

## CHARACTERISTICS OF VISUAL THINKING

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Visual thinking is a type of non-verbal thinking, and it has been extensively studied by psychologists in recent years. Psychologists believe that the main function of visual thinking is its ability to coordinate different meanings of images into a complete, visible picture. Visual thinking also helps us to ontologize the results of abstract verbal thinking so that an abstract essence becomes intellectually visible. Using it to examine and analyze various works can yield new insights and a more complete understanding in fields ranging from scientific to artistic.

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There is a traditional philosophical view, according to which human thinking exists only on the basis of linguistic material in forms of words and their combinations. This verbalistic approach is widely spread in philosophy till our days, it has a force of a prejudice in spite of the fact of existence of a developed branch of modern psychology named "*visual thinking*". Many years ago Leo Vygotsky suggested a more broad notion of *thinking*, he described it as a mental process of operating upon representatives of external objects, i.e. upon signs and symbols of any nature. In his work "Thinking and Oration" (M., 1934) Vygotsky tried to prove that "verbal thinking does not cover neither all forms of thought, nor all forms of speech. There is a large part of thinking, which does not have direct attitude towards verbal thinking. Instrumental and technical thinking together with a whole realm of the so called *practical intellect* in general may be included into this realm of non verbal thinking<sup>1</sup>" (p. 95). A nonverbal kind of thinking is as real, as a verbal one. If many years ago practical intellect was psychologically described as a preliminary and primitive stage of thinking's development only, then today it is shown, that this kind of intellect has all properties of effective thinking in its literal form. Verbal and non-verbal thinkings do not exist separately but constitute two different cuts of any subjective reality - a cut still not verbalized and a cut verbalized already. A non-verbalized level of thinking can be verbalized in future. In the beginning of the 60-s

M. Gazaniga and R. Sperry, American psycho-physiologists, investigated a functional asymmetry of a human head brain from a point of view of differences among verbal and non-verbal thinking. If to cut a bunion body, which unites two brain hemispheres, then two independent spheres of conscience emerge in the same brain. Intellectual processes by means of the left hemisphere are usually happen in a directly verbal form. The same processes but determined by the right hemisphere's activity are resulted often in rational images of ontologized spatial structures. Products of two brain hemispheres are combined by means of a bunion body into a whole knowledge of an object's class and sensual features of objects of this class.

Visual thinking is one of kinds of non-verbal thinking, it is studied by psychologists much better than other kinds of the last. Audial, tactil and snuff thinking are objects of a very active interest within psychology in recent years. Some years ago there still was a strong habit to subdivide culture into two principal parts. The first part was called "*intellectual culture of a scientist*" and it was necessary associated with thinking as itself. The second subdivision of human culture was associated with professions to reflect upon values. Humanitarians, artists, composers of sound melodies and aromatic spirits were treated as possessors of sensual perceptions, feelings and impressions primarily. For instance, still now it is easy to notice in textbooks such usual general oppositions as *scientific thinking* and *artistic perceptions*, as if

a scientist is primarily a rational creature but an artist has nothing to do with a sphere of essences and he is able to build professionally only sets of sensual images; it is a wrong opinion. Good artists, writers, composers of symphonies of sounds or spirits are able to penetrate deeply into invisible structures of different kinds of reality not less than scientists; a symphony is like a theory of a serious object. To compose spirits accordingly, for example, to a peculiar class of women is to cognize rationally some essential and hidden character of these women. It is wiser to find difference among epistemological properties of a classical natural scientist and a typical artist namely in peculiarities of their rationalities, but not through a prism of an opposition *rational-sensual*.

If the scientific rationality is based on operating upon words and mathematical symbols, which represent external objects (but this definition is not the whole truth), then rationality of an artist or engineer is based on iconic representatives of external or inner objects, i.e. on graphs, diagrams, spatial sign structures. For example, it is known that engineer's thinking usually consists of 60-80% of visual thinking and only 20-40% of it one can describe as verbal thinking. Within Ch. Peirce's classification of signs, an iconic kind of signs is seen as an effective instrument of valid thinking. Psychologists see the main function of visual thinking in its ability to coordinate different meanings of images into the whole visible picture. Rudolf Arnheim, an American aesthetician and psychologist, writes that one can not pass any information to another person directly before the object of this information is not represented in a structurally clear form.

Visual thinking helps us to ontologize results of abstract-verbal thinking; by means of it an abstract essence becomes intellectually visible. It is necessary to stress, that visual thinking is a contentive product of synthesis of previous sensual experiences and abstract-verbal thinking; by means of it an abstract essence becomes intellectually visi-

ble. Visual thinking is a constructive product of synthesis of previous sensual experiences and abstract-verbal activity. So a sensual component of an image of visual thinking is not just the same as some direct sense-data. This component is radically changed within a visual-rational image; it reflects those objective structure, which are not given in a direct perception. An image of visual thinking is able to foresee future events, to draw future worlds in forms of designer's projects.

Thus, within structure of human cognition, an image of visual thinking is a medium among abstract-logical thinking and a future practical activity. This image does compose the main content of an aim of practice. Often it is possible to crystallize in it the principle content of this or that achieved knowledge. Probably, it is an image of visual thinking, but not pure conceptual construction, which is a basic building element of scientific pictures of the world. When we are asking to imagine a modern picture of the world, which exists in science, we at once can remember associations of incandescent stars" balls and cool planets around them, atom's model of Rutherford. pictures of electron's and ion's exchange among atoms and molecules, of chromosome's chains of Watson and Crick's model and so on. But usually we (if we are not narrow specialists in Physics, Chemistry, Biology) do not remember mathematical and conceptual sides of those scientific theories, within which the mentioned visual-rational images were born.

So, an image of visual thinking of a proper level of generality helps to transport main conclusions of different theories throughout science at whole and outside, it helps to popularize general scientific results in society. By means of it an invisible structure of atoms or genes becomes mentally visible for scientists and ordinary people. Visual thinking is a cognitive bridge between verbal thinking and external practical activity, between words and business. That is why it is very important to teach culture of visual thinking to begin from early childhood, to graft this culture in pupils, students, scien-

tists, engineers. It is a pity that our pedagogical system was (and still is) based on an illegible philosophical idea of cognitive process. According to this idea, formulated by sensualists (see V. Lenin's 'Philosophical copybooks') - a cognitive process has the following structure: from direct sensual contemplation of an object through abstract thinking to practice. Of course Lenin could not foresee that this sensualistic formula would be blindly copied in the Soviet pedagogical practice.

Visual thinking is a human activity, which results with new images, new visual forms. These forms make visible the meanings of abstract concepts. While mediating verbal thinking and practice, images of visual thinking are comparatively free in correspondence to objects of perception. They have an ability to reflect in themselves practically any categorial relations of reality - spatial, temporal, attributive, causal, teleological, existential and so on. But they reflect these relations not by means of word's expression, but through expression of them in spatial-temporal structures, in transformations and dynamics of sensual images. Epistemological function of visual thinking includes (beside the mentioned above property to be a bridge between verbal and practical activity) an ability to find information about structure-spatial and temporal characteristics of possible worlds by means of imaginative transformations of schematic pictures of objects and modes of acting upon these objects. Ontological function of visual thinking is an ability to ontologize products of verbal thinking, to give them existential properties, a feeling of reality. This happens because of a sensual component of synthetic images of visual thinking. Of course such images may be not only true but false also, nevertheless there is a stamp of reality on them subjectively.

We mentioned some more functions of this kind of thinking before - prognostic, methodological and communicative. The last, communicative function is very important. When a verbal communication among people

is not sufficient or even impossible, visual thinking gives an opportunity to transport information among subjects, for instance, in a graphical form. Especially it is effective in arts, engineer projects, design. The existence of visual thinking falsifies some radical consequences of Sepire-Worf's theory of linguistic relativity - for instance, its thesis, that grammar itself forms human thoughts as a program of an individ's mental activity and as a means of analysis and synthesis of our impressions. It seems that visual thinking is a necessary condition of finishing of a theory's construction. Due to its images of visible essences a scientist can interpret empirical data of partly or completely invisible objective and subjective processes. Pictures of theoretically investigated objects are built upon a conceptual system and accordingly to this system. By means of such pictures a scientist is able to correspond his theory to external reality, to check it or to materialize his ideas in artificial objects. From the point-of-view of a conceptional content of a theory, a theory is a knowledge of its abstract objects directly, but not a direct knowledge of external objective reality as itself. Epistemological functions of visual thinking help to transform theoretical knowledge about abstract objects into a kind of practical knowledge of non-theoretical objects.

A general theory of visual thinking is to be extrapolated on arts. A. Baumgarten, the father of Aesthetics, classically defined this branch of philosophy as a theory of sensual cognition. This definition is right in general if to understand *cognition* in its categorical meaning. Some philosophers described aesthetical cognition as the lowest level of human cognition, but some of them, on the contrary (Shelling, for example), have seen in Aesthetics the top of human knowledge. *Cognition* is cognition, it is a process of penetrating into roots, essences, nature of things. If to explain an aesthetical attitude towards a world not only as plain sensations and presentations (as sense-data), but as visual thinking, then an aesthetical image may be briefly denoted as *Visible Essence*.

Simply speaking, a world around us may be divided on two parts. One part is directly visible, it is a surface of phenomenons. We can see it, touch it, smell it, etc. But the second part is invisible.

Philosophers use to call it 'essence' of objects of our perceptions. If 'essence' is not known it seems to be dangerous and hostile towards a man. So it is necessary to understand 'essence', to express it via sensual images. We suppose that *aesthetical attitude* is nothing else but an expression of rationally cognized essences in structures of transformed perceptions and presentations, i.e. in forms of images of visual thinking. Aesthetical attitude is universal, one can find it in every kind of human activity and knowledge - in everyday life, spheres of arts, science, technique. For instance, a mathematical graphic curve aesthetically expresses a definite equation, though such an expression happens to be some mode of aesthetical quality - beautiful or un-seemly, elevated or low, tragic or comical. Aesthetical attitude is a human ability to express essences ideally, i.e. via ontologized and sensual representatives of these essences. That is why, while aesthetically expressing some deep essences, men subjectively make them known and not so dangerous; such a kind of visual thinking is accompanied with a feeling of pleasure, admiration, relief, reliability and so on positive emotions.

Followers of Plato and Hegel do understand *essence* as something very different from a sphere of sensual phenomenons, which manifests itself towards a perceiving man indirectly; nevertheless a man is able to cognize essence. This philosophical position determines a set of peculiar theories of arts and notions of realism in arts. Within them, realism is a true description of *essence* (not natural phenomenons of life) in terms of revised and transformed presentations. Essence is truly reflected in art works when ordinary presentations are changed due to a rational scheme, which a talented artist has found and hidden in his work. From this point of view, surrealism and similar artistic methods are

true and realistic. Followers of Kant or other agnostical doctrines think that *essence* is out of our perceptual reflection, it can be artificially expressed in sensual forms only allegorically.

Religious arts (icons, church architecture, etc.) are clear examples of this mode of thinking. If one believes that a pure geometrical visual form only is good to express essence, but not accidental phenomenons' shapes, then cubism, suprematism and other artistic methods are corresponding to this conception. If another artist thinks (as nominalists), that essence or doe does not exist at all or it is manifested, directly and fully, in sensual phenomenons, then he believes in a kind of a surface realism, photo-graphical arts.' And so on. Another base for principal differences among conceptions of arts is a question of what definite sensual material is good to express essence -visual, audio, etc.? If you understand essence as a struggle of inner contradictions, you receive a special notion of a "good" art also. If essence is something else for you ('oneness', 'undividable', etc.), then you disagree with the previous point of view; accordingly, interpretations of aesthetical categories of harmony, taste, beauty and so on would be alternative.

The second idea - the idea of arts' importance for our social life — provides another angle of view on nature of arts. If one believes that a human being is a product of nature, then to know natural essences means to know man's essence. So, from this point of view, it is very important to express nature artistically for a benefit of society. On the contrary, if somebody thinks that a man is a mistake of nature or nature is principally unknown, then it is not important to express natural essences artistically, but better to make picture of social life. Knowledge of essence (natural or social) can teach or can't teach people - a basic alternative for artistic discussions also. We would not continue further on this topic; you see already the revealed logic of history of arts and historical dialogues among distinguished artists. It is very important to give freedom for all princi-

pal artistic tendencies. Only then arts, taken totally, are developing normally and effectively. Suppression of any principal artistic

program leads to a disharmony in artistic creativity.