

**Małgorzata Muszyńska**

KUJAWY AND POMORZE UNIVERSITY IN BYDGOSZCZ

<https://orcid.org/0000-0001-7375-8371>

## **VISUAL ANALOGIES IN AESTHETIC EDUCATION. CROSS-SECTIONAL AND EXPERIMENTAL STUDIES**

### **INTRODUCTION**

The work<sup>1</sup> is of theoretical and empirical character and belongs to the domain of aesthetical education in a post-structuralist perspective (J. Marshall, 2004). The visual analogies are the main subject of the study. Capability of their apprehension in art is, probably, the origin of developing interpretation qualifications, the potential serving for future inter-textual practices (J. Kristeva, 1980). Analysis of Arne Melberg's *mimesis* theory initiates the theoretical part of the work (A. Malberg, 2002). Following footsteps of Melberg's analyzes create introductory conceptual outline. That is repetitive and temporal nature of phenomena in culture observed within the course of history since Plato's *mimesis* up to Derrida's "*iterable structures*"; in which the relations of analogy between the creations form particular "*economimesis*" (J. Derrida, 2003, p. 33).

Theoretical analyzes and quality data obtained from experimental studies in the form of analogy profiles, allowed to conclude the following general statement: Analogy – its creation by an artist and observance of the indicative relations between creations by the recipient, is the phenomenon repeatable in time (temporally repetitive), in which renewal of meaning (idea) as well as changing "position" of the subject being in motion has a chance to occur. Analogy as metaphorical comparison is then a figure changing in time by cause not only of transformation of artistic practice, but also for the figure of "repetition", which the subject wants to notice consciously and in reflection enlighten the difference, thus renewing the

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<sup>1</sup> This article is an abbreviation of the book *Visual analogies in education. At the basis of anthropological idea of students' training*, Ed. UMK, Toruń 2005 (The work supported financially by KBN – 1 H01F034 18).

meaning. The following C.S. Peirce's semiotics approach (1994) creates possibility for conceptualization of analogy outline when individual perception is projected as abductive inference (abductive reasoning) – interpretative process, in which iconic-index symbols can be recognized.

In the empirical part I, two stages of my studies are presented: pedagogical cross-sectional research involving: 12 year old pupils, 17 year old pupils of Toruń's high schools, 20 and 21 year old pedagogy students (2nd year and 3rd year) of Nicolas Copernicus University in Toruń, and experimental one according to the following scheme: preliminary studies, crucial experiments, and final research. I have carried out pedagogical experiment in students groups including primary school pupils, high (secondary) school pupils and university students, and the results were compared with those of G. Domino, 1989; M. Dailey, C. Martindal and H. Bokhum's, 1977). My work presents cross-sectional and experimental tests concerning noticing analogy in art (in synesthetic, abstractive, and symbolic codes), their constructing as semiotic equivalences and relation of those abilities to creative thinking.

### RESEARCH OBJECTIVE

The aim of experimental researches in a students' group was to elaborate the semiotic method and to test its influence on development of interpretative qualifications which consist, as I suppose, of abilities to observe analogy in art and create semiotic equivalences. Observations coming out from academic teaching methods impelled me to look for ways of offering students facilities for artworks interpretation. I was searching for visual means convenient to valuable, reflective narrations (idealizations). Therefore, I have carried out experimental researches using the semiotic method. That method expresses efforts for finding the grounds of anthropological conception of development of interpretative competences. The main task of the method is to discover relations of significative similarity in artworks. I understand it as follows:

Relations of similarity between two artworks, which are identified on the base of comparing (indicative) features, create the relationship, which may be referred to metaphorical comparison (simile), from semiotic point of view e. g. the second production becomes an interpreter of the first one. Moreover, in the semiotic process the further interpreters will arise, having the power of modification and expanding the sign (symbol) and therefore increasing the

knowledge – according to the idea of sign's continuity proposed by Tomasz Komendziński (1996). Possible analogized contents and thus ideological conclusions, will depend on the noticed indicative (piloting) feature.

I was interested in finding an answer to the questions: at what level (i) interpretative qualifications and (ii) creative thinking advance in particular age groups (children, high school pupils and students)? The basic interpretative qualifications, as I suppose, consist of abilities to notice analogy in art and to construct semiotic (drawn) significative (meaning) equivalences. I was also interested in finding an answer to the question whether interpretative qualities have a relation with creative thinking.

### RESEARCH PROBLEMS

The first problem concerns defining interpretative competences level within the domain of art, that consist of abilities to apperceive significative similarities (analogies) in art and to create semiotic significative equivalences, an then, analyzing creative thinking levels in each group. With the aim of attaining it cross-sectional studies will be carried out.

Next problem refers to mutual relation between abilities of significative (meaning) similarities perceiving and abilities of semiotic equivalences creation.

The third problem deals with examining possible correlations of afore specified abilities (noticing meaning similarities and creating semiotic equivalences) with figurative creative thinking.

The fourth problem concerns efficiency of semiotic method applied as an experimental factor. In reference to the problems outlined above, the following research-questions relating to appointed aims have arisen:

1. Whether and to what extent abilities to recognize similarities in art can relate with the ability to create semiotic equivalences (using Significative Similarities Test (SST) and Semiotic Equivalences Test (SET))?
2. Whether and to what extent abilities to recognize significative similarities in art and constructing semiotic equivalences can relate with the creative thinking examined with The Test for Creative Thinking-Drawing Production by K. K Urban and H. G. Jellen (TCT-DP)?
3. Whether an essential statistical difference will occur between the results of preliminary and final tests in a students' group (the group taking part in the experiment) in the following denotations:

- a) recognizing significant similarities in art,
- b) constructing semiotic equivalences,
- c) advancement of creative thinking.

The answers to research– questions constitute following working hypotheses:

Hypothesis 1 – referring to question 1 reads as follows:

Ability to notice similarities in art does relate with ability to construct semiotic equivalences.

Hypothesis 2 – referring to question 2 reads as follows:

Abilities to notice significant similarities in art and to create semiotic equivalences do relate with abilities of creative thinking examined by The Test for Creative Thinking –Drawing Production of K. K Urban and H.G. Jellen (TCP–DP).

Hypothesis 3 – referring to question 3 reads as follows:

Abilities to notice significant similarities in art, to construct semiotic equipollences and to think creatively can be successfully developed by semiotic method (in its anthropological aspect), relying on modification of art creations in par – artistic realizations.

## RESEARCH PROCEEDING

Verification of working hypotheses was performed based on data obtained from tests. Conditions control assumes necessity of accurate registering during the course of experiment all its basic elements (variables). Thus, in compliance with the foregoing methodological requirements, the semiotic method was accepted as experimental factor (independent variable). Whereas alternations caused by it (dependent variables) were defined in the case of SST (Significant Similarities Test) as relevant interpretative profiles (appereived analogies), in the case of SET (Semiotic Equivalences Test) hierarchical classification based on plain typology of signs was adopted.

Dependent variables control was conducted in order to separate them during the crucial experiment, collecting for documentation drawing art productions<sup>2</sup>.

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<sup>2</sup> On account of great number of persons included in the experiment, forming equinumerous control group was impossible (the rest of the same students chose aesthetical-music education). Therefore, the situation occurred, that experimental

## RESEARCH PROJECT

Research was proceeded in two essential stages.

In the first one: cross – sectional research in three age groups, using three tests: Significant (Meaning) Similarities Test, Semiotic Equivalences Test and Test for Creative Thinking – Drawing Production (TCT–DP) by K.K. Urban & H.J. Jellen (in Polish adaptation) was accomplished.

In the second stage pedagogical experiment using one whole (unified) group technique according to the schedule: preliminary research, crucial experiment, final research was performed. In cross–sectional tests the same instruments were applied as in the preliminary research, whereas tools constructed on likewise postulate were implemented in the final research.

## METHOD DESCRIPTION – PEDAGOGICAL EXPERIMENT

The method applied in pedagogical experiment relied on supporting development of abilities to recognize significant (meaning) similarities of artworks.

Logical premise of experimental studies was analogy model constructed basing on C.S. Peirce's semiotic conception. Recognition of similar artworks in significant (meaning) respect occurs when indicatory (guiding) feature is perceived simultaneously in two artworks (also of various codes) and similarity relations are defined by comparing both features. Feature 'x' in artwork A can be compared to feature 'x' in artwork B and on this ground it can be stated whether both productions refer to the same object or idea, and in consequence ascertain whether they are visual analogies or semiotic equivalences.

The method was composed of para–artistic activities performed along the same axis of logic formed by the analogy model. Those were pantomime études created by students in order to recognize analogy relation between two artworks and plastic art activities, which point was to create artworks'

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group was of unique character (J. Brzezinski, 2000, p. 81). Carrying out the research in other university center would be very expensive and would require long time-period to prepare competent persons in the subject-matter range.

semiotic equivalences (i.e. analogies) with application of different codes: synesthetic, abstractive and symbolic<sup>33</sup>.

It is postulated that constructing semiotic equivalences – besides its role as an exercise in a form of a play – which would be conducive to the development of recognizing analogies in art abilities, sensibilizes perception towards art codes reading.

The described method finds its justification in the perspective of semiology specialist Jurij Łotman's reflections, in which he confronts the art model with two other ones – learning and playing related to it (2002, s. 53).

Art visual	→	analogies
Learning	→	semiotic
Playing	→	para-artistic activities

In this construction composed of three-element artistic contents, which are recognizable owing to semiotic and created, according to its concept, in analogous representations, coexist.

Emphasized interdependences not only ennoble playing as a method, but also indicate the border line of semiotic and art as vivifying for education, since semiotic perspective constitutes method – playing structure, whereas art composes its substance.

### PERSONS UNDER INVESTIGATION

Cross-sectional research carried out from October to December 2000 comprised 12 year old school-children, 17 year old high (secondary) school pupils of Toruń public schools and 20, 21 year old pedagogy students of 2nd year and 3<sup>rd</sup> year (stationary) of NCU: 1/ children group included 83 persons, 2/ secondary-school pupils – 90 persons, 3/ students – 134 persons. Pedagogical experiment was carried out in academic years 2000/2002 and 2001/2002. Experimental proceedings lasted about 15 hours, partly in university halls, and some of them outdoor.

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<sup>33</sup> In my opinion, synectics method of W. Gordon in Wiesława Limont's elaboration and experimental experiences encourage to undertake congenial attempts, but already in a new cognitive context, aforementioned author's: *Synektyka a zdolności twórcze*, Ed. UMK Toruń, 1994.

## RESEARCH INSTRUMENTS, ABILITIES ADVANCEMENT INDICES

Indices of abilities development in perceiving the semantic similarities in artworks presented in SST test are constituted by noticed analogy correlations between two art products' profiles. They were theoretically verified on the ground of Andrzej Wierciński's (1987, p. 179) anthropological formula of symbolization processes, Włodzimierz Ławniczak's (1983, p. 81) description of idealization regularity (I characterize those profiles as models in my book) and abduction phenomenon described by Wojciech Kalaga (2001, p. 77). They were acknowledged by three competent arbiters as reasonable. Here is the example:

*Sorrow* V. van Gogh and *Study tree* V. van Gogh. Woman's figure is bent likewise a tree root that survived many storms. The woman experienced reverses of fortune and she is so jaded with life as a tree struck many times by thunders.

In semiotic equivalency test (SET) the task consists of reading off a picture meaning of presentation in drawn form (of a drawing) and its verbal interpretation.

Development abilities of constructing semiotic equivalences indices were arranged in hierarchy (granted points from 0 to 3) from literal level to subsequent levels evaluated as weak, medium and good regarding efficiency and satisfactory interpretation on idealizing level.

The task of completing the drawing and creative thinking level indices that refer to the Test for Creative Thinking–Drawing Production TCT–DP of Klaus K. Urban and Hans G. Jellen, are accurately elaborated in Polish Version by A Matczak, A, Jaworowska and J. Stańczak in their handbook (2000) and for obvious reasons cannot be published as a whole.

Maximal sum of points (according to 14 estimation criterions) is obtained by persons, who considering all elements of unfinished drawing, composed a readable picture full of original details in realistic, abstract or symbolic convention (according to 14 estimation criterions).

## RESEARCH RESULTS (QUANTITATIVE)

Quantitative results elaboration is connected with necessity of working hypotheses verification. First of all, however, it will concern cross-sectional

research. The data obtained from qualitative inquiries, to which scores evaluations (in points) are assigned became the material for statistic handling.

### RESEARCH: STAGES 1 AND 2

Hereunder the two stages of the study are presented: cross-sectional research for three age groups (stage 1) and experimental research (stage 2), including exclusively students as participants.

The cross-sectional studies were performed in three age groups: 12 year old children, 17 year old secondary-school pupils and 20 – 21 year old students. Pre-tests: significant similarities test (SST), semiotic equivalences test (SET) and The Test for Creative Thinking–Drawing Production (TCT–DP) of K.K. Urban and H.G. Jellen (UJ) in a version of Polish adaptation by A. Matczak, A. Jaworowska, J. Stańczak, were used.

#### Examined qualities (features)' goodness of fit of distributions testing between children, secondary school pupils and students groups in initial research (stage 1)

Table 1. K.K. Urban – H.G. Jellen's test results specified in groups. Children and secondary – school pupils

Points rate obtained in Urban-Jellen's test	Number of persons in children's group	in %	Number of persons in high-school pupils group	in %
(0 ; 10>	11	13,253%	3	3,333%
(10 ; 20>	36	43,373%	18	20,000%
(20 ; 30>	13	15,663%	32	35,556%
(30 ; 40>	15	18,072%	27	30,000%
(40 ; 50>	8	9,639%	9	10,000%
(50 ; 60>	0	0,000%	1	1,111%
(60 ; 70>	0	0,000%	0	0,000%

Table 2. Brandt–Snedecor's test results

	SST	SET	UJ
Children- secondary-school pupils	1,181	8,432*	22,835**
Children-students 2 <sup>nd</sup> year	6,662	2,690	8,186



cd. Table 2.

	SST	SET	UJ
Children-students 3 <sup>rd</sup> year	5,480	20,000**	15,554**
Children-students together	9,488*	10,945*	12,072*
Secondary school pupils-students 2 <sup>nd</sup> year	4,719	1,901	9,481
Secondary school pupils -students 3 <sup>rd</sup> year	3,737	4,838	3,111
Secondary school pupils- students together	5,866	0,173	5,064

Critical values for columns SST and SET (3 degrees of statistical distribution freedom  $s^2$ ): 7,815 on significance level  $\alpha = 0,05$  and 11,345 on significance level  $\alpha = 0,01$ ; critical values for column UJ (5 degrees of statistical distribution freedom  $c^2$ ): 11,070 on significance level  $\alpha = 0,05$  and 15,086 on significance level  $\alpha = 0,01$ . statistics on significant level 0,01 are marked with\*\*, while on the level  $p$  0,05 with\*.

Results posited in table 2 indicate, that within the range measured with SST (significant similarities test) between children and students of the 2nd year and the 3rd year, secondary school-pupils and students of the 2nd year and the 3rd year, secondary school-pupils and students (2nd year and 3rd year together) statistically significant differences do not occur. Whereas statistically significant difference takes place only at a level  $\alpha = 0,05$  between children and students (2nd year and 3rd year together). Those abilities are not located at distinctly different levels in particular age groups. This is confirmed by median test.

Within the range inquired with SET (Semiotic Equivalences Test) statistically significant differences on level  $\alpha = 0,05$  occur between results obtained by children and results for secondary (high) school-pupils and at the same level of statistical significance between children and students (2nd year and 3rd year) inquired together. There are not, however, statistically significant differences between the results obtained by secondary school – pupils and by students inquired together (value 0,173). This is confirmed by median test presented hereunder.

Within the extension examined with K.K. Urban & H.G. Jellen's (TCT–DP) statistically very significant difference on level  $\alpha = 0,05$  between the results obtained by children and those of students (2nd year and 3rd year together) is evident, what is confirmed in the median test, which results are presented below. However, there are not essential differences in creative thinking between secondary school–pupils and university students.

**Table 3. Median test results**

	SST	SET	UJ
Children-secondary school-pupils	0,069	0,080	1,275
Children-students 2nd year	3,794	0,269	2,641
Children-students 3rd year	0,858	0,034	3,815
Children-students together	3,089	0,041	4,254*
Secondary-school pupils-students 2nd year	3,031	0,069	4,316*
Secondary-school-pupils-students 3rd year	0,495	0,201	0,066
Secondary-school-pupils students together	2,599	0,011	0,016

Critical values in median test (number of statistical distribution freedom  $s=1$ ):6,635 ( $\alpha = 0,01$ ); 3,841 ( $\alpha = 0,05$ ). Statistics on significant level of 0,01 are marked with \*\*, whereas on significant level of 0,05 with\*.

**Remarks:** The results are ambiguous. In cases of SET and UJ tests significant differences in quality distribution in examined populations on the level 0,01 were noticed.

### **SST and SET tests results of three groups: children, secondary-school-pupils and students (stage 1)**

#### **Children**

	SST	SET
0	38,55%	39,76%
1	40,96%	37,35%
2	8,43%	22,89%
3	12,05%	0,00%

In children's group examined with SST 38,55% of answers qualified to the lowest level: 0 pts., and proportionally almost the same quantity, that is 39,76% drawings with interpretation at the lowest literal level were noted. The smaller number of tasks were accomplished at the highest level: in SST 8,43% persons were given 2 pts., and 12,05% acquired 3 pts. Also in SET the highest results are 2 pts., obtained by 22,89%, whereas no results for 3 pts. were noted.

**Secondary-school students**

	SST	SET
0	37,78%	25,56%
1	43,33%	53,33%
2	11,11%	17,78%
3	7,78%	3,33%

In secondary-school-pupils' group much more drawing interpretations were classified for 1 point in SET than in children's group where occurrence of works for 3 pts. were recorded.

**SST and SET test results in university students' groups – the difference between (initial) preliminary and final research (stage 2)****Students 3rd year – initial results**

	SST	SET
0	51,61%	11,29%
1	33,87%	64,52%
2	11,29%	19,35%
3	3,23%	4,84%

**Students 3rd year – final results**

	SST	SET
0	4,84%	0,00%
1	25,81%	41,94%
2	38,71%	45,16%
3	30,65%	12,90%

The above data indicate differences between the results obtained in preliminary (initial) research and those from the final research of 3rd year students within SST and SET range.

Within SET range in final research number of tasks estimated for 2 and 3 points increased – 38,71 % of tasks were completed on 2 points level, i.e. 27,42% more in relation to the initial research (11, 29%), while tasks completed for 3 points include 30,65% and their amount is 19, 36% more in relation to the initial research (11,29%).

The number of the lowest estimated, for 0 points, decreased markedly in final research, since in this last 4,84% of such tasks were obtained i.e. 46,77% less in relation to the initial research.

Within SET subject-matter 45,16% tasks were completed for 2 points of estimation level that is 25, 80% more, comparing with initial research (19,36%), and 12,90% more tasks on the highest level – 3 points i.e. 8,06 (4,84%) were obtained.

In the final research no tasks completed on the lowest (0 points level) were noted; in the preliminary (initial) research, there were in amount of 11,29%. The number of tasks accomplished on the level of 1 point – 41,94%, that is 22,68% less in comparison to the initial research. (64,52%).

#### Students 2nd year – initial results

	SST	SET
0	49,25%	34,33%
1	41,79%	46,27%
2	7,46%	17,91%
3	1,49%	1,49%

#### Students 2nd year – final results

	SST	SET
0	1,49%	1,49%
1	29,85%	20,90%
2	46,27%	67,16%
3	22,39%	10,45%

Data within SST and TPS tests indicate differences between the results obtained of 2nd year students in the initial research and those obtained in the final one.

SST results showed increased number of tasks accomplished at the higher level (those estimated for 2 points) – 46,27 % – i.e. up to 38,81 % more than in the initial research (7,46 %); tasks estimated for 3 points amounted to 22,39 % that is 20,90% more in relation to the preliminary (initial) research (1,49 %). A number of tasks made at the lowest level diminished markedly: in the initial research tasks estimated for 0 points amounted up to 49,25%, whereas in the final research only 1,48%, that is 47,74 % less. Quantity of tasks completed for 1 point decreased – in final research there were 29,85 %, i.e. 11% less in relation to the initial research.

Within the extension of SET a number of tasks accomplished at the highest level increased: 67,16% of tasks estimated for 2 points, that is 49,25% more comparing with the initial research (17,91 %); 3 points were achieved by 10,45% of inquired persons i.e. 8,96 % more in relation to the initial research (1,49%). Amount of tasks fulfilled on the lowest levels evidently decreased: in initial research there were up to 34,33% of tasks completed on 0 points level, whereas in final research – only 1,49% at this level. A number of tasks realized at 1 point level diminished from 46,27 % (initial research) to 20,9% in the final research, i.e. 25,37% less.

#### Students total – initial results

	SST	SET
0	50,39%	23,26%
1	37,98%	55,04%
2	9,30%	18,60%
3	2,33%	3,10%

#### Students total – final results

	SST	SET
0	3,10%	0,78%
1	27,91%	31,01%
2	42,64%	56,59%
3	26,36%	11,63%

**Remarks:** Dominant (modal) values for particular test can be read from graphs. Dominant (modal value) is one of a given occurrence's level measures

The difference between the initial research results and the final ones of SST and SET tests performed on student's group (2nd year and 3rd year together) presents as follows:

In SST 42,64% of tasks were performed on 2 points estimation level, i.e. 33,34% more than in initial research (9,3%) and 26,36% at 3 points level, i.e. 24,03 % more than in the initial research (2,33% were noted). A number of tasks completed at 0 points level decreased markedly from 50,39% in the initial research down to 3,10% in the final research, therefore 47,29% tasks scored at the lowest level (0 points) were registered. In the final research

a number of tasks estimated for 1 point decreased only by 10,07 %, in the initial research it equaled to 37,98%, and in the final one: 27,91%.

Within SET a number of the highest scores increased: 56,59 % of tasks estimated for 2 points, that is 38,99% more in relation to the initial research result (18,60%), amount of tasks estimated for 3 points increased to 11,63%; in the final research, however, quantity of those tasks at the highest level raised only by 8,53% in relation to the initial one. In the final research quantity of the lowest estimated tasks evidently diminished, let's remind: in the initial research up to 55,04% of inquired were estimated on 0 points' level, whereas in the final res. as few as only 0,78%. In the initial res. 1 point obtained as many as 55, 04% of inquired persons, while in the final res. only 31,01%, i.e. 24,03% less.

### Testing average abilities level with SST, SET and UJ and significance of correlation coefficients tests (stage 1, stage 2)

#### Children

	$\bar{x}$ – arithmetic mean	Me – median
SST	0,940	1
SET	0,831	1
UJ	22,036	19

#### Correlation coefficient

	Pearson's correlation coefficient	t-value	Significance level a
SSTSET	0,322**	3,066	0,003
SST UJ	0,368**	3,565	0,001
SET UJ	0,318**	3,019	0,003

In the children group SST with SET and SST with UJ and SET with UJ highly correlate.

#### Secondary school

	$\bar{x}$ – arithmetic mean	Me – median
SST	0,889	1
SET	0,989	1
UJ	28,044	28

**Correlation coefficients**

	Pearson's correlation coefficient	t-value	Significance level a
SST SET	0,248*	2,398	0,019
SST UJ	0,336**	3,341	0,001
SET UJ	0,395**	4,034	0,000

In secondary school–pupils SST with SET correlate inversely, whereas SST with UJ (abbreviation of Test for Creative Thinking – Drawing Production of K.K. Urban & H.G. Jellen's (TCT–DP), and SET with UJ correlate highly.

**Students 2nd year****Initial results**

	$\bar{x}$ – arithmetic mean	Me – median
SST	0,612	1
SET	0,866	1
UJ	24,060	23

**Correlation coefficients**

	Pearson's correlation coefficient	t-value	Significance level a
SSTSET	0,389**	3,404	0,001
SST UJ	0,347**	2,978	0,004
SET UJ	0,487**	4,491	0,000

**Final results**

	$\bar{x}$ – arithmetic mean	Me – median
SST	1,896	2
SET	1,866	2
UJ	34,463	35

**Correlation coefficients**

	Pearson's correlation coefficient	t-value	Significance level a
SSTSET	0,002	0,016	0,987
SST UJ	0,140	1,137	0,260
SET UJ	0,193	1,583	0,118

## Students 3rd year

### Initial results

	$\bar{x}$ – arithmetic mean	Me – median
SST	0,661	0
SET	1,177	1
UJ	28,226	24

### Correlation coefficients

	Pearson's correlation coefficient	t-value	Significance level a
SSTSET	0,344**	2,842	0,006
SST UJ	0,034	0,260	0,796
SET UJ	0,380**	3,184	0,002

### Final results

	$\bar{x}$ – arithmetic mean	Me – median
SST	1,935	2
SET	1,710	2
UJ	31,484	33

### Correlation coefficients

	Pearson's correlation coefficient	t-value	Significance level a
SSTSET	0,313*	2,552	0,013
SST UJ	0,294*	2,387	0,020
SET UJ	0,247	1,976	0,053

## Students total (2nd year + 3rd year)

### Initial results

	$\bar{x}$ – arithmetic mean	Me – median
SST	0,636	0
SET	1,016	1
UJ	26,062	23



**Correlation coefficients**

	Pearson's correlation coefficient	t-value	Significance level $\alpha$
SSTSET	0,363**	4,388	0,000
SST UJ	0,181*	2,074	0,040
SET UJ	0,457**	5,786	0,000

**Final results**

	$\bar{x}$ – arithmetical mean	Me – median
SST	1,915	2
SET	1,791	2
UJ	33,031	33

**Correlation coefficients**

	Pearson's correlation coefficient	t-value	Significance level $\alpha$
SSTSET	0,171	1,952	0,053
SST UJ	0,224*	2,590	0,011
SET UJ	0,236**	2,742	0,007

**Remarks:** Statistical significance level is the probability of making error when accepting correlation occurrence between results of applied tests. When significance level is less or equal to 0,01, it means that test statistic is on this level. In this instance we reject null hypothesis which assume non-significance of correlation coefficient. Coefficients significant at 0,01 (1%) level are marked in tables with\*\* and at the level of 0,05 (5%) with\*.

In the final research (population: 2nd year and 3rd year students) SST and SET do not correlate, and this result calls for interpretation, which I posit in subsequent section. Whereas SST correlates with UJ on the significance level of 0,05 (5%) and SET correlates highly with UJ on the level of 0,01(1%).

### **Examined qualities' goodness of fit of distributions testing between students groups in initial and final research (stage 2)**

Goodness of fit of distributions of two independent samples  $\chi^2$  test results

Test statistic is calculated according to the formula:

$$\chi^2 = \sum_{i=1}^k \frac{(n_i - \hat{n}_i)^2}{\hat{n}_i},$$

where  $n_i$  – empirical values (observed) and  $\hat{n}_i$  – theoretical values (expected)<sup>4</sup>.

In the instance K.K. Urban and H.G. Jellen's tests results' detailed series were converted into stem-and-leaf contingency plots. Converted data were inserted in tables.

**Table 4. Test for Creative Thinking-Drawing Production of K.K. Urban H.G. Jellen results grouped in blocks; students – initial research.**

Number of points in Urban-Jellen's test	Numbers of population in 2nd year students group	in %	Numbers of population in 3rd year students group	w %	Total numbers	in%
(0 ; 10>	7	10,448%	1	1,613%	8	6,202%
(10 ; 20>	22	32,836%	17	27,419%	39	30,233%
(20 ; 30>	18	26,866%	19	30,645%	37	28,682%
(30 ; 40>	17	25,373%	15	24,194%	32	24,806%
(40 ; 50>	2	2,985%	8	12,903%	10	7,752%
(50 ; 60>	1	1,493%	2	3,226%	3	2,326%
(60 ; 70>	0	0,000%	0	0,000%	0	0,000%

**Table 5. Test for Creative Thinking-Drawing Production of K. K. Urbana and H.G. Jellen (TCT – DP); students – final research.**

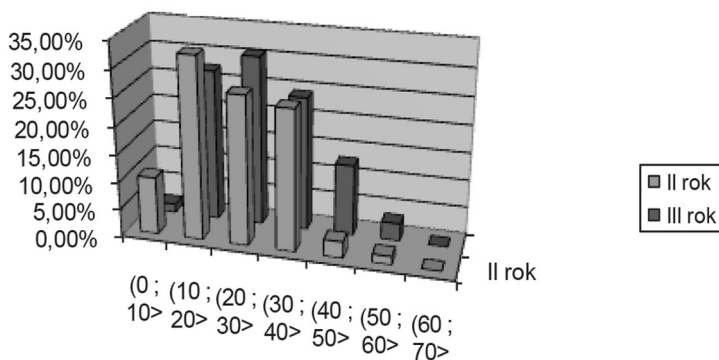
Number of points in Urban-Jellen's test	Numbers in 2nd year students group	in %	Numbers in 3rd year students group	in %	Total numbers	in %
(0 ; 10>	0	0,000%	2	3,226%	2	1,550%
(10 ; 20>	7	10,448%	12	19,355%	19	14,729%
(20 ; 30>	11	16,418%	11	17,742%	22	17,054%

<sup>4</sup> See: M. Krzysztofciak, A. Luszniwicz (1977), *Statystyka*, PWE, Warszawa, p. 203.

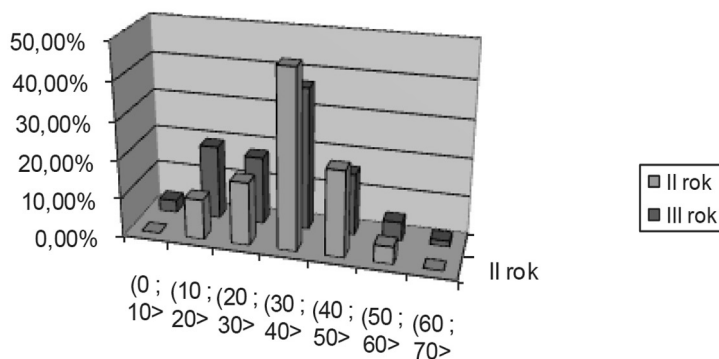
c.d Table 5.

Number of points in Urban-Jellen's test	Numbers in 2nd year students group	in %	Numbers in 3rd year students group	in %	Total numbers	in %
(30 ; 40>	31	46,269%	23	37,097%	54	41,860%
(40 ; 50>	15	22,388%	10	16,129%	25	19,380%
(50 ; 60>	3	4,478%	3	4,839%	6	4,651%
(60 ; 70>	0	0,000%	1	1,493%	1	1,493%

### I Results of Urban – Jellen's test (initial research)



### II Results of Urban – Jellen's test (final research)

Table 6.  $\chi^2$  test results for the 2nd year students

Series	$\chi^2$ – value	Significance level $\alpha$
SST and SST f	1062,073	0,000
SET and SET f	533,986	0,000
UJ and UJ f	55,520	0,000

Table 7.  $\chi^2$  test results for the 3rd year students

Series	$\chi^2$ – value	Significance level $\alpha$
SST and SST f	309,148	0,000
SET and SET f	19,806	0,000
UJ and UJ f	12,917	0,044

Table 8.  $\chi^2$  test results for total number of students

Series	$\chi^2$ – value	Significance level $\alpha$
SSTi and SST f	999,827	0,000
SET i and SET f	905,982	0,000
UJ i and UJ f	69,743	0,000

**Remarks:** Statistical significance level is the probability of making error when accepting that the differences within the tested series are significant. Only one of statistics UJ p (initial research) and UJ k (final research) for the 3rd year students is non-significant on the level  $\alpha = 0,01$ , but it is significant on the level  $\alpha = 0,05$ . The foregoing results, thus, indicate (almost univocally) that abilities measured with UJ test advancement under the influence of experimental factor occurred.

### Median test results

#### 2nd year students

SST	50,281**
SET	42,052**
UJ	14,713**

#### 3rd year students

SST	38,286**
SET	14,606**
UJ	4,645*

#### Students in total

SST	88,212**
SET	56,387**
UJ	15,077**

**Remarks:** Critical values in median test (number of freedom degrees  $s=1$ ):

6,635 ( $\alpha = 0,01$ ); 3,841 ( $\alpha = 0,05$ ).

Statistics significant on the level 0,01 were marked with \*\*, whereas on the level 0,05 with\*.

Median test indicates explicitly differences in results obtained in initial and final researches.

- t-Student's test for significance results

Student's t-test for dependent samples, which is applied when two measurements groups (that have to be compared ) were carried out on the same objects twice measured, is based on the statistic of form<sup>5</sup>

$$t = \frac{\bar{x} - E(x)}{S(x)} * \sqrt{n-1}$$

This test can be acknowledged as equipollent to  $\chi^2$  test.

### 2nd year students

	<i>t</i>	$\alpha$
SSTi and SST f	-10,230**	0,000
SET i and SET f	-9,222**	0,000
UJ i and UJ f	-7,660**	0,000

### 3rd year students

	<i>t</i>	$\alpha$
SSTi and SST f	-8,853**	0,001
SET i and SET f	-5,085**	0,000
UJ i and UJf	-2,462*	0,017

### Students in total

	<i>t</i>	$\alpha$
SSTp i SSTk	-13,512**	0,000
SETp i SETk	-9,937**	0,000
UJp i UJk	-6,988**	0,000

**Remarks:** Significance level means – as before – probability of making error, if we reject hypothesis of non-significance relation between tested series ( results in initial and final tests). Statistics significant on the level 0,01 were marked with \*\*, and on the level 0,05 with\*.

<sup>5</sup> See: M. Krzysztofak, A. Luszniwicz, (1977), *Statystyka*, PWE, Warszawa, p. 176.

It follows from statistic calculations, that there is statistically very significant difference between the results of the initial research and the final one obtained in students group, what allows to accept hypothesis of educational method impact on abilities development measured with SST and TPS, and abilities development measured with TCD–DP K.K. Urban and H.G. Jellen’s tests.

### ANALYSIS OF RESEARCH RESULTS

Research results reveal that within the range measured with SST (test of meaning, similarities) there are no statistically significant differences between children and secondary school-pupils; between children and students of the 2nd year and the 3rd year (together); between secondary school-pupils and students of the 2nd year and the 3rd year (together). But there is statistically significant difference only at  $\alpha = 0,05$  level between children’s and students (of the 2nd year and the 3<sup>rd</sup> year together) results. Those abilities are not distributed on distinctly varying levels in particular age groups, which is an alarming signal. That is confirmed by median test.

Within the range of SET (semiotic equivalences test) there are statistically significant differences at the level  $\alpha = 0,05$  between the results achieved by children and results of secondary school-pupils, and at the same significance level between the children’s and 2nd and 3rd year students.. Whereas statistically significant differences between the results achieved by secondary school-pupils and by students tested together (quantity 0,173) do not occur. This result is disquieting as well.

As for the subject-matter measured with Test for Creative Thinking–Drawing Production K.K. Urban and H.G. Jellen’s statistically very significant difference at the level  $\alpha = 0,01$  between the results obtained by children and those obtained by secondary school – pupils, and significant difference only at the  $\alpha = 0,05$  level between children and students (of 2nd year and 3rd year together) results. It is confirmed by median test.

Results of cross–sectional research within SST (Significance – Meaning–Similarities Test) indicate that abilities of perceiving meaning similarities (apprehended as visual analogies) by children, secondary school pupils and students do not occur at distinctly differentiated levels, what first and foremost should be associated with lack of reading artworks’ im-

PLICIT meanings abilities recorded in synesthetic, abstractive and symbolic codes. It should be expected, that in the process of symbolic alphabetization conducted correctly those abilities will develop accordingly to the age and experience, and particularly in secondary school-pupils and students they will stand on a higher level.

The results within the range measured by SET (Semiotic Equivalences Test) allow us to suppose that development of abilities for creating semiotic equivalences as if have stopped at the level of secondary (high) school and it continuously undergoes regression. It should be expected, however, that differences between students and children within the observed area will occur on a higher significance level. Favourite semiotic equivalences used by inquired students (preliminary test) are commonplace signs of mass – culture origin. One can have an impression that there is lack in their memories of artistic traces, signs and symbols, which could be transformed by their dormant visual imagination what is also indicated by the next test's result.

Secondary school-pupils' group includes much more works of original: symbolic and abstractive character than the students' group. Forms presented as identical in meaning are manifestation of looking for artistic representations.

Within the scope of K. K. Urban – H.G. Jellen's (Test for Creative Thinking–Drawing) it is surprising that statistically very significant difference at the level  $\alpha = 0,01$  is observable between children and secondary school-pupils and significant difference only at the  $\alpha = 0,05$  level between children and students' (2nd year and 3rd year together) results. The result alarms again, because it should be expected that the differences in the aspect of creative thinking abilities between students and children would be on a higher significance level. I insert in Annex two for each group examples of drawings from K.K. Urban and H.G. Jellen's test made by children, secondary school-pupils and students – the drawings represent the same level; and works made by secondary school-pupils and students.

The three tests' results (SST, SET and TCT–DP K. K. Urban and H.G. Jellen's), achieved by pedagogy students comparing with children's works should be estimated as rather poor ones, what allows to suppose that abilities of this kind are not developed in Polish education.

Therefore, an attempt should be taken up to develop visual creative thinking and interpretative qualifications, which would be based on abilities

to apperceive analogous relations in works of art and capability of constructing semiotic equivalences. Deficiency of those qualities can largely contribute to impoverishment of cultural condition of future teachers and their disciples. Consequently cross-sectional studies prompt to undertake this problem e.g. initiating with drawing up taxonomy of aesthetic education objectives. Let us remind – it was elaborated by Goodman (H. Gardner, 2002, p. 197–201).

We know, that primal and innate tendency to perceive similarities between natural phenomena, what should be forcibly stressed, is – in the light of anthropological concepts of symbolization – primary disposition for achieving competences of higher category, to which reading abstractive and symbolic codes should be included. Subsequently, there is potentiality that should be impelled towards development.

#### **INTERPRETATION OF FINAL RESULTS IN STUDENTS' GROUP**

Just to remind us – Students' abilities measured with SST (Significative [Meaning] Similarities Test) and SET (Semiotic Equivalences Test) in statistic elaboration do not correlate. Examined persons create semiotic equivalences generally on a higher level (in comparison with the results obtained in the initial research) and perceive more significative similarities, although it happens that those ones obtaining high scores in SET perceive e.g. one or two types of similarities. This phenomenon is probably connected with their preference of a particular code type in art.; those participants in tests declare e.g.: „I don't like abstraction, it means nothing". However, in the partakers majority are those persons, who within the extent measured with SET made only little progresses in comparison with the results achieved in initial stage. Nevertheless, the fact is important enough for those persons' sign-creative thinking, that it can be associated with their remarkable advances in perceiving meaning similarities. It is, therefore, the type of recipient, whom we want to educate, and who can be characterized with the following words: „I have an idea for semiotic equivalent of the picture, but its realization, having regard to my poor efficiency, is not perfect, my drawing testifies, however, that I understand the work's idea, I am able to see meaning similarities between artworks; experimental classes enabled me to realize, that what is painted must mean something." Therefore it is worthy, breaking stereotypes, to engage seriously in aesthetical education



of all persons, irrespective of their artistic talents expressed in plastic art works<sup>66</sup>.

Complex creativity paradigm, in which newly announced conception on multiple intelligences by Howard Gardner is placed (H. Gardner, 2002) may become to some extent in the nearest future explanatory one to differences in perceiving meaning similarities and in constructing semiotic equivalences (synesthetic, abstractive or symbolic) occurring between tests' participants. The individual character of interpretative abilities formation was noted in my studies, therefore, I present in this chapter the typology of interpretative competences features.

Tracing psychologists' studies of creativity that refer to synesthesia relates to searching an answer to the question: what role can it fulfill in creativity? Georg Domino in publication *Synesthesia and Creativity in Fine Arts Students: An Empirical Look*, agrees, that it is synesthesia which states for margin part for creative thinking process of students (future artists), is a part of their individual style, the language of painting expression, and is inter-related with intuition. The author regards synesthesia as primitive style of creativity (G. Domino, 1989, p. 27), but synesthetic activity as the stage in creativity development should not be ignored. Basing on Domino's studies we are legitimated to suppose, that those persons who stop at this level are noncreative, and on the grounds of Audrey Dailey, Collin Martindale and Jonathan Borkum, we are justified to surmise that those individuals, who did not initiate that activity as primary aspect of thinking process may be non-creative. In the article "Creativity, Synesthesia, and Physiognomic Perception" we read: „Primary process cognition is linked with creative inspiration" (Kris, 1952; Suler, 1980). Because physiognomic perception and synesthesia are aspects of primary process thinking (C. Martindale, 1977) creative people should have better access to and show more of these phenomena than noncreative people" (M. Dailey, C. Martindale, J. Borkum, 1997, p. 1, emphasized in bold. M.M.).

Creativity psychologists' studies results allow to uphold the thesis of synesthesia as primary thinking aspect connected with emotional pro-

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<sup>66</sup> Such an idea is put forth by Irena Wojnar interpreting Gaston Bachelard. That is „dream poetic" which makes that we can become „masters of all arts, because our life makes it impossible for us to become real painters or musicians, we can compensate this lack by describing painting or music masterpieces." (I. Wojnar, 1984, p. 269).

cesses. Thus, they are convergent with traces of anthropologists' studies, which I followed. My researches confirm this thesis, because more synesthetic similarity choices (van Gogh's pictures) were observed in 12 year old children's group, than in all the other age groups. This fact should be connected, as I suppose, with primary sensual quality, characteristic to childish recognition of the world: „something is like...as...” “the woman is so wrinkled and bent as this tree. Edward Nęcka notices this regularity, which consists in returning to primitive sensual reality as condition of creating good metaphors, giving the example of association: a dog is something which is “warm and hairy” (E. Nęcka, 1999, p. 86).

On the base of recalled studies we can suppose that synesthesia<sup>7</sup> as primary sensual quality underlies visual imaginative abilities. Its conceivable atrophy probably blocks up their arising and development. Therefore, all the more attention to ABC initiation of education should be directed, not forgetting, about its anthropological dimension – in which the experience of being as a condition of the humankind forming is included.

Visual imaginative abilities, studied by Stephen Kosslyn (1983), are differentiated both inter and intra-individually and are not treated as general ability, but compose of various independent efficiencies corresponding with various information processing modules (W. Limont, 1994, p. 73). Visual imagination advancing individuality presumably conditions the character of artistic expression.

Differences occurring among students in codes, which they chose most preferably when constructing semiotic equivalences and noticing analogical relations, should be interpreted in this study area. Then, that is the next research perspective surpassing the limits of the present paper.

The subsequent task performed by students consisted in assorting individually artworks similar in meaning and constructing inter-textual (art, philosophy, literature and other disciplines e.g. religion, in case when religious symbols appeared). Essays are additional study material on the grounds of which it can be ascertained what types of similarities are no-

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<sup>7</sup> According to Richard E. Cytowic and David M. Eagleman: “Synesthetic percepts are attached to an overt affective state. [...] The reason should be clear: *synesthetic percepts are foremost meaningful, and affect inheres in the meaningful, evaluative component of the semantic differential*” (2003, p. 290–291). See: research of Aleksandra Rogowska (2007).

ticed by particular persons and in what way they constitute material for reflection of inter-textual values development (then it is not naïve and characterized with common knowledge). It should be underlined that students' own narrations are also an evidence of experimental activities' effect consolidation-indicator of studying humanist's interpretative competence development, an attempt of higher rank, if we appreciate the effort in creating expressions of cultural values precious and desired in education. I highly estimated the effects of this undertaking, they were very satisfactory for students, who admitted that they had to put much effort and time to perform the task. Above all, students in their enthusiasm proved to be ambitious and able to overcome difficulties. I suppose that my research (tests enclosed in package form) can also become the didactic resources serving as self-evaluation of persons already not taking part in experiment, but in exercises with implementation of semiotic method. Collecting of the results would form participants' self-evaluation, enabling them to decide on further initiatives concerning interpretative competence development and, what is important, would manifest consciously realized necessity of symbolic alphabetization in every scale.

Moreover, the results of the final researches' analysis enabled us to distinguish the following traits of interpretative qualifications concerning art:

1. Complete trait of interpretative qualifications (occurs rarely) is characterized by:
  - capability for apperception of all types of similarities in art synesthetic, symbolic and abstract);
  - high level of drawing creating semiotic equipollence of an observed picture in a selected style (2 p. and 3 p. );
  - using those abilities in essay narration (various relationships: symbolic, abstract and synesthetic occur in test-works; the persons examined select several creations which, in their opinion, are significantly similar.
2. Explicit trait (complex) of interpretative qualities is characterized by:
  - capability for apperceiving artistic similarity of the two types selected from among three types;
  - capability for constructing drawn semiotic equipollence of an observed picture (in mark scale from 1 to 3 p. );
  - capability for using selected similarities in narrative essay.

3. Explicit trait (common) of interpretative qualities is characterized by:
  - capability for apperceiving specified type of similarity (whether synesthetic or symbolic or abstract);
  - capability for constructing semiotic equipollence of specified type at the level evaluated per total scale from 1 to 3 pts.;
  - capability for using selected similarity of a specified type in narrative essay.
4. Trait of underdeveloped interpretative qualities (only single cases) is characterized by that:
  - a person examined so far does not notice significant similarities in art, he/she interprets the work of art literally, referring to the iconic signs contained in it to ordinary everyday life; classifications of art creations based on the logic different from that artistic one, are appearing; The expressions characteristic for that group of persons examined: “there are trees here, therefore the subject–matter is naturalistic, people are there, then that is the difference between those pictures”;
  - a person being tested is unable to make a drawing being the semiotic equipollence of the watched artistic product – he/she tries to draw something like replica (reproduces the composition of the picture) or uses commonplace symbols e.g. two hearts;
  - a person examined is writing an essay by selecting similarities in art which are commonly known e.g. *Luncheon on the grass* by Pablo Picasso which is the paraphrase of widely known Manet’s painting under the same title, the person being tested does not develop his or her own narration, but quotes someone’s else’s analysis on the verge of plagiarism referring, in such case, to the artistic qualities of the picture: colour, value, light – shade effects;
  - a person examined obtains very poor results in K. K. Urban’s and H. G. Jellen’s Test of Creative Thinking–Drawing Production.

Appearing in final research, however, only occasionally expressed traits of underdeveloped interpretative qualifications needs explication. Probably they are conditioned by intelligence so called “cold”– alexithymic type, different from “hot” – symbolectic type, which is used by creative people in various disciplines of science and art (C.G. Jung, 2002;C. Nosal, 2002 a).

## HYPOTHESES VERIFICATION

The statistical analysis of results presented in this work, made possible to verify hypotheses specified above.

### Hypothesis 1

That hypothesis confirms, which can be verified on the base of results of testing pupils, high-school pupils and of the preliminary students' research. The results of final researches indicate, however, that it becomes unproven in the students' group. Abilities of both types (examined by SST and SET tests) are varied; In general, the examined create semiotic equivalences at a higher level (in comparison to the results obtained by them in preliminary researches), however it also occurs, that those achieving high notes in SET observe e. g. one or two types of similarities. This phenomenon correlates probably with preferences of particular code in art – those examined declare e.g. "I do not like abstraction – it means nothing". Whereas, the majority of persons under the test, made only little progress within the limits determined by SET in comparison to results achieved in the initial research. Nevertheless, they are so much important for symbol – creative thinking of those persons, that this fact can be correlated with clear progress in observing significative similarities by them. It is therefore, the type of recipient whom we can educate and who can be characterized with the following words: "I have an idea of a semiotic equipollence of a picture but its accomplishment due to poor instrumentation is imperfect, however my picture testifies that I understand the idea of a masterpiece and I am capable of perceiving significative similarities between art creations; those experimental classes enabled me to realize that what is painted must mean something". Therefore it is worth, breaking out the stereotypes, going in for seriously with aesthetical education of all persons, regardless their artistic abilities revealed in artistic works.

### Hypothesis 2

The results of final research, as the correlation factor at the essential level demonstrates, allow us to suppose that there is a probability of acceptance of hypothesis 2. Thus, if abilities to notice significative similarities in art and constructing semiotic equivalences correlate with abilities for creative thinking examined by The Test for Creative Thinking-Drawing Production (TCT-DP) by K. K. Urban and H. G. Jellen, then we can begin to consider them as creative abilities related with divergent thinking. Verification of the hypothesis may open, in my opinion, the further researching field serving educational practice.

### Hypothesis 3

Statistical calculations accomplished using the two tests – t – Student's and equivalent test  $\chi^2$ , applied in preliminary and final researches for the students' group, explicitly point on a very essential statistic difference between the results obtained from tests SST, SET and K. K. Urban's and H. B. Jellen's Test for Creative Thinking-Drawing production in preliminary researches and the results obtained in final ones, which allows to accept hypothesis 3 with high probability.

## CONCLUSIONS

Experimental research and theoretical context entitle me to acknowledge that formation of interpretative qualifications in art domain is based on capability for apperception of significative similarities of artistic creation (analogies), as well as for constructing semiotic equipollences. They correlate with creative thinking. Their trait becomes noticeable not earlier than in narrative essay which, besides revealing preferences for similarity types indicate a high intellectual involvement of students in developing reflection concerning creations originated due to art.

The semiotic method introduced as an experimental factor, assuming the statistic results of investigation on a high essential level, probably has an effect on:

- development of capability for apperceiving significative similarities (analogies),
- development of capability for constructing semiotic equivalences,
- development of creative thinking.

## FINAL NOTE

Interpretation of works of art, considered as a process of intertextuality, is determined by visual imagination combined with reflective thinking (idealization). More precisely it can be said, that at this stage of the research, the process of interpretation of art creations depends on the ability to see visual analogies between works with different codes.. These capabilities correlate with the individual visual imagination; complex in terms of efficiencies compounding it, however, you can try to develop them

by creating semiotic analogies – pictorial transformations, which lead to understanding various art codes.

Experiments initiated by experimental research had a somewhat artificial character (which is obvious in experimental proceedings), since it is unknown for us; whether and to what extent they had an impact on each of partakers' life, nevertheless, it should be pointed out, there is clear evidence of commitment in the form of well-written essays.. On the other hand, in human life there are many of such threads initiated, that did not expressed in their later life(also professional), did not impel sufficient development dynamics to become a satisfactory quality.

The purpose of realizing a claim for developing the idea of aesthetic education is explicit in this study, because of these theoretical aspects at its base, which put an intense stress on a *quasi*-initiation of aesthetical experiences and try to explain compound process of art perception beginning with *bricoleur* up to the conscious preceptor of art and bring them to the position of essential in mankind development in his subjective “motion of iteration with variability”.

The results of cross-sectional studies (for which the same research tools that in preliminary students' test ), in the subject matter tested SST show that children, high school pupils and students' capabilities for perceiving significant similarities (considered as visual analogies) are not revealing distinct differentiation of levels, that should be related with the lack of awareness of the need for advancing usage of interpretative reading of art creations' meanings in Polish education. In the subject-matter measured by TES, it would be considerable to expect that the differences between the students' results and 12-year-old pupils should be at a higher level of essentiality. The outcome is alarming. The results of high-school students which display more capabilities in performing creative activities on non-trivial symbols –, appear better in that matter.

The results of three tests (SST, SET and The Test for Creative Thinking–Drawing Production by K. K. Urban and H.G. Jellen, which were obtained by pedagogy students in relation to children, should be evaluated as rather poor and that allows to assume that the development of these abilities in Polish education is neglected. Therefore, an attempt should be made to develop visual creative thinking, and interpretation competences, which would be based on the ability to see analogous relations in works of art and the ability to create semiotic equivalences. Lack of these abilities can



contribute to impoverishment of the cultural qualities of future pedagogues and their pupils. The cross-sectional researches then prompt to undertake the problem e.g. by initiating to arrange the taxonomy of aesthetical education aims. Let us remind, that it was prepared by Goodman (H. Gardner 2002, p. 197–201). The phenomenon of synesthesia clear dominant in the observed children group would constitute the starting point for elaborating the domestic taxonomy. We know since, that this predominant innate disposition for apprehension of similarities between the natural phenomenon (G. Domino, 1989; M. Dailey, C. Martindale H. Borkum, 1997), constitutes, what should be firmly stressed, in light of anthropological ideas of symbolizing – the basic inclination for acquiring qualities of superior kind, among which the reading of abstract and symbolic codes should be included. Thus, there is a potential, which should be set in motion towards development.

The researches' results relating to creative thinking to which I applied the Drawing

Test for Creative Thinking by K. K. Urban and H. G. Jellen are also distressing. It was likely to expect, that the results' differences between students and pupils would appear on the higher essentiality level.

The results of three tests obtained by students in relation to pupils may be accounted to be poor. Whereas the students' advances, proved in pedagogical researches with experimental method application, provide hope and optimism.

Generally speaking; the results of cross-sectional researches are a symptom of postmodern consumer society culture crisis, as well as the manifestation of ineffectively conducted reform of Polish education Csikszentmihalyi and Rochberg-Halton's (2002) studies clearly articulate this problem, also existing in America. Misfortune caused by expelling *mimesis*, as the most negative and undesirable step of "iteration" of that practice in culture affects also contemporary man.

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## SUMMARY

The work is of theoretical and empirical character and belongs to the domain of aesthetical education in a post-structuralist perspective (J. Marshall, 2004). The visual analogies are the main subject of the study. Capability of their ap-

prehension in art is, probably, the origin of developing interpretation qualifications, the potential serving for future inter-textual practices (J. Kristeva, 1980). Analysis of Arne Melberg's *mimesis* theory initiates the theoretical part of the work (A. Malberg, 2002). Following footsteps of Melberg's analyses create introductory conceptual outline. That is repetitive and temporal nature of phenomena in culture observed within the course of history since Plato's *mimesis* up to Derrida's "*iterable structures*", in which the relations of analogy between the creations form particular "*economimesis*" (J. Derrida, 2003, p. 33). Theoretical analyses and quality data obtained from experimental studies in the form of analogy profiles, allowed to conclude the following general statement: Analogy – its creation by an artist and observance of the indicative relations between creations by the recipient, is the phenomenon repeatable in time (temporally repetitive), in which renewal of meaning (idea) as well as changing "position" of the subject being in motion has a chance to occur. Analogy as metaphorical comparison is then a figure changing in time by cause not only of transformation of artistic practice, but also for the figure of "repetition", which the subject wants to notice consciously and in reflection enlighten the difference, thus renewing the meaning. The following C.S. Peirce's semiotics approach (1994) creates possibility for conceptualization of analogy outline when individual perception is projected as abductive inference (abductive reasoning) – interpretative process, in which iconic-index symbols can be recognized.

In the empirical part I, two stages of my studies are presented: pedagogical cross-sectional research involving: 12 year old pupils, 17 year old pupils of Toruń's high schools, 20 and 21 year old pedagogy students (2nd year and 3rd year) of Nicolas Copernicus University in Toruń, and experimental one according to the following scheme: preliminary studies, crucial experiments, and final research. I have carried out pedagogical experiment in students groups including primary school pupils, high (secondary) school pupils and university students, and the results were compared with those of G. Domino, 1989; M. Dailey, C. Martindal and H. Bokhum's, 1977). My work presents cross-sectional and experimental tests concerning noticing analogy in art (in synesthetic, abstractive, and symbolic codes), their constructing as semiotic equivalences and relation of those abilities to creative thinking.

**Key words:** analogy, analogy as metaphorical simile, capabilities to apperceive visual analogies, and abilities to construct semiotic equivalences in codes: synesthetic, symbolic and abstractive, creative thinking abilities measured by drawing test.