graphic design to claim their rightful place as elements in a non-verbal type of communication that affects us all. That fact makes them a significant object of study, all the more at a point when we witness a simultaneous effort to standardize and singularize.

A critical approach towards pictograms and symbols will show that, although they are an invention of the twentieth century, and our dependence upon them is increasingly bigger on multi-lingual, multi-cultural societies, as manifests the constant production of new signage, they are also, in the strictest sense, mere compositional pictures – the result of a long tradition in the history of visual representation. For that reason, it is important to review some key points and milestones from the visual arts that encompass the whole figurative system where pictograms can be found, since they provide the background on which present-day assumptions about signs' significance rely. This chapter will, then, cover iconic signs from ancient petroglyphs, pictographs and hieroglyphs, before referring to purely graphic symbols that have been used - and are still in use - in specific and/or restricted areas of study.

The fact that we see things frontally, conditioned by our binocular vision, indicates an inherent human tendency for painting and other expressive arts; in the same measure, the apprehension of visual signs, entangled with needs of survival, makes man bring to light within the space around him whatever may be useful or

useless, harmful or harmless, and come to him, in epistemological terms, as "simple seeing", before settling as perceptions (already a cognitive experience). Beyond all visual, perceptive constraints, the production and interpretation of visual signs has to do with culture, or better yet, with the many cultural responses man creates in order to understand and (try to) control the world he lives in. Thus, any evolutionary recuperation of these sorts of signs involves aspects as significant as the development of man's capacity to symbolize since the dawn of humanity, the socialization of human groups, the advance in working techniques and, specifically – mainly because the origins of visual figuration are linked to a religious, magical or mythical sentiment, they coincide with the evolution of representation. Art and representation entail a knowledge of space which is necessarily epochal: to look at any given representation is to try to place it in its proper date of production and meaning. To understand the sense of a sign, one must take into account the culture, historical or not, from which the sense the sign possesses has issued.

If the course of history can be understood in terms of continuity and change, the origin of pictograms and symbols can be traced back in time to the farthest ancestors that share a common denominator: the fact of being unequivocal pictorial signs made by people for a reason, and usually, with a function. The variety of materials employed and the range of styles they exhibit emphasize the creative character of sign-makers, and their use of available technologies to produce more appropriate signs for a given situation.

Mysterious and fascinating, the earliest records known to us of human forms of communication date back to prehistoric times. Petroglyphs, or images incised in rock, can be found in various points of the globe – from North America to Scandinavia, Africa, Caucasus and Australia/New Zealand; in fact, they are spread across all continents. While it is extraordinary to consider that a large number of these rock carvings date back to the Upper Paleolithic and Neolithic Ages (circa 9.000 BC), others, such as the Inca carvings of central Bolivia, have been found to be posterior, probably from between 1200 AD to 1500 AD, before the Spanish conquistadores took over the Andean territory and dismantled their empire.

The dating methods of rock drawings and etchings are many and not always consensual among archaeologists (Bednarik, 1994; Rafifar, 2007); radiocarbon and thermoluminescence processes are now able to provide a more scientific explanation of materials and their erosion over time, yet a sensible interpretation of a given site's

symbols and signs must necessarily involve an analysis of style. What exactly are these millenary pictures supposed to represent, and why? Could we possibly consider them writing? In most cases, petroglyphs depict people as stick figures, animals like the mammoth, bison, bear, ibex, aurochs or deer, and objects, like shields and spears. North American examples from Arizona, California and Utah are very illustrative of this. Carvings from Gobustan, in Azerbaijan, for example, represent, in addition, pictures of the sun and the stars, and important collective actions such as battle scenes and ritual dances. In Norway and Sweden, UNESCO has declared two areas as World Heritage Sites for rock art, one in Alta and one in Tanum, where figures of whales and fish can be found, next to boats and scenes of people hunting and fishing.

Pictographs are different from petroglyphs, and also much more fragile, because instead of being cut in stone, they are images painted or drawn with mineral paints or blood generally in cave walls or ceilings. There are quite a number of examples, the best known probably the cave paintings of Lascaux, in France, or the ones in Altamira, Spain. The precise meaning of these paintings, albeit much discussed, remains unexplained. There is a respected theory, a formal model, in fact, for the interpretation of mythical representation in the Upper Palaeolithic (until 8.000 BC) developed by the eminent French archaeologist and pre-historian André Leroi-Gourhan, which explicates the importance of animal figures in the caves' main and secondary panels in combination with non-iconic symbols that are grouped in alpha, beta or alpha+beta categories. According to this model, alpha symbols are several variations of the phallus – that is, masculine; the beta symbols are feminine, and more markedly geometric, and the alpha+beta represent a connection between the two (Leroi-Gourhan, 1982). Whether or not these images and symbols served the function of communicating some sort of message, mystical or pragmatic, is, again, still a matter of theory. It seems highly unlikely, though, that the ones responsible for painting those pictures some 17.000 years ago would go through the trouble of doing it for purely decorative reasons, as art critics and historians remark (Gombrich, 1950). If indeed cave paintings had a strong informative purpose, then no doubt they could be classified as the earliest types of pictograms.

In reality, to quote the influential German philosopher Ernst Cassirer, art, myth, language and science appear as symbols; allegorically, they refer to something real. "These symbolic forms are not imitations, but organs of reality, since it is

through them that anything real is converted into an object for intellectual apprehension, and as such is made visible to us."(Cassirer, 1946)

To Leroi-Gourhan (1982), the evolution of symbolization is decisively enhanced with the production of prehistoric art, which is already imbued with magical, religious or mythical conceptions. This symbolization concurs with the development of human language, which at this stage was capable of expressing myths. Myths, much like art, work through metaphors and use numerous analogies, namely magical. But despite detecting the rules and formal categories that are recurrent in murals, if we do not know the language and the sense of the narrative, we cannot understand the stories they narrate. The depictions of animals and the few human depictions (one of which, apparently profane, can be found in the Côa region, in Portugal) are thought to have a symbolic function, but they are represented side by side with the masculine/feminine or mixed signs - those graphs that add meaning. These narratives studied by Leroi-Gourhan seem to extend to other mythical performances, since they are present in the big, sacred "cathedrals" of pre-History; in Portugal, they are not just in hidden, secret caves, but out in the open air: pairs of animals can be found repeatedly noted with the signs of alphas, betas and alpha+beta. That seems to imply the existence of a grammar of representation, which must have been common. Supposedly, they represent aspects of a syncretic structure that escapes us, which was intended to a public who understood its grammar and content, in verbal terms, as a language made of particular signs, where the partial stood for the general.

We know that later, during the final stage of the Neolithic and throughout the Bronze Age, the word is viewed as something sacred. The major known theogonies - Egyptian or Sumerian – trace the first act of creation to the word. Then, they associate it with gods of creation (gods who think well before creating the world), showing there is a link between the prehistoric sign and the word used to translate it. Signs would have to be easily recognizable, easily interpreted, by words. The metaphorical sense of the sign – or, recognizing as identical that which is diverse – so skillfully used in Palaeolithic art, makes the connection between what is represented in art and the sense that is conferred by the community. In *Les Religions de la Préhistoire*, Leroi-Gourhan writes:

> *The exact nature of the relation between signs and animals is still not very clear, but its existence is flagrant. In effect, it is impossible to imagine that signs and animals corresponded to two different systems of signs, either*

> *consecutive or simultaneous; the consistent geographic distribution of both symbolic series, their synchronic development, the spatial structure of their associations and the presence in movable objects determine they belong to a single symbolic system. (Leroi-Gourhan, 1964: 101; my translation)*

Realistically, since most hypotheses can never escape the status of educated guesses or mere speculation, the accepted view is that pictographs are the quintessence of prehistoric art, which remains a plausible conclusion in a field so difficult and obscure to study with mathematical precision. There are really no documents that can support final theses on the subject. Common sense dictates that the ways of analyzing each picture or collection of pictures from Palaeoart to the Bronze Age should respond above all things to a criterion of function, and so cave paintings have come to be better evaluated as "a means of magical conjuration, produced through fear of the supernatural, for reasons of survival and the satisfaction of natural instincts." (Frutiger, 1998: 111)

Unclear motivations aside, there is, nevertheless, an agreement as to the fact pictographs were the basis upon which writing systems started to evolve. In his book that traces the story of writing, Andrew Robinson has called this the theory of pictographic origin, opposed to that of a divine origin of writing, which was in favour until the eighteenth century Enlightenment period (Robinson, 2000, p. 11). Also investigating matters of broad literacy, Furtado (2000) expertly explains how the different modes of human expression can be summed up, from their genesis, in two different tendencies, that of gestuality and the other, picturality:

> *(...) The gestuality option, comprising systems which are, by definition, fleeting, and the picturality one, comprising systems that may endure, withstand the test of time and travel through space, which means the pictural is inextricably linked to a particular force within expressive and communicative functions (...): [it ensures] the conservation or perpetuity of the message. (Furtado, 2000, p. 27 – my translation)*

The invention, or gradual evolution (Barton, 1994, p. 120) of scripts like Mesopotamian cuneiform from c. 3100 BC or the Egyptian hieroglyphs from c. 3000 BC, which unquestionably mark a major advancement in cultural development, strikes us first and foremost as an improvement of the pictorial means of representation. At a universal scale, it is the moment that defines the beginning of history, with writing

turning out to be, in Coulmas' words, "the single most consequential technology ever invented" (Coulmas, 2003:1).

Writing came about with its own codes, different as they were, from hieroglyphs to Mayan glyphs. To master a writing system was no longer a shamanistic matter of drawing and interpreting pictures. It presupposed a common knowledge, a fixed set of rules, which had to be learned – not magically discovered. This transition from sacred to secular is a decisive one: the shift goes from the secret to the public, from sect to community. Even at the earliest stages of development, writing served a number of purposes – administrative, political, religious, commercial, etc. – and was given a special importance, confirmed by the social status granted to scribes, priests and the privileged few who could actually read and write. With the spread of the alphabets, things would change, socially as well. While in Egypt and Mesopotamia scribes were wealthy and highly respected persons, in Rome, to write would be a work of servitude. The master would dictate or scribble a draft so that his slave, normally Greek, could from there do the proper writing (Furtado, 2000).

For the visual part, the transformation that occurred with the appearance of writing was remarkable: pictures, or the symbols used systematically to denote both objects from the concrete world and ideas (immediately recognizable representations, such as birds, hands or feathers) did not necessarily express the intended meaning of the sign. The rebus principle that images could be used for representing sounds is of tremendous importance: it marks the transition from proto-writing to full writing (Robinson, 2000: 44) and ties firmly and directly written language and speech, with the additional advantage of not being constrained by time limitations. On top of that, there is a unifying aspect to consider: In writing like the hieroglyphic, the link between the physical, the material and the metaphysical world is combined in each ideogram.

Egyptian hieroglyphs are sacred writings, especially those which contain tightly within their cartouches the names of gods and pharaohs (see fig. 1). After the First Intermediate Period in ancient Egyptian history, the name is the person in his/her global measure; identity was thus protected by means of a linear perimeter, a sort of magical enclosure. The importance of the name could not be stressed enough; it provided the clue for the French scholar Jean-François Champollion, in 1823, to finally crack the code of the Rosetta Stone. He would then reveal that the hieroglyphic script mixed pictographs - also known as ideograms or logograms – and phonograms

(phonetic marks representing one or more sounds), to create semantically different signs. Because of their noble and religious function, and also because they were for the most part written in stone, hieroglyphs barely experienced drastic transformations. But in scrolls, where they appear more linear and schematically, the graphic symbols prevail. As in all scripts that later ensued, Cretan, Phoenician, Greek, etc., the crucial link sound/sign would not be abandoned. Even in Asian languages, like Korean, Japanese and Chinese, which make ample use of logograms and are, in comparison to European languages, the farthest set from pure phonography, the basic principle of combining phonetic and semantic elements is present. A functional script totally based on ideograms, capable of conveying its message directly to the mind without the restrictions imposed by the intermediary of speech, is something that remains a myth. The search for the perfect, Adamic language after Babel's punishment can be seen as evidence to that idea. The failure of artificial languages further stresses it. Renown scholar and sinologist John DeFrancis (1984) points out "there has never been, and never can be, such a thing as an ideographic system of writing". What happens in particular with Chinese is that the phonetic value of its characters is low, and they are far more impressive in their graphic dimension, as well as in number, than any Western script, but the nature of its system is not intrinsically different from that of alphabets.

Figure 1: Egyptian hieroglyph cartouche

The first un-mysterious system of writing – the alphabet – is to be found with the Phoenicians, developed mainly for commercial reasons, and owing much to other systems like the Ugaritic. It is a Semitic invention that has apparently nothing to do with the pictographic or ideographic modes of representation. What the Phoenicians do is to isolate 22 consonants, which are the root of sound (the letters) used in language and with them form a consonant system that ultimately creates the alphabet. It is, thus, an analytical concept, starting from phonetic units. As the Greeks start to dominate the Mediterranean commerce, they utilize this alphabet as basis, take away some consonants/phonemes that are foreign to the Hellenic language and substitute them by signs or sound notations which allow writing to imitate even the shortest of

sounds of speech. By the 8th century BC, the Greek alphabet is crystallized; a number of other European and Near East alphabets stem from there, namely the Etruscan, the Italic, Armenian, Cyrillic and Coptic. Around the 6th century, the direction of writing is set from left to right, horizontal.

But in reality there is general agreement as to the fact that the pictorial aspect in writing systems shifted from an iconic form to a more abstract, stylized type of representation. Curiously, this contradicts the theory that alphabets were absolutely exempted from pictography or ideography. In effect, an authority on language evolution, Gelb, observes: "At the basis of all writing stands the picture". (Gelb, 1963, p. 27) And it is possible to perceive a sort of modulation going from the Phoenician aleph, shaped as an ox's head, to the Greek alpha to the Latin letter A. Nevertheless, independently from graphs, picture signs and symbols continued to be created and used in a myriad of contexts, in a fashion that greatly relates to modern pictograms, both in respect to their design and the information in them contained.

One of these contexts is the science of the stars, which absorbed much of the pre-scientific knowledge kept in Egyptian Houses of Life and also in Babylonian and Persian temples. Under the Hellenistic period, this "wisdom" ends up being used either in the study of the occult or in sciences of observation and calculation. Astrology and, later on, astronomy, employed more or less standardized signs and symbols to represent celestial bodies - the sun, the moon and the planets - and the constellations of the 12 signs of the zodiac, beginning in Aries and ending in Pisces. Horoscope icons remain popular today, both in Western and Chinese traditions, the latter using representations of animals only (rat, ox, tiger, rabbit, dragon, snake, horse, sheep, monkey, rooster, dog and boar), as the study of the stars and their influence on people's lives did not lose its allure over time. The will to understand the cosmos is expressed in the form of symbols that can be manipulated, turned into formulas, displayed graphically for a quicker connection between the physical and the metaphysical.

Figure 2: Zodiac signs

Similarly, a large number of symbols were developed and employed in alchemy, the pseudoscience that is seen as the predecessor of modern chemistry and also associated with fantastic tales of magic and superior powers. During the first centuries of the Christian era, times of social agitation under Roman imperial rule, the whole of the Mediterranean fed on Greek culture; in Alexandria, the unofficial cultural capital, home to the famous Library, a third of the population was in fact made up of Jews from the Diaspora who were leading cultural agents. Influences from so many different traditions meeting when religions were being formed meant that rituals, customs and symbols passed on, were appropriated and re-appropriated. It was, in fact, the Arabs who revived the old practice of alchemy, but kept many elements that are typical of Egyptian hermetic sciences. But be it in China, where it was always performed, Egypt or Persia or anywhere across the Hellenistic world, alchemy is about one thing only: purification. From the most exotic laboratories – places of work (labor) and places of prayer (ora), the alchemist's goal is to purify impure substances, so to become dexterous in the process of turning his very soul utterly pure. Starting from a burnt, amorphous mass called *nigredo*, the process begins with finding the four elements of the world and refining them (*abluto*), then reconstitute them harmoniously (*congelatio*) before finally fixing them in their newly acquired purity (*fixatio*).

Alchemical symbols are all completely abstract and frankly esoteric, as suits a practice that became more and more secretive. Primes (sulphur, mercury and salt), elements (fire, water, earth and air) and planetary metals (gold, silver, copper, iron, etc.) combined in the search for the art of transmuting metals, finding the philosopher's stone or the elixir of life. Not surprisingly, alchemical symbols never did achieve an international standard level, as the practitioners of this discipline (?) employed a wide variety of codes, so to cloak their findings from potential rivals. In some cases, the signs for alchemical formulae strangely resemble the letters from the medieval runic alphabet.

Figure 3: Alchemical signs

The very opposite situation of concealment occurred with regard to another category of pictorial signs that came to use in Europe during the Middle Ages, whose primary objective was rapid identification among elements of equal status. The coat of arms, or heraldic banner, was a design on a knight's coat or on his shield – the only way of distinguishing the noble in full body armour during battles, and, as its use widespread, of asserting his affiliation with specific families (fig. 4). Arguably, already a utilitarian form of writing (Barton, 1994, pp. 113-114), for heraldic signs acted as signatures and indicated ownership, they are marks that evidence a growing attention to the importance of property, social category, its preservation and originality. The social aspect of heraldry and, most of all, the reasons that justify the necessity and propagation of heraldic signs, vindicate their presence in this overview.

Typically, a coat of arms consisted of at least five elements: an escutcheon at the centre topped by a coronet or a helm; a crest; two supporters (side by side) and a motto at the bottom. Arms had to follow rigid rules of composition in their use of figures, shapes and colours, which, to this day, are still referred to in French. At present, coats of arms are in use outside the monarchic, aristocratic circles, as logos for towns and cities, in a sort of old-fashioned, high-status corporate identity symbol.

Figure 4: Heraldic signs

In print, especially after Gutenberg's groundbreaking invention and the beginning of mass circulation of the book, small graphic symbols called vignettes emerged, with features that are similar to those of modern pictograms. Vignettes were decorative designs, initially floral, or based on foliage, but very soon displaying a wide range of motifs, from the seasons to animals, to depictions of professions and organizations. Indeed, the style is typically Renaissance, and very often the images were copied from works of art – paintings, sculptures or architectural details. Vignettes were primarily used on books, in frontispieces or to separate sections or chapters, but as their usage became standard throughout the years, newspapers in the

nineteenth century would also come to publish them sometimes, as illustrations, either in woodcuts or copper plates (later on, as photography widespread, the use of vignettes would frankly decrease). Frequently they were elaborate and very minute compositions – a characteristic unalike pictograms – with arabesques and multiple shadows, symbolizing emotions like love and friendship.

Figure 5: 19th century vignettes

For the sake of clarity in argument and delimitation of the material in use, there is an important distinction to be made at this point, which concerns the types of symbols under observation here. Ever since Aristotle offered a definition of what writing is, stating "words spoken are symbols of affections or impressions of the soul; written words are symbols of words spoken" the Greek translation of *symbolon* has appeared as "symbol" or "sign", and the two terms have been used randomly and interchangeably; however, without going into semiotic discussions about the nature of communication signs at this stage, it is evident that the signs mentioned so far do not fit the same category as religious symbols, like the Jewish Star of David, the Islamic Crescent Moon or the Roman Cross, all of them strikingly familiar and charged with a social weight that is beyond question.

If religion emerges from the experience of the sacred, myths of time and nature, the religious man relies on its symbols to allow him to recall and participate in that experience. The spiritual, too, makes use of pictures to symbolize: the ankh, the yin yang, the Celtic triquetra, they all stand for something else to the eyes of the believer. Catholics in particular nurture a special fondness for symbols – called icons, in this context – that they adore or at least revere, from the crucifix to the fish, lamb, palm, shell, bread, wine, to the pictures of the angels and the saints. On the other hand, to counter the representation of goodness, faith and hope, there is also an array of evil symbols that religion has made sure to display in its cathedrals: the male goat (buck), the devil, the serpent, the dragon, the witch or the many monsters painted or

sculpted in porticoes, lurking around in corners or behind church doors; they can also be found a dime a dozen as illustrations in religious books throughout the Middle Ages. In truth, they are popular representations, far from the religious hermetism that Renaissance men like Pico della Mirandola were so enthused with, which lead to the recovery of the figure of Hermes Trismegistus – syncretic god of wisdom, patron of astrology and alchemy, and model to future students of science.

Surely an overview of man-made, purpose oriented, graphic signs produced without the help of a photo camera (for photographic images open a whole new series of discussions) would not be complete without citing the incredible power religious symbols possess, and have possessed throughout the course of history. The same applies to more recent political symbols like the Soviet hammer and sickle, the Nazi swastika – in itself an ancient Hindu and Indo-European symbol, found in numerous Greek amphora and hydrias, or the Republican elephant, just to name a few. The pirates' black flag with a human skull and cross bones is another good example.

These deeply rooted symbols that tie faith and devotion, political beliefs and movements of the masses, interesting as they may be, for their origins and variations, uses and misuses, will not be analysed here. It is outside the scope of the present study to investigate the sociological phenomena that brought forth the condition of icons, or even amulets or lucky charm signs. Neither will there be much research made into commercial logos that have, by reason of their popularity, gained a status of international symbols, like Puma's puma, Macintosh's apple or McDonald's golden arches. However, it must be said, the wide collection of images that these symbols constitute, which is so connected to, and indeed responsible for, a sense of international familiarity, is unquestionably part of our cultural landscape, and more so of the physical features of cities and urban equipments. It is relevant to acknowledge their existence and consider them as intrinsically different from the pictograms and signs that, while coexisting in the same geographical environment, are free from these politico-religious connotations; in fact, they can even be defined in opposition to them.

Logotypes belong to the realm of marketing; branding and advertising does, in fact, when effective, impact other sectors of contemporary life (Floch, 2001). However, the creation of a logo can never be dissociated from an intention of sale (at least initially) and a clear reference to product – not to straightforward information. Long-lasting and memorable logos like that of Woolmark or Coca Cola have become

classical examples of well-achieved designs for successful companies, a sign of assurance to the consumer. But pictograms per se have no obligatory connection to the laws of the market and are irrespective of a client relationship. The similarities between effective logos and pictograms end in their shared qualities of simplicity, clarity and distinctiveness.

Having said that, as a prologue to the major pictographic developments of the twentieth century, it becomes imperative to examine traffic signs, which constitute a fundamental step towards an accepted means of communication of global reach on the one hand; on the other hand, they paved the way for new information sign systems that rely on pictures, as will be demonstrated further.

Within the context of a newly industrialized Europe, where cities grew at a steady pace and automobiles became more popular, road networks were built to respond to the population's demands and the need for traffic regulation arose. The first ideas for standard pictorial traffic signs were devised at the turn of the century by the Italian Touring Club and, later, by the International League of Touring Organizations. Previous road information was limited to milestones that indicated distance and direction – used already by the Romans, especially in the shape of obelisks, made from granite or marble stone, or arrow plaques placed on intersections to inform the name of the nearest towns, more after the Industrial Revolution introduced cast iron and the use of moulds, which was then used for producing the traditional finger post.

In 1908, the International Road Congress held in Rome set the basic patterns of road signs. The following year, nine countries agreed on the adoption of four signs that indicate "bump", "curve", "intersection" and "railroad crossing", all of them still in use today. The intensive work that ensued on international road signs eventually led to the development of the European road sign system as we know it. It owes much to Great Britain's update of its road and motorways' system, developed by the graphic designers Jock Kinneir and Margaret Calvert, appointed by an advisory committee that came to be known as the Anderson committee, during the late 1950's to the mid 1960's. The new system they developed came to replace the confusing mishmash of English road signs – there were no official guidelines about direction signs until 1920 in the United Kingdom - with a coherent system of lettering, shapes, symbols and colours. About the latter, black was first considered for the signs' background, but

dismissed for being too funereal. Instead, blue was chosen for standing out from the countryside and contrasting well with white type.

The main concerns when devising the British system – and the same is valid for all signage systems - were simplicity, consistency, readability (which implies issues of scale, contrast and letterform) and practicalities such as cost, manufacture and placement. So, in practice, the new motorways' signs offered directional and distance information to be read from around 180 metres (600 feet) away; indicated junctions three times with map-type representations, each with differing amounts of information, from the general to the particular. Also, a new typeface was created and introduced, called Transport, designed to be friendlier than the modernist lettering used on continental European road signs (German DIN lettering).

The new signs were a success, and the year following their implementation the British Parliament appointed another committee to recommend signs for all-purpose roads, both regulatory and informative. In time, the British Department of Transport issued an official manual containing the guidelines for the Kinneir/Calvert signing system, which was bought by many countries and aspects of it can now be seen in Spain, Italy, Greece and elsewhere in Europe (Baines & Dixon, 2003, p. 32). France remains somewhat an exception in this standardized European panorama, chiefly because the country's first road information signs, developed by the Michelin company, the *poteaux*, were so effective and responded to the needs of both locals and tourists. Up until today, *poteaux* and ceramic tile direction signs from the 1930s coexist with the newest metal retroreflective-coated signs designed for night-time driving and low visibility conditions on the road.

Meanwhile, the United States developed its own road signage system, employing much more verbal guidance and a much wider variety of shapes than its European counterpart: on top of the usual triangular, circular and square shapes, it includes rectangles, diamonds, trapezoids, and the distinctive shield shape (Hampshire & Stephenson, 2008, p. 226). Every state and province in the USA is free to choose different markers for its own highways; standard signs are only required for federal highways, and must conform to what is legally defined in the Federal Highway Administration's Manual on Uniform Traffic Control Devices[1]. There is, nevertheless,

[1] http://mutcd.fhwa.dot.gov/ <retrieved 01/09/2010>

a dominant typeface that drivers may perceive as an element of unification in the system, which features generous inter-character spacing and uses both upper and lower-case settings. Incidentally, that is said to have influenced Kinneir and the British engineers in the 1950s. As with the Transport, the American Interstate typeface has undergone some modifications along the way: in 1994, it was digitized and made commercially available; nowadays it is widely used by designers worldwide for purposes far removed from its origins.

However different from country to country, road sign systems across the globe generally obey the directives of the 1949 protocol resulting from the UN world conference on road and motor transport held in Geneva and the 1968 Vienna Convention on Road Traffic treaty[2]. The first directive established three basic kinds of traffic signs: signs to warn, signs to prohibit and signs to instruct. The treatment of shape and colour of each plays a cardinal role in differentiating between them and conveying their message. (There is, however, a considerable degree of latitude when it comes to the design within, as will be noted further, on chapter IV.) The latter directive aimed to facilitate international road traffic and to increase road safety.

Knowing what traffic signs stand for is an essential condition to getting a driver's license, so anyone attempting to get one has to learn what they mean. Daunting as the task may look at first – for there are literally hundreds of traffics signs – there is comfort in knowing there is always somebody to teach them. There are textbooks, manuals and quizzes that facilitate learning. Moreover, traffic signs are part of a regulated system that follows logical principles, which suggests it is always possible to interpret their meaning using deductive reasoning. That does not always happen with pictograms outside the road sign system; in fact, the where a pictogram is placed may affect the how it is read.

The link between traffic signs and other pictograms – which will be discussed later in this study – is an interesting one, as very often the signs employed in one system are transferred to the other, or the two systems themselves are complementary in the physical space. This is clear with the example of the stick figure, used worldwide in pedestrian crossing lights, which looks pretty much the same as the one on the door to public toilets for men. Conversely, pictograms used in labels for

[2] Full transcription available at http://untreaty.un.org/unts/120001_144071/3/4/00002017.pdf

hazardous products/actions/situations borrow their triangular shape and yellow background from warning traffic signs. The points of interference and collaboration between two or more systems of communication will also be explored further ahead, in connection with the different pictogram usages and the case of Isotype, which, for all its significance and condition of model of a pictorial language, needs to be mentioned briefly at this point. We will return to it in chapter III, with a more careful analysis.

The International System of TYpographic Picture Education, or Isotype for short, was developed during the 1930s in Vienna by the social philosopher Otto Neurath, in association with designer Gerd Arntz, as a method to communicate complex information on society, economy and politics in a simple pictorial form. This method was based on clear-cut, elementary pictograms that depicted key information from industry, agriculture, demographics, politics, leisure, economy, etc., in combination with highly structured maps and diagrams. The system it produced aimed to enlighten the people who could not, or hardly, read, and overcome the barriers of language and culture. The social, progressive motivations behind the development of Isotype are fairly evident, and should be understood as part of the historical conjuncture of the rise of socialism in an Europe that was bursting with revolutions. The particularities of this international picture language, its consistent visual techniques of expressing social, economic and historic arguments, will be taken up again in chapter III, but it is worth stressing the importance and influence that the Isotype graphics had in fields other than the originally envisaged by Neurath. Arntz's pictograms are without question in the same line as those that came to be developed regularly for an event that turned their use into indispensable: the Olympic Games.

Figure 6: Gerd Arntz's pictograms for Isotype

The Olympic Games, especially the Summer Games, make up a pictographic category in its own, as an occasion that gathers huge crowds of multiple nationalities and backgrounds, with high media coverage, would suggest. In general, graphics

created for sports events are ephemeral and very rarely memorable. But the Modern Olympics' signage tells a different story: not only are new series of pictograms produced for every ceremony, but also the tendency is that each pictographic system somehow reflects the local colour of the host country. And so, the last decades in particular have witnessed an increasing attention to the quality of the signs, fiercer competition among designers and bolder styles to mark cultural statements. This accompanies also the Games' swing to becoming an event that is not just about sports, but great entertainment for the masses. Graphic designers themselves observe, not without some discomfiture, that:

> *Today, environmental graphic design for the Olympic Games plays an important role but it has become part of a very complicated project involving many disciplines working together in various specialized teams, all catering for an immense international media event. […] Information design elements like pictograms became part of the leading commercial goal and were transformed into lucrative candidates for merchandising of all sorts. (Smitshuijzen, 2007: 327)*

Looking back, it was the Berlin Olympics of 1936 that brought forth the first original (and appropriate) Olympic pictograms, but the real spur to our present concept of pictogram was the Tokyo Olympics of 1964. That was because abstract, systematically geometrical images were used to communicate general information as well as identifying the different sports to visitors (fig. 7). The need for a clear system totally independent of language and culture was essential, since it was the first time the Games were held in an Asian country, home to a complex linguistic script. The Olympic pictograms developed by Masaru Katsumi (undeservedly forgotten in the graphic design milieu) originally represented each sport by depicting the athlete and not the apparatus, in black figures over white background.

Figure 7: Olympic pictograms for Tokyo 1964

In 1972, the Munich Olympic Games had their complete graphics programme authored by the German designer Otl Aicher, who is until today credited with creating

the model that gave rise to the paradigmatic, modern pictogram – the ubiquitous stick figure, made of highly simplified and stylized forms, that are under strict mathematical control. Aicher is renowned for his projects in graphic designing as well as for being an educator, and praised for his conviction that designers have a moral responsibility to work in the service of a better society. It is no surprise, then, that the professional association for design, AIGA, concerned with showing how public-minded designers address universal communication needs, rehabilitated his pictograms in a set of 50 new signs known as the AIGA/DOT pictograms.

Figure 8. Olympic pictograms by Otl Aicher

The signage project was commissioned by the United States Department of Transportation (hence the acronym DOT) and it is used extensively, royalty-free, in public spaces like airports, train stations and at large international events. Prior to this compilation effort, several international, national and local organizations had devised symbols to guide passengers and pedestrians through transportation facilities and other sites of international exchange. But while effective individual symbols had been designed, there was no system of signs that communicated the required range of complex messages, addressed people of different ages and cultures and were clearly legible at a distance. For that reason, AIGA and DOT gathered together an inventory of symbol systems used in various locations worldwide, and appointed a committee of designers of environmental graphics to evaluate the symbols and make recommendations for adapting or redesigning them. Based on their conclusions, a first set of 34 symbols was produced - published in 1974, which received one of the first Presidential Design Awards. 16 more symbols were added in 1979. They are now all available on the world wide web.

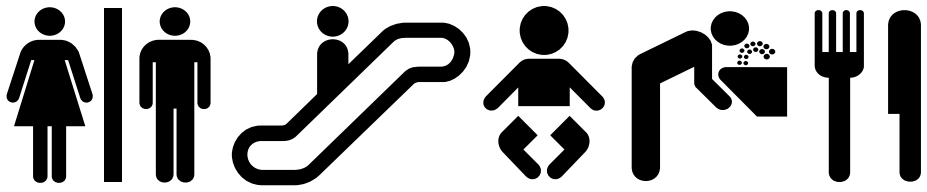

Figure 9: AIGA/DOT pictograms

After delineating some fundamental milestones in pictorial sign design and application, we now proceed with caution, as we come to the point in the pictogram production chronology that is not only the most proficient one ever, but also the most diverse and spread out. New pictographic signs – or modern-day hieroglyphs, as they have also been called (Robinson, 2000, p. 17) - are being created every day for a multitude of purposes, one of which, possibly the fastest changing, is within the field of new technologies.

As more products, and more sophisticated, are invented, the gap between the dense information they presuppose and the user-friendliness that marketing attempts to sell must be filled with an impression of a cool and trouble-free means of handling them. The pictogram is seen as a clean and stylish solution to the need of having to provide a lot of instructions. But, in addition to this new instructional requirement, it could be said the multiplication of pictograms manifests a trend in pictorial communication. Given the multitude of items that exhibit pictographic signs, it is fair to question whether their application might not even be slightly far-fetched. Was it not for this sort of fever of icons and signs, who would ever have thought of checking the pictogram in a cooking pan to make sure it could actually be cooked in? Or finding instructional labels attached to the most rudimentary wooden spoon? A non-iron pictogram engraved in a vinyl bath mat? Even the most conscientious greenwasher will at times be baffled by the proliferation of labels and the assortment of symbols from ‘recycling’ to ‘low carbon’, ‘bio’ and ‘organic’.

But in truth, it is not surprising that it is so: the phenomenon is owed to the essential human need to identify and qualify the characteristics of material things. And the same occurs every time there is a need for an alternative to verbal signs of one particular language for a steadfast transmission of knowledge, be it scientific or prosaic. Where the lingua franca fails, the picture seems to resist. Historically, it has happened with mathematics – the discipline has secured its long repertoire of graphic signs that make operations, functions and schemata absolutely clear and unequivocal

in all parts of the world. The same could be said of chemistry, nuclear chemistry and physics, which have developed symbols for their universal formulae.

Obviously, in times of rapid information processing development, the signs and icons made to identify products or functions run the inherent risk of quickly becoming obsolete. There is, however, for all those who do not slavishly follow hi-tech news, some encouragement to be found in the idea that most technological symbols have an incredible longevity, like the buttons for play, pause, stop, record, fast forward and rewind (fig. 10). The proprietors of new technologies develop new symbols for two reasons: to brand the intellectual property of the technology, and to indicate a device's compatibility with that technology. Current media symbols such as the Wireless, Bluetooth or USB icons are not only more and more familiar, but also reassuring for those laymen and women who will never fully understand the complexities of the virtual, computer world.

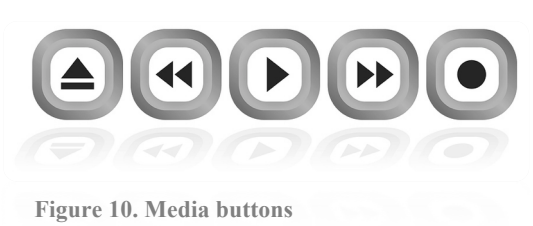

Figure 10. Media buttons

By now, it has been established that pictograms and symbols have a long history behind them. What we need to work out is how they are also a sign of our times. "More and more of the informational energy required by a mass-consumer society is being transmitted pictorially", George Steiner said. "Increasingly, the word is caption to the picture." (Steiner, 1971) And so, we must consider that the culture of the image, which quickly became associated with photography, moving pictures and design, (and from the 1960s onwards, with a growing conceptualism) was forced to multiply its communication signs in order to appease the masses. The culture of hedonism and show business, is, above all, the culture of the here and now, brief and ephemeral. Within this context that the French anthropologist Marc Augé calls supermodernity[3], urban equipments tend to be intelligent and informative, thus, imaginative and efficient in their signage.

These contemporary signs we term pictograms or the ones we recognize as icons are really no longer comparable to the symbolic image Carl Sagan designed for NASA's Pioneer project, which was sent to Jupiter in a spacecraft in the beginning of

[3] In connection to his idea of supermodernity, Augé elaborates on the relevance of non-places, which are spaces of transience that do not have enough significance to be considered a place.

the 1970s. In it, the shape of the man, hand raised in a gesture of good will, slightly reminiscent of Da Vinci's Vitruvian man, made clear what he thought of himself and mankind. We have, indeed, come a long way in only 40 years in what refers sign-making for ourselves and for others. Computer-generated design that is sent to space today is not only more scientific, but also, ironically, transpires an idea of humankind that is more reductionist. Perhaps it is because it has conformed to standards, or that our present understanding of a sign, much more easily generated and reproduced than before, could not have it any other way. These matters of pictorial value and the ultimate purpose of a sign are ingrained in visuality; in that sense, they concern all of us, and determine how we see everyday objects and people (Sturken & Cartwright, 2001, p. 370).

As declared in the beginning of this chapter, the history of signs carries with it the mark of their epoch; although some signs and symbols seem to be eternal (probably one of the most accomplished being the example of the heart, that is tied to emotion and affection), in general, symbols are dated. That is why the study of visual language has to adapt them to contemporary modes of reception.

Chapter II.
Methods and theories

1. An approach to semiotics

Chapter I listed several types of visual communication made of signs. It provided a general idea of how ancient and broad the field of pictorial signs really is, in both the eras pre- and post-print, and raised awareness to the need of contemplating it as a true subject matter. Deliberately, the domain of art was not considered, unless in certain points where the boundaries with non-art are dubious. But, primarily, we drew attention to ordinary, everyday-life visual signs, which have a purpose and a history, yet are often neglected. To better understand what all these disparate signs mean and how they function, we enter the domain of semiotics, or the systematic science of signs.

Designed and established in the 1960s and 1970s as the study of production of meaning in culture and society, semiotics set about the grand task "to construct an account of the rules and conventions, the system of signification, if you will, that enable cultural objects to function as they do – to have the meanings that they do for members of a culture" (Culler, 2001, p. xv). From the beginning, semiotics' ambitions were immense, the fields it touched extremely varied and the volume of works produced in the name of this new science massive. Indeed, semiotics is the matter that envelops the questions posed about the type of signs under exam in this thesis; consequently, it is through semiotic analysis that we will tackle the problems that arise when reflecting upon the pictograms and symbols which are being produced in the world today. No other framework is more to the point, no other theory more suitable. Nevertheless, it must be acknowledged, this science that boasted such potential and did, in fact, encourage so much enthused writing, has failed to deliver its promises and nowadays scarcely figures in the theoretical landscape (Culler, 2001). We may be tempted to think that in the last two decades it just stopped being fashionable as a subject, or that, as a science, it developed as a critique of itself and was thus consumed (Kristeva, 1969).

In truth, semiotics did not die out, but the mega project of taking all knowledge as object-study and mothering the disciplines of the *sciences humaines* (linguistics, anthropology, psychology, philosophy, etc.), seems to have lost its momentum for good. Somehow, the academia had difficulty digesting claims like that of Umberto Eco, for whom semiotics is concerned with anything that can be taken as a sign, which, in turn, is defined as everything that, on the grounds of a previously established social convention, can be taken as something standing for something else (Eco, 1976). Nevertheless, with regard to the role played by semiotics today, it is defended here that it is what truly animates the development of cultural studies in whichever name they go by, in the sense it is the driving force to understanding different cultural practices and evaluating their relative meaning.

Of course cultural studies has a history of its own: it started with a rather ambiguous programme in Britain in the 1950s, as an amalgam of art history, anthropology, sociology, art criticism, film studies, gender studies and journalism (Elkins, 2003). In some cases, it evolved into something more intrinsically visual and went off to become Visual Culture studies or simply Visual studies, focusing mainly on the sums of popular visual practices from the mid-twentieth century until today. Professor Mirzoeff, a visual culture theorist, further explains that "visual culture is concerned with visual events in which information, meaning or pleasure is sought by the consumer in an interface with visual technology", which, we might add, can be varied (Mirzoeff, 1998, p. 3). We also find the academic world offers a more general and hip discipline of Media studies, with an increasingly bigger technological component, that is concerned with, on top of all the traditional communication issues, reflections on the interplay between sound and sight, text and image – be it still or moving, hand-drawn or virtually produced.

It seems clear that the multitude of courses on new media, media culture, global media, multimodal discourses, etc., all try to address communicative problems raised with the emergence of new technologies. It is a fact, as McLuhan affirms, that the media of our time reshape and restructure patterns of social interdependence and all aspects of our personal lives (McLuhan & Fiore, 1967). But the struggles to master new products, new networks, software or industries in communication remain struggles over meaning, significance and knowledge. And these preoccupations are no different from those that semiotics introduced decades ago. Mutatis mutandis, contemporary culture studies seek to develop theoretical frameworks applicable to a

wide variety of modes, which are appropriate to communication practices happening today, for the masses, at a global scale.

In pictograms and symbols, the focus is on the visual medium; in investigating the ways we read and interpret them, the focus shifts to processes of intellectual, social and cultural apprehension. Because this study aims to explore the kinds of meaning(s) conveyed by pictorial signs – images filled with content that are present literally everywhere and make up a semiotic system in themselves, it calls for research into different bibliographic documents and sources. It digs into the above-mentioned multidisciplinary field of Visual studies to find references to signs which are today popular in Western culture (with a tendency to becoming global). Further, it looks into the importance that the visual codification of signs carries in relation to universal systems of communication. It does so in order to judge just how pertinent, utopian or reductionist is the appearance of new universal languages, be it with creations like Esperanto or computer-generated icons. This is understood as a step to discover the possibilities and advantages of visual elements that can project a wider sense of literacy. And while signalling the range and heterogeneity of visual expressions, acknowledging the role of semiotic perception in acts of reading, we expect to find how signs communicate their numerous messages in their unique, condensed way.

1.1 Theories in play

There are necessarily two types of content operating in this investigation: one that deals with the rules of language, which is Saussurean to the core; the other, about the characteristics of visual language, and how they are described and interpreted in the light of semiotics, with some support from art history, which is still a valid instrument to explain the evolution of symbols and signs in connection with the myths they represent.

When analyzing the development of artistic styles of representation, one is forced to consider the changing mental and technical perspectives of interpretation, and to look into influential studies of anthropology and sociology for a comprehensive understanding of all the variables that affect the field of picture production and reception. The key point of paradigm shift in the transition to a contemporary critique of the visual, which accounts for "a new way of seeing" is approached via Victor Burgin's *The End of Art Theory – Criticism and Postmodernity*. In regard to the

semiotic role of signs in visual communication, the fundamental works consulted are by Fernande Saint-Martin, *Semiotics of Visual Language*, and by Gunther Kress and Theo van Leeuwen, the insightful *Reading Images: the grammar of visual design.*

Many studies on visual language are marked by a period of epistemological questioning, and attempt to counter the perception we have of the world, which we translate by symbols and signs, with the physical and biological reality of the two vehicles that are responsible for visualization – brain and eyes. It is not an understatement to quote Paul Lester: "visual communication relies both on eyes that function and on a brain that makes sense of all the sensory information received." (Lester, 2006). In a broad sense, we must consider that there is a duality of material forces at play, one, regarded as objective, the other, our understanding of it through our senses, which naturally condition the way we do it; the two things are present in the process of cognition, that goes from intuition to percepts and to perception.

1.1.1 Seeing

All questions pertaining to visuality begin with the act of seeing. And seeing is not a simple matter. At a physiological level, it is an automatic neural activity, and very basically results from light being reflected from objects into our eyes. But then, advances in science (medicine and optics) have taught us so much about the intricacies of vision: we know that the retinal image is inverted; we know that both our eyes have a slight discrepancy and we see only one image instead of two; we know that one object placed far away is not smaller in size than if put right in front of our eyes, … The most accomplished analogy we can make in an effort to understand how vision works is, of course, with the camera. It helps to see the mechanics, the tricks and the illusions.

All mental allowances we make about the way we see and what we see, the many factors that are dealt with by the psychology of perception, cognitive psychology and related disciplines prove that, with so many mechanisms involved, the act of seeing is a complex process. Sturken & Cartwright (2001) could not stress more that to look is an act of choice, and that is is "through looking we negotiate social relationships and meanings" (2001, p. 10). In this process, there is a constant coming and going between knowledge and belief, an alternation between perception and reflection, best exemplified in the ordinary act of looking at a two-dimensional

surface and believing in a three-dimensional space. Art historian and critic E.H. Gombrich summed it up by saying: "We can never neatly separate what we see from what we know" (Gombrich, 1950). In the end, we realise that what reaches the visual cortex, although triggered by the external world (objects, the environment), is never its faithful copy. And so, we are forced to admit, like Victor Burgin, that seeing is not an activity divorced from the rest of consciousness, and that "an account adequate to the facts of our actual experience must allow for the imbrication of the visual with other aspects of thought" (Burgin, 1986, p. 53). In this measure, it is necessary to consider the realm of the visual as being interconnected and in many ways analogous to the verbal.

1.1.2 Seeing and saying

Comparing pictorial systems to linguistics, or, more plainly, images and words, is no new thing. Philosophers since Heraclitus have discussed matters of the *logos* and the *eikon* in their doctrines with the intention of determining true reality and our representation of the world. Plato spoke allegorically of caves, Aristotle used metaphors to explain his concepts of form and matter, and believed that language was a picture of reality. At the heart of all comparisons lies the intricate relationship between 'seeing' and 'saying'. Both actions being to some extent "natural" and "spontaneous", they are also, as affirmed above, extremely complex, given the massive amount of organic, cognitive and cultural phenomena they include.

"Seeing comes before words. The child looks and recognizes before it can speak", wrote John Berger, defending a new, critical way of seeing art, in 1972. The easiness offered by pictures, so much more straightforward than the signs of alphabets, is indeed an attractive feature; and the fact a child can read the message of a pictogram by the age of 3 a feat not short of amazing. But even if seeing precedes words, there is no hierarchy established between the two. What we say may well be prompted by what we see, but also, as the Austrian philosopher Ludwig Wittgenstein put it, the limits of one's language mean the limits of one's world. To that, the French semiotician Roland Barthes would add: there is only meaning of what is named and the world of the signifieds is that of language. (Barthes, 1964, p. 81) The debate seems to be wrapped up in a vicious circle, as if chained in metalinguistics. In the practice of critique, we cannot express what is seen in any means other than through

language. And so, while Berger's point is a focal one, it does not obliterate the fact that once language is mastered, there is no turning back to images alone, a presumed world of simplicity and innocence.

Considering the potential for sociological analysis, the point of contact of seeing and saying (and we keep using these terms instead of sight and sound, as the latter couple seems to refer to abstract entities rather detached from the subject; in other words, seeing and saying are personal actions) has come to be seen as an actual field of expertise. In recent years, the development of theories that within the pictorial medium seek to understand and find a shared meaning with some degree of predictable universality has been given the name of visual literacy.

1.2 Visual literacy

The considerations on the specificities of pictorial signs presented in the previous chapter and also this one lead to this point. Visual literacy is the concept that validates the criticism on visuality and appears both as method and end result of visual culture. The expression 'visual literacy' is not, as argued by Elkins, free from contradiction or paradox (Elkins, 2008): it is a metaphor that "compares the acquisition of skills, competence and expertise (quite distinct levels of mastery) to the mastery of language and literature" (Mitchell, 2008, p. 11), suggesting that seeing is something like reading. However, the very notion of (verbal) literacy is also not as straightforward as it might at first seem: historically used to report the practice and/or knowledge of reading and writing, it has nowadays come to comprise "a variety of spin-off activities and benefits from these core skills", as Holme explains, and its use has been extended to more specific fields, like 'computer literacy', 'geographical literacy' and 'emotional literacy' (Holme, 2004; Barton, 1994). Visual literacy deals, in the same measure, with the processes of deciphering, apprehending and producing, much like reading and writing texts, but instead of being dependent of a script, it is applied to visual, non-written forms of representation.

If there are any doubts about the strength of this metaphor and how it is entrenched in our thought and speech, we need only to refer to all the experts who can "read" Renaissance, Surrealist or abstract paintings, photographs or advertisements on magazines. Very commonly, we find ourselves asking "Can you read me that map?", or saying "I can't get round to reading that graffiti". Likewise, there are those who

are good readers of tattoos, astrological charts or direction signs - and that means roughly they are able to clearly "identify", "comprehend", and sometimes even "judge" and "memorize" their constituent parts. In fact, visual literacy is often identified with the capacity to remember images. Remarkably, it has been claimed in cognitive psychology that the ability to comprehend images is linked to memory itself, so that images tell us what to remember.

It has been argued that we live in a visual age, an age of pictures that are becoming more and more fleeting and fragmentary, like our own attention. (Sturken & Cartwright, 2001, p. 1). For that reason, today's Western culture is the most visually literate ever; with pictures being attached to all sorts of communicative supports, the visual has finally dominated the textual medium, as once the textual triumphed over the oral. But our acquired proficiency at reading or decoding images does not compensate for the erosion of our ability to understand the more individual and sometimes obdurate creations of past centuries. In the sense it is an intelectual skill, this competence needs to be trained and properly taught. At any rate, visual literacy should be construed as an adequate capacity to identify images and to parse them according to the ways they refer to the world. In the end, it serves us as a toolbox of visual interpretations, and on those we rely to understand our culture.

While pointing out the particularities of modern day pictograms and symbols, visual literacy is being employed, as far as it is understood as a resource, much like verbal literacy, that allows for the construction of a system for "learning, recognizing, making, and understanding visual messages that are negotiable by all people" (Dondis, 1973). That implies acknowledging that the basic components which make up visual messages – the elementary concepts of abstract objects such as point, line, surface, etc. – must be learned, even if our ability to see them and our immediate recognition happens innately and without effort.

The process of becoming visually literate differs greatly from that of becoming verbally literate; the latter having, of course, dominated the educational orientation for centuries, and granted the pictorial a mere and impoverished status of illustration. At university level, even today, the study of visual literacy – as an end objective and a means of explaining visual culture – is often found mixed in courses of "Introduction to Visuality" or "Art Appreciation" (Elkins, 2003). The main and obvious reason for this difference in literacies, as already mentioned, is that the visual does not encompass the intrinsically arbitrary elements of a written language: there

are no minimal elements called morphemes to analyse in something that is purely visual; there is no sense of grammatical correctness or incorrectness in visual statements, nor has there been a formal syntax that can rigidly define the arrangement of visual units – not in the same way it happens in linguistics at least.

But this is where the studies on the visual get interesting: to escape the long-held and universally accepted label of art (or any pictorial representation, for that matter) as individual and subjective, they seek to anchor their elements and their modus operandi in observable, general, scientific principles. If a literary work can be analysed in respect to the language it employs, so should pictures be amenable to an examination that issues demonstrably valid results. In other words, an exercise that produces de facto knowledge and an applicable sense of criticism, and not just a nominal talent, comparable to a set of functional literacy measures. The guarantee for that validity could lie in the adoption of a visual grammar rooted in visual semiotics. A non-normative grammar, that is, meant to stress the regularities of the visual medium, and thus make the process of reading visual messages become as structured and univocal as that of reading a stream of words. We will return to this idea in connection to Kress and van Leeuwen's *Grammar of Visual Design* and Saint Martin's *Semiotics of Visual Language*.

2. Visual language

The theoretical approach to visual language is situated within the universe of contemporary, structuralist linguistics as defined by Ferdinand de Saussure. The connection between structuralism and semiotics comes into being in the 1970s with, among other issues, the debate on intertextuality, which supposedly contains all clandestine elements, both linguistic and non-linguistic, in the works of any given author. The notion of intertext brought a dynamic and dialectic dimension to literature, opening it to extra-literary potentiality. As the linguist Julia Kristeva explained, she who is credited to have coined the term, intertextuality should be seen as "a network of sign systems situated in relation to other systems of signifying practices in a culture". Reading the intertext would then mean untying the text, liberating meaning from the closure of signifiers, while opening it up to interpretation from other discourses, primarily textual – but by no means exclusively. Barthes elaborated on intertextuality, comparing the phenomenon to a mirage of citations, a

state of constantly experiencing the *déjà lu* – or the already read – that being the sort of knowledge that makes it possible for texts to have meaning in the discursive space of a culture.

In turn, this links to the concept of ideology, whose presence or impact we cannot escape. Althusser stated that ideology has the defining function of "constituting concrete individuals as subjects" (Althusser, 1979). It represents the imaginary relationship of individuals to the real conditions of existence, and positions us towards accepting contemporary reality as legitimate, natural and normal. Thus, all the work built on signs within the spirit of functionalism or structuralism, marked by a mathematical and logical rigour, after all, typical of Modernism, that had attempted to create a scientific and apolitical language, would come to be substituted by the analysis and deconstruction of those clandestine elements of interpretation present in works of art, literature and scientific laws. The psychology of the Gestalt had also insisted that object and sign should not be confounded, for indeed words and referents do not coincide, but coexist in tension. Prominent linguist Roman Jakobson would further add:

> *Why need it be stressed that the sign is not confused with the object? (...) their antinomy is inevitable, for without contradiction there is no mobility of concepts, no mobility of signs, and the relationship between concept and sign becomes automatized. Activity comes to a halt, and the awareness of reality dies out. (Jakobson,1972, quoted in Lechte, 1994, p. 73)*

Already in the late 1960s, Barthes had suggested that Saussurean linguistics, while emphasizing the basic arbitrary link between the sign's signifier and signified, underrated the dimension of meaning, and that the notion of connotation was in fact more important than a sign's denotation in acts of communication. The Russian linguist and literary critic Valentin Voloshinov, in 1973, would complement that "meaning is always permeated with value judgement" (Voloshinov, 1973), however distinct from individual subjectivity, given the existence of cultural codes. Regardless, when considering the whole system of signifiers, one is sent to the experience of the world, that is, the totality of signifieds that may be applied.

We are reminded, then, that semiotic analysis is born out of the relation between signifier (a sign's material or physical form) and signified (the mental concept that the signifier represents). Linguistics investigates the structural elements within the system that comprises the object and our perception of it, starting from the

way we see the world, how we experience it in terms of subject-object. It looks for grounds in data from biology and physics, in interpreting the smaller, molecular forces. This is the method of semiotic analysis shared by a number of researchers, among which is Fernande Saint-Martin. Her model of semiotics proposes that any visual representation can be observed in a systematic way according to parameters constituted by visual variables to explain fundamental mechanisms of the symbolic function. The methodology requires that conclusions be based on the elementary unit of visual language - a new term she coined, coloreme.

2.1 The contribution of Saint Martin (1990)

To study a visual field as a language phenomenon, one must first consider that visual representations are signifying practices which lend themselves to analysis, and they can be examined to their minimal particles, in the same measure as morphemes and phonemes function in relation to verbal language. The idea is not totally new; in many aspects it follows the footsteps of Barthes: "The point is to draw analytical concepts from linguistics which we think a priori are sufficiently general to permit semiological research to be initiated*"*. (Barthes, 1967, quoted in Saint-Martin, 1990, p. x)

But there are of course many obstacles to be surmounted just to make the analogy viable: for instance, verbal language works with a finite set of symbols (graphic signs), which are standardized. The constituents of visual language, besides variegated, are virtually infinite. Therefore, there is a need to define a basic visual unit. Next, there is a need to adopt a model that can grasp the sense of spatiality – a fundamental facet of the visual. This model is topological and recognizes that peripheral vision frames the observation space, and yet leaves room for a number of forces to interrelate in the picture, affecting different areas of it. The effect is one predicted by Gestaltian theory; seeing happens as in scanning, as if the eye were to sweep the object, in movements of expansion and contraction, of interactions between percepts which modify the configurations of the visual field.

In order to discover whether visual signs have the same characteristics of verbal language and if they can equally be interpreted according to the same method, it is necessary to know if 1) signs have double articulation; i.e., if they can be analysed into two abstract structural levels; and 2) if they are constituted by isolated or isolable elements. If not, then they are perhaps not apt to constitute a *bona fide*

language, but only a secondary kind of language, interpretable via the verbal, its meanings or connotations placed at the level of intertextuality.

Saint-Martin sees visual language as a continuous, spatialized topological entity, better understood with borrowings from a(n adapted) topological geometry, with its notions of vectors, intensity and equilibria, which allow the interpretation of the visual space as a continuum of undulations, a field of forces that work in three dimensions – height, width and depth. The energy of the chromatic dimension results from an aggregation of elements that determine energetic behaviours and visual variables. This cluster of visual elements, which has in colour its most reliable fixation, is called the coloreme. In other words, the coloreme corresponds to the percept that limits a regrouping of visual variables in the momentary unit of an ocular fixation.

As to topology, it lends a mathematical vocabulary that promotes discussion, but it does not reveal a specific content – and thus, avoids abusive interpretations. It does, however, allow us to work with quantifiable bodies that are volumes, and they are of two sorts. There is a notion of internal volume and another of external volume: internal volume being the quantitative perception of the matter that constructs the object; external volume, the place occupied in the environment, measured from a point of view exterior to the object. Given its polymorphic quality, the fact that it is an extensible mass not defined by its external contours, internal volume is a key term to describe visual variables – and the perceptual process itself. These topological notions are necessary in the experience of an exterior reality; without them, a surface represented in two-dimensional Euclidian geometry would remain purely hypothetical.

More than searching for a presumed essence, semiotic analysis looks into the interrelations between the elements. The basis remains the linguistic analysis between parts (of the text) and the dependence its elements have on each other, and, as in verbal language, there is a system that supports it. Without it, it is impossible to envisage any process of intervention. The system provides homogeneity and semiotic analysis is then able to clarify the meaning of the concepts of homogeneity and continuity in verbal language, thus making the structure interlinked and dynamic.

But unlike verbal language, which has to have gaps and periods of silence, visual language has no voids, no spaces. Our perception does not admit chromatic silences, and so visual texts are marked by unbroken contiguity; coloremes are

permanently juxtaposed, their interrelations and regroupings forming supercoloremes. As the children in Piaget's experiments put it, "for the eye, everything touches everything."

Visual variables are essential in visual language, like building blocks of visual texts. They are organized and classified according to dynamic principles of the visual field, which, in turn, attest to their constant alteration in topological spaces. Coloreme intensity and interaction, says Saint-Martin, are the energy that distinguishes the different dynamics of visual language manipulation in the works of, say, Cézanne, Matisse and Pollock.

Visual variables are, then, the fundamental material in a semiotic study that expresses visual language, and the coloreme its basic unit. Within a coloreme, the variables are organized in terms of colour/tone, contour/shape, texture, dimension, vector and position in plane. Colour and texture, being plastic variables, belong to the first group. The second group is a product of complex subjective processes that synthesize the matter which constitutes the visual field. The variables are different databases, separated by ocular centrality in the external field, with the animation of coloreme.

Thus, to observe colour with higher degrees of precision (by optical instrumentation) is not going to supply us with objective, scientific knowledge, for, strictly speaking, colour is not a property of matter itself and consequently it remains an unquantifiable concept. At the level of human perception, colour can only be apprehended through the intermediary of ideas of similarity and difference; a necessary simplification that results from the realisation we are only able to see limited reflections of light on materials and objects, which happen according to variations of wavelengths, luminosity and so on. Of course, we bear in mind that colour is a plural, conventional and abstract term, and its meaning elusive. Scientists and philosophers alike agree that a theory of colour can only be conceived with borrowings from mental conceptualizations, metaphors and literary appropriations.

Along with subjective elements, there are perceptual variables that form the coloreme and that appear as shapes from the plane position, dimension, vector and contours. But they are not universally given: each artist and each viewer has its own reception; a reception that depends of visual illusions created by convention or even by physical gestaltian laws, that happen in the act of seeing. Typical of a convention may be the idea that red is power and warmth, against the freezing blue. But we do

know that the energy of the photons that produce the appearance of red is inferior to that which produces blue. Conventions also apply to shapes: symmetry has a connotation of calm, asymmetry one of conflict. All these nuances are not strange to painting; in fact, they have been thoroughly explored in studies of art history.

With its units defined to their maximal precision, visual language constructed a syntax; rules that allow for a bigger number of communication acts. Syntactic rules regulate both energy and transformation of basic elements that operate in diverse visual fields. It is the sum of the regular modes of production of visual movements that constitute dynamic variables, forces within context, which depend on the rules of agglomeration in the coloreme. They are topological relations, gestalt connections and laws of colour interaction.

Visual grammar offered a taxonomic description of the characteristics of its elements that is not wholly satisfactory. But it compensates by developing grids of typological features. The grid reveals the distribution of elements in space and brings to light their connotations. It reproduces the movement of sweeping the basic plane, the impulse of looking, along successive moments of apprehension, accompanying the field of forces until perception. Again, there are no perfect geometric lines, only different modes of feeling with the eyes the dynamic that attracts the spectator.

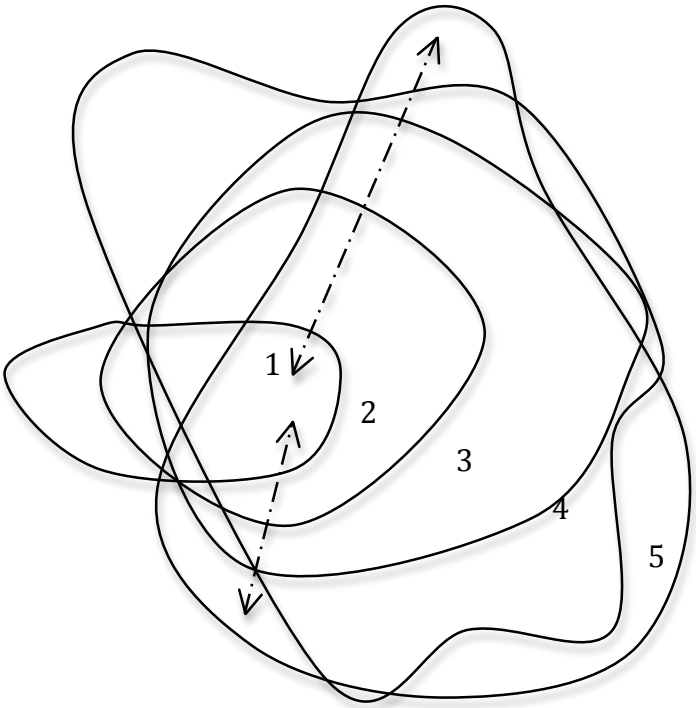

Figure 11. Structural levels of visual grammar, according to Fernande Saint-Martin

In the scheme is an illustration of the perceptual mechanisms of peripheral vision, which provide syntactic information on the visual field. The boundaries are neither rigid nor clear-cut and they continuously transport the energy of each level towards the others.
The central zone is more connected to the objective aspect of the visual field and the other zones more linked to the subjective dimensions of perception. We can merely conceive visual language as a product of continuous interactions of several structural levels, but we note here that a description of its functioning results only from artificial distinctions to serve the ends of an analysis.

Others have attempted to unravel the visual language of the basic plane, with results falling short of definite. Before Saint-Martin, Barthes carried out a similar type of analysis, applied to the study of photography, in *La Chambre Claire (1980)*. While trying to find the intentions which create and animate images, he did establish the distinction between two types of information collected by the eye at the moment of fixation: the *studium,* which corresponds to what we can recognize as units of time and space, or situational and descriptive elements that give us the where and the how – the kind of habitual, "comforting" information that ensures we get the gist of the work; and the *punctum*, an aggressive term in itself, which refers to the element which may be subtle or unclear – more like a percept – but grabs or pricks or the viewer, provoking an unpredictable, emotional response.

On the same note, we may consider the Portuguese philosopher José Gil contributing to the debate; in his usual poetic wording, he finds in the field of forces of the basic plane constellations of floating information, tiny perceptions, that are nevertheless susceptible to becoming a presence:

> *No doubt it is a force, or a beam of forces. To the extent that forces are captured without precise connections or shapes, we can consider they emanate from small, insensitive perceptions. But at the last stage of perception, the forces are arranged in beams and appear to have a "form" of their own, a certain singular way of manifesting themselves, certainly linked to the figure that they represent. (...) Where does the force that underlies the form come from? From the small perceptions, those tiny perceptive units that Leibniz called "imperceptible" or "insensitive", which are in infinite motion, and whose clusters or associations give rise to macro-perceptions. But before they are formed, they are precisely organized in an agitated environment with the characteristic of enlarging the scale of perception. The form of a force is nothing more than the result of that scale enlargement: it is now possible to "see" an invisible whole, as if our sensory organs had received an implant of electronic microscopes.*
> *(Gil, 1998; my translation)*

We are well within the realm of epistemology, but the sidetrack is justified: Gil provides an accurate explanation of the difficult, still insufficient and (by lack of a better term) indispensable visual language.

3. Grammar

Grammars use broad, abstract classes of items, but provide fairly definite rules established at a generative level of their structure for combining them into an infinite number of possible utterances. They are decontextualised and intangible, but also powerful in what can be done with them. Kress and van Leeuwen's grammar of the visual is a descriptive framework that can be used as a tool for visual analysis, analogous to the system of relationships and contexts that makes verbal communication possible. In its core is not the notion of coloreme, but the notion of sign, and the relationship between signifier – that is, in the authors' view, forms such as colour, line and perspective, and signified – the meanings produced.

Here is a tentative grammar that is consciently anchored to social semiotics, since it recognizes that the communicative actions of all those who make signs in the environment of their cultural world are connected to the resources they use, which, in turn, influence their potential, and so evolve in a dynamic continuum. The signs from which images are composed, the authors stress, have developed socially, in the interactions of image makers, their intended meanings and their readers or viewers. To quote Lewis, "what makes visual images intelligible is that makers and users alike share common understandings about how the world – real and imaginary, outer and inner – can be represented, and about how images can be and are used." (Lewis, 2004, p. 214) Kress & van Leeuwen's grammar of visual design borrows from Halliday (1978) its essential ideational metafunction, that is, it represents the world around and inside us, as well as an interpersonal function, for it enacts social interactions and social relations. The implications in terms of communication efficiency are tremendous.

From this perspective, it makes sense to consider pictograms and symbols as privileged signs, the product of a fundamentally social concern. Traffic signs are paradigmatic, for they arise from a need to fix and regulate various types of messages within certain communities, representing both concrete and conceptual realities, and function effectively because they are part of a recognized system.

The grammar, then, provides an important key to not only interpreting spatial dimensions, but also to form meaningful visual compositions – something that is skilfully explored in advertising, but can also be extrapolated to the analysis of any other pictorial support (which the authors do, in fact, taking examples from children's

drawings, picturebooks, charts, diagrams and maps, fine art paintings and scultpures and commercial websites). For instance, when considering layout, in itself an instrument of communication, we are told how elements placed on the left of a space (typically a page) correspond to given information, opposed to elements on the right, that denote new information, as the figure below illustrates:

Left > Given information	Right > New information
Top > Ideal situation	Bottom > Real situation
Centre > Focus	Margin > Periphery

Table 1. Dimensions and values of visual space correspondence

3.1 Practice

Perhaps the whole discussion on the modes of seeing, reading and understanding the visual would feel less intangible had it had begun with this part here, save for the weight of theories is a necessary one. But at this point it is salutary to be reminded that this study is about giving visual signs a place in the theoretical arena, and pictograms and symbols serve as models to that end. To state the necessity for an education in visual literacy, we must acknowledge that the signs it deals with, and the characteristics of the statements they produce are in fact shouting out to specialism. Visual signs are observable facts happening everywhere around us, present in the clothes we wear, in the packages of the food we eat, in the displays of the cars we drive, on the buttons we push, all around in the cities we live in. These are signs that not only have a physical existence, but also represent a social and technological phenomenon which is a rich source of cultural analysis. Those more or less geometrical compositions of squares and circles, standard and proportional, have become so useful we cannot imagine our environment without them.

3.2 Definitions

Many concepts belonging to linguistics and semiotics have already been introduced and discussed throughout this chapter. A basic familiarity with the notions has been assumed. Nevertheless, a few terms need to be briefly defined, even if only to clarify their affiliation with the theories in which they are inscribed. In that sense, this section might work as a sort of glossary, which is useful to take into consideration, also for the chapters to come.

When talking about semiotic signs, it is impossible not to revisit the seminal concepts used by the two unrelated founders of semiotics in the early years of the twentieth century. We refer, of course, to the Swiss linguist Ferdinand de Saussure and the American philosopher Charles Sanders Peirce.

Sign. Signifier and signified

Saussure's definition of a sign as a relation between a signifier and a signified is as fundamental a concept as that distinction of *langue* and *parole* in regard to language. It appears as semiotic's basic axiom. But despite being dual in nature, the sign is more often than not modulated through a deeper analysis of the signified dimension (Saint-Martin, 1995). Saussure contrasted the verbal signifier, which is a physical, sensorial acoustical image (or percept) characterized by its discontinuity, linearity, irrevesibility and arbitrariness, with the visual signifier which is continuous, multidimensional, and spatial. The latter is motivated through a resemblance to sensorial visual groupings of variables. In both cases, while the signifier is sensorially apprehended, the signified is not, as it must be deduced from the signifier.

The link between the two entities, signifier and signified, is arbitrary and conventional: that is to say, there is no inherent, essential, transparent, self-evident or natural connection between them; the sound or shape of a word and the concept to which it refers is a mental construct. In addition it may be said, there are orders of signification, which give a sign denotation and connotation, or connotative meaning.

With Peirce, we find a different, triadic definition of the term, as sign is considered to be the relation between a representamen (what Saussure would call a signifier), an object (a referent) and an interpretant (pointing to meaning). Paraphrasing Eco in his theory of semiotics (1976), the meaning of the sign is not contained within it, but arises in its interpretation. Whether a dyadic or triadic model

is adopted, the role of the interpreter must be accounted for – either within the formal model of the sign or as an essential part of the process of semiosis.

As to the modes of relationship between signifier and signified, or, better yet, the degrees of arbitrariness in them, Peirce proposed a trichotomy of symbolic, iconic and indexical. The following definitions are according to Daniel Chandler[4], posted on his website:

- A symbol is a sign in which the signifier does not resemble the signified but which is fundamentally arbitrary or purely conventional, so that the relationship must be learnt. Examples are alphabets, words, phrases, numbers, or flags.
- An icon is a sign in which the signifier is perceived as resembling or imitating the signified, being similar in possessing some of its qualities. Examples are photographs, portraits and scale models.
- An index is a sign in which the signifier is not arbitrary but directly connected in some way (physically or causally) to the signified. This link can be observed or inferred: Natural signs, like smoke, thunder, footprints, echoes; medical symptoms, like pain or pulse-rate and signals like a knock on the door, a phone ringing are all indexes.

It is perhaps worth emphasizing that indexicality is based on an act of judgement or inference whereas iconicity is closer to direct perception, making the highest modality that of iconic signs. The way we interpret symbols is dependent on rules or habitual connections, which are either acquired or inborn. Similarly, there is always an element of cultural convention involved in reference to icons. When we speak of icons, symbols and indexes, we are not referring to objective qualities of the sign itself, but to the reader's or viewer's experience of the sign.

Pictogram

A central notion throughout this study, the pictogram is usually described as a pictorial symbol for a word or a phrase. However, we will adopt the more precise definition by Abdullah & Hübner, which states "a pictogram is an image created by people for the purpose of quick and clear communication without language or words,

[4] Online source, no date available: http://www.aber.ac.uk/media/Documents/S4B/sem-gloss.html <retrieved 10/08/2010>

in order to draw attention to something." (Abdullah & Hübner, 2006, p. 24) As we understand, in the universe of public signage, that rules out signs that bear letters, like the the i for information, the @ for internet connection or the P for parking. More formal in comparison, we also present a definition by Professor Herbert Kapitzki, an authority in German graphic design, which states "a pictogram is an iconic sign that depicts the character of what is being represented and through abstraction takes on its quality as a sign." (Abdullah & Hübner, 2006, p. 10)

Icon

The Peircean proposition already advanced (above), we turn to the OED[5] for an update on the definition of icon. Although senses 1 and 2 are irrelevant to the matter in question (apart from the religious icons which were mentioned briefly in chapter I), the entries on computing and linguistics express the ways in which icon is used in connection to either verbal or pictorial languages.

> **1** a devotional painting of Christ or another holy figure, typically executed on wood and used ceremonially in the Byzantine and other Eastern Churches.
> **2** a person or thing regarded as a representative symbol or as worthy of veneration
> **3** *Computing* a symbol or graphic representation on a screen of a program, option, or window.
> **4** *Linguistics* a sign which has a characteristic in common with the thing it signifies, for example the word *snarl* pronounced in a snarling way.

Other symbolic types of representation

Within the field of graphics, with or without applied design, there is a number of aids for visualing concepts, instructions, data, general information, which of late (especially following the vulgarisation of internet sites) have collectively gained the name infographics. But representing begins with marking, before it proceeds to writing and other abstractions. We have listed here several visual supports, that share the Greek element *gramma*, or written thing. Some of the terms have already been used in chapter I, in a more contextualized manner. In any case, the table below summarises the most common objects and provides an example - among many that were possible - for each entry (third column):

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[5] http://oxforddictionaries.com/view/entry/m_en_gb0397940#m_en_gb0397940 <retrieved 02/02/2010>

Iconogram	Illustrative representation	Schematic drawing
Pictogram	Pictorial representation	Isotype
Cartogram	Topographical representation	City map
Diagram	Functional representation	Pie chart
Ideogram	Representation of a concept	Pictorial logotype
Logogram	Conceptual representation	Hieroglyph
Typogram	Typographical representation	Word
Phonogram	Phonic representation	Phonetic alphabet

Table 2. Definitions, adapted from Abdullah & Hübner, 2006, p. 11

Before turning to the next chapter, which deals with the signs of languages from a universal perspective, a conclusion must be drawn after theorizing on the subjects of visual semiotics and literacy, from Peirce and Saussure onwards. It has been established that a reflective sense of what images are taken to be in various fields of our society (as well as in other non-Western societies) is a crucial imperative. It forces a consideration of visuality to become a discussion also on the social construction of vision, the relation between seeing and saying, the necessity of continual interpretation and the involvement of the viewer in what is seen. We have mentioned the multi and interdisciplinary aspect of visual studies, and the same is valid for this skill or ability we call visual literacy, which can encompass segments from the fine arts, anthropology, physics, cognitive science, psychology, engineering, etc.

Of course that granting latitude to visual literacy studies does not mean they must deal with all visible entities, that the whole world is a stage. Like visual semiotics, visual literacy is primarily concerned with the study of visual representations which are part of a symbolic process, a process whereby reality is represented in the mind by signs, the meaning of which is defined as a relation of something to something else. These representations in the mind and their meanings can only be reached through their approximate translations into forms of signic representations, whether verbal or non-verbal. From there sprout the myths, the images, language that can turn to poetry. It touches the most human-specific character we find in the world – that is why it is important.

Chapter III.
Universal languages

The previous chapters were about symbols and signs, how and when they first appeared, why they became popular and how they are interpreted in the light of social and visual semiotic theories. The subject of visual literacy was introduced as the field that congregates the realization of practices of seeing and forms of reading, which is sine qua non in understanding visual culture; the culture of post-modernity that seems to be headed for homogeneity. There is, in connection to those matters, a pressing question, which links visual signs to the utopian idea of a common language everyone understands. Pictorial signs, as stated before, have the advantage of cutting across specific language *malentendus*, and of communicating messages in a straightforward and immediate way. The same no smoking sign can convey its prohibitory meaning in the Philippines, Nigeria or in Peru. Assuming for a moment that pictorial signs are universally understood, the way is paved for the construction of an inclusive system that binds them together logically and delivers fault-free information to any receiver. In other words, the door is open to the construction of a universal language.

If the development of a universal language is to be considered the key to solving communication problems, then by no means has the quest for it been fortuitous or senseless. In fact, the debates on the possibility of a world language are as old as time, recurrent throughout history and apparently hard to leave to rest. Because language is a living thing, in constant mutation, a body that grows and develops, suffers setbacks and even dies, it is not at all surprising that it should provide an ample field of study, and that theories abound in every subject into which it is fragmented. But the case of language multiplicity in particular, how it is explained, defined and dealt with, is something so fundamentally intriguing, a germ so powerful, that is able to create myths with astonishing reach and endurance.

1. Babel

The myth of Babel stems from there, an unavoidable biblical reference: it involves scenarios of human pride, divine fury, punishment and confusion. It begins with one

perfect, harmonious language spoken by all sons of Noah, who grew in number and in knowledge; but arrogance and vanity made them design and build a tower so high it would reach unto heaven. And seeing this, God said: "Let us go down and there confound their language, that they may not understand one another's speech" (Genesis 11:7). And thus was mankind plunged into a state of linguistic misery. The many languages of the world were born as curses, barriers to an otherwise peaceful coexistence and mutual understanding among people. In George Steiner's words, "the tongue of Eden was like a flawless glass; a light of total understanding streamed through it." (Steiner, 1998, p. 61) It is a beautiful image, of one amazing gift. After the scattering, all that was left to do, in a way mourning the loss, was to start the quest for redemption, and, persistently, the dream of a single language has suffused human spirits.

Whether this language is a natural or artificial one, it has (pre)occupied the minds of novelists, scientists and philosophers alike, with its promise of an easier form of communication, the end of misunderstandings and poor translations, and ultimately a better world. But how to achieve widespread linguistic unity? In a world that speaks over 6,000 languages, how can a single one be picked over all others? And by whom, with which authority, using what kind of criteria?

The Adamic, ideal language set aside as a cultural fable, there never was such a thing as one language for all people. But historically there are (were) languages which came rather close to being just that – serving the purpose of communication between people of different cultures and tongues. The most finished examples in ancient culture are the koiné Greek and Latin; not surprisingly, languages imposed by force and kept authoritatively during a period of imperialism. Many times also called bridge or vehicular languages, the bases for pidgins or creoles, they are best known as lingua franca, and are defined as the language one speaks when "thrown" together with other people and no common speech.

2. Lingua franca

The term lingua franca was originally used to refer to the medieval Levantine pidgin based on the language of the Riviera (between Marseille and Genoa), since many sailors who traditionally traded in the eastern Mediterranean came from that area, and commerce was the ultimate driving force for interaction. In general, lingua francas are

provisional languages, characterized by a limited lexicon and a drastically simplified syntax in relation to the language used as base, and survive only as long as the situation that motivated their use is maintained. Eco (1994) refers to them as 'bricolage languages' and further stresses they arise in areas of colonialism, implying there is always an underlying relation of power in their use. Thus, Portuguese, for instance, was a lingua franca from the time of the great maritime discoveries up to the twentieth century, a language spoken by millions throughout West Africa and India as a second, awfully necessary, communication tool. But the status of lingua franca is irrespective of figures, and the list of natural languages it includes is long and diverse, comprising for example Arabic, Afrikaans, Swahili, French and German. Naturally, occurring at different times, in different places and for different reasons.

Today, it is plain to see that English is the whole world's lingua franca. Standard English, that is, in its formal state. Even though the vision of English as a true world language was already noted in Victorian times, as Hitchings points out - it was said a language 'destined to reign over all parts of the globe' (Hitchings, 2008, p. 282), it was the last decades of the twentieth century that definitely swung the balance to its favour. Not considering all the reasons that explain its predominance nor if its popularity carries implicitly the death or resurgence of minority languages (Crystal, 2005), English is, in fact, the preferred language for international trade, diplomacy, advertising, travel, technology and computing, science and medicine. And, very importantly, the language of entertainment business and youth culture. With over 300 million native speakers, and even more people using it as a second language (an overall 1,5 billion users, but figures are not totally reliable), its reach is without any doubt global. However, that is not the same as being universal.

The much sought-after universal character in language is something that can rise above all barriers of idiosyncrasies, regionalisms, dialects, languages, cultures, and communicate concepts and ideas in a clear and unambiguous manner. A single form of communication that not only revives the dream of the original nomothete, implying the possession of a transcendental knowledge of things, it also brings a certain easiness to the thought of being face to face with new realities. And these have a tendency to emerge at any time. Consider, for example, trade, especially maritime trade, expanding, and mercantile motivations that could not be ignored throughout the late fifteenth to the sixteenth centuries. Or the discovery of distant, unknown lands, already in the *Quattrocento*, with Portuguese ships setting sail "to seas no one had

sailed before[6]"; the contact with exotic, unintelligible languages only deepened Babel's wound, and reinforced the need for a new language everyone could profit from.

3. The language of John Wilkins

A project of an artificial language does not, at first, seem to have much comparison with the matters of visuality or picturality we have reflected upon before. But in fact it does. Behind the creation of every artificial language is the recognition that natural languages are deficient, insufficient, incapable of either conveying meaning universally or conveying the right type of meaning. As a result, new systems of expression are devised, products of a condensed theory, with new signs, new rules, new conventions. These may be visual or verbal, but are nevertheless constructed with a purpose of fixing a clearer way of understanding. There lies the answer to why it is significant to bring up the remarkable projects that follow. How they work or why they fail has parallels in visual systems. The visual signs that we read everyday are as constructed as those used for the expression of thoughts, like in any language, natural and artificial.

We find the intention of creating an artificial language well in place in the works of seventeenth century thinkers, namely John Wilkins, Descartes and Leibniz. The first of these, following the footsteps of George Dalgarno[7], is the author of the analytical language described in *An Essay Towards a Real Character and a Philosophical Language*, published in 1668. Wilkins was a respected scholar, founding member of the Royal Society, head of a college in both Cambridge and Oxford. Passionate about cryptography and the overall science of the time, his *Essay* must have been influenced by Descartes' claim in 1629 that "it is possible in a single day to learn how to name all the numbers up to infinity and to write them in a new language, of ciphers".

In the universal language devised by Bishop Wilkins, each word defines itself, each letter has significance. There is a structure of forty categories or genera into

[6]" *Por mares nunca dantes navegados*", a verse from the opening of Camões' epic *The Lusiads*(1572)

[7] George Dalgarno's *Art of Signs* (*Ars Signorum*, 1661) was the first work in the seventeenth century to present a fully elaborated universal language constructed on philosophical principles.

which the universe is divided, and then subdivided into differences and species; to denote each genus, Wilkins assigned a monosyllable of two letters, to each difference, a consonant and to each species a vowel. The result of this rigorous categorization is a vocabulary that is self-explanatory – the antithesis of an arbitrary sign. Its ingeniousness notwithstanding, the language's divisions of classes and species remained contradictory and vague (Borges, 1981) and the project did not really prove as lasting as its author had expected.

But other works followed, and not only in England; Wilkins was not alone in his quest for the logic of a universal grammar and language. In fact, the project of a universal character was, according to Cohen (1954), "the intellectual commonplace in seventeenth century Western Europe". Understandably so, communication had become a challenging matter, since Latin was visibly declining, checkmated by the vernacular, in which literature was being steadily produced. English was experiencing its Golden Age, with Shakespeare and Milton choosing to write in their mother tongue; in France, Racine, Molière and Corneille were elevating French into the sublime.

On the other hand, a new scientific discourse was in the making, for science was booming with new impetus, advancing chemistry, astronomy, physics, biology, botany, and in mathematics, modern algebra, geometry, trigonometry. In this climate of methodical questioning, of rejection of dogmas and superstition and search for rational truths, what was happening to language can be compared to the building of a new Babel. Figuratively speaking, Latin, the primordial language, represented God's order, or the established powers: the Church, the aristocracy, the intelligentsia. But thirsty for more knowledge, people wanted an edifice of reason, to achieve the universal truth. Translating the Bible into the common tongues of men was an act of defiance, a breach in the establishment, as was affirming the sun was at the centre of the solar system. The plurality of languages was paradoxically the instrument of rebelliousness and rebels' chastisement. And, just as with the doomed sons of Noah, the hope remained that a new language could step in, this time as a medium of the modern discourse, a logical, deductive and complex expression of the universal philosophy. To many heirs of the long Jewish tradition, to Pietists, Gnostics or students of the occult, all longing for a glimpse of Illumination, that would be nothing other than the original Logos embodied in the primal language, be it Hebrew, Aramaic, the language of Nature, or, as Kepler argued, instrumental music; this

stimulus made them dig deeper in the mysteries of the Kabbala and the 72 names of God.

4. Descartes' say

What became generally known as *ars signorum* was a vision René Descartes embraced, even if he did confess to reservations about the practicality of an artificial language before the elaboration of an analytic logic was complete. The principle of arbitrariness, he understood, is a difficult one to overcome. But, like most others, he was ready to admit that natural languages are deficient, full of imperfections, their grammars corrupted by usage, and that a doctrine of enumeration is the viable way to order and measure.

In his letters, Descartes wrote of a simplified and basic language that could establish a set of primitive names for actions, and corresponding substantives might be formed from such names by simply adding affixes. From there, "a universal writing system might be derived, in which each primitive name was assigned a number with which the corresponding terms in natural languages might be recovered"(Eco, 1995:217). Again, the stress is on logic and Reason, the instrument leading to the discovery of truth, and the challenge to understand nature is an exercise that involves the discussion of notions as ideas, universal forms and substances. As Rossi (2006) noted, the natural world was being compared to a language written in different characters; the mind and its faculty of conception had the task of recording the signature of those characters. By means of a universal alphabet (of which more later) one could order these concepts in such a way that there would be perfect congruence, without homonymy or synonymy, between the signifier and the thing signified. The tone is in consonance with Galileo, who, in *Il Saggiatore* (1623), wrote that:

> Philosophy is written in this grand book—I mean the universe—which stands continually open to our gaze, but it cannot be understood unless one first learns to comprehend the language and interpret the characters in which it is written. It is written in the language of mathematics and its characters are triangles, circles, and other geometrical figures, without which it is humanly impossible to understand a single word of it; without these, one is wandering around in a dark labyrinth.
> *Il Saggiatore* (1623), translated by Stillman Drake (1957), *Discoveries and Opinions of Galileo* pp. 237-8

Again, we are reminded of how important the theme of languages and their signs was for the making of a new scientific age. The language of mathematics is, of course, to be read *lato sensu*; the geometrical forms Galileo mentions could well be allusions to the constellations or, very plainly, the graphic symbols in scientific notations. Also, 'philosophy' should be understood as 'general knowledge', the mother of all sciences, and the image of the labyrinth can be associated also with the dark, medieval ages, when scholasticism, aristotelism and Christian dogmas were the order of the day. In reality, Galileo is referring to themes that are dear to all the actors of the so-called scientific revolution, from Copernicus to Comenius, Leibniz and Newton.

5. Leibniz and the *Characteristica*

It is Leibniz who is usually credited as the greatest genius in the making of a universal ideogrammatic language system. And it is true his interest in the universal character was enthusiastic already at the age of 18 (Cohen, 1954); not surprisingly, as someone in contact with Kabbalistic thought, he did acknowledge his debt to Raymond Lully and his *Ars Magna*, revised and expanded by Athanasius Kircher, to George Dalgarno and John Wilkins – thinkers who preceded him on the subject. In common with them, he believed that a universal language would serve not only to promote healthy commerce between nations, but also, most significantly, it would prove to be an instrument of discovery and spread of rigorous scientific knowledge, for it constituted the key – the thread of Ariadne, to return to the metaphor of the labyrinth – to all human reasoning.

The assumptions behind his famous *Characteristica Universalis*, dated from 1688, are as follows: all complex notions are composed of irreducible basic concepts (*cogitatio*), which form what he called the *alphabetum cogitationum humanorum*. Since characters are assigned to the concepts in a way that the rules for the construction of complex characters and those for the combination of irreducible concepts to form composite ones correspond to each other, there must be an analogy between the combinatorial structure of the complex concept and the structure of the corresponding character (Peckhaus[8]). That is to say, signs are constructed and ordered

[8] Online source, no date available. http://kw.uni-paderborn.de/fileadmin/kw/institute/Philosophie/Personal/Peckhaus/Texte_zum_Download/twotraditions.pdf <retrieved 15/11/2010>

in such a way the relations among the signs are strictly analogous to the relations they signify. This is the mechanics behind a logical script that is the instrument to obtaining all complex ideas in an infallible process.

Essentially, the *Characteristica* should be viewed as a step towards the realization of the ambitious project of creating a heuristic general science (*scientia generalis*), the rational ground for all particular sciences, which, according to Pombo[9], can be compared to an incipient demonstrative encyclopaedia. In addition to the *characteristica universalis*, or language of human thought, whose ultimate goal was to represent by means of characters everything that can be known, Leibniz put forward the *calculus ratiocinator,* a quasi-mechanical method of symbolic calculation capable of mirroring the processes of reasoning. In other words, the rules of reasoning (which come down to operations of combination and substitution of characters) would be translated by laws like those of algebra, thus eliminating the chance for imagination to step in and increasing the power of the mind. In his own words, he explains that

> "(…) although learned men have long since thought of some kind of language or universal characteristic by which all concepts and things can be put into beautiful order, and with whose help different nations might communicate their thoughts and each read in his own language what another has written in his, yet no one has attempted a language or characteristic which includes at once both the arts of discovery and judgement, that is, one whose signs and characters serve the same purpose that arithmetical signs serve for numbers, and algebraic signs for quantities taken abstractly. Yet it does seem that since God has bestowed these two sciences on mankind, he has sought to notify us that a far greater secret lies hidden in our understanding, of which these are but the shadows."
> *On the General Characteristic,* translated by Loemker (1969: 222)

There seems to transpire, in Leibniz's words, the long-held belief that language has a single, divine origin, and consists of elements that, by suitable means, can be reconstituted to reveal truths of creation and nature. In that sense, it is fair to place the *Characteristica* among the other attempts to mend Babel and recapture the epistemological power of the original language of creation. This mythical explanation of language's beginnings was strongly criticized by the French philosopher and mathematician Marin Mersenne, who plainly rejected it as chimerical; instead, he

[9] Online source, no date available.
http://cfcul.fc.ul.pt/textos/OP.%20Leibniz%20and%20the%20Encyclopaedic%20Project.pdf
<retrieved 12/10/2010>

affirmed, and by doing so was branded as sceptic, that whatever the original language, it was made by men as need arose, and no better than their limited knowledge allowed. He defended observation, experience and reason as the only sources of knowledge of nature.

As regards the representational aspect of the *Characteristica,* Leibniz discussed various types of signs, out of which visible characters for actual artificial languages could be constructed. Besides numbers and other mathematical symbols, he considered letters, chemical formulae (derived from alchemical elements), astronomical figures, Chinese ideograms, Egyptian hieroglyphs, musical notes and the means employed for secret writing (cryptography). These notations were supposed to represent ideas immediately, and not words for them. But they were uncertain combinations, and unable to "achieve that *mathesis* of unambiguous denotation and discovery which the seventeenth century and Leibniz himself had intended." (Steiner, 1998, p. 211)

In the end, despite his prolific writing and elaborated discussions, Leibniz never did produce a final version of a finished artificial language, in the sense a full descriptive grammar was in place, as the one designed by Wilkins or the less known *Logopandecteision*, published in 1653 by Sir Thomas Urquhart, the Scot. And so, at sight of incompletion, we are left wondering about the actual feasibility of such a project, even when transposed to the reality of our days.

As maintained by Rossi (2006), both Leibniz's *Characteristica* and other *a priori* language projects that issued from the late Renaissance to the period of Enlightenment in England, France and Germany should be understood within the context of a tradition which fused the medieval notion of the *ars artium*, mnemotechnics, emblematics, cryptology, the kabbala and other modes of communication. For that reason, it is common to find in their schemes a jumble of symbols, mathematical formulae and alchemic diagrams as the ones already described and illustrated in chapter I. Observing this strange sign mix and how signs are recuperated vaguely echoes Lavoisier's maxim: "Nothing is lost, nothing is created, everything is transformed".

In the late nineteenth century, something fundamental changed, and projects for universal languages (that did not cease to exist, but got somewhat sidetracked with the question of language universals, that would culminate with Chomsky) became essentially *a posteriori* in their design; i.e., instead of constructed *ab ovo* from

philosophical principles and taxonomies, they were based on the comparison and synthesis of existing natural languages. In the cases of Volapük (published for the first time in 1879), Esperanto (1887), Ido (1907), Novial (1928) and Interlingua (1937-1951), all international auxiliary languages, the words which make up their lexicon have roots in Western European languages. Part of their appeal lies in the simplicity and regularity of their grammar and syntax, which is complemented by a fundamental trait of familiarity, making them learner-friendly. However, the reasons for the diffusion of these languages remain mainly psychological and ideological.

6. Esperanto

Looking closer into Esperanto and the man behind it, Dr. Zamenhof, it is plain to see his grand intent was to promote economic and social development, to counter totalitarian threats by means of a language that was politically neutral. Among all the other projects of artificially constructed languages, it was his that (al)most succeeded: it was taught all around the world as a foreign language would be, recognized by UNESCO, used in literature and in language learning; it is to this day the most widely spoken international auxiliary language. There are aspects of it that, from a users' perspective, make it in fact a paradigm of equality.

Esperanto is free from the weight of political dominance. It belongs to no country; it has no history of conquests attached. No doubt that a potent *hope* is present in this creation, but it is no longer the hope to access the *clavis universalis*, or *the* language that enables man to see beyond the veil of phenomenal appearances, the "shadows of ideas", and grasp the essential structure of reality. Rather, it is one of attenuating the contempt that inevitably arises from men's inability to understand each other; a marginal win as a second language.

It remains a utopian project, yes, which leaves everyone thinking the cup is half empty. Esperanto failed because no artificial language can ever possess the versatility and flexibility of a natural one; a claim for clarity cannot encompass the ambiguity which is richness in speech. Also, there is the problem of meaning, which cannot be reduced to a static setting nor is it ever neutral in any given linguistic community. On the other hand, neutrality conflicts with individuation, and if a language is not malleable, if it does not lend itself to appropriation by subjects or

groups of subjects, then the tensions between what is private and public, so essential in discourse, simply do not exist.

7. Literature

A serious matter in philosophy and the exact sciences, in fiction, the ways of approaching universal language tend to be more jocose. An example taken from Swift's *Gulliver's Travels*, set at the school of languages, hits the right notes of derision at "old" academic debates:

> The other project was, a scheme for entirely abolishing all words whatsoever; and this was urged as a great advantage in point of health, as well as brevity. For it is plain, that every word we speak is, in some degree, a diminution of our lunge by corrosion, and, consequently, contributes to the shortening of our lives. An expedient was therefore offered, "that since words are only names for things, it would be more convenient for all men to carry about them such things as were necessary to express a particular business they are to discourse on." […] However, many of the most learned and wise adhere to the new scheme of expressing themselves by things; which has only this inconvenience attending it, that if a man's business be very great, and of various kinds, he must be obliged, in proportion, to carry a greater bundle of things upon his back, unless he can afford one or two strong servants to attend him. (…) Another great advantage proposed by this invention was, that it would serve as a universal language, to be understood in all civilised nations, whose goods and utensils are generally of the same kind, or nearly resembling, so that their uses might easily be comprehended.
> *Jonathan Swift, Gulliver's Travels (1726-7) Part III, chap. 5*

The comical element here does not dispense with the reference to different schools of thought: one, of Quietism, that evokes the figure of Angelus Silesius, who in the seventeenth century claimed the Divine could only be accessed through silence; on the other hand, Swift expresses a view highly critical of linguistic idealism, which finds a diversion via the material, ontologically-inspired solution of the show-instead-of-tell. The satirical critique of pointless verbosity, directed especially at eighteenth century English society, goes, too, without saying.

In between these two poles of solemnity and playfulness, we find the space for pictures. They were, after all, a material too good to be dismissed, especially after the invention of photography in the 1830s, which represented a new support of objectiveness, immediateness and correspondence to the real world. A technology with rapid acceptance and relatively free distribution, photography permitted people to "see things as they are", unambiguously and in a memorable way. The advantage of

the visual medium, used graphically – and, therefore, more abstractly, would be used as a remedy to heal the deficiencies of verbal language when considered at universal scale. Visual signs would, then, be the core of Neurath's Isotype, also an international helping language, but one originally developed with pictures in mind.

8. ISOTYPE

Isotype may well epitomize the practicality of pictures in relation to a universal language. Not only does it stand out as a finished project of visual communication, it also set the precedent of using pictograms (picture-signs) instead of words, with the primary purpose of education. To look into it is to discover a latent literacy, for Isotype's design serves to promote knowledge with pictures, and at the same time those pictures are basis for more knowledge.

The context for the appearance of Isotype, as already mentioned in the first chapter, the acronym for International System of TYpographic Picture Education, is that of Austria in between world wars. Otto Neurath, a social scientist, was founding member of the Vienna Circle together with Rudolf Carnap, Moritz Schlick, Hans Hahn, among others, who took on the project of an empiricist, anti-metaphysical and language-oriented philosophy that would come to be labelled logical positivism. The Vienna Circle group was politically active and engaged in the dissemination of liberal and scientific ways of thought (Stadler, 1991).

At the height of this intellectually productive period, Neurath's name became associated with the Gesellschafts-und Wirtschaftsmuseum, which opened in Vienna in 1925. The museum - Ge-Wi-Mu for short - would be home to several exhibitions focussing on housing problems and general living conditions for the working classes. Neurath took the opportunity to there present social and economic facts by means of his new method of pictorial statistics. For the first time, graphic design was the central instrument used to achieve education for the masses; it would be part of the master plan of teaching through the eye.

Embracing the principle that "words make division; pictures make connection", his idea of supplying graphic symbols to represent all spheres of life was, in fact, what he considered the simplest means of edifying the population. The cause for that simplicity lay in the effortlessness of seeing, but to provide a complete system for working out pictures and getting most profit from them was in fact a

labour that required expertise. It is an art to get the full effect from words, as it is to get the full effect from pictures. Hence, good professionals were of the utmost importance, for only they were capable of putting together works of science and works of design, and transforming them into teaching materials. (Public instruction was, on balance, the primary field of application of picture language, followed by advertising as a secondary purpose.)

The principles behind the pictorial-statistical work of Isotype were compiled in a book called *International Picture Language*, written in Basic English, in 1936. Basic is, too, an acronym: it stands for British American Scientific International Commercial, and it is the international auxiliary language "invented[10]" by C.K. Ogden in 1930 that features a remarkably minimal vocabulary of 850 English words. Basic English has the advantage of being short enough to be printed on a single sheet of business notepaper, yet long enough to express all the root ideas needed for practical communication. Stripped to the most essential, this simplified language, already enjoying its status of lingua franca, suited Neurath and his intended public of schoolteachers, for it ensured the emphasis remained on pictures.

To defend a power shift in the use of verbal and visual media in education, Neurath would claim: "the effect of pictures is frequently greater than the effect of words, especially at the first stage of getting new knowledge" (Neurath, 1936, p. 22). In that measure, the use of pictograms as signs for a communication system with the potential for becoming universal is perfectly justified. On top of that, as pictures were believed to have a greater effect and a longer existence than words, also to produce a good picture was considered a more responsible work than to make a statement. Teaching materials that made use of pictures had to, then, avoid common traps language tends to employ, like for example to circle around certain details of a message in a way that makes it impossible for the "reader" to see the bigger picture. That is to say, signs (especially verbal) get so easily tied up in themselves they compromise the content and obfuscate the understanding of the more general statement.

Things like the growth of cities; the population on earth; the spread of automobiles; the diversification of factories; the organization of goods, are better understood in panoramic terms. That is, they make more sense to be visualized in a

[10] Given the nature of Ogden's project, the term 'assembled' might be more appropriate.

picture than simply described with words – when the impression on the mind is more profound, the information is more promptly secured. So much has cognitive perception already taught us: when facts are put before the mind in a simple, straightforward way, they are kept in memory. And a simple picture kept in memory is better than any number of verbal explanations which have gone out of it. So, for a picture to make good use of this system, it must give all the important facts in the statement it is picturing. Neurath further explains the basic rules in picture-making: "At the first look, you see the most important points, at the second, the less important points, at the third, the details, at the fourth, nothing more – if you see more, the teaching picture is bad." (op. cit. p. 27)

In Isotype, the pictograms themselves are in fact part of a bigger picture; the system for conveying the right message cannot do without words and diagrams – or what we today call infographics. The incorporation of these three modes is a concept we find also in Robert Horn's (1999) understanding of visual language. Indeed, Horn sees the full integration of words, images, and shapes into a single, unified communication unit as the building of a distinct language. Thus, visual language is not about images alone, or shapes alone, but the use of images, shapes, and words that create messages comprised of integrated elements. Neurath had no problem admitting Isotype had "no qualities for the purpose of exchanging views, of giving signs of feelings, orders, etc.", what in linguistics we would call performing phatic and poetic functions of language (which did not fit the programme of a neo-positivist project anyway), and in reality he did make clear this system was not in competition with the 'normal' languages. Isotype, this new language of pictures and graphics, was all for inclusion.

But to return to pictograms, insofar as systematic signs that carry signification, they must possess certain minimal characteristics and follow criteria of, above all, legibility. In practical terms, this means they have to be designed with clarity; they must be identifiable at a glance and leave a memorable impression on the mind. As Neurath himself put it, the signs of picture language had to:

1) be clear in themselves, without the help of words as far as possible;
2) be different from one another, so that no doubt remains of their name;
3) be simple enough, that they may be put in lines like letters;

4) be of such a form that the onlooker will not get tired of seeing lines of the same sign;
5) be abstract enough to be truly representative. I.e., the sign for man should not give the idea of a special person in particular, but depict the individual as part of a species.

Figure 12. Isotype pictograms by Gerd Arntz

Figure 12 shows only a small sample of the pictograms Arntz designed for Isotype, but from there we can infer the extraordinarily large amount of signs that were produced to express the complex relations of so many different fields, from agriculture to transports, professions and world population[11]. The result of the graphic designer's work of drawing more or less abstract signs, despite under the regulations described above, remains at any rate open to discussion. The degree of abstraction in a pictogram may have consequences both at the level of readability and of aesthetics. Although Neurath passes over the subject of artistic weight without any seeming care, we see today, eighty years or so after they were produced, the value of these pictograms lies much in their aesthetic quality. As to a hypothetical reduction in the capacity of being read after undergoing a process of abstraction, it is mitigated by the fact that they denote concrete, material objects. Factual correspondence between pictograms and things ensures at least the understanding of their referents; the matter of their intrinsic meaning is a question of conceptual semantics. As Dondis explains,

[11] A database of all of Isotype's pictograms is available online at http://www.gerdarntz.org/isotype

"abstraction, visually, is simplification toward a more intense and distilled meaning." (Dondis, 1973, p. 74) With Isotype pictograms, the meaning is always tied to a sensible and practical view of real and quantifiable entities.

The challenge with Isotype was to present scientific facts in a different way than the bookish, traditional one, which for many meant memorizing lists of numbers and names. Neurath's belief in comparisons and statistics as the only unbiased view of social and economic realities (against the photographic register, for example, so potentially subjective) was something that fundamentally agreed with the material foundation of knowledge he wished to establish; for that reason, he would choose to represent quantity with quantity, instead of relative, manipulated schemes.

Despite claiming Isotype is intuitive, ("We may even say that almost no knowledge at all is necessary of the words of the picture language – the signs – or of the rules for talking this language – the system" (Neurath, 1936, p. 30)), we must nevertheless point out that it did not do without some assumptions of prior knowledge (for example, in fig. 12, the names of chemical elements appear as in the periodical table). The appeal of an instinctive or intuitive reaction to pictures that were nonetheless designed to be self-evident, refers to subconscious associations, and can be exemplified also in the rules for colour use: "if, for example, he [the designer/educator] has to give a picture of cold and warm water, he will make the warm water red (red is warm, power, industry…) and the cold water blue" (op.cit. p. 46).

Subconscious associations might also explain the transparency of signs that represent farming, industry and trade, which we could say are indexical – or metonymical, in rhetorical terminology: the first is a curved knife, the second a toothed wheel, and the third a picture of scales. Their use in this language system is so logically striking it could even be viewed as a visual cliché. But clichés can be used in a good sense; they can lend a certain local colour to a sign that helps to place it historically. Arntz applied that strategy to clothing (fig. 13) with different objectives. Statistics presenting the working force in the 1890s show women in long dresses, but they wear skirts below the knees in the 1930s. Hat and clutch too, help to place the fashion of the day,

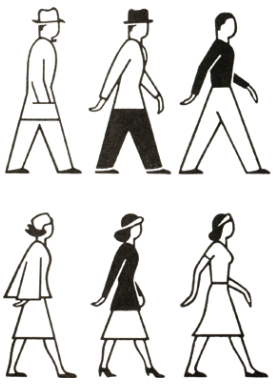


Figure 13. Diversity in fashion. Isotype pictograms.

which permitted some variation without compromising readability. And still more information could be deduced from clothing: for instance, a large number of women at work in the 1950s are represented with the pictogram of a uniformed maid.

Neurath understood the risk of markers, and even tried to avoid them: "Giving a sign its fixed form for international use, possibly for a great number of years, is responsible work. It will not do to take the taste of the present day as our only guide; we have to take into account the experience of history." (ibid. p.40-41) However, in our capacity to recognize the clues of fashion or maybe just the overall style of European modernist drawing, that marker is revealed. That makes these picture-signs dated. But only slightly.

As for the unfolding of historical events, what followed the institutionalization of anti-Semitism in Austria, frankly anticipated after the repressive actions taken up in the name of neo-Romantic conservatism (namely at the University of Vienna), was the Circle was forced to disperse. In 1934, civil war broke out; it brought the museum's activities to a halt. Neurath and his team moved to The Netherlands, as most members of the Circle emigrated to other European countries or to the United States. That was also the year the name Isotype was adopted and its clever logo - a figure watching figures - designed (fig.14).

Figure 14. Isotype logo, designed by G. Arntz

Tireless during the years he was at the Mundaneum Institute in The Hague, Neurath worked in parallel as editor-in-chief for the project of the International Encyclopaedia of Unified Science, to which Charles Morris and Rudolf Carnap would also contribute. It was a work in the Leibnizian, and not Cartesian, tradition, for knowledge was seen as a continuum, and the principle of *tabula rasa* rejected. Neurath's mega-project of materializing encyclopaedic knowledge revives the concept of the *scientia generalis*, with a neo-positivist twist – that is to say, free from Kantian *a prioris* and metaphysical nebulae. A first volume of the work, entitled *Foundations of the Unity of Science*, was actually published by the University of Chicago, but it was only a small fragment of what Neurath had planned; his Visual Thesaurus, pictorial or Isotype, never did make it to print.

What above was said of Zamenhof applies also to Neurath in this instance: it is obvious his intention was not to create a language that could mirror cosmic harmony as the one envisaged by Wilkins or Leibniz in the seventeenth century. Neurath's

purposes with the Vienna Method and pictorial statistics were eminently pragmatic: Isotype was to be a realistic tool to combat illiteracy and promote social equality. Nevertheless, there is an undeniable idealistic trait to the project of an education in clear thought. His optimism not confounded with naivety, as a visionary, he was perhaps ahead of his time. To this day, Isotype represents a breakthrough for pictograms from a graphic perspective, and the legacy of Arntz a true source of inspiration for graphic designers around the word.

Neurath died in London in 1945. His project for a functional universal language, Isotype, did not live very long, like many of the intellectual works born out of the Vienna Circle, which would come to be viewed as impractical, and even criticised as old-fashioned (Kress & van Leeuwen, 2006, pp. 100-101). But jump ahead to today's methods of public communication, in whichever environment they are produced. Do we not use as many visuals as possible to second our verbal propositions? Has the phrase "a picture is worth a thousand words" not been hammered times enough into our heads? Newspapers and magazines without pictures, statistics, diagrams and graphics are unthinkable today. Teachers at different levels of school used to have their large *mappa mundi* and posters of human anatomy – *displaying* information like Neurath intended; nowadays classrooms are equipped with more sophisticated technology. Teachers use Powerpoint presentations, show films, search the internet – all means to achieve exactly the same end.

The fact remains, it could be argued, that graphics cannot totally replace words, and a comparative approach to social and economic problems may not be the most effective way to produce real and applicable knowledge. Nevertheless, inasmuch as visual reinforcements of spoken statements, they are powerful tools to bridge barriers of language and culture. Their widespread, global application today is proof to their potential of reducing translation, improving comprehension and easing learning. Making a fuller use of pictures as a learning strategy is valid today, so Neurath was a visionary after all.

9. Picture languages today

The debate on a kind of literacy, specifically visual, that extends to pictures and pictorial signs continues to be justified when we switch to more ludic and/or contemporary cases. There are three non-phonetic pictogram languages we will be

examining in connection to this, which, despite not being born out of philosophical concerns, nonetheless exhibit some characteristics that fit in under the banner of universal. The three are pictorial systems, and in common they have the fact they are somewhat dependent of digital technology. This information age which is ours seems to shout out that this is the way forward. In addition, they share the attributes of rationality, coherence and a good degree of common sense.

All signs used in visual languages that aspire to be universal are inspired by, and inscribed in a matrix of, common sense. Because common sense is transparent and evident; but it is also superficial, for it disregards the structures that are beyond consciousness and, for that reason, captures only the horizontal depth in the conscious relations of people and of people and things. According to Scott Lash, quoted in *Revista de Comunicação e Linguagens*, "common sense is undisciplined and non-methodical … it accepts what exists and how it exists" (Mourão, 2002). A visual language is understandable only if announced as intentional, aesthetic and capable of being schematized. In other words, it is comprehensible as long as it possesses its own plane of expression. And for that to happen, a set of rules must, necessarily, be in place, for a sign is never transparent and its lack of absolute clarity always refers to other signs within and outside the system.

The three examples under observation here are: PCS[12] - Picture Communication Symbols, Icon Language[13] and the Elephant's Memory[14]. While not pretending to present a definitive analysis of each, some of their most relevant aspects will be stressed, namely structure and purpose. We include them in this chapter on universal languages, as the characteristic (implicit or explicit) of their claim to worldwide applicability is a given. But they all function in different ways; and to understand the dissimilarities between each of them, visual skills of decoding and interpreting are once more put to the test.

9.1 *PCS*

The first example, Picture Communication Symbols, is a product of the USA-based company Mayer-Johnson, and was developed in the 1980s-1990s to enhance learning and expression for all those with special needs through symbol-based products and

[12] http://www.mayer-johnson.com/education/symbols/pcs/ <retrieved 01/10/2010>
[13] http://www.icon-language.net/english/project%3A.html <retrieved 01/10/2010>
[14] http://www.khm.de/~timot/PageElephant.html <retrieved 01/10/2010>

services. Today, the company has a repertoire of more than 11,000 PCS symbols (like pictograms), which are used in a number of applications, from the most traditional (cards and books) to electronic (software programmes).

The label of universal language can only be applied loosely and very cautiously. PCS is actually defined as an augmentative and alternative communication system (AAC), which is a technique that "by increasing the user's perception provides an alternative method for communicating and thus is used in learning disabilities and neurological pathologies" (Artoni, Buzzi, Buzzi, & Fenili, 2011). PCS has been - and is still - extensively employed in the work with people with cognitive impairments, children with ADHD, autism, dyslexia, suffering from traumatic brain injury, cerebral palsy, dementia, and many other conditions.

For both the patient and the care-provider/educator, PCS is thought to be a practical and entertaining means of communication, that combines graphically appealing symbols (colourful and regularly updated, for a better correspondence between symbols and their referent in the real world) and efficient learning techniques that, when tested, prove to result in significant improvements at the level of story comprehension and vocabulary acquisition (Harini, Sivaswamy, & Indurkhya, 2010).

Figure 15 gives an idea of the type of signs PCS uses: they depict, indiscriminately, persons, animals, objects, actions, feelings, requests, impressions and emotions. Very importantly, the symbol consists of both image and word, or words, if it refers to more than one thing or a phrase. Given the interdependence of verbal and visual, even if they are granted equal weight in the process of decipherment, there is a certain lameness to the symbol that elicits the question: is the picture an illustration or the writing a caption? At any rate, there is an obvious concern with rendering a realistic image of the things depicted – despite the undeniable trait of child-like representation – but it does not eradicate the need for conventional graphic signs that make ambiguous meanings more explicit: for example, the arrow to represent time, the diagonal slash for prohibition and the exclamation mark to express a sudden feeling, like surprise or irritation.

Figure 15. A sample of PCS symbols

The idea of using pictures and symbols in the treatment of people suffering from language impairment and communication disorders was in fact not new; the standard Blissymbolics structure and vocabulary, consisting of signs made of black-and-white lines and simple elements, had been published already in 1971, under the name Blissymbolics Communication International. That happened long after its author, Charles Bliss, himself passionate about the possibility of a universal language, put down his thoughts on the possibility of an ideographic writing system in his *Semantography* (1949), incidentally, without meeting much success.

Having produced encouraging results as an alternative means of communication, the original PCS system was translated and is presently available in 40 languages. It has evolved from a simple database of symbols into a software called the Boardmaker, which is required to form sentences when using the digital version of this product. Fig. 16 shows how a sentence's structure is linear, meaning symbols are arranged sequentially from left to right following the structural, grammatical rules of English.

Figure 16. A sentence in PCS. quoted in Ting-Ju (2006)

As mentioned before, the analysis of this system is made rather superficially here; significant aspects of it such as symbol diversity, resort to conventional graphics from typography, or the cultural problems that might arise in translation, although interesting, will not be considered here for the sake of brevity. The main reason for including this particular example was to show there is a clear continuity in the development of pictorial systems, following the case of Isotype in the 1930s. But the doubt remains about whether or not this effort to produce a method for improving communication, with all its scientifically proven benefits and clinical importance, can rightfully be called a real language, or if language is just a well-intentioned and logical metaphor. The next example, called Icon-language, is certainly less ambiguous in setting its scope.

9.2 *Icon-language*

Icon-language demonstrates how the ancient dream of a universal language still persists with vigour and produces original, concrete results. Furthermore, it shows how this dream is reshuffled and updated, turning to techno-scientific media in order to keep up with the demands of an increasingly more computer-dependent society. To comment on it is useful after the considerations on the relationships we maintain with visual signs, since it is a means of questioning and problematizing aspects that can subsequently be included in theories of literacy and visuality.

Icon-language is a project run by Jochen Gros, fully available online, which aims to transfer current pictogram systems into an icon vocabulary similar to written and spoken language. With support from software, this icon vocabulary can consequently form a new pictorial script, to be employed by women and men alike, all over the world.

Its author a keen enthusiast of Egyptian hieroglyphs and Chinese writing, he made signs that can be drawn in a continuous line, as a cursive script, assembled a vocabulary that can easily be memorized and set up rules to make phrases and sentences. Similar to a written or spoken language, this icon language starts out from a set of conceptual images that gain their identity through small details in their design, which is simple enough to be hand-drawn but can easily be digitized and pasted virtually everywhere by computer.

In fact, the closer we look, the clearer it becomes that to everything in Icon, computer is key. All we need to know about this language, its uses and potentiality, is

found in a website. So wrapped up in computer technology, in fact, that the signs which compose it took on the name "icon" – and not in the Peircean sense of referring to a signic mode in which signifier resembles or imitates its signified, but in the modern and correspondingly virtual sense, where it stands for a small image that represents something in a graphical user interface. In rough layman terms, it is a picture made of pixels we see on a screen. In correct computer terminology, "icon" designates an image that represents a device or program, which can be activated with the click of the mouse.

When downloaded from the internet, the symbols of this language will appear instead of the graphical, alphabetic word which is actually typed, letter by letter[15]. And so, what we get from the download is a kind of translation software that turns words into icons. There are several versions of Icon-language, all of which can be found for free in Gros'-administered and copyrighted websites. The first version is icon.black, that can be seen in fig. 17, reminiscent of Arntz's designs, Aicher, etc. Then, there is icon.line, from which derives the icon.calligraphy, and the icon.pix, which is strikingly different because it is the only one to have colour, a minimal height, and the possibility for animation. Table 3 makes it easier to figure out the differences; it shows the sign for Hello.

Even though all icons look different, it is clear that the principles behind them are the same. They represent a person in a simplified manner, with minimal markers of personality. The gesture that conveys the message (hi!) is a raised right hand, and there is a speech balloon to the left of each of them. Black is the most pictogram-like, in the good tradition of the little, round-headed stick figure; Line is more like a quick doodle - a form one would expect specifically made for youngsters, or, in any case, that appeals primarily to a public on an intermediary stage of literacy development, which still relies heavily on images, like readers of picture books (although this is a debatable interpretation). Lastly, Pix seems to belong to the family of the icons we have grown accustomed to see on web forums or instant messengers, known as smilies or emoticons[16].

---

[15] Automatic visualization of the icons happens only after installing the font. The feature of "replacing words by icons as you type" is only true provided one uses the applications QuarkXpress or InDesign.

[16] The word "emoticon" results from blending emotion with icon, and has been in use since the 1990s to designate a representation of a facial expression (originally, a smiling face, hence

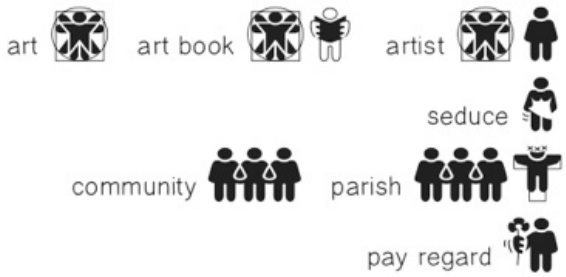


Figure 17. Icon-language signs, by Jochen Gros.

Icon.black	
Icon.line	
Icon.pix	

Table 3. Icon language in its three available versions

The icon by Gros takes from the pictogram what it has of democratic, global, and neutral characteristics to ensure universal acceptance. Still, compared to pictograms, icons are less static, more dynamic and more easily rendered into a function, especially on electronic interfaces, like digital displays, mobile phones and computers, where, by relatively simple operations, they can be animated. That reason may also account for why emoticons became so popular in virtual contexts: they have a more informal feel and are better vehicles to express moods, tones or attitudes. In other words, while pictograms denote formality, impersonality and timelessness, icons are more playful, lend themselves more easily to appropriation and mark belonging to the digital age – of visual expression and image manipulation skills.

It remains that icon-language is not given; it requires some learning, even if light for those who already speak one. But then again, we have observed the same with Neurath's Isotype. In reality, the two projects – Isotype and Icon-language –

the aka, smiley) made from a combination of characters to convey the mood, tone or attitude of the writer of electronic messages, such as emails, chats, or sms.

have much in common, and Gros makes a point out of crediting Neurath for his vision of a universal pictorial system. Apropos of his influence, Gros remarks, in his website:

> "Wow" - Otto Neurath would say, if he could use
> a messenger today.
>
> "What a Technology:
> easy picture writing,
> color, without cost,
> animations as well as pictures,
> simply to write
> by keyboard![17]

But while Neurath and his team toiled for years to build Isotype - he wrote: "The writing of this language requires a group of experienced people, which proceed together: Specialists of the science, the teacher and people with knowledge in drawing, colouring, printing, sticking etc." (Neurath, 1936), Gros did it all by himself, an enterprise assisted by computer only.

As stated, the icons have an inescapable trait of post-modern youth to them. They turn to a fairly common resource in the iconography of signs, which is used extensively in comics, that is borrowing, for example, a question mark to indicate a question, the arrow for a direction, segments of parallel curves to give a dynamic impression of movement and, as in the example above, speech balloons for the act of speaking or engaging in conversation.

When it comes to grammar, Icon-language has a comprehensive set of rules and a large number of signs to represent demonstrative, possessive and personal pronouns; it has signs for adverbs, prepositions, interrogatives and conjunctions. It has plural forms and collective nouns (for instance, one pictogram of a man means a single person, two pictograms stand for men, three, mankind). Moreover, there is a clear way of showing inflexion – an icon denotes an action (verb) when there are speed lines attached; and of expressing gender – by adjoining the icon for man or woman in grey before the noun-icon. Also, according to the same logic, all adjectives are grey before the nouns.

[17] http://www.icon-message.com/english/Neurath.html <retrieved 25/04/2010>

From this, we gather both the obvious logic of visual emphasis (the use of grey and black to highlight the meaning or background the context in the cases of icon.black and icon.line) and the incredibly large number of signs that have to fulfil syntactic functions, which constitutes an obstacle to language economy. But the real challenge comes with semantics. Indeed, the meanings of Gros' icons have often to be inferred from personifications or embodiments that are clearly references to Western culture and ideology. So we find a vocabulary that looks more or less like a charade, and need to constantly check the text (a caption or glossary) to confirm our guesses on the interpretation of metaphors or metonymy. The table below provides some lexical entries on an imaginary dictionary (table 4):

Art is a rendering of da Vinci's Vitruvian Man	
Boss or chief is a Napoleon figure	
Freedom is Lady Liberty	
Revolution is a rendering of Delacroix's *La Liberté Guidant le Peuple*	
Europe is Europa on the back of Zeus as bull (although not white)	
Poetry is Pegasus	
Ecology is a green heart	
Luck is a pig and a four-leaf clover	

Table 4. Icon-language lexicon. Selected examples.

The first conclusion that can be drawn from the small sample of terms in the table is that the identification between sign and its meaning happens exclusively to those who have a Western cultural baggage that is somewhat erudite – for the allusions are to classic or high culture, like Greek mythology or the fine arts. Secondly, we note that decoding the sign is a process that happens in two distinct stages: first, the identification of the icon (signifier) with a referent (da Vinci's

drawing, to take the first on the list), and secondly, associating that referent with a signified (art). And from these unitary signs, composites can be formed, as the constructions art + house = architecture; art + dance = ballet; art + chef = gastronomy. To understand these compounds, a third stage has to be conceived, one of connection between two icons.

The exercise of visual and cultural association is a fascinating one, and indeed it raises the question about the existence of archetypal images, that may run deep in our collective unconscious, as Jung suggested; however, by being evidently ethnocentric, it undermines the language's pretensions of universality. Verbal language works daily with metaphors, which tell us a lot about our culture and our own ways of reasoning (Geary, 2011), but a visual language that aims to be global cannot afford doing the same, at the risk of total incomprehension. To put it differently, a language of pictures built with the purpose of being decoded in any culture and any language cannot rely on presumably shared free associations as the defining factor of the signs of its vocabulary. Even at a time of digital predominance, internet and fleeting images, those things we embrace as our references in culture are what makes our culture ours, and not of the whole world.

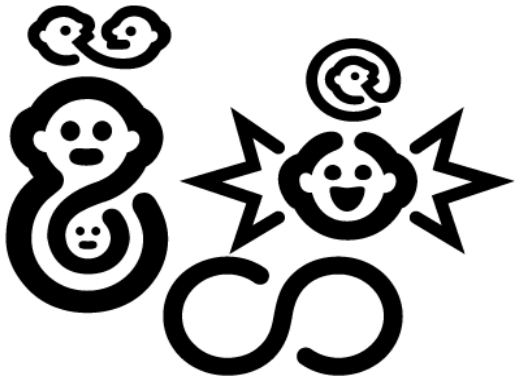
That establishes the universality of icon-language as dubious, at least. As an AAC, icon-language would already be in a more credible platform. But there is no doubt as to more positive notes in this project: in the words of the author, "Good old Smiley (☺) cannot jump of joy, wear clothes, show personal relations, use tools or have sex."[18] But his icon-men and -women can do all this – and to see how they do it, we might add, is already a big thing.

9.3 *Elephant's Memory*

Finally, the last example of contemporary pictorial systems is Elephant's Memory, an interactive visual language that started out as an experimental workshop oriented towards children. Its author is the French-Dutch artist Timothy Ingen Housz, and the language advertises simply as "original material for families and educators to encourage dialogue and creativity". Of all the languages mentioned until this point, this is the only non-linear one, which means people can read and write in any direction, starting and ending from any component of a sentence. It is also, from all

[18] http://www.icon-message.com/english/Newdesign.html <retrieved 01/03/2011>

the examples we have referred, the one which most relies on an artistic interpretation, for it requires an evaluation and appreciation of space. It consists of about 200 signs, which can be combined to form sentences, as the one illustrated in figure 18.



"I am so happy that you are pregnant"

Figure 18: Elephant's Memory: a sentence

Of course, in order to be described as a language, Elephant's Memory has its own rules of grammar, which "vaguely" (Ting-Ju, 2006) teach us about the value of size, position and connection to other signs within the system. We will not go into the details of sentence construction, but we can conclude that, on the whole, this is a language that leaves much room for ambiguity, for, at a first look, its signs are indisputably opaque.

Having traced some of the works from the seventeenth century until today, it is not difficult to imagine that projects for a universal language will keep appearing in the future. As commented in the beginning of the chapter, there is something alluring in the possibility of solving the mysteries of language which keeps us permanently searching for a final word. Much more could have been said about each and every one of these attempts at a perfect language; we have, at any rate, tried to demonstrate how they link to visuals and, conversely, how visuals link with them.

Esperanto was singled out amongst others for it may well be the last big case of a strictly verbal artificial language to reach a widespread acceptance. Indeed, it seems unlikely that another artificial language in the same mould should materialize, given the steady institutionalization of English as lingua franca, but who knows? The cases of Isotype, Blissymbolics, PCS, Icon-language, and Elephant's Memory seem to point in the direction of a continuous development of projects for global

communication that incorporate pictures (pictograms, icons or symbols, any name goes), increasingly, with the support of the computer. Perhaps the computer itself will eventually provide us with the recipe to transparency in symbols, that their meaning may be readily guessed in the absence of the referent.

Looking back to hieroglyphs tactically reinforces visual language, by giving it historical weight, as well as an aura of mysticism that can hopefully turn into enlightenment. But at the same time, it is a bad example to illustrate universality, for, as we explained in chapter 1, hieroglyphic writing was far from being a language for all. A source of inspiration for future accomplishments, we could say, without prejudice to Kress and van Leeuwen (2006), who outspokenly claim that "visual language is not – despite assumptions to the contrary – transparent and universally understood."

Chapter IV. The problematics of pictograms, icons and signs

Having affirmed that pictograms and symbols in use today are not only ubiquitous but also necessary, reflecting upon the impact they have on several fields of societal life becomes an important exercise. More so if we consider their tendency to replicate themselves, as technological devices become more widespread and the notion of "global village[19]", which communicates via the internet, turns into an evident reality. We have seen how pictorial signs surround us in our homes, out in the streets, in all public places; they appear in the shape of traffic signs, indication signs, labels, electronic buttons, etc., so to guide us – to help us find our way quickly and safely. And that is not only in the literal sense, of finding our place in terms of GPS coordinates, but in the broader, metaphorical sense of solving problems, getting things done. Not getting lost is a primary, fundamental human concern, and it does not apply just to geography. It is important not to lose one's way when it comes to business, studies, social relations, the self. To be functional in a community means we can communicate and work our ways through the environment. And all the time, we see pictorial signs are there to help us.

So how do we really deal we them? We abide by their rules, recognizing they have an authoritative function; we feel the need to create more of them if there is a new thing (an invention, a discovery) that needs to be represented; we get rid of old ones and design afresh, because renovation is necessary in times of rapid changes. But when we pause to think about the purposes visual signs fulfil, three main problems become apparent, which we propose to tackle in this chapter. These are problems of universality, abstraction and style. And they are fundamental and interconnected, since we have grown accustomed to judge a "good sign" as universal, fairly abstract, and having no style.

[19] McLuhan was the first to use the expression referring to members of every nation connected by communication technology (McLuhan, & Fiore, 1967)

1. Universality

A universal sign is applicable to all cases and affects all people. It is internationally recognizable and independent of culture. The paradigm, inescapable, is the traffic sign. Traffic signs in all their extension (danger warning, regulatory and informative signs), are, from a commonsensical point of view, nicely tucked under the universal label, with the seal of approval by the United Nations, which agreed on the Vienna Convention (see chapter I). In practical, visual terms, this means that all around the globe, the signs below are applied. Unproblematically. (fig. 19)

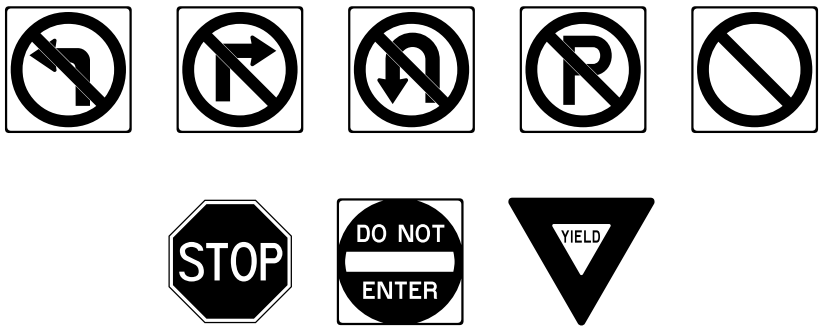


Figure 19. Traffic signs

Or maybe not. When there is a word written, it is written in English. And as for the slashed P, it stands for No Parking. In Portuguese, it translates as *Estacionamento interdito*; in Spanish, *Aparcamiento prohibido*; in Italian, *Sosta vietata*. However, the sign is always a P. In Norwegian, the word for 'hospital' is *sykehus*, yet the traffic sign that represents it has an H. And while the lack of correspondence of the letter to the word in a given language does not seem to compromise the observance of its message, it is only so because of convention. "The word 'stop' is familiar enough worldwide to make it a permissible exception in pictogram design", say graphic design manuals, that otherwise strongly advise against the use of text (Abdullah & Hübner, 2006, p. 36). 'Taxi' and 'zone' go by the same principle. In any case, there is nothing in the sign that is in fact universally understandable; particularly, yes. The sign suits perfectly English speakers around the world. Like the ones below, which can be found in the USA (fig.20).

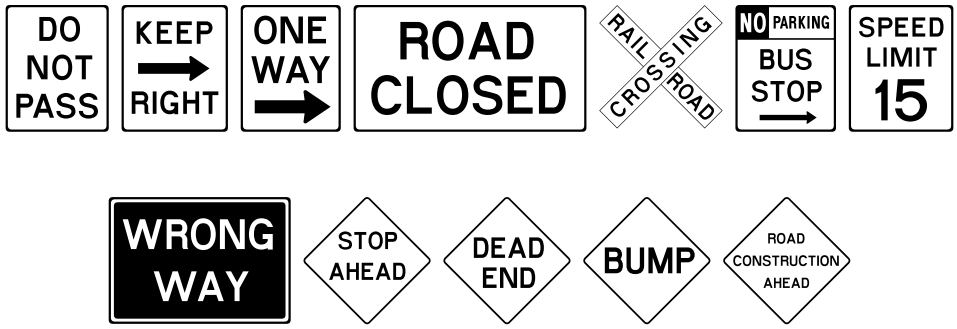


Figure 20. Traffic plates in USA

As discussed in chapter I, the American traffic sign system relies much more heavily on verbal language than the European system. Even pedestrians can read the words 'walk/don't walk' on light posts before crossing the road. Indeed, if you have no knowledge of English, to get round in the streets of America can be a real challenge. So much for the rules of shapes and colour; in reality, there are places where they just do not apply[20]. And the shortcomings of this so-called universal system (one standard for all) do not end here. At the risk of repetition (see chapter I, on traffic signs), let us remind ourselves of the basic requirements for traffic sign effectiveness:

1. Fulfil a need
2. Command attention
3. Convey a simple, clear meaning
4. Command respect of road users
5. Give adequate time for proper response

It is the obligation of expressing a simple, clear meaning which raises most problems, for sign-makers have to deal with issues that are, in fact, complex and demand a visual solution in the most condensed manner. If, on top of that, the need they have to fulfil is one which cannot be expressed in any other way but through words, sign-makers are bound to resort to multimodality, i.e., they have to mix visual and verbal

[20] Danger warning signs > triangular shape > red rim; Priority signs > diverse in shape > diverse in colour; Prohibitory signs > circular shape > red rim; Mandatory signs > circular shape > blue (with white rim); Informative signs > square or rectangular > blue (with white rim)

signs in their messages. Sometimes even animation[21]. Underlying this common practice is, of course, the acknowledgement that pictures, or pictorial representations, are not always the most adequate or effective means for unambiguous communication.

Other common cases of multimodal signs are those which borrow punctuation markings or other graphic notations. The triangle with an exclamation mark warns of danger ahead; the @ sign indicates the proximity of a cybercafé or a point of internet connection; the ⍰, often interchangeable with the ⓘ marks an information or help desk.

It is clear that, although sign-makers prefer to avoid them – in the name of a sort of visual hygiene, pictograms with captions or written addenda can be found in a number of places. Sometimes it is an institutional requirement – as happens in countries with more than one official language, that have to conceive bilingual or even trilingual signs. It does not mean they are admittedly flawed; only that the limits of visual communication potential were reached and another stratagem for a comprehensible readability had to be devised. Granted, the use of national languages defies a sign's claim for universal status; a sign will sacrifice it for functionality, within the limits of the region where it physically stands. So clearly, the solution to concrete problems of public signage is going from the principle of universality in moderate steps towards one of particularity. Only then can we justify the appearance of signs that are undeniably regional. We refer, for example, to signs that depict camels, monkeys or polar bears, found in few and specific geographic locations.

Certainly, there is a significant difference between signs that alert to the most general conditions or to particular details in a given space. In terms of importance, anyone would say a stop sign ranks higher than a panoramic view sign – failure to observe the first may provoke an accident, it will get you fined, while the latter will make you miss a moment's sight, with no big (pecuniary) loss involved. But the difference can also be viewed as a question of necessity, which would translate in a distinction between indispensable and superfluous signs. And this raises yet another issue: if a sign deals only with non-vital information, if it merely marks a curiosity, then why bother?, why litter the environment with a sign? Upon reflection, we may

[21] We refer to digital displays found more and more frequently on highways that by intermittently switching two or three images "animate" signs like 'work ahead'.

conclude that a sign does the same job as an interlocutor. We accept it gives us orders, prohibits and cautions. However, less commandingly, it is also capable of talking to us of more agreeable subjects. An informative sign placed nonchalantly on a roadside equals a gratuitous comment, an inconsequential line in a visual chit-chat. It does, above all, prove the environment is humanized. It might not be occupied in the now we are in, but someone has been there before, and that someone thought we ought to pay attention to this. (fig. 21)

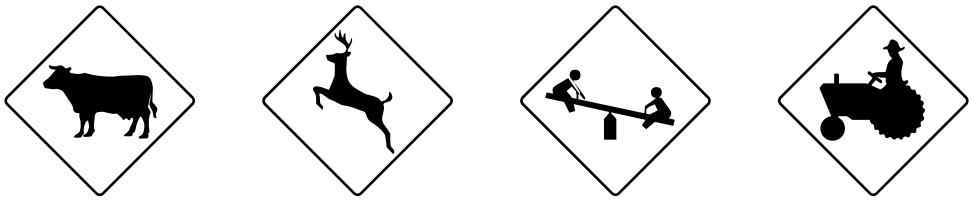


Figure 21. Informative signs

As if the particular or regional things depicted (anything from animals to national monuments, to natural landscapes) were not enough to question the condition of global applicability, the reactions to such signs are also not universal. People around the world respond differently to the stimulus of pictures, and again, the reason for that is ultimately cultural. A southern European finds the pictogram sign for moose strangely exotic; a Hindu looks at the sign for cow with reverence; a transsexual sees toilet signs as a difficult dilemma. Frequently we observe that what is site-specific is at the same time culture-specific. So most of the times, the signs around us, in our own environment and culture, do not elicit any unusual response, as often they go unnoticed. But displaced from our natural habitats, we grow more aware of the signs and of the different realities they represent. In a sense, these local-specific signs are like a double-edged sword: when they are close to us, signalizing what we consider a common vision, we pay no attention, but when we see them in distant places they gain a kind of exotic dimension that reinforces our perception as foreigners. Perhaps a good way to put it is that they are made specifically for the potential local alien.

The matter of regional diversity is, then, an obstacle that pictograms and signs for public use need to overcome so to be understood, if not by all, at least by most people. The way they do it is by fixing a standard. A parallel can be drawn between what occurs with pictorial signs and language, taken abstractly. Referring to the

English language, David Crystal stated: “standards exist to avoid the dangers of variability.” (Crystal, 2005, p. 222) In effect, English has so much regional variation, dialectal differences, nuances of the tongue, that he argues there is no such thing as one English language, but many Englishes. And these Englishes coexist with the Standard, which is no longer the Queen’s English, but a more plebeian version that is in the origin of English as lingua franca. A Cockney speaker is all the same capable of understanding Standard English, just as anyone used to a particular feature in his/her surroundings can nevertheless identify it in a standard mode. Let us use examples: a person approaching the Bois de Boulogne, the bottom of the Kilimanjaro or the steps of the British Museum has no problem understanding what the pictograms below refer to (fig. 22). But they could just as easily be placed close to the Wienerwald, Mount McKinley or the Met. It is not difficult to see they depict the general and not the particular, and in the sense they are supra-regional, they are stable.

Figure 22. Pictograms by Fabrizio Schiavi

As vehicles of stability, pictograms make way for internationalization. They spread the feeling for the same image in a way comparable to the adoption of uniforms. And nothing proves it better than the stick figure. If it were a real person, he would be the most famous on earth, for there is hardly a public place left in the world that does not have a picture of him.

The stick figure is omnipresent. Used for so many purposes in so many different contexts with such variation, to study it alone would give an interesting thesis. Because it is an image of the person in the most universal way possible, we shall considered it here under the theme of identification, for it is through identification we are able to accept or reject a dominant culture, its myths, its ideology.

Before even considering its distinctive trait of impersonality, (the stick figure is designed to be impersonal) we observe that, already at level zero of representation,

we are in presence of a universal thing. For men, women and children alike, across continents, skilled or not, will simplistically draw a person in the same moulds: with a circle and five lines. Few things could have a more compact expression. Moreover, there is no question we believe that, if the sign for a person is featureless and anonymous, it will remove the inherent dangers of similarity and bring forth a sense of belonging to all.

We cannot but entirely agree this is an ingenious way to avoid prejudice. The stick figure depicts a person in its most elementary traits of humanity: one head, a body, two arms, two legs. Amputees excepted, (but they too have a pictogram, made for the handicapped), everybody shares these characteristics. As for all possible aspects of personality or physical appearance, the sign does not say. And by omitting, we observe merely that a stick figure is not too fat, not too thin, not Asian, Hispanic or Afro-American. It is not tall or short, bald or hairy, conservative or liberal. It is not homosexual or heterosexual, not Catholic, Muslim or Scientologist. It is a person, ugly or pretty, rich or poor, intelligent or dumb. The ultimate democratic symbol.

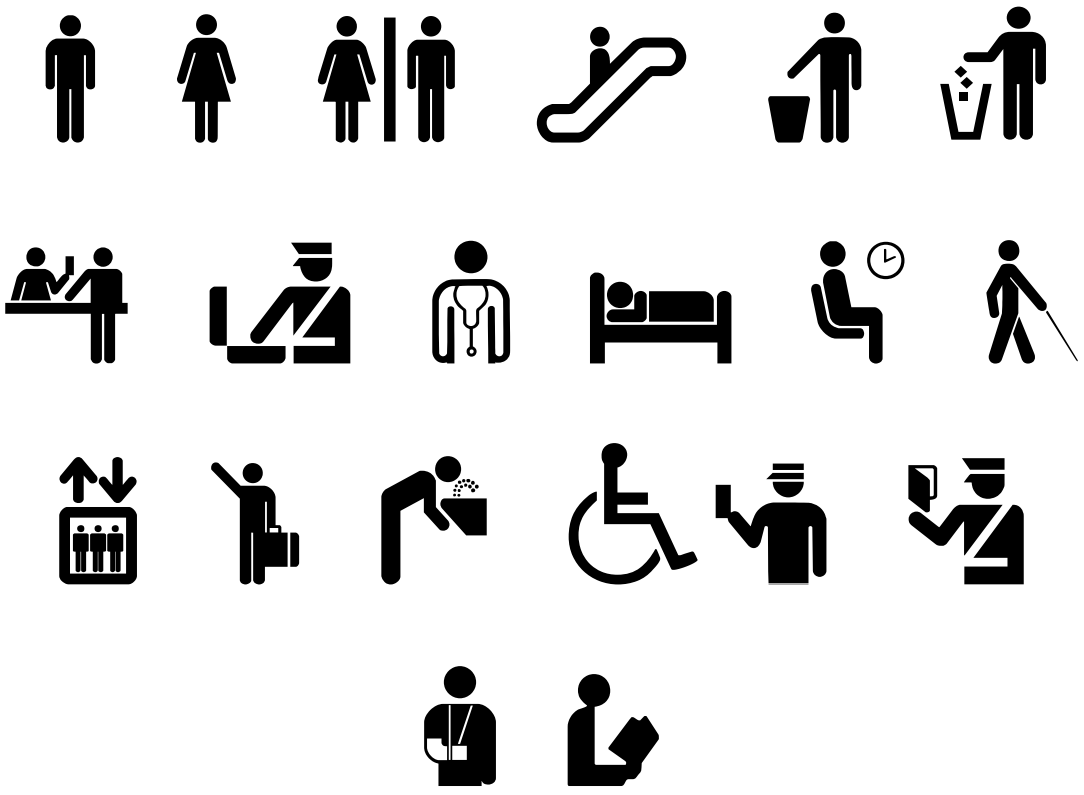


Figure 23. AIGA/DOT pictograms. Human figures.

But, like democracy, it is not perfect. And the objections we may raise begin right at the distinction male/female, that after all, depends solely on a skirt. A piece of clothing, that is, a simple circumstantial detail, which is far from defining a person's sex. Needless to say, not all women wear skirts, and not all persons who wear skirts are women. Whether fair or unrepresentative, it has become standard. Convention rules once more.

Most official signage systems will only use the female pictogram to mark the ladies' lavatories. In other contexts, the choice of pictogram falls upon the "pure" stick figure, which is supposedly asexual. The person on the escalator, the water fountain drinker, the sleeper, the traveller, the customs officer, the doctor, the handicapped – they all could be men or women. Olympic games' pictograms too, have a single form for male and female athletes. And it should not be a problem to conceive them that way, because asexuality occurs in verbal language as well. Again, a parallel between what we say and what we see comes to the aid of our understanding. If we think about the concept of grammatical gender we realise it has nothing to do with sexual identification. The eminent psychologist and linguist Steven Pinker wrote: "'Man' denotes both man and human, and the use of the word 'man' to refer to human carries no hidden agenda, pace modern-day feminists. Thus, constructions like 'chairperson', instead of chairman are not only awkward and pedantic but totally superfluous." (Pinker, 1994)

The main reason for the breach in pictogram asexuality may prosaically lie in the need to separate men and women in public toilets. Just an exemption from a system devised for egalitarian representation of individuals, which, ironically, turned out to be one of the most widespread pictograms in the world. There are, however, a few exceptions to this directive of representing female figures exclusively in bathrooms, which we list in the examples below:

- Woman on lift, amongst two men;
- Woman at ticket purchase, opposite man (not sure if she is buying or selling);
- Woman next to a pair of scissors and a comb, stands for beauty salon or hairdresser;
- Woman next to a sanitary towel, indicates disposal unit;
- Woman flight attendant, found on commercial aircrafts;

- Woman leaning over baby, shows place for nappy changing

Finally, a bit less common, but nevertheless official in the hotel branch, is the pictogram for housekeeping, which depicts a maid with an apron and the cliché feather duster. Could it be an updated version of the Isotype sign to which we referred in the previous chapter? With its minimal representation of the uniform, there is no question it resolved the predicament of datedness, and turned it timeless. Before calling it sexist, we note that the pictogram for bellboy is of course a man carrying bags, with a cute little hat tilted to the left of his perfectly round head.

As always happens in functional communicative systems, there are voices complaining about the fairness and even safety of pictogram signs. The cases of hysterical vigilantes scandalized by the footpath sign of a man taking a little girl by the hand (as implying abduction) or feminists demonstrating against the pictogram of pedestrian crossing because "it shows a man in a hat" are worth considering. They bring to mind Pinker's repudiation of 'chairperson' as a noun. But it is a fact that when a lot of dissatisfied sign-viewers get together, the causer sign usually ends up being replaced. If not for the sake of a wider-ranging comprehensibility (the utopian universal character), then for reasons of style, that we will analyse further ahead. It remains that the discontented feel happier with a stick figure; people who use hats and little girls with braids lose their mirrors of public signage.

The principle of pictogram universality goes side by side also with abstraction, which at times is described simply as "a very general character" and eventually modulates into familiarity. This has consequences on the level of pictorial signs, because we know, from the practice of a visual language of signs, that a pictogram tends to gain a concrete signification merely by habituation. I.e., it is the habit of seeing a given sign meaning something that legitimizes it and makes it a rule – universal, at its last stage. So it can be said of symbols that are instantly identified, like the first aid cross, the snowflake or the recycle sign, that their degree of universality was reached thanks to insistency. And convention, once again, that in this case means resting on the power of a familiar image. That explains why the pictogram for 'fragile' is always a wineglass and the one for 'No Pets' does not have a cat nor a hamster, but always a dog.

2. Abstraction

Abstract is something that exists in thought, but does not possess a physical or concrete existence. Something theoretical, which is usually associated with freedom and simplification, in art and outside it. Apply that to pictorial signs, and we observe that immateriality and concreteness are rather dislocated concepts, for what really matters in design is the skill of leaving out details and preserving the gist of a message. But if the most accomplished examples of abstract signs are icons like the play, stop, fast forward and rewind buttons; laundry symbols, like bleach, tumble dry, dry clean; the Bluetooth and USB connection icons; home utility device symbols for microwave oven or for circulating hot air, etc, just by their sheer practicality, they elude the airy connotations of abstraction. The list of examples could go on, but basically, it would only show that what these signs have in common is the fact they are all composed of geometrical shapes: squares, triangles, circles, undulating lines – with a small degree of iconicity in relation to their referents, therefore, a higher degree of abstraction.

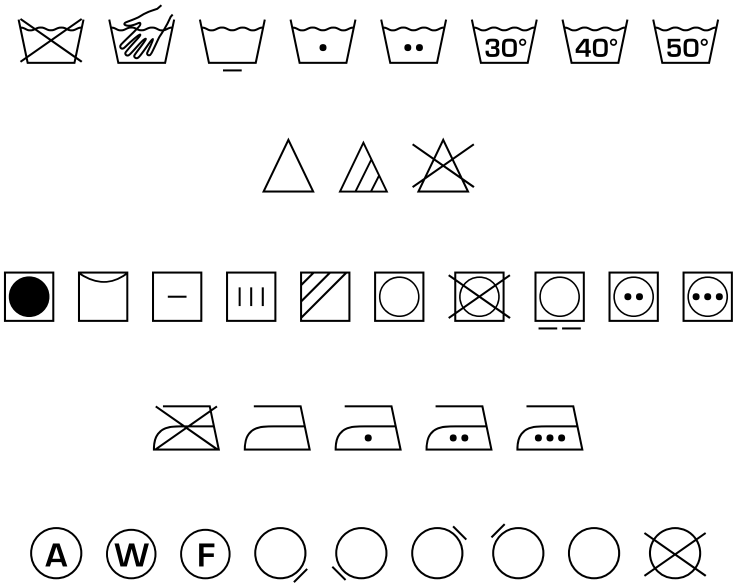


Figure 24. Laundry symbols. Hand and iron are the only iconic signs.

As a result of their patent arbitrariness, laundry symbols are usually accompanied by text. But if a garment has only a small tag attached, it may be just the symbol we see. Many of us find it useful to have a table of symbol decoding at hand when doing

massive washing. However, behind textile care signs is a logic very easy to follow: there are five types of shapes that correspond to 1) washing instructions; 2) bleaching instructions; 3) drying instructions; 4) ironing instructions and 5) dry cleaning instructions. The reason we sometimes forget which one is which is due solely to bad learning. Because in fact, if we were taught the meaning of these symbols at the same time we were taught the letters of the alphabet, they, too, would stick to memory.

The many questions we can pose about the adequacy, validity, readability and longevity of pictograms, symbols and icons in everyday use have roots in an underlying, possibly unconscious, yet constant, comparison of visual signs against alphabetic signs. In this measurement of forces, certain qualities of one or the other are put in evidence, but there is a deep tendency to consider the verbal first. This might be erroneous, for, as we have seen in chapter I, the very first manifestations of human creativity appeared in pictorial form. But with writing, man's way of thinking changed. "The alphabet is a funnel. Reality is squeezed through the funnel of the alphabet". The image is by John Culkin, quoted in Horn (1999), as he tried to describe the reductive effect of writing. He does, in reality, acknowledge, like de Kerckhove (1997), that the alphabet determines the way we see the world; it functions as living cells, as RNA, the messenger gene.

The Greek writing system (26 simple signs that could translate all known phonemes), whose importance was so stressed by the Positivist movement, was without doubt a decisive step towards a general literacy among citizens. The power of writing, previously held by the political and religious elites, was made available to the majority of the population. And so the knowledge of writing would help to form conscious citizens and even democracy. In spite of the limited coverage of Greek democracy, this way of thinking that valued abstract writing over pictorial writing (as in the cases of ancient Egypt and ancient China), dismissed the real progress made in the literature and pre-science of these and other civilizations which relied heavily on pictograms as effective signs. The belief that abstract signs should be valued more than pictograms remained unquestioned for centuries, although it is now possible to see how, for example, Egyptian literature reached expressions of such metaphorical force that in all ways equal contemporary literature.

The transfer of spoken language into writing, from classical to modern, had to face certain characteristics of speech that were difficult to translate, even with diacritics and punctuation. That is why spoken language, almost always combined

with body language, remains the most effective communication form of all. This despite that even in language there are sensations we cannot express – like the percepts which are more intuitive than perceptions and best comprehended via music and the arts.

Alphabets are phonetic codes; from their very beginning they were not intended to represent images nor concepts or ideas – only represent the spoken. They enable combinations of sounds that make up words. Thanks to them, translation into other languages becomes possible – a move from individual phonemes to graphemes. The simpler and more accurate the code, the more powerful and effective is the conscious control of language. In addition to improving commerce, this facilitates the construction of a common literature and a first level literacy.

In this process of pinpointing abstraction, we can further add that, in the nineteenth century, the telegraph brought about a very simplified language, which somehow matched the 26 letters of the alphabet to 3 signals only (dot, dash and silence). Naturally, it applied to a model of international transport-communication and appealed to a collective intelligence. It was a fragmentary, decontextualized and recombined practice, yet in it we can foresee the advent of the computer.

As the multiplication of effective visual languages accelerated in times of war with the creation of new codes for espionage, multiple visual codes became indispensable in social life. Come the electronic age, expression turned so nomadic that it gave rise to new conditions: cyberspace accessed via written language, conventional images and icons. But here is an extended recombination, very effective in terms of communicative results as well as in the interest of the new "I", the subject that is open to a recombination of cognitive operations and, above all, is experiencing learning within a culture of images.

So, from this long and complicated process, we learn that the virtual space of the digital era has pushed human abstraction to new limits. And that given the evident rebirth of hieroglyphs in new technological supports, the superiority of the alphabet is no longer taken for granted, as Andrew Robinson (2000) suggests. Or even we may ask ourselves - in the natural cycle of a sign, who is to tell for certain whether or not it tends to abstraction?

To return to Burgin, whom we quoted in chapter II, he said a large part of seeing depends upon habit and convention; we are forced to admit convention is, all things examined, the culture in which we are inscribed. Finally, an example will make

clearer the relationship between what is culturally given and consciously represented, eruditely or not: The pictographic sign for a pharmacy is the bowl of Hygieia; a snake coiling around a patera. How many of us know Hygieia was the Greek goddess of health, daughter of Asclepius, god of medicine? Not many, and neither is it really necessary: the symbol has become abstract.[22]

3. Style

When it comes to style, we think of ornamental signs. And to judge decorative elements, we are extraordinarily tolerant. Not only do we grant that many forms and fashions are allowed simultaneously, but also we are able to excuse omissions and flaws at the level of representation we normally would not if style were not called into play. "Artistic liberty" is what accounts for variation in sign design, since standardization and universality in the end clash with the attitude of individuation, which is a primeval human characteristic. Regardless of the number of ISO standards[23] published each year, their importance and validity notwithstanding, there will always be variation in expression, symbolic and pictogrammatic included. That is as certain as no two heads think alike.

It is attractive for business, be it big or small, to normalize and conform to international standards since it means meeting the expectations of consumers. But even outside a market-oriented context, normalization in general tends to affect everybody's quality of life. Standards ensure desirable characteristics of products and services, such as quality, environmental-friendliness, safety, reliability and efficiency (and note how all these concerns have pictograms or symbols associated to them). Being a standard makes things official, uniform and safe, and the same adjectives apply to their style. Rarely is a norm called exciting, fresh or beautiful; to be that is to be out of the ordinary, to stand out in difference, to show a personal vein.

Although generally viewed as anodyne, pictograms and signs as part of communication systems can be stylish at times too. The opportunities to display

[22] The symbol for pharmacy may also appear as Asclepius rod, a snake-entwined staff or, alternatively, in a fashion entirely unrelated to mythology, a mortar and pestle. In most European countries, the symbol of a Greek green cross is indicative of pharmacy.
[23] ISO standards are published by the International Organization for Standardization, a non-governmental organization that "operates" in 159 countries and has its headquarters in Switzerland.

uniqueness are many, as the author of the ultimate symbol guide, Mies Hora (2005) explains; the items below summarize the main issues signage systems have to address:

- Identification > create landmarks, help establish recognition (public marking)
- Information > communicate facts about circumstances (symbols, directory)
- Direction > guide users in wayfinding (airport signs)
- Interpretation > explain verbally and visually particular topics (exhibitions)
- Orientation > provide frame of reference within a given space (maps)
- Regulation > display rules of conduct
- Decoration > meant to beautify the environment

There is no structural reason why signs created for any of the mentioned purposes should not evidence non-conformity to the standard. In other words, there is no impediment to a display of a particular taste or style in the making of pictorial signs. What it might be perceived as such is associated to matters of readability and comprehensibility – we conveniently judge more secure in what is typical and customary - and so the dependence on stereotypes is unbroken, the standard sets in.

But the truth remains author signs are constantly being produced. And they are defined by style, against the norm. The case of Olympic pictograms has been mentioned a number of times throughout this study – for they helped to establish the standard that would become universal (with the signs of 1964 and after 1972). Yet, most crucially, the Olympics also opened a precedent, in 1992, of proudly exhibiting a mark of singularity, of national identification, and leaving blandness behind. The example of fig. 25 shows exactly that trait of style, which is at the same time a sign of cultural belonging, expressed in pictograms like Cycladic figurines, black shapes as those in vases evoking the image of ancient Greece.

Figure 25. Pictograms for the 2004 Olympic Games, Athens.

And other examples abound, not necessarily related to the Games. A signage system of one's own is a trademark, and in the measure it defines corporate identity and increases visibility, it is a coveted product that interests commercial and non-commercial groups alike. Many airports have their unique signage system, different from the AIGA/DOT, just as museums, zoos, councils, universities, postal services and hospitals have theirs.

Sign-makers (usually designers) decide the style of a sign or a sign system when it is made from scratch. There is a whole arduous process of conception that involves techniques like mindmapping, choice of motif, choice of format, choice of bearer[24], choice of layout, etc., until it is designed, digitized and ready for use in the outside world. A lot is in the hands of the designer, but even more is in the hands of decision-makers, who have the power to commission new signs or to decide to preserve old ones. In reality, questions of style from a user's perspective are most frequently prompted by comparisons between old and the new signs we see out there.

Like language, pictorial signs change with time. Some evolve, some disappear, some are born, every day. In public places, the old and the new coexist surprisingly close: it is not uncommon to find zebra crossings with signposts on each side, man in the hat to the left, stick figure to the right. Or yet another example: a scenic route may be populated by signs with a folding camera from the 1920s on a tripod and images of a stylized Nikon alike. The urgency of renovating pictograms does not seem to be very consistent when it comes to putting in practice the golden rule "if it ain't broken don't try to fix it". Because we find that sometimes pictograms are removed for good, other times they are mercifully left alone. Indeed, it is difficult to explain why some signs keep being updated, while others may remain unchanged for years and years, when they no longer are a reflection of the object as it physically is, high-tech and all, but an image of how it used to be. Below are the examples of telephone and train.

Figure 26. Old and new pictograms - telephone

[24] The bearer is whatever support holds a sign or pictogram, like a sticker, a plate, a lamp, etc.

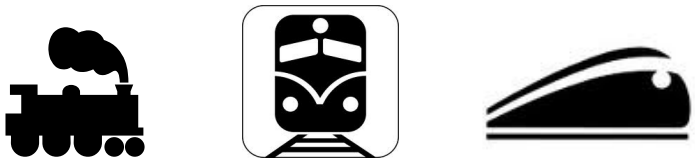


Figure 27. Old and new pictograms - train

The most sensible explanation to this phenomenon is in the fact that, despite lack of correspondence, "old-fashioned" pictograms do not jeopardise universal comprehensibility, and, if they perform their function correctly, there is no need to destroy them. Again, it is all a matter of style. Deep down, we all see a choo-choo, even when in front of the TGV.

The last consideration about style in pictograms or signs has to do with the characteristics of the drawing itself. Many view pictorial signs as illustrations, (which to some extent they are), but illustrations can be much, much more than mere pictograms. An illustration in a book or another support has no limit to its size or coverage, it can be detailed to exhaustion, it can employ a million colours, any point-of-view, any technique, any form. In relation to text, which may accompany it or not, it can elaborate or simplify, complement it positively or act as counterpoint. It can be composed of multiple parts, function narratively, in sequence, linear or non-linear, as comics. In short, an illustration has all the potential of a single means of communication with open possibilities. Pictograms, on the other hand, have limitations. But to spot a pictogram amid illustrations can be at the end of the day an exercise of pure semiotics. Figures 28 and 29 attest to it.

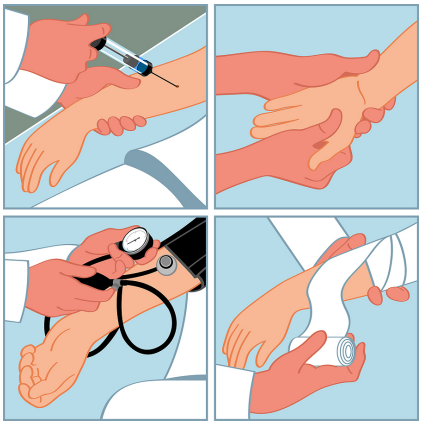


Figure 28. Medical illustration

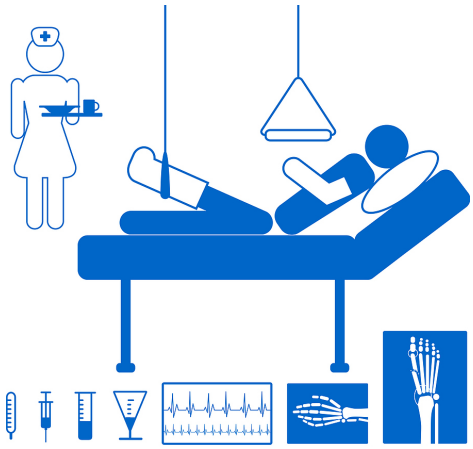


Figure 29. Medical pictogram

Who is to say fig. 28 is not pictogrammatic? It is, after all, an image quickly and clearly understood, that uses no words, and draws attention to a concrete fact. It entirely concurs with the definition of pictogram provided in chapter II. Fig. 29, in turn, despite featuring good ol' stick figure (plus debuting the figure of a female maid/nurse), violates the principle of simplicity, in integrating so many disparate elements, and the principle of disambiguation, for as a matter of fact we do not understand what the message might actually be.

All the examples of pictograms and symbols included in this chapter, have illustrated how much these everyday signs have to say not only about pictorial categories but also about our own ways of seeing and thinking the world. Any categorization of signs carries with it the culture in which they were created and in which they are inscribed; only when the culture is accepted and understood can the sign be easily received – and studied in terms of macrostructure. Although we did not provide a definite categorization of pictograms and signs – a project that would be extremely valuable – a few pertinent issues concerning their representation and their interpretation were nevertheless discussed for a better understanding of their function in our society and culture.

So, while admitting that to sort this bulk of pictograms that surrounds us into manageable groups or categories could help with the problem of taxonomy, we are reminded that the danger of starting taxonomic speculation is ending up like Peirce, who identified ten trichotomies in which signs could be classified, something that rendered a possible 59,049 classes of sign, which, cleared of redundancies and

dependencies, came to 66 classes. Of those, we remember 3 – icon, index and symbol. Moreover, we agree with the insight of the American psychologist Jerome Bruner, who stated: "To perceive is to categorize, to conceptualize is to categorize, to learn is to form categories, to make decisions is to categorize." (Bruner, 1990)

It was mentioned how in this age of image and information any given institution that sets up its visual language may or may not rely on pre-established visual languages, and yet introduce symbols that refer specifically to its public image: museums, public areas that correspond to the multiple type of information Marc Augé called "non-places", road signs, warning signs, safety signs, etc. Not only is there a proliferation of these codes to serve the wide public and commercial marketing, but also we witness the adoption of innovating sources for a code that targets the common man, like the performance, art and design. Today we see there are more and more borrowings from several sciences and an interdisciplinarity which helps to support a definition of those codes. Writing about performance, Marvin Carlson affirmed:

> *According to Bakhtin, the utterance is a strip of language that is "always individual and contextual in nature", an "inseparable link" in an ongoing chain of discourse, never reappearing in precisely the same context, even if, as often occurs, a specific pattern of words is repeated. All words, Bakhtin proposes, exist in three aspects: "as a neutral word of the language, belonging to nobody; as an other's word, which belongs to another person and is filled with echoes of the others utterance; and, finally, as my word, for, since I am dealing with it in a particular situation, with a particular speech plan, it is already imbued with my expression. (...) We continually "assimilate, re-work, and re-accentuate ...* (Carlson, 1996, p. 58)

This tension between repetition and innovation, which is present in performance, can be found in all languages, including visual languages. New performative attitudes are transferred to design and shape new visual signs – mostly because traditional forms of social analysis do not respond well to change, to conflicts, to deconstructive inabilities and new exclusions. These are the sensitive questions that performance analyses and exposes. It becomes clear that scientific and philosophical literature helps to define categories for various languages – the visual included.

We conclude the relationship we entertain with pictograms and signs is one of necessity, but perhaps not the healthiest. The paradox in which we find ourselves could be put in the following terms, full of chiasmus: we want our signs to be universal in a world full of particular, national, regional differences. We want signs to

be abstract, so that they communicate in terms of ideas, that are more rapidly produced and understood, but we prefer they refer to something concrete, as it diminishes the chances for ambiguity. We want them to have no style, not to impose any *weltanschauung*, any ideology, not to offend any tradition or belief on the one hand. But on the other hand, we struggle and strive to have signs that reflect authorship and are in all ways original and creative. We juggle with anonymity and visibility, hoping that we can finally produce something that does not exist as a person, but at the same time, is all the persons in the world.

Conclusions

The matters approached in *Reading pictograms and signs – the need for visual literacy* rely on the generally accepted observation that a significant part of all human communication occurs without resorting to linguistic signs. Put aside gestures, posture, eye contact and other personal and interpersonal cues, there is a myriad of non-verbal types of communication that explain much of what we know and how we behave in society. We have focused on visual signs. Because visual signs are everywhere, and in their many forms, they communicate something. Historically, they always have been carriers of meaning. Throughout this study, we have given proof, with many examples (especially in the first chapter), to the extreme diversity of pictorial signs, even within the limits of non-art. We have seen how they have been around from the earliest days of civilization and how they can be found anywhere on earth, but mostly in cities and urban environments, where the need for their presence and guidance is felt more deeply.

The field of visual representation is wide, and among other possible types of visual signs that communicate meaningful messages, we chose pictograms, symbols and icons. Basically, that choice is owed to the omnipresence of these signs in all environments; the universality their system claims to possess, and, finally, the ingenious creativity that precedes their production – a characteristic that goes hand in hand with matters of aethestic nature. All these aspects are addressed by studies of visual culture, which identifies them as social concerns, and proceeds to analyse them in the light of theories, namely semiotics. And so, we have explained how semiotics, originally a science that studies the interpretation of linguistic (verbal) signs, has come to penetrate the realm of pictures, and produce a whole new branch of the discipline, called visual semiotics.

We have moved within the domain of visuality – through pictograms and other signs - to finally (and inevitably) realise the need for visual literacy. We have defined visual literacy as the ability to decode, interpret, negotiate and judge meaning from the information that comes to us via images. Moreover, it became clear, when

comparing visual to verbal signs, that these two modes of representation are interlinked and very often interdependent. We have also shown how deep the connections go between seeing and saying, at even the most elementary levels.

Having affirmed the necessity for a critical approach to the universe of pictograms, for their quality of conveying messages that are almost universally observed, we have turned to the debate on universal languages. We were reminded of how ancient the dream of a perfect language is, with the reference to Babel, and how in the course of history projects to mend Babel's curse have appeared, with variable degrees of success. The languages designed by seventeenth century thinkers preceded the indication of Esperanto as an example of artificial language. We then analysed Isotype, a picture language built specifically for the development of visual education in the 1930s, which remains until this day a paradigm of pictorial systems and infographics. We have suggested that contemporary systems of visual communication such as Icon-language owe a great deal to the Isotype project, even though they now rely on a more obvious aspect of visualization, which is computer technology.

From the observation of pictorial languages, we could finally conclude that, just like in spoken languages, there is no such thing as total transparency or homogeneity in their signs. And also how universality is an ever-eluding concept. Not only are the signs of a language plural, they are also open to interpretation and reformulation; and that is made evident in the constant production of new signs and signage systems, either to represent new realities or the same, old ones.

In the analysis of pictograms we made in chapter IV, we took into consideration semantic, syntactic and pragmatic dimensions. In other words, we regarded the ways through which signs represent a given message; how they relate to one another, and how they are received or perceived by users (readers or viewers). Again, we noted how plurality and diversity will always exist in pictorial signs, and how those characteristics manifest themselves in relation to universality, abstraction and style.

If this study has raised awareness to the importance of visuality in our daily lives, starting from the smallest signs we interpret almost unconsciously, then the first step is made towards accepting visual literacy as a fundamental skill in this digital age of ours. The immense number of messages that are sent and received by means of pictograms, how they are simultaneously fixed and in evolution, intuitively or forcibly deciphered, remain clues for further investigation. Whether or not they will prove, in

the future, that they can become instruments of an effective universal communication, is also out in the open. At any rate, we can say that pictograms and other pictorial signs have found their way out of a mere metadialect. They are here, there, and everywhere, claiming and expressing for themselves a reaching and active pursuit.

Bibliography

Abdullah, R., & Hübner, R. (2006). *Pictograms, Icons & Signs - A guide to information graphics.* New York: Thames & Hudson.

Althusser, L. (1979). *Filosofia e filosofia espontânea dos cientistas.* Lisboa: Presença.

Arizpe, E. a. (2004). Seeing, thinking and knowing. In T. Grainger, *The RoutledgeFalmer Reader in Language and Literacy* (pp. 185-198). London: RoutledgeFalmer.

Artoni, S., Buzzi, M. C., Buzzi, M., & Fenili, C. (2011). Didactic Software for Autistic Children. *Advances in New Technologies, Interactive Interfaces and Communicability , 6616*, 73-80.

Baines, P., & Dixon, C. (2003). *Signs: Lettering in the Environment.* London: Laurence King.

Barton, D. (1994). *Literacy. An introduction to the ecology of written language.* Oxford: Blackwell Publishing.

Baudrillard, J. (1981). *For a Critique of the Political Economy of the Sign.* (C. Levin, Trans.) St. Louis, MO: Telos.

Bednarik, R. G. (1994, March). *A taphonomy of palaeoart*. Retrieved February 7, 2010, from Cog Web - Cognitive Cultural Studies: http://www.sscnet.ucla.edu/comm/steen/cogweb/ep/Art/Bednarik_94.html

Bednarik, R. G. (n.d.). *Cog web*. Retrieved March 15, 2010, from http://www.sscnet.ucla.edu/comm/steen/cogweb/ep/Art/Bednarik_95a.html

Berger, J. (1972). *Ways of Seeing.* London: BBC & Penguin.

Borges, J. L. (1981). *The analytical language of John Wilkins.* Retrieved April 10, 2010 from wiki.uiowa.edu:

https://wiki.uiowa.edu/download/attachments/570/Borges-TheAnalyticalLanguageofJohnWilkins.pdf

Boutaud, J.-J. (1995). Visual Semiotics, Pragmatics and Communication. In T. A. Sebeok, & J. Sebeok-Umiker, *Advances in Visual Semiotics* (pp. 3-19). Berlin and New York: Mouton de Gruyter.

Bruner, J. S. (1990). *Acts of Meaning - The Jerusalem-Harvard Lectures.* Cambridge, Mass.: Harvard University Press.

Burgin, V. (1986). *The End of Art Theory - Criticism and Postmodernity.* London: Macmillan.

Carlson, M. (1996). *Performance, a critical introduction.* London: Routledge.

Carmona, M., & Tiesdell, S. (2007). *Urban Design Reader.* Oxford: Elsevier Architectural Press.

Cassirer, E. (1946). *Language and myth.* (S. K. Langer, Trans.) New York and London: Harper / Bros.

Chandler, D. (n.d.). Retrieved January 10, 2010, from Semiotics for beginners: http://www.aber.ac.uk/media/Documents/S4B/sem01.html

Cohen, J. (1954). On the project of a universal character. *Mind , LXIII*, 49-63.

Cornell, E. H., Sénéchal, M., & Broda, L. S. (1988). Recall of picture books by 3-year-old children: testing and repetition effects in joint reading activities. *Journal of Educational Psychology , 80* (4), 537-542.

Coulmas, F. (2003). *Writing Systems - An introduction to their linguistic analysis.* Cambridge: Cambridge University Press.

Crow, D. (2003). *Visible Signs.* Crans-près-Céligny: AVA Publishing.

Crystal, D. (2005). *The stories of English.* London: Penguin.

Culler, J. (2001). *The pursuit of signs.* London: Routledge.

Dallow, P. (2008). The Visual Complex - Mapping some interdisciplinary dimensions of visual literacy. In J. Elkins. New York: Routledge.

de Kerckhove, D. (1997). *The skin of culture: investigating the new electronic reality.* London: Kogan Page.

DeFrancis, J. (2002-2009). *The Ideographic Myth*. Retrieved February 12, 2010, from Pinyin info: http://www.pinyin.info/readings/texts/ideographic_myth.html

Dondis, D. A. (1973). *A primer of visual literacy.* Cambridge: MIT Press.

Eco, U. (1976). *A Theory of Semiotics.* Bloomington: Indiana University Press.

Eco, U. (1995). *The search for the perfect language.* (J. Fentress, Trans.) Oxford: Blackwell Publishers.

Elkins, J. (2008). *Visual Literacy.* New York: Routledge.

Elkins, J. (2003). *Visual Studies - A skeptical introduction.* New York and London: Routledge.

Fletcher, K. L., & Reese, E. (2004). Picture book reading with young children: a conceptual framework. *Developmental Review* (25), 64-103.

Floch, J.-M. (2001). *Semiotics, Marketing and Communication - Beneath the Signs, the Strategies.* (R. O. Bodkin, Trans.) Palgrave.

Foucault, M. (1983). *This is not a pipe.* (J. Harkness, Trans.) Berkeley: University of California Press.

Frutiger, A. (1998). *Signs and Symbols: their design and meaning.* (A. Bluhm, Trans.) London: Ebury Press.

Furtado, J. A. (2000). *Os Livros e as leituras, Novas Ecologias de Informação.* Lisboa: Ed. Livros e Leituras.

Geary, J. (2011). *I is an Other. The secret life of metaphor and how it shapes the way we see the world.* New York: Harper Collins.

Gelb, I. (1963). *A Study of Writing.* Chicago: University of Chicago Press.

Gil, J. (1998). A Construção da Presença. In M. Valente Alves, *O Impulso Alegórico.* Lisboa: Ordem dos Médicos.

Gombrich, E. H. (1982). *The Image and the Eye: Further studies in the psychology of pictorial representation.* London: Phaidon.

Gombrich, E. (1950). *The Story of Art* (Pocket edition, 2006 ed.). London: Phaidon.

Halliday, M. (1994). *An introduction to functional grammar.* London: Edward Arnold.

Hampshire, M., & Stephenson, K. (2008). *Signs and symbols - communicating with pattern.* Hove: RotoVision.

Harini, S., Sivaswamy, J., & Indurkhya, B. (2010, January). Assistive systems for children with dyslexia and autism. *ACM Sigaccess Accessibility and Computing* , pp. 32-36.

Hitchings, H. (2008). *The secret life of words: How English became English.* London: John Murray.

Holme, R. (2004). *Literacy - An Introduction.* Edinburgh: Edinburgh University Press.

Hora, M. (2005). *Official Signs & Icons 2.* New York: Ultimate Symbol.

Horn, R. E. (1999). *Visual Language: Global communication for the 21st century.* Bainbridge Island: MacroVu Press.

Hu, R., & Comeyras, M. (2008). A case study: emergent biliteracy in English and Chinese of a 5-year old Chinese child with wordless picture books. *Reading Psychology* (29), 1-30.

Kress, G., & van Leeuwen, T. (2001). *Multimodal discourse - the modes and media of contemporary communication.* London: Hodder Arnold.

Kress, G., & van Leeuwen, T. (2006). *Reading Images: the grammar of visual design* (4th edition ed.). London: Routledge.

Kristeva, J. (1969). *Semiotiké.* Paris: Seuil.

Leborg, C. (2006). *Visual Grammar.* New York: Princeton Architectural Press.

Lechte, J. (1994). *Fifty key contemporary thinkers - from structuralism to postmodernity.* London and New York: Routledge.

Leroi-Gourhan, A. (1964). *Les religions de la préhistoire (Paléolithique).* Paris: PUF.

Leroi-Gourhan, A. (1982). *The dawn of European art: an introduction to Paleolithic cave painting.* Cambridge: Cambridge University Press.

Lester, P. M. (2006). *Visual Communcation: images with messages* (4th ed.). Belmont: Thomson Wadsworth.

Lewis, D. (2004). A Word about Pictures. In T. Grainger, *The RoutledgeFalmer Reader in Language and Literacy* (pp. 199-216). London: RoutledgeFalmer.

Lupton, E. (1996). *Mixing Messages: Graphic Design in Contemporary Culture.* New York: Smithsonian Institute and Princeton Architectural Press.

Marshall, P. D. (2004). *New Media Cultures.* London: Arnold.

McLuhan, M., & Fiore, Q. (1967). *The Medium is the Massage.* London: Penguin.

Mirzoeff, N. (1998). *The Visual Culture Reader.* New York: Routledge.

Mitchell, W. (2008). Visual Literacy or Literary Visualcy? In J. Elkins, *Visual Literacy* (pp. 11-29). New York: Routledge.

Mourão, J. A. (2002, June). Funambulismos: A narrativa e as formas de vida tecnológicas. *Revista da Comunicação e Linguagens* , 378-379.

Neurath, O. (1936). *International Picture Language* (Facsimile reprint, 1980 ed.). Reading: Department of Typography & Graphic Communication University of Reading.

Nikolajeva, M., & Scott, C. (2006). *How picturebooks work.* London: Routledge.

Ninio, A. (1983). Joint book reading as a multiple vocabulary acquisition device. *Developmental Psychology , 19* (3), 445-451.

Peckhaus, V. (n.d.). *Calculus Ratiocinator vs. Characteristica Universalis. The two traditions in logic, revisited*. Retrieved November 15, 2010, from http://kw.uni-paderborn.de/fileadmin/kw/institute/Philosophie/Personal/Peckhaus/Texte_zum_Download/twotraditions.pdf

Pinker, S. (1994). *The Language Instinct - How the mind creates language.* New York: Harper Collins.

Pombo, O. (n.d.). *Leibniz and the encyclopaedic project*. Retrieved October 12, 2010, from Centro de Filosofia das Ciências da Universidade de Lisboa: http://cfcul.fc.ul.pt/textos/OP.%20Leibniz%20and%20the%20Encyclopaedic%20Project.pdf

Poyatos, F. (1983). *New Perspectives in Nonverbal Communication - Studies in Cultural Anthropology, Social Psychology, Linguistics, Literature and Semiotics.* Oxford: Pergamon Press.

Rafifar, J. (2007). *Some indications of shamanism in Arasbaran rock carvings*. Retrieved February 15, 2010, from http://arheologija.ff.uni-lj.si/documenta/pdf34/DPrafifar34.pdf

Robinson, A. (2000). *The Story of Writing - Alphabets, hieroglyphs and pictograms.* London: Thames & Hudson.

Rodowick, D. N. (2001). *Reading the Figural, or, Philosophy after the New Media.* London: Duke University Press.

Rogoff, I. (1998). Studying Visual Culture. In N. Mirzoeff, *The Visual Culture Reader* (pp. 14-26). New York: Routledge.

Rossi, P. (2006). *Logic and the art of memory: the quest for a universal language.* (S. Clucas, Trans.) London: Continuum.

Rutte, H. (1991). The Philosopher Otto Neurath. In T. E. Uebel, *Rediscovering the forgotten Vienna Circle* (pp. 81-94). Dordrecht, The Netherlands: Kluwer Academic Publishers.

Saint-Martin, F. (1990). *Semiotics of Visual Language.* Bloomington: indiana University Press.

Saint-Martin, F. (1995). Verbal and Visual Semantics. In T. A. Sebeok, & J. Umiker-Sebeok, *Advances in Visual Semiotics* (pp. 375-401). Berlin and New York: Mouton de Gruyter.

Schapiro, M. (1996). *Words, Scripts and Pictures: Semiotics of Visual Language.* New York: Braziller.

Sebeok, T. A. (2001). *Global Semiotics.* Bloomington: Indiana University Press.

Seppänen, J. (2006). *The Power of the Gaze: An introduction to visual literacy.* (A. A. Clark, Trans.) New York: Peter Lang.

Smitshuijzen, E. (2007). *Signage Design Manual.* Baden: Lars Müller Publishers.

Sonesson, G. (1995). On Pictorality: The impact of the perceptual model in the development of pictorial semiotics. In T. A. Sebeok, & J. Umiker-Sebeok, *Advances in Visual Semiotics* (pp. 67-105). Berlin and New York: Mouton de Gruyter.

Sonesson, G. (2004). *The Internet Semiotics Enclyclopaedia*. Retrieved Nov 23, 2009, from Lund University - Department of Semiotics: http://filserver.arthist.lu.se/kultsem/encyclo/pictorial_semiotics.html

Stadler, F. (1991). Aspects of the social background and position of the Vienna Circle at the University of Vienna. In T. E. Uebel, *Rediscovering the Forgotten Vienna Circle* (pp. 51-77). Dordrecht: Kluwer Academic Publishers.

Steiner, G. (1998). *After Babel: aspects of language and translation* (3rd edition (first published 1975) ed.). Oxford: Oxford University Press.

Steiner, G. (1971). *In Bluebeard's Castle: Some notes towards the re-definition of culture.* New Haven: Yale University Press.

Sturken, M., & Cartwright, L. (2001). *Practices of Looking: an introduction to visual culture.* Oxford: Oxford University Press.

Swift, J. (1726-7). *Gulliver's Travels.* (Project Gutenberg eBook) Retrieved January 6, 2011, from http://www.gutenberg.org/catalog/world/readfile?fk_files=1289066

Ting-Ju, L. (2006). *A preliminary study of learnable pictogram languages.* Retrieved October 1, 2010, from https://uhra.herts.ac.uk/dspace/bitstream/2299/4384/1/903899.pdf

Voloshinov, V. (1973). *Marxism and the philosophy of language.* New York: Seminar Press.

Wilkins, J. (1984). *Mercury: or the Secret and Swift Messenger - Shewing how a Man may with Privacy and Speed communicate his Thoughts to a Friend at any distance(Foundations of Semiotics)* (Reprinted from the 3rd edition (1708) ed., Vol. 6). (B. Asbach-Schitker, Ed.) Amsterdam: John Benjamins B.V.