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LONGITUDINAL STUDY OF THE CREATIVE ABILITIES

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Abstract

The article describes the results of a longitudinal study of the creative abilities of children in the junior school age and adolescence. In order to compare the studying this problematics in various paradigms the authors research the phenomenon of creativity in the procedural activity paradigm, following Vygotsky and defining the intellectual activeness as the ability to develop the activity by one's initiative. As the development of the activity by the initiative of a subject cannot be studied out of the problem situation, where it is initiated by the original demand, the new research technique the Creative Field has been introduced (Bogoyavlenskaya, & Kotlyarova, 2017a, 2017b). In the psychometric paradigm, demanding evaluation of the studied object, creativity has been reduced to the height of the intellectual level and has been measured by Raven's tests. Creativeness as Guilfords's effort to connect creativity with specific factors in the intellectual sphere often is being studied using Torrance tests of Creative Thinking. The article presents the facts stating that creativity cannot be reduced to intellect. The creativity indexes in the Torrance tests do not reveal age connections. Their absence puts a question on the phenomenon of the research. Wherever the unique fixation of the intellect level does not allow finding out the creativity phenomenon, the results of the creativity tests often depend on the factors, which lay far from creativity. As the explaining factors the regulator and personality characteristics of children are used and that supports the conception of the holistic development of a child.

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Keywords: Creative abilities, intellectual activeness, creativity, intellect, giftedness.



1. Introduction

The actuality of the problem of finding out and developing creative abilities is rising tremendously in the last quarter of the century. In the beginning of the 21st century it is being considered at the state level. That brings the issue of the creativity concept in the focus of attention. Outside the solution of this problem, the ways of the support of gifted children can lead to the reverse effect.

The efforts of the interpretation of a phenomenon in psychology begin with describing its external side, which is available for a research. The width of such description depends on the methodological abilities at this stage of development. That fact explains the emergence of various approaches in the studying creativity. It is possible to analyze the phenomenology of the state of the art of the creativity problem theoretically, but a longitudinal research allows proving it with the utmost validity.

2. Problem Statement

Any phenomenon in psychology should be considered from the point of view of its steadiness-unsteadiness, its self-identity, the identity of those essential qualities, which define it. In this sense, a longitudinal research of the creative abilities allows defining stable phenomena and current phenomena. That let us define the concepts in which their development happens and see the basic structures of personality, which affect their appearance. Comparing various methods and correspondingly approaches in understanding phenomenon of creative abilities on the same group of children allows analyzing and comparing the effectiveness of the methods and excluding the error of difference of the samples.

3. Research Questions

The creative abilities are defined in the psychological practice mainly via a high intellectual level or the ability to introduce an original idea.

3.1. Prevailing approaches in the practice of diagnostics of creativity

A centenary experience of testing intellect has shown the impossibility of finding individuals capable to creativity by using intellectual tests and that has led to the development of creativity tests. But those tests do not allow differentiating neither intellectual nor motivational components. They are impacted by the factors distant from creativity. Theoreticians all over the world argue considering this matter. Wide-spread application of the creativity tests (Torrance, 2000, 2008; Bart et al., 2017; Furnham & Bachtar, 2008; Kim, 2006, 2017; Jaarsveld, & Lachtmann, 2017) goes along with a serious criticism of this approach (Baer, 2011; Batey et al., 2010; Kim, 2006; Silvia, 2008).

3.2. The positions of the Russian methodology

Intellectual activity is a unit of creative abilities, representing the unity of intellectual and motivational structures of personality (Bogoyavleskaya, & Kotlyarova, 2017a, 2017b). It allows a child not only mastering the activity but also developing it which in a wide sense is a definition of creativity. The intellectual component of the IA even by its high indexes does not allow a child developing activity. The determining factor here is the cognitive motivation, an interest aroused by itself.

4. Purpose of the Study

The research aim is revealing the nature of creativity and age specifics of phenomena related to creativity in various paradigms.

5. Research Methods

We have studied the creative abilities of a child, his/her intellectual development, learning ability (levels of the regulation and indexes of the school progress in various subjects), characteristics of motivational sphere and self-appraisal. This article describes the results of the experiment, which was carried out in the GBOU Centre of Education “The School of Health” #1679 from 2013 to 2018. There were 42 participants in the age from 8 to 13 years. The time samples were performed in the 2nd, 3rd, 5th and 6th forms.

5.1. Studying the creative abilities using various techniques

The study of intellectual activeness (Bogoyavlenskaya, & Kotlyarova, 2017b) was carried out using the Creative Field Technique (methods “Animals in the Circus”, “Naval Clash”). Creativity was studied by the Torrance standard battery (form A), including 3 tasks: (1) Picture construction task, (2) Incomplete figures task and (3) Circles and squares task. The level of intellect was estimated using Raven’s Colour Matrices and Progressive Matrices and the Creative Field Technique (CFT). Learning ability, regulatory characteristics and the characteristics of sensorimotor sphere were studied in the training experiment of the CFT.

5.2. Studying personality characteristics of the children

The aspiration level and level of achievement were evaluated in the modification of the Hoppe’s method and some scales of the Dembo & Rubinstein technique of self-appraisal estimation. The self-appraisal of intellectual level was defined by the scales of Dembo & Rubinstein technique. The level of achievement was measured also by characteristics of school progress in the 3rd and 5th form.

5.3. Mathematical processing and statistical methods

Statistical analysis was done using Spearman’s rank correlation, contingency tables, Fisher’s test and the Exploratory graph analysis using EBICglasso (Golino, & Epskamp, 2017). Mathematical processing was carried out in R. For creation of the EBICglasso model of correlated factors was used “qgraph” package with default lambda ratio and gamma argument equal to 0.25.

6. Findings

A complete network of interconnections of 40 measured factors (indexes) is shown in Figure 01. The minimal lambda ratio used in EBICglasso equals 0.01. Tuning parameter used in estimation corresponds to the gamma argument 0.25. Descriptions of all indexes are given below.

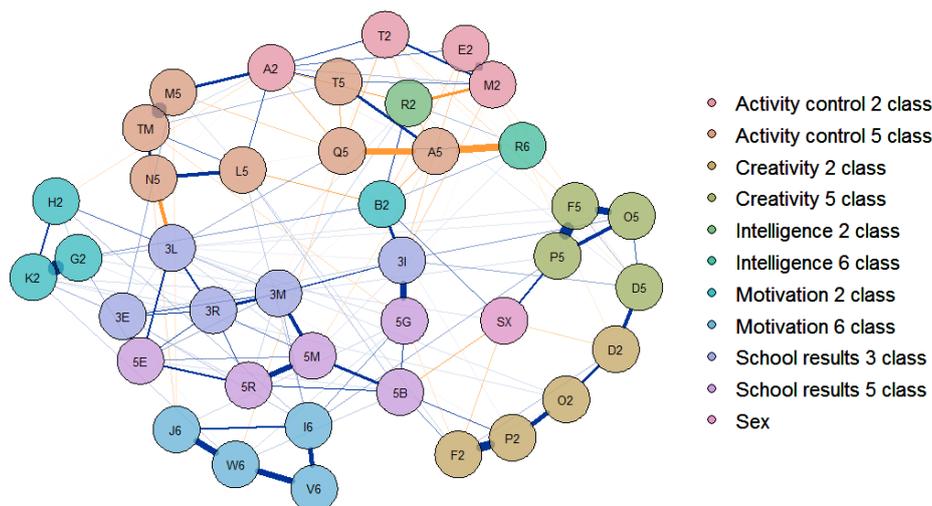


Figure 01. Forty correlated factors model made using EBICglasso method with “qgraph” package in R, gamma argument 0.25.

Indexes of intellect according to Raven’s test: R2 – general score (GS) in the Colour Matrices Test 2nd form; R6 – GS in the test Progressive Matrices Test 6th form.

Indexes in the Creative Field Technique (CFT): E2 – speed of mastering the activity in the training experiment (TE) CFT; M2 – dexterity of mastering the activity in the CFT 2nd form; T2 – time of problem solving in the main experiment (ME) CFT; A2 – intellectual activeness (IA) 2nd form; A5 – IA 5th form; Q5 – number of heuristics used in the CFT; N5 – lightness of orientation in sensor noise in the CFT; M5 – dexterity of mastering the activity in the CFT 5th form; L5 – the level of development of ocular-motor coordination in the CFT; TM – medium time of lining the trajectory in the CFT; T5 – time of problem solving 5th form.

Indexes of creativity in Torrance tests (TT): F2 – TT fluency 2nd form; P2 - TT flexibility 2nd form; O2 – TT originality 2nd form; D2 – TT readiness 2nd form; F5 – TT readiness 5th form; P5 – TT flexibility 5th form; O5 – TT originality 5th form; D5 – TT readiness by Torrens's test 5th form.

Indexes of motivation: B2 – finding a solution in the method aimed at the evaluation of the level of aspiration (LA); K2 – LA 2nd form; G2 – level of achievement 2nd form; H2 – last choice of experiment, shows LA; I6 – self-appraisal of the Intellect index 6th form; J6 – self-appraisal of the Abilities index 6th form; V6 – LA of the Intellect index; W6 – LA of the Abilities index;

School progress indexes: 3E - English 3rd form; 3L - Literature 3rd form; 3M - Mathematics 3rd form; 3I – Surrounding world 3rd form, 3R - Russian 3rd form; 5B - biology 5th form; 5G – Geography 5th form; 5E – English 5th form; 5M – Mathematics – 5th form; 5R – Russian – 5th form.

SX – sex: boy/girl.

6.1. Creative abilities diagnosed with the Creative Field Technique

Intellectual activeness which can be observed in the 2nd form still can be seen in the 5th form as well ($p = 0.55^{***}$), that indicates the stability of this phenomenon. Some children in the 2nd form do not show such stable results so we refer to them as the transitional group. By the 5th form they reach heuristics, which are the results of developing the activity. The index “number of heuristics” in the 5th form is connected with

manifestation of the IA in the 2nd form ($p = 0.50$). IA in the 2nd and 5th form is connected with indexes of intellect in the Raven's tests in the 2nd form ($p = 0.58, 0.49$) and in the 5th form ($p = 0.64, 0.70$).

IA is connected with the indexes of intellect in the technique either in early age or in the elder one and that indicates its continuity and translator development. The index of IA correlates with dexterity of mastering the activity ($p = 0.51, 0.52$) in the 2nd and 5th forms, its stability ($p = 0.49$), high level of ocular-motor coordination ($p = 0.51$), speed of problem solving in the CFT experiment ($p = 0.41, 0.52$). The connection of the IA index in the 2nd form with the school progress in literature ($p = 0.33$) characterizes this group as a reading one as well as a sensitive to the meanings. In the 5th form the IA is mostly bases on a good school progress (literature $p = 0.42$, mathematics $p = 0.51$, surrounding world $p = 0.47$, Russian $p = 0.50$). As a tendency we would like to mention the inverse relation between the IA indexes and self-appraisal of intellect, i.e. the heurists consider themselves more critically.

6.2. Analysis of the data obtained in the intellectual tests

The indexes of intellectual development in the Raven's tests R2 and R6 demonstrate the age connections ($p = 0.53^{***}$), i.e. they are stable. The Raven's index in the 2nd and 6th form shows multiple connections with the level of success in all school subjects in the 3rd form and with progress in mathematics and Russian in the 5th form ($p = 0.59^*, 41^*$). That fact corresponds to the data of other research (Deary et al., 2007). Besides, a high intellectual level corresponds to a high value B2 characterizing the level of aspiration ($p = 0.32^*$). It is interesting that it is the last choice that demonstrates the correlation and that shows the adequacy of the level of aspiration and, possibly, criticism and only the last choice defines the real value of the level of aspiration.

6.3. Analysis of the data obtained in the creativity tests

Among the creativity indexes the age connection can be seen only in complexity of the drawing D2 and D5 ($p = 0.50^{***}$). The indexes of fluency, flexibility, originality and general score of creativity do not cohere even as a tendency and it means that the nature of those indexes in 8 and 13 years of age is quite different. But in every sample the creativity indexes reveal strong internal correlations in the test.

Let us consider the concurrence of the creativity indexes with intellectual parameters. We can see a positive correlation between the flexibility and the intellectual indexes (with the time of problem solving in the CFT experiment ($p = 0.42^{**}$), with IA and the number of heuristics in the 5th form ($p = 0.31^*, 0.36^*$), between complexity and dexterity of mastering the activity in the CFT ($p = 0.31^*$), with the Raven's test in the 2nd form ($p = 0.33^*$), and that proves the closeness of those indexes to intellect. The index of flexibility in the 2nd form is a predictor of successfulness in the main school disciplines: in the 3rd form in literature, mathematics and Russian ($p = 0.36^*, 0.36^*, 0.33^*$), in the 5th form in biology, mathematics and Russian ($p = 0.44^{**}, 0.41^{**}, 0.35^*$). In the 5th form this index is connected with successfulness in English and mathematics in the 3rd form ($p = 0.33^*, 0.35^*$). The index of fluency in the 2nd form is connected with the successfulness in biology and mathematics in the 5th form ($p = 0.36^*, 0.31^*$), and that can be explained by the fact that this subject is connected with the knowledge of the surrounding world and concrete objects. And in the 5th form we can see the connection of the fluency with successfulness in mathematics in the 3rd form. In the 5th form we observe the connection of the fluency and indexes of the speed of problem solving

in the CFT ($p = 0.49^{**}$). The index of originality in the 2nd form does not reveal external connections, but in the 5th form it corresponds only the level of successfulness in the learning in the 3rd form ($p = 0.37^{**}$, 0.33^* , 0.32^* , 0.36^*), i.e. the level of achievement. Those regularities are interesting because of the absence of correlation with the level of school progress in a certain age. The motivation of achievement demands its realization and implements in those conditions where there is a possibility of it, in our case – in the originality of a drawing. The index of fluency and flexibility in the 5th form is connected with self-appraisal of the intellect in the 6th form ($p = 0.33^*$, 0.37^*): children who introduce various ideas consider themselves wiser than their peers.

7. Conclusion

Intellectual activeness is a system quality of psyche developing in time prospective. The intellectual component defines the possibility of mastering the activity and the motivational one defines the development of activity. A high level of intellect without domination of the cognitive motivation in the structure of personality leaves a child in the frame of stimulated activity. That explains the fact that intellectual tests can not differentiate in the group individuals with a high intellect also having the creative abilities.

The data obtained in the research allow interpretation of high indexes in the Torrance tests as the phenomena of a compensatory character emerging by the influence of the test instruction.

The longitudinal research allows us making conclusions and setting new issues. The age connections speak for stability of the phenomenon of the intellectual activeness. In this aspect studying the creative abilities in the longitude allows referring a constant and steady revealing the phenomenon of intellectual activeness. Observing its dynamics we could discuss the battle of motives. But this phenomenon remains and, even if disappearing for some period, then in the next moment it reveals itself again. And it is understandable as in the foundation of this phenomenon lie basic structures of personality: intellectual and motivational. Those structures do not exist separately; they co-exist in unity, defining each other.

The indexes of creativity in the Torrance tests do not reveal age connections. The main characteristic of creativeness – originality does not correspond to the intellectual level and probably is stimulated by the motive of achievement in the situation of unsuccessfulness in basic activities. The obtained data put a question of existence of the phenomenon of the research in the Torrance tests of Creative Thinking.]

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