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PSYCHOLOGICAL IMAGINATION PROCESSES IN ART

Що відомо психологам, в рамках їх компетенції, про основи зображень вишуканих композицій образотворчого мистецтва? Навіть якщо їм вдасться написати декілька розумних зауважень щодо функції візуалізації, вони можуть необгрунтовано вважати, що це буде корисно для художника? Наукові статті не є першою причиною творчого натхнення і зростання самосвідомості художника. Це навпаки, означає, що думки художників про своє мистецтво є осередком дослідних робіт з пошуку елементів артистизму.

Ключові слова: *уява, конструкція, символ.*

Что может бить психологам известно, в рамках их компетенции, об основах изображений изысканных композиций изобразительного искусства? Даже если им удастся написать несколько разумных замечаний относительно функций визуализации, они могут необоснованно полагать, что это будет полезно для художника? Научные статьи не являются первой причиной творческого вдохновения и роста самосознания художника. Это наоборот, означает, что мнения художников о своем искусстве есть сосредоточением исследовательских работ по поиску элементов артистизма.

Ключевые слова: *воображение, конструкция, символ.*

What may psychologists know, within the scope of their competence, about imagery foundations of refined compositions of fine arts? Even if they manage to write a few reasonable remarks on the imaging function, could they be so unreasonably impertinent to believe, that it is going to be useful for an artist? Research papers are not the first cause of artistic inspiration and growth of artist's self-awareness. It is the other way round, which means that scarce opinions expressed by artists about their arts focus research papers on the search for elements of artistry.

Keywords: *imagination, construction, symbol.*

SHORT HISTORY OF RESEARCH ON IMAGINATION

Empirical theories of human visualisation were developed together with the theories of fields of consciousness in the 2nd half of the 19th

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century. Earlier theories, such as Hegel's theory, were generally philosophical and they did not deal with empirical study of the process of specific visualisation. In the late 19th century and early 20th century a far-fetched studies of "imagination family" started (Bachelard, 1985). In philosophy, having settled with mechanicisim, Bergson worked out excellent analysis of imaginations in the experiencing life. Fabulative function of the people called primitive ones was the subject of Lévy-Bruhl's anthropology, Janet's psychiatry which had a direct impact on Freud and the beginnings of psychoanalysis of phantasms. The turn of the 19th and 20th centuries observed also the beginnings of photography and movies, that are contemporary visual arts. All these things happened during the first great revolution in the art of imagining of object, that is the impressionist revolution. Its essential purpose in painting was to reflect natural features through relativisation of presentation. A long stagnation in psychological studies of images, except developmental psychology, was observed until late 1960's. It is enough to say that almost all concepts of old-time psychologists are still valid in this field of research. The reasons of such situation need to be analysed in detail. Here we will mention two basic reasons. First of them are the remains of sensualism that derives imagination from sensations. According to extreme empiricism, imagination provides unclear copies of things or even empty phantoms (Sartre, 1970). Gaston Bachelard's sentence that "imagination is the ability to create images" seems obvious until we found extreme difficulties to specify features of an image that do not derive from the features of other cognitive processes, such as perception, notion, memory, operation. The other reasons, why the issue of imagination is neglected by psychologists, is over-intellectualised perception of a human being. Imagination is not only a image of a structure of features of a spatial and physical object, but also intellectual variant of dreams and all expressions, an element of a poetic image. Often textbooks in psychology have not chapters on imagination, and if somebody wishes to know more about it, may read papers in philosophy and theory of arts and observe artists.

As far as psychology and psychoanalysis are concerned, there are plenty of studies of imagination in reference to developmental and clinical aspects. Two main effects of studies of children's drawings are: 1. defining stages of intellectual development in artistic activities: from naïve realism to relativisation of scheme (Piaget, Inhelder, Szemińska, 1973; Szuman, 1975); 2. learning the features of artistic activities in correlation with personality features: determining low dependence of a creative process on mental abilities, in particular convergent ones (Strzałecki, 1969)

and a considerable dependence of this process on stylist and emotional orientations (Strzalecki, 2003). The clinical trend of the research provided data on changes in creative imagination activities in result of developing process of pathology of emotions. It was proven that a considerable amount of human imagination is similar to imagination in mental disease, which means that there is no direct proportional dependence of destruction of artistic works on pathological tendencies of personality. What is more, in different periods of symptom dynamics a certain manner of more intensive creativity is observed (Tyszkiewicz, 1987).

The developmental and clinical trends of psychology provided numerous interesting results. It must be said however, that developmental studies in the psychology of artistic activities were dominated by the problem of relationship of developing operations to the figurative scheme. The problem of a relationship of imagination to intellectual processes as semiotic processes, creators of sign representation of the reality in cultural environment was not posed, definitely. And it seems that such psychological approach to intellectual construction could be interested for artists since they bring to life specific creations in the sign function (Vygotskij, 1980). On the other hand, a mistake reoccurring in the clinical researches was an identification of morbid outbreak and regression of expression in emotional disorders with the essence of artistic creativity. To sum up, they are important reasons of why the psychological research did not refer to the revolution in the modern art during the entire 20th century. A lack of researches focused directly on creation of specific images by artists divided according to their specialisation: painters, sculptors, photographers, film makers, architects, authors of musical and literary images, is particularly painful. I will not be mistaken if I generalise that the whole psychology of arts suffers from this.

CERTAIN GENERAL CONDITIONS OF ARTISTIC VISUALISATION

It is very likely that only human being is able to visualize a whole object. The vertebrates recognize objectivity fragmentarily in the environment of activities that is accessible to them. In case of a human being, every intellectual presentation is an indication of a more general function of objectivisation function as a typically human function (Buber, 1992; Gehlen, 1988; Plessner, 1988; Scheler, 1987). Scientists tend to elevate the meanings of terms and sometimes only a contact with imagery arts may permanently show this essentially human function of visualisation to them (Bronowski, 1984).

Representations created in cognitive, practical and artistic fields show primitive human disposition to divide a field of consciousness to changing contexts of figures and background in different mental objectivisations and in conscious visualisation, as well. Holistic construction of figurative material is possible only if the subject can link profiles of an object. It is also a developmental ability that confirms thinking in terms of formal operations. It is very interesting how Arnheim explains the difficulty of imaging of the entire massiveness of an object, that is a problem even of professional: "Every beginning sculptor states that he is always attacked by simplicity of a cube. If he tries to get rid of it, in the name of round shapes achieved by Renaissance, he has to overcome the "Egyptian" in himself. Moreover, all the time he has to fight a temptation to complete one side of the work, that is seen from every point of view, and after a monument is completed he finds out that the horizon of his previous view is no longer a border line. In result, he faces unexpected refractions and edges; he is looking at uncompleted surfaces that go into external spaces instead of surrounding the statue. An ability to understand the whole volume in a continuous way appears only later, when a sculptor fully learns the three-dimensional space" (Arnheim, 1978, p. 221). Spatial visualisation is always three-dimensional in thoughts, moreover sculptures and every other imaging art requires proper function of visualisation that creates abstractive space in artistic activities.

ABILITY TO IMAGE STRUCTURE OF AN OBJECT

The wealth of the family of imagination results from a diversity of types of imagining and their elements. Knowledge about is very unclear. There is plenty to do with the methodology of psychological research of imagination in terms of separating and naming individual factors and the very selection of research tasks. Imagination rotations are regularly confused with spatial operations. A distinction between these two abilities is difficult, because a rotation of an object in an image, individual neuropsychological performance (Cooper, Shepard, 1985) is connected with operational thinking by means of spatial forms that is a developmental activity. No separation between dynamic imagining and logical operation can be well seen in some interpretation of Piaget's tasks. One task requires to draw a water line in a container that has been leant from a horizontal position. Even persons with university education sometimes do not draw a horizontal line inside the leant container, which is eagerly interpreted as a deficit of imaging presentation resulting from a biological difference (Ciarkowska, 1998). Rey's, Piaget's and Inhelder's drawing tasks were

used for studies of mental rotation by the early 1970's. (Shepard and Metzler, 1971). Moreover, sometimes an iconic means of communication is identified as "imagining". Iconic medium of representation, that is separated by nursery school children, is provided by cultural environment. Children from Ivory Cost were slower in solving tasks in form of rotation of drawn items than children from Switzerland (Nunez, Corti and Retschitzki, 1998). A failure to notice a developmental operational aspect of images and iconic way in which items are presented after sensory and motor coordination phase results in biologisation of imaging activities.

Some theoreticians and researchers claim that general superior imaging ability probably does not exist at all (Kosslyn et al., 1984), while those who distinguish spatial ability claim that is may not be a synonym of imagination (Stumpf and Eliot, 1994). In the course of a study of developmental and educational groups, from nursery school to university students, by means of tasks diagnosing imagination Raszkiewicz (1995, 2010) defined seven main factors. The task sets includes the author's non-verbal and verbal Constructional Imagination Test (CIT), Kohs block tests, Rybakow Squares Test, Mednick's Remote Associates Test (RAT), schemes of incomplete imagination sentences that needed to be completed, Richardson's questionnaire on styles of thinking (Verbalizer-Vizualizer Questionnaire, VVQ), vividness of visual imagery scale or, as it was defined by its author, David Marks, "distinctiveness and vividness" of images (Vividness of Visual Imagery Questionnaire: VVIQ) and the author's Questionnaire of Imagery Distinctiveness (QID) that may be interpreted as an extension of Marks's idea and consists of scales of visual, hearing and verbal imagery generated in perceptional sceneries, fantastic sceneries and the ones generated from notions. Moreover, there was a set of 10 problems involving imagery presentation of the phenomena. If a factor was conspicuous, the types of tasks in which such factor was distinctive are presented below:

1) imagining recreation of space and movement of objects (VVIQ);

2) visualisation as changing (variation) of a structure of features of objects (verbal CIT);

3) profiling an object from different points of view, called mental rotations and other imagery transformations such as shifts, reflections, enlargements, diminutions (non-verbal CIT);

4) operation on imaginary material (Squares Test);

5) imagery senses in verbal language (imagery sentences/judgements) (verbal CIT);

6) distinctiveness of scene structure (VVIQ, QID);

7) expressiveness or vividness of scene structure (VVQ, QID).

First to fifth factors are mainly of functional nature. Sixth and seventh factors are of functional and stylistic nature. The fifth, sixth and seventh factors indicate inclinations to more intellectual or more emotional images. The seventh factor may be distinguished in the material of scene structure imagining tasks and it seems to be characteristic for images in emotional terms. An existence of the eight factor: text imagery as an imaging communication is also recommended.

1. Psychological studies often deal with the first factor, that is highlighted here, as relationships of imagination with motor skills, perception and other cognitive processes. Recreating space, movement and features of an item in a picture is constantly connected with memory, operations, notions, verbal components and imagining judgement. Reproductive functions of visualisation are used in practice in the therapy modifying physiological processes (Paul-Cavallier, 1996).

2. Besides recreative visualization there is also active, or often called "creative imagining" – changing of sets of features (properties, qualities) of objects in a visual, hearing or verbal image (Raszkiewicz, 1991, 2010). The scarcity of psychological knowledge on imagery linking of features is proportional to psychologists' limited knowledge on imagination. Visualization of features of objects and scenes was long time ago separated by Thurstone (1947) as one of seven fundamental abilities of a human being, besides perceptional ability, direct memory, knowledge of words and verbal fluency, arithmetic operations and reasoning. It should be added, that the fact of solving imagination tests is strongly correlated with tests of general intelligence potential (Gregoire, 1997; Stumpf and Eliot, 1994).

3. In the course of development we observe mental rotations and other imagery transformations that are linked with logical operations. According to some models of imagining representation, imagery transformations – such as shift, rotation, turn, shape reflection, reflection of rotation, gliding reflection, changes of size, putting pieces together (Chen and Chen, 1993) – constitute an analogue transformation process that corresponds to transformation in real space in terms of structural analogy (Cooper and Shepard, 1985; Nowak, 1991). The scale of psychological stability of perceived or imagined sized of a geometrical feature or a movement feature (for instance pace of rotation) is not an angle size and probably no other geometric or physical value (Werkhoven and Koenderik, 1993; Zimmer, 2004). Mathematical psychology searches for group models that are "used for the purpose of describing internal representation structure

and to identify an object as a set of invariant features in transformations" (Chen and Chen, 1993).

Experimental facts have particularly well documented a hypothesis that men are better than women in mental rotation tasks, while women prevail in imagery reproduction of perceived space of items, as it is said <<female>> care for details. However, the differences between genders are not of statistical importance in case of all mental rotation tasks and scene visualisation, and not on all age levels (Uecker and Obrzut, 1993). As far as a choice of imagination styles and preferences is concerned, great importance of occupational training and life style is emphasised (Isaac and Marks, 1994).

A mental rotation is of imagery nature, it gives depth (perspective) to objects "seen" from different points of view. As it has been shown by Deręgowski (1995), since the Palaeolithic Era drawings made by children and adults have numerous malformations, since subjects cannot fit the visible whole of an object in the foreground by means of uniting its numerous "typical" perceptions. In other words, linearity of perceptional presentation is not able to create depth arising from sidedness and interior of an object (which can be seen in particular on a painting) – linear structure of presentation is interpreted two- or three-dimensionally (Deręgowski and Parker, 1992). Technical solutions of the problem of foreshortening of objects in mutual relations occurs together with formal operations. Operations do not change perception in an imagination effect but let understand and demonstrate that perception of the profile of things is made in the context of indefinite profiles. When operations are used, imagination covers an area of possible perceptions and becomes precise in determining objects that are relationally linked to each other. We can also try to imagine what we could see for example on Mars. In fact, it is the consequence of theory of mental image development according to Piaget.

Icon painters and other artists who crated centrifugal perspective did not take account of one centripetal geometric perspective, but of those positions of an observer using imagination that they considered important due to the types of imagined objects. I agree with arguments of Uspienski, which is quoted in Deręgowski's interpretation (1993): "A difference between two styles (Western centripetal geometric perspective and Eastern imaginary centrifugal perspective – H. R.) resulted (according to Uspienski) from the fact that a Byzantine artist changed places and a viewer of his paintings finds himself in a different position than the one taken by the artist in his imagination while painting".

How difficult is the issue of uniting feature representation through perception, imagination and operation is proven by the fact that is was posed

by cubists only. Cubism proved that there is no "natural" or "typical" point of view on an oject that is to be reflected by its drawn image. A painting or a child's drawing is a full intellectual construction. The impressionist revolution in the West meant recognition of a value of a constructed form regardless of what is pictured. And since impressionism it has become clear that the manner of presentation of a temporary impression is a construction and not "naturalism" that reflects the nature. Picasso started cubist revolution when he encountered forms of archaic expression. He said the same what was later noticed by imagination researchers, that is the fact of uniting typical perceptional views by a prehistoric or folk artist in one view leads to inevitable deformation. The artist's task is to deal with this problem. Deręgowski reminds that the psychological research in this field were commenced by the author of intelligence tests, Alfred Binet. It was Binet who stated that while drawing an animal or putting it together out of elements a child links, for instance, dog's head with a neck in a shape of a serpent and elephant's body. Surprising interpretations of drawings of animals and other objects were detected in case of children from different countries and illiterate inhabitants of Africa (Deręgowski, 1990, 1993).

In Pontius's research (1993), Amazon Indians and hunters and gatherers from Indonesia arranged block patterns in Kohs tests that did not arise three-dimensional associations. Those people, who live in a similar way to their predecessors in the Neolithic Era, made patterns contradictory to the test standards but not accidentally. They characterised with global configurationality, neglecting a precise analysis of size, proportions of individual elements, internal relations between components of the pattern. In the Draw-A-Person-With-Face-In-Front Test Neolithic patterns characterised with fluent transfers from forehead plant to a nose line and area of eyes. As it was stated by the author of this study, primitive environmental conditions required a quick general evaluation of appearing configurations of an edible and inedible objects, an attacker and a victim. Such evaluation differs significantly from the subtle analysis of components inside a pattern in the environment of industrial civilisation – relations of elements, positions, abstracting details. It is the way in which even neuropsychological functions are modified by ecological requirements (Raszkiewicz, 1999).

4. Imagery transformations occur in specific material and there are not logical operations. Heil, Rosler, Link and Bajric (1998) pointed out that although specific effects of learning are observed while practising mental rotation, but in case of new point of views of known objects and rotations

of new objects the transfer effect is very limited. Imaging processes are rooted in bodily biology and the features of the material of a task and they unite with the course of operation. Stabilisation of the factors of efficient imagery thinking occurs in result of maturity of body, learning imagination on the material of various data and training of operations. The imagination itself changes in stages and is mutlidirectional. Both, a child and an adult cannot continuously imagine; if an imagination moves from one position into another one, it is not longer in the previous position. Attempts of coordination of spatial continuum of numerous features in the brain follow in the development of operations (Piaget and Inhelder, 1967). Moreover, in consequence of the development of imagery transformations and operations, an object more often bases its images of the structure on verbal description since verbal meanings constitute a more durable, symbolic medium of imagination (Paivio, 1971).

Examined illiterate natives who do not autonomize the iconic substance in respect to physical objects and do not develop operational systems, do not understand a destruction of objects in a picture, for instance that due to the reasons related to perspective a bird in a painting has one leg only but it has not been harmed (Gombrich, 1978). Artistic creation requires learning a specific visual language (Deręgowski, 1993; Limont, 1994). It is an important problem in the study of construction of three-dimensional vision in children's drawings, pre-historical rock paintings and paintings from different historical epochs (Deręgowski, 1995; Deręgowski and Dziurawiec, 1994; Deręgowski and Parker, 1994).

5. Although we recognize imagery sentences, the issue of imagery sentences/judgements seems to be completely confused. Experimental and diagnostic studies so far have looked in such a way, that examined persons were provided with sentences that had been earlier assessed by other people as high or low imagery sentences, which means that they had imagining predicates or had none. High imagery sentences usually defined shapes and colours, for instance: "Great tits have narrow eyes", "Great tits are usually yellow-brown", "The Star of David has 6 arms", "Sun is significantly bigger than an orange". Low imagery sentences were for instance as follows: "Great tits lay eggs" (Eddy and Glass, 1981). Imagination plays a more direct role in creation of "concrete" meanings than strictly categorial ones with precise syntactics.

It is said in psychology that an imagination has of form of a specific picture or it may be generated through verbal determination – it exists in an image and/or verbal system. Paivio's theory (1971) assumes imagery and verbal coding of representation; information maintained in two

independent codes supplement each other. What is the issue here, is the fact that not every information may be "translated" into a picture or verbal form. Such "translation" is of structural nature as other sign processes. In most extreme theories of image representation by judgement it is assumed that a judgement does not need to be verbalised however it confirms that something exists. We would rather say that non-verbalised pictures precede a language meaning and representation through imagination adopts a language form. Imagination is a picture, not a judgement; truth or false is a feature of a judgement in a grammatical and logical form but not a representation of features – it is how the results of numerous psychological studies may be summed up (Nowak, 1991). Artists (Krzysztof Penderecki) claim that their imagination is richer that a record in form of a completed work of arts.

Due to a differentiation between two systems of coding of image information, code of imaginations and "abstractive" code of language processes, an unclear relationship of non-verbal imagination representation with imagery words and judgement as a language interpretation is frequently encountered in psychological literature. The term of code is one of most frequently used but at the same time worst defined terms in the psychology of intellectual processes. Most of all the relation of a code to the interpretation of meaning relations in a language is not clearly defined (in Polish psychological literature: Maruszewski, 1996; Nosal, 1990; Obuchowski, 1982; Wojciszke, 1991; Wolniewicz, 1980). A relationship of imagination and imagery judgement would be probably more clear without an identification of code and language. Psychological judgement does not always comply with a logical judgement; it generates imaginations and notions (Chlewiński, 1999) but the interpretation of meaning in any ethnic language or domain of knowledge is a different element of human cognitive representation than images and notions. Cognitive processes which are not so "closely" related with brain as in case of perception, imagination, notion and memory of figurative material are less defined in psychology.

Imagery representation does not need to be verbalised. Metal semiosis contains also a representation of properties of the reality in meaning relationships, that is in language interpretations. The language material that is used in psychological studies contains imagery language elements but it frequently refers to spatial relationships on which the reasoning of an examined person is conducted. As far as proper imagery meaning are concerned, researches of imagery representation intuitively adopt examples of judgements. Thus, the biggest doubt refers to what it means

that contents of words or sentences is easier or more difficult to image, so they are in general of imagery type rather than perceptional or notional one. This claim is linked to another one. When researchers provide imagining language materials, the tasks of an examined person include an assessment, selection and correction of clearness of images generated by complementary specification of shapes, colours and other properties (Eddy and Glass, 1981; Goldenberg, 1992) but not an active creation of imaging interpretation. It was proven that an image is included in a word, but it was not said precisely, what type of vocabulary is most entitled to imagery wording, and what are its relationships with pre-language representation and use of logical relationships. In Denis's opinion, Paivio's dual-coding theory is too general: "it does not define clearly if the notion of verbal code is limited to surface aspects of an utterance or if it includes other aspects of such utterance" (Denis, 1989, p. 117). The issue of imagery judgements and also perceptional, notional and memory judgements in psychology is open to new solutions (Raszkiewicz, 1991).

6. We assume hypothetically that the structure of imaging presentation is characterised by distinctiveness while imaging of experience characterise with vividness of symbolic expression and may occur together with a presentation of the structure of object properties (Raszkiewicz, 1996, 2010).

A short history of research on imagination may be measured by the fate of questionnaires on imagery vividness – starting from Galton's idea, through a review of this method first made by Betts and Sheenan and then in more contemporary times by Paivio and Richardson, and then a preparation of Vividness of Visual Imagery Questionnaire (VVIQ) and Vividness of Movement Imagery Questionnaire (VMIQ) by Marks and his colleagues.

The questionnaires of Marks, Isaac and authors collaborating with them raise methodological doubts: 1. introspective nature of such measurement (Nęcka, Orzechowski and Szymura, 2008); 2. unclear separation of perceptional, notional, memory, operational elements and language interpretation from imagery presentation of a field of characteristics; 3. confusing intellectual properties of an image with emotional one. The first claim may be rejected pointing out to the fact that every questionnaire examination refers to introspection. Significant interaction of imagery vitality and localisation of activated brain alpha waves during the performance of imaginary task was detected (Behrmann, 2000; Cohen and Saslona, 1990). In case of good imaginers the activity of alpha waves in the left cerebral hemisphere grows during visual and motor imagination (Behrmann, 2000; Marks and Isaac, 1995). It proves that there is a relation

between imagination, perception and motor skills that is proposed by developmental psychologist. The second claim was presented in the series of reports by Chara and co-authors of experiments (Chara, 1989, 1992a, 1992b; Chara and Hamm, 1988, 1989; Chara and Verplanck, 1986). They proved that VVIQ does not have the expected factor accuracy. The same was found in experiments conducted in Poland by Cielecki (1990), however in case of study of 334 university and high school students performed by Raszkiewicz (2010) Cronbach's alpha coefficients in 8 groups were in the range of 0. 75-0. 82. In his articles Marks pointed out to excellent reliability of VVIQ and VMIQ, within the range of 0. 85-0. 95, and to their criterion accuracy (Isaac and Marks, 1994; Isaac, Marks and Russell, 1986; Marks, 1989). It appeared imaginers are children with high motor skills, students of sport schools, athletes practising "artistic" sports (high diving, gymnastics), pilots, air traffic controllers. In Marks's questionnaires children are able to create vital visible and motor images at the age of 7-8 year, while Piaget's "anticipating images" are created at the age of 8-12 years, that is the age of concrete operations (Isaac and Marks, 1994) – this difference supports relative independence of the properties of a scene imagery vitality in relation to use of imagery in operational activities. It seems that the best protection of such tools of imagery examination as VVIQ and VMIQ is the care to comply with the theoretical assumption of image independence in relation to perception, motor skills, notions, memory and operations and extending the scope of examination of the images to hearing and verbal images within the meaning of the former idea of Galton, Betts and Sheenan. The third claim is most difficult to reject, since it is difficult to demand that images occur only in the function of signification of an object. The problem may be solved while assigning the trait of distinctiveness to the determining structure of an image while the trait of vividness or vitality to the symbolic representation expressing the emotional relation. Although VVIQ is about imagery vividness, the instruction requires concentration on properties of imagined scene structure, the study does not deal with symbolic expression of their quality. In general athletes have better visualisation results in VVIQ and VMIQ than the control group, particularly in case of disciplines that require them to use only the bodies: high diving, synchronised swimming, gymnastics, archery. Pilots and air traffic controllers visualise well. People working in air flight control record better results in Marks's questionnaires since the visualise with open eyes, because it is important that they perform their professional duties in the state of full vigilance (Isaac and Marks, 1994). In case of Raszkiewicz's study (1994) by means of CIT, that is

dominated by mental rotation factor, higher class professional dancers achieved significantly better results as compared to lower class dancers. In the Australian study conducted by means of Multidimensional Body-Self Relations Questionnaire, a positive impact of dancing practice on the image of own body and satisfaction from an approval of one's appearance and skilfulness was detected (Lewis and Scannell, 1995).

In Marks's opinion, imagination supports accurate vision and performance of sequences of movements. Marks refers here to the Test – Operation – Test – Exit model by Miller, Galanter and Pribram (1980), it should be emphasized however that the structural and expressive aspects of Marks, Richardson and Paivio's questionnaires have not been assessed. More known measurements of imagination, that are based on introspection reports, do not define clearly structural and expressive aspects of images: distinctiveness of structure and vividness (vitality) of expression.

Richardson's VVQ is a questionnaire that better suits examinations of expressive style than Marks's VVIQ. VVQ and VVIQ are lowly correlated with each other; there are only low significant relationships of VVQ with spatial thinking tasks and visual and verbal strategies of learning. As far as reliability and accuracy are concerned, Richardson's VVQ has bad results, it seems that this idea should be rejected or significantly reworked. On the basis of several studies preformed in the 1980's and 1990's Antonietti and Giorgetti (1998) stated that contents is confused in VVQ, this questionnaire is not reliable in a long-term and it does not allow forecasting of a role of imagery thinking of an examined person while acknowledging the reality. Imagery style defined by means of a questionnaire juxtaposed to the notional one is an example of too explicit typology. Preferring imagination is not the style that would supersede notional and verbal preference.

It is still worth arguing about what is the essence of imagination and search for diversity of imagination. It could seem that rotations in the mental space and their operational specification contribute most to construction of sculpture's shape. However, transformation in the visualisation space is only one of the elements of a construction of an image, but let's not forget about expressive factors. Cognitive psychologists accentuate the meaning of mental rotations connected with operational transformation in paintings but this factor is not always most important for fine artists. The example of August Renoir, who travelled to Italy to study Renaissance paintings, shows the artist's disappointment with post-impressionist experiments. In arts there an no such explicitness of spatial organisation like in case of intellectual capabilities tests. In CIT, when the mental rotation factor is strongly emphasised, fine art group recorded average results (Drzyzgula, 1991).

VISUAL MATERIAL AS EXPRESSIVE REPRESENTATIVE

In symbolic arts hidden meaning generates an individual form of expression; observation is only an allusion for a deeper, dramatic or religious meaning. For instance the Egyptian art that presents half-animals and half-humans, like prehistoric art, also gods in human bodies. Egyptian sculpture is silent, it decorates graves. Greek sculpture proceeds to express the beauty of naked men and women who are clothed more often, as well as entire social scenes; it announces the truth of human faith: it presents myths, tragedy of feelings. Greeks encountered sculpture everywhere and such sculpture was at the same artistic and applied arts: vases, amphorae, columns of public buildings and houses, marble gods in temples, tombstones – "a real forest of all types of sculpture" (Hegel, 1966, p. 534).

In the individual development there is not only a stabilisation of structures of intelligence, also most frequent attempts to make metaphoric and metonymic utterances and give a form to emotional images. It is a difficult and full of conflicts process to integrate symbolic meaning with mental construction. Images bear dense experiential meaning, that is often unpleasant and attack psychic protection. Authors of images are particularly exposed to the danger of lowering structural tendencies in personality, as it is defined in ego psychoanalysis (Kris, 1965). It may be shown externally with inclination to uncompleted visual structures, confusion of meanings and finally feeling of artist's block.

An assumption of strong dependence of the nature of sculptural activities on artist's gender is very doubtful. It may be stated on the basis of systematic observations, that "male" sculptures – in respect to the distinctiveness of their psycho-biological type – are characterised by strong spatial abstractness while the "feminine" sculpture characterise with corporeality of form, expression of sensuality and organicity of material that are more adjusted to haptic than visual perception, which is seen in sulptures of Magdalena Abakanowicz and Alina Szapocznikow, that are known worldwide. It has its neurofunctional and emotional explanation. Questionnaire studies from Galton to Marks determine that imagining of scene structure is systematically better in case of women. At the age of 7-8 and 13-14 years it is better in case of girls than boys (Isaac and Marks, 1994). It should be also mentioned that iconicity as a manner of intellectual presentation is a particular distinctive feature of female semiotic preferences (Raszkiewicz, 1994, 1999). Summary measures of questionnaires do not enable a detection of subtle differences. In Paivio's and Richardson's questionnaires women achieve higher total results but only some items make a clear distinction between genders (Antonietti and Giorgetti, 1996).

It is a fact, that psychological studies show bigger capabilities of spatial presentation in case of men contrary to better language fluency of women. It is now a trendy topic that is covered with the problems of "brain sex" (Moir and Jessel, 1993). Numerous studies show that a differentiation of spatial thinking aspects depends on a gender to a rather small extent and in a quite ambiguous manner. Obtained differences in tests are interpreted as a result of accumulated biological, training, educational effects, specific properties of one's occupation and a mood on a study date (Stumpf and Eliot, 1994; Stumpf and Jackson, 1994). It seems that rather hemisphericalness of skills, not gender, is the fundamental factor that differentiates capabilities and styles in generation of image structures. Left-hander, first of all left handed men are often better in generating image structures and show higher imaging preferences indeed. In case of left-hander the localisation of verbal and non-verbal functions and their coordination in opposite hemispheres may have an impact on better results in imagination tasks. Who knows, maybe it is the reason why numerous fine artists and musicians use both brain hemispheres in an excellent way, being able to draw, play music and conduct orchestra both hands (in Poland: Jacek Kaczmarski – musician, Krzysztof Penderecki – musician, Nicolas Słonimski – musician and biologist, Franciszek Starowieyski – painter). In general it seems that contradictory to the current trend for "brain sex", classification of skills on the brain level in respect to handedness is stronger than in respect to gender (Annett, 1992; Uecker and Obrzut, 1993).

One should also ask, to what extend the stability of capability tests, their convergence or lack of it results from a biological factor, and to what extent it is a result of functional preferences (motivations) related to an impact of biology or environment (Raszkiewicz, 1999). Performance factors may have an impact on efficiency of spatial task solving. Goldstein et al. (1990) noticed that in case of such tasks men tend to act more quickly and they are more self-assure while women answer more slowly but more precisely. Two types of indicators of solutions of spatial tasks were used: conventional (time limit) and a ratio of a number of well solved tasks to the number of all tasks undertaken by an examined person. Differences between genders were observed in case of conventional indicators only. In Stumpf's study (1993) the factor of the way in which spatial tasks were formed was slightly observed in a battery of tests. Masters (1998) did not find any effects of an impact of performance factors of mental rotation test on a group of male and female college youth.

Emotional conditions of image creation are not frequently discussed. Vitality of imagination is obviously related to personal life experience

(Winczo-Kostecka, 1988). Limont (1994) proved that generating artistic expression at children by means of synectic methods that referred to the experience of the children had long-term effects. Psychoanalyst, Erik H. Erikson (1963) observed that block constructions and other spatial forms are built by boys in a more vertical dimension and are more intrusive that constructions made by girls that are more horizontal and rounded, indicating bigger passiveness and lesser aggressiveness. The same features are common in writing. Having an address on an envelope we can quite well recognize if a letter has been written by a man or woman. However, not only the power of distinctive geometricity would differentiate male and female features of a work of art but an inclination to treat the same material in a different way: rather than inorganic material which may be modelled to sharpen differently the form of expression or more as an element of substances similar to organic material, that is according to the body of expression that presents a given work of art. A distinction into structural and expressive elements of a product is very general. It depends not only of biological determinants of human development in cultural environment. The material of a creation shapes the body of items, plants and animals, it has sensual and affective meaning. And a creation expresses also a body of a human being and personified beings; a myth, symbolic, sometimes pompous meaning of an event.

PROBLEM OF EXTRAORDINARY IMAGES OF ARTISTS

Artists create images that are not common. Let's call them extraordinary images. Following is the scene from his childhood that will be later on used by Luis Buñuel in his first surreal movie "An Andalusian Dog": "One day, when I was walking with my father in an olive garden, the wind brought sweetish repugnant smell to us. A few hundred metres from us there was a dead donkey that was terribly swollen, torn, with a few hundred vultures and a few dogs around making a feast. I was simultaneously attracted and repelled by this spectacle. Overeaten birds had problems to fly away. Peasants did not burn dead animals in the belief that their rotten bodies fertilize soil. I was standing there like paralysed thinking that this rotten substance has a metaphysical sense. My father embraced me with his arm and took me away from there" (Buñuel, 1989, p. 13).

Mental images play an outstanding role in creation of works of art. It is commonly believed that painters, sculptors, photographers, architects rather than other people are particularly trained in imagery structuring. However, it seems that at the first stage the artistic creativity does not mean stricte rational making of objects. It is not only a connection of

features in imagination and imagery transformations that are the main important elements in a work of an artist, but rather imagining similarities in figurative space, including feeling, affective and other emotional expressions included in the presenting structure – probably non-prosaic imaginings in which qualities of imagined substance are more important than the formulation presenting them. Imagining activities of an artist do not occur without a connection with the substance of artistic activities. The fact that a painter, sculptor, photographer or film director notices unusual objects and circumstances on the scene of its work – and there are plenty of descriptions in biographies of artists – is not related only to variation of features and spatial rotations, with operational, language and textual level of semiosis, that is with the entire thinking that produces signs. Contacts with iconic material initiates pointing out to similarity of features that are expressed emotionally. Painters, sculptors and probably other authors of imagery presentations seem to be sensitive not to the impression of structure due to resolution of perception but to the impression as a feeling of quality of the structure. Artists connect analogue operations with it, and as it seems they discover extraordinary point of view of objects in a network of possible, regular, unregular, clear and diluted relationships. On a picture there is a difference between spatial and physical abstraction of object features and a relation of "live feeling" of their materials. Imaging presentations are related to the effect of distinctiveness, while vividness (vitality) of a picture is connected with expression of sensual, impulsive, emotional and sentimental properties of imagined objects. The process of symbolic imagining in the rational structure form has been called fancy for a long time. It is very likely that thanks to fancy the authors of visual arts, music and poetry unite formalism of thinking (they even study mathematics) with imagining of concrete items in artistic, sound or language substance.

As defined by means of questionnaires high preferences of iconic presentations in artistic groups are clearly related to what the artists create in iconic material. Inclinations to this functions are connected with preferences to metaphorical expression of affects. Artists are under a strong pressure of affects and show expression in the structural shape in result of controlling tendencies in the ego. "The power of the ego", that is a tendency defined by Ernst Kris (1965, 1st publication in 1938) as "id in the service of the ego", favours construction of expressions in form of signs. In general, an author of imagining presentations and expressions – a painter, sculptor, musician, poet – often experiences a conflict between elevation of structural tendencies in personality and a tendency to lower

them, since an author of images deals constantly with multi-quality, emotional substance and at the same time he tries to provide the work of art with rational organisation. Physical and spiritual troubles of an artist do not result from intellectual efforts only but from stress and frustration caused by a reduction of emotional control before the symbolic nature of an experience receives an appropriate sign form.

PERSPECTIVE

In cognitive psychology there are popular terms that narrow the problem of imagination to representation structures called "mental images". By means of certain standard psychological methods it is sometimes possible to reach a disappointing conclusion that artists construct schematic images and visualise scenes in the similar way like other people. The essence and type of images are still the most difficult problem. Thus, the first problem of psychology of images is caused by imaging structures in the whole artistic activity. It should be pointed out that it is specific semiosis. The awareness of the subject of art in its intellectualistic trend evolves constantly – now in relation to changes brought by the electronic era. The field of artistic visualisation is also a common place for rational structures and symbolic expressions. Now is the time for reliable knowledge about expression in the symbolic and representational aspects. Illustration of extraordinary images of artists implies the second most important problem of psychology of imagination.

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