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Graphic Intelligence

Drawing and Cognition

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Preface

Starting from the discussion on the theory of multiple intelligences discussed by Howard Gardner in his famous work *Frame's of Mind*, this book presents and discusses the hypothesis of a particular form of intelligence, which will be named as *graphic intelligence*. This expression identifies the ability to use graphic abilities and, more generally, the ability to integrate the use of eye, mind and hand to solve problems of various kinds and generate effective products aimed at the creation, acquisition and communication of knowledge.

The most recent studies in the field of cognitive sciences suggest the existence of important relationships between graphic representation and cognitive development that support the idea of a graphic intelligence detectable among the other forms of intelligence capable of describing and containing a range of human intellectual competences.

As well as verbal languages, also drawing can be legitimately defined as a medium because it is not only a graphic translation of thought, but is itself a form of thought, besides being a product of thought. Thus, *graphic intelligence* would be confronted equally with the best-known linguistic and logical-mathematical intelligences on which the school and the curricula today tend to focus more and to complete and enrich the already investigated visual and spatial intelligences that, according to the literature produced so far on the subject, include and coordinate with the graphic skills.

Generally, stimuli related to graphic representation and communication gradually decay as the child grows, peaking in the early years of kindergarten and then slowly fading away at the end of secondary school. The observation of the process of activation, learning and evolution of the graphic sign starting from kindergarten, and the analysis of teaching methods and tools, allow to evaluate the contribution of graphic thought, expression, communication and visual perception in the development of design and creative skills, as well as imaginative and perceptive abilities.

Can graphic and visual education really contribute to the evolutive development, growth and formation of the individual? Is it by chance that the difficulties in the graphic and visual field are consistent with a more general impoverishment of the linguistic, expressive and imaginative abilities of most of the young adults facing

university courses? What role does the ability to express oneself graphically play in individual cognitive development? Can this ability increase cognitive potential? How do these skills develop and how can they be stimulated within educational paths? These are the questions that this volume tries to answer, investigate or at least suggest ideas for future studies.

Each research starts from the observation of particular clues that are resonant in the mind and stimulate the curiosity of the scholars, orienting them to the development of a research path. In this case, there are two different inputs from which the investigation presented in this book started. The first is related to the observation of the spontaneity with which children use graphic languages in early childhood; the second, by contrast, concerns the observation of the loss of this spontaneity and the almost total lack of use of graphic languages in young adults. The contrast between these two phenomena reveals the vertical fall of the ability to draw that Richard Sennett defines as the divorce between hand and head.

A book that talks about images cannot but speak through images, and if it wants to discuss the value of their production as an instrument of thought it needs their use. For this reason, in parallel with the texts will be used complementary and never didactic images. The graphic language, in fact, as we will discuss in this work, is able to translate thought into that 'cursive' form which allows us to capture the rapid flow of mental images that are processed in our heads. The images presented in this volume have been chosen not only because they are illustrative and significant of what has been discussed, but also because they demonstrate clearly how drawing can enhance cognitive processes and knowledge building.

The choice of the iconographic apparatus—fundamental in the development of this research—was facilitated by the wide availability of images accessible on the web and, above all, by the possibility of consulting the digitized archives made accessible by the most important public and private institutions; just think, for example, of the archive of Isaac Newton's writings published by the University of Cambridge Digital Library, The Thomas Edison Papers Project of the Rutgers University, or Fellini's drawings that can be consulted in the archives of the Federico Fellini Foundation. Also thanks to the consultation of these sources, the book tries to make available to the reader a relevant and illustrative iconographic repertory on graphic intelligence in its different forms and applied to the different possible fields of investigation. The availability of these sources opens a further possible field of research for the study of the relations between thought processing and graphic representation.

The study here presented adopts Howard Gardner's theory on multiple intelligence as a starting point in the discussion of different forms of intelligence in order to better analyze and understand a particular area of human intellectual capacity that is that of drawing and graphic representation. According to the theory of multiple intelligences, discussed in Chap. 1, human intellectual competences are many, relatively autonomous and their nature and number is not exactly definable, also because different intellectual capacities tend to shape and combine in a variety of adaptive ways. For this reason, Gardner's theory takes into consideration the

possibility of candidating certain abilities to be defined as a particular form of intelligence through the satisfaction of certain requirements.

The analysis discussed in this volume also focuses on the use of the words ‘spatial’, ‘visual’ and ‘graphic’, which often assume different meanings in the various disciplines and theories, but always remain strongly connected in relationships of interdependence or subordination depending on the authors and disciplinary views. Therefore, we try to investigate the different meanings of these words in relation to the forms of intelligence connected to them in order to hypothesize the possibility of isolating a particular form of intelligence, the graphic intelligence.

Following the analysis of the different meanings of the terms ‘visual’ and ‘graphic’, in Chap. 2, it is investigated then the concept of graphic skills and graphic communication, considered as different from the more investigated ‘visual communication’ in order to emphasize the aspects related to the coding of the message rather than those related to decoding on which studies on visual communication are more oriented. The processes of visual perception and graphic representation, although strongly connected, are different mechanisms whose understanding is fundamental to understand graphic intelligence and graphic skills. So we compare these two aspects starting from the functioning of the cognitive processes on which perception and representation are based, going so far as to affirm that visual perception and graphic representation can be considered two sides of the same coin: if visual perception can be seen as a process of decoding the visual stimuli that the mind receives, graphic representation can instead be considered as a process of coding the signs that must then be perceived and decoded by the eye.

In Howard Gardner’s discussion of multiple intelligences, spatial intelligence would embrace both the sphere of visual and graphic skills, however, highlighting important differences. The adjectives ‘spatial’ and ‘visual’ would, from his point of view, be usable as synonyms since all spatial competences can only arise from vision. Graphic skills would also be part of the large family of spatial skills but they would still lend themselves to be analyzed in an autonomous way, allowing you to hypothesize and then verify the graphic intelligence, making it possible to hypothesize and then verify the graphic intelligence, as discussed in Chap. 3.

Once discussed the relationships between graphic intelligence and scientific investigation (Chap. 4), and after having used them to demonstrate the autonomy and the role of this kind of intelligence in the development of scientific thought and in the evolution of the history of science, the role of graphic intelligence is explored in relation to the professional and educational fields in which it is most exercised so as to highlight which cognitive processes it will be able to activate. The relations between graphic intelligence and design action can be considered the highest example of the use of graphic intelligence for thought development. During their training and experience, designers acquire a *modus operandi* that makes graphic language and graphic thought the privileged tool for the production of ideas and for the representation of the projects on which their professional activity revolves (Chap. 5). The ability to use it in parallel and at the same time alternatively to

verbal language, the ability to translate mental images into drawings, makes their graphic ability a model that should be taken as a reference not only in specialist training but also in generalist training.

In the awareness that each of the paragraphs of this chapter would require to be explored more deeply, other fields of investigation such as sciences, arts, literature, cinema and theatre are equally significant and illustrative of how graphic intelligence can be a fundamental tool in the most diverse professional fields (Chap. 6).

Graphic intelligence can not only be an effective tool for enhancing thinking and producing knowledge but can also be a powerful learning tool. Starting from the learning by doing approach and from the traditional use of images as a learning strengthening tool, in Chap. 7 is discussed the role of drawing in memorizing information and in learning processes.

Science, design, art as well as learning processes cannot benefit from the advantages of such intellectual abilities unless they are adequately stimulated. For this reason, in Chap. 8 is discussed the role of graphic intelligence in training and learning from childhood to adulthood.

Finally, in Chap. 9, some concluding notes indicate possible ways to strengthen graphic intelligence and recover the cognitive potential linked to it, to which our entire culture and history are indebted.

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