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Two different paths to creativity

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Abstract

Introduction.

One of the main aspects of research on creativity is analysis of creative abilities dynamics and comprehensive influence on its growth. It has been discussed what effect there might be if knowledge of the self was successfully involved into creativity fostering. The study aims at discovering distinct marks of such an influence on creative abilities growth and outlining those abilities, which are eventually more sensitive to it. It is obvious that a stable personality evolution stimulates creativity development anyway; nevertheless intellectually gifted students may conceivably possess some specific characteristics, which should also be considered.

Method.

In course of three-year study the program "Psychology" was offered to 24 gifted and 35 ordinary participants. The undertaken research has defined that it is exactly true that psychologically educated students are quickly improving the results on creativity, despite different levels of IQ. On the other hand, the gifted students proved to be distinctive in their way "to trigger" certain personality features into positive creativity dynamics.

Results.

As a result, highly intellectual participants facilitate and enhance their creativity growth by tolerating some anxiety tension within social contexts and successfully fighting for resilience whereas the ordinary are apparently dependent on evolving certain adaptive adjustment and enjoying emotionally positive experiences within the family.

Discussion.

This paper will also discuss these facts as well as implications of the psychological studies to typical school settings so as to analyze the impact of the course.

Keywords: creative abilities, giftedness, psychological education, identification, adaptation

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Resumen

Introducción.

Uno de los aspectos importantes en la investigación sobre la creatividad es el análisis de las dinámicas de las habilidades creativas y la influencia de la comprensión en su desarrollo. Se discute sobre los efectos que el autoconocimiento podría tener en el desarrollo de la creatividad. El estudio trata de descubir marcas distintivas de tal influencia en el desarrollo de las habilidades creativas y esquematizar tales habilidades que son eventualmente más sensitivas. Es obvio que una evolución estable de la personalidad estimula el desarrollo de la creatividad, sin embargo, como podemos imaginar los alumnos superdotados poseen características específicas que han de ser consideradas.

Método.

Durante tres años el programa "Psicología" fue ofrecido a 24 superdotados y a otros 35 participantes más. La investigación parte de la hipótesis de que los estudiantes que participan en el programa mejoran más rápido la creatividad independientemente de los niveles de cociente intelectual. Por otro lado, los alumnos superdotados confirmaron ser diferentes a la hora de activar ciertas características personales para el desarrollo de dinámicas positivas de creatividad.

Resultados.

Como resultado, los participantes con alto nivel intelectual facilitaron e incrementaron el desarrollo de la creatividad gracias a su capacidad para tolerar la ansiedad en diferentes contextos sociales y su perseverancia en tanto que el resto de partipantes dependían aparentemente del desarrollo de ciertos ajustes adaptativos y de la implicación en experiencias emocionalmente positivas en la familia.

Discusión.

El artículo discute tanto estos hechos como las implicaciones de los estudios psicológicos para la realidad educativa así como analiza el impacto del curso.

Palabras clave: habilidades creativas, superdotados, educación psicológica, identificación, adaptación.

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Introduction

Admittedly, creativity is a subject, which is frequently as well as brilliantly investigated and comprehended at its high level, less often as showed by ordinary adults and/or children. For many the terminology, naturally, is connected with outstanding people, e.g. scientists, artists, musicians, inventors, etc. The majority of descriptions of creative people are concentrated on studies of creatively productive persons (Berry, 1981; Eysenck, 1995; Gagné, 1995; Gardner, 1993; Simonton, 1991; Treffert, 1983; Walberg, Rosher & Hase, 1978; Zuckerman, 1983). Often gifted children are seen not only as creative children but also as future creative and eminent adults. There is much evidence that many gifted children, especially, prodigies, burn out, while others move on to other areas of interest. Though some of them turned out extremely successful, they failed to fabricate anything genially creative. E.Winner (1996) upholds the view that what could not be assumed a priori is a link between early giftedness and adult eminence, because only a very few of the gifted become eminent adult creators. Consequently, over and above the level of ability, significant roles are played by personality, motivation, the family environment, opportunity, and chance. Although there is a number of creativity research based upon children and adults who are not distinguished for clearly visible creative attainments, that research has led to a certain understanding of creativity as a psychological process and as observable conduct and activity results tested (Freeman, 1991; Gallagher, 1990; Milgram & Milgram, 1976; Simonton, 1994; Vaillant & Vaillant, 1990).

This study aimed at highlighting possible individual differences within the creativity abilities growth of the intellectually gifted compared to the ordinary participants through a primary grade to a secondary school. Eventually, the awareness of the specific nature of creative abilities development could help successfully foster those capabilities in children and teens despite scores of IQ.

Pretty vital seems to be the fact that personality attributes predict what will happen to the gifted child in adulthood more reliably than does the child's degree of giftedness. In other words, levels of ability above a certain point produce less influence than do personality and motivational factors (Feldman & Goldsmith, 1991; Goldsmith & Feldman, 1989; Howe, 1990; Simonton, 1994; Trost, 1993). It was also experimentally proved that there is likely to be a complex of factors responsible for the cycle of creative abilities. For instance, preference for productive cognitive activity is thought to be the main predictor of primary school chil-

dren's creative productivity, but this factor appeared to lose its importance in teenagers (Fidelman, 2003). Assuming that issue one should apply to J.Feldhusen (2002), who is convinced, that creative or divergent thinking is not done in a vacuum. The author claims, that it depends on and uses a knowledge base. "There is too much emphasis on trying to understand the process purely from a procedural point of view and not from the point of view of the necessary knowledge base. Close observation of the creative thinking processes of children illustrates clearly the critical role of the knowledge base" (Feldhusen, p.179). He insists on the fact that there is an assumption of some acquisitions for the processes of creative thinking, which one can retrieve to plunge into creation. In other words, there are qualities likewise skills to thrive or fare well in life which we learn in childhood, and which would be able to assure the mighty creativity for a few. At the same time, for the rest of children those skills will be simply reduced to the adaptive behaviour.

Thus, a subject in question is certain distinctive marks boosting creativity and its division traits both cognitive and personal ones in gifted and non-gifted samples that presumably emerge given to psychological education. It would be noteworthy to discover a connection of socio-emotional characteristics in intellectually gifted and ordinary children related to their creative abilities dynamics.

In accordance with that some hypotheses ought to be put into the questions:

1) Would the intellectual abilities level influence creativity growth providing *psychological enlightenment*, and to which extent?

2) Is there any meaningful impact on development of creative faculties stimulated by *self-knowledge*?

3) Could any significant differences between gifted and non-gifted samples be found in case non-creative factors were to involve in booming creativity and, if so, which of them is preponderant?

As mentioned, the differences can take place to divert gifted and non-gifted individuals. For instance, due to a six-month longitudinal study (Memmert, 2006) it has been proved that the influence of a diversified sport enrichment program on the development of creative thinking in team ball sports among gifted children easily revealed. A contrast between a gifted control group and a non-gifted treatment group showed that the creative performance of the gifted children significantly improved. Besides, the results of the monitor-task by Most *et al.*

(2000) proved significant differences between both samples in the "Near" condition but not in the "Very far" condition. Contradicting to the presented issue, some researchers have considered the interaction of IQ and creativity in the perspective of making diagnosis on the future (Block & Kremen, 1995; Duncan, Featherman & Duncan, 1973; Gardner, 1983; McCleland, 1973; Simonton, 1994; Sternberg & Wagner, 1986; Wallach, 1976). They believe that IQ level is unlikely to predict creativity. Actually, tests seemed to be insufficient to tell us about the kinds of abilities that are critical for getting along in the world. On the contrary, a great amount of authors anticipate the tremendous future in this respect for some personal factors such as *understanding of others, understanding of oneself*, "practical" intelligence (it means solving practical problems faced in real life), and resilience.

It is remarkable that there are so many researchers who deny a tight connection of creativity and intelligence as much as those who seriously assert these links (Boden, 1991; Getzels & Jackson, 1962; Guilford, 1967; Heller, 1991; Koenig, 1986). The matter may be true that researchers and practitioners are still facing a combination of stumbling blocks in the domain of creative thinking developments.

Creativity and its cognitive and non-cognitive predictors

Generally, up-to-date the notions of creativity account 50-60 subjects of terminology both in Russian as well as in English speaking psychological literature and it tends to expand (Baer, 1991; Barron, 1969; Holodnaya, 1993; Jamison. 1995; MacKinnon, 1962; Ochse, 1990; Piirto, 1994; Torrance, 1972, 1992; Treffinger & Renzulli, 1986; Yurkevich, 1996). As far as Russian authors are concerned, there should be taken into consideration some of their concepts.

In reference to A.Matiushkin's (1989) model of creative giftedness, creativity is that of an interconnection between psycho-physiological pre-conditions and capability to elaborate the problematic context situations which could be solved in the most unusual way. In the model one can outline the following elements: cognitive motivation, search for the new, something innovative, problematic, ability to create perfect moulds for a variety of social life representations. The author claims that all talents derivate from this common base developing to the high level of creativity in science, arts, technology.

D.Bogoyavlenskaya (1983) considers intellectual activity as ability to create. From the author's point of view the intellectual activity presents an integrative property of personality that provides productive activity free from the requisite conditions of the situation. The important characteristic of this activity is its connection with the system of values and the person's attitudes to the world.

Having contemplated creative personality proclivities V.Asseyev (1993) concentrates on creative motivation considering it as a cluster of significant needs. Among them the following ones project - overcoming stereotypes, stamps, ability to differentiate allegedly "unimportant", "unremarkable" objects' sides, etc.

According to a number of authors, motives and needs in creation occur under an effect of appropriate emotions – aggression and enjoyment (Csikszentmihalyi, 1996; Csikszentmihalyi, Rathunde & Whalen, 1993; Torrance, 1972). Studying the characteristics of creative people P.Torrance discovered that lots of personal traits are based on those feelings which result in ego expansion. Among these properties the following ones are frequent: aspiration to predominance, superiority, inclination to risk, prophecy to independence, radicalism, etc. In addition to that creative persons are distinguished by optimism, readiness to help, sense of humour and sensibility to perfection.

J.Guilford (1950) emphasized the importance of such qualities of divergent thinking as an unusual use of the subject, producing distant associations, a new, functional transfiguration of the subject. Ideally, all these marks can represent so to speak the breadth of categorization. The author underlined that these qualities are inherent in the divergent thinkers and they are not compatible with the convergent ones. Basically, there were found out some fundamental marks of creative thinking, with which a considerable number of psychologists do not argue (Barron, 1969; Guilford, 1950; Milgram & Hong, 1993; Torrance, 1992).

- The first mark stands out for its distinct nature to differ creative thinkers from the others, e.g. intellectuals. This quality represents a certain openness to experience, sensitiveness to fresh, new problems. Compared to intellectuals creative thinkers are capable of searching for some problems and exposing them whereas intellectuals are able to find a solution, but incapable of putting forward a problem.

- The second characteristic of creativity is thought to be the breadth of categorization. Creative people tend to make broad conclusions, which include the objects apparently unconnected through categorical links. On the contrary, intellectuals are not good at penetrating into the common uncovered nature of the sundry objects; they are evidently confined within one categorical framework.
- The third one is entitled fluent thinking. This kind of thinking characterizes a capability of producing an enormous quantity of ideas, associations to ordinary stimuli. A creative person intentionally includes objects into the numerous unusual, odd relations, categories, and their diversity is crucial for the fluent thinking. Incidentally, the fluency can be explained in terms of transition of conscience towards sub-conscience and upwards.
- The fourth mark means the ability of an individual to transfer ideas quickly from one category to another, from one way of solution to another one. This ability represents flexibility of thinking.
- The fifth mark is the most difficult to figure out. This one refers to the originality of thinking. The majority of authors haven't yet come to terms with the criteria of the definition, e.g. some of them offer very controversial criteria of the estimation of children's products, in particular, "rarely produced answer". However the main point of the term has been left untouched: it is that of independent, unusual and witty decision (in reference to stimuli or traditional ways of solution).

The characteristics are tightly interwoven though they have their immanent specific nature and certain measurement representations (quantity, fluency, quality, comparison, relations). However cognitive characteristics of creativity separately can not be taken into consideration to ponder over the issue.

There might be a great deal of personality traits that predict later creativity. E.Winner (1996) accounted that without paying attention to these factors there is little hope of becoming an outstanding person in adulthood: "For those who do make it into the roster of creators, a certain set of personality traits proves far more important than having a high general IQ, or a high domain-specific ability, even one at the level of a prodigy. Creators are hard-driving,

focused, dominant, independent risk takers" (Winner, p.292). Having analyzed a lot of studies on the field E.Winner (1996) produced a list of general non-cognitive markers that highlight creativity.

Drive and Energy

The most creative people are workaholics and also the most prolific (Roe, 1952). Critically important is that creators must be able to have stamina in the face of obstacle and cope with many hardships in the process of creative discovery. Willingness to toil and bear frustration and failure is crucial. Howard Gruber (1981), in his study of evolution of Darwin's thought, pointed out that what predicts great achievement is a passionate and prolonged involvement with a subject, this quality is not yet visible through standardized intelligence or achievement tests.

And when Csikszentmihalyi (1993) studied those gifted adolescents who did remain committed to their particular domain of gift at the end of high school compared to those who did not, he discovered an important thing: those who remained committed were identified as those who earlier had shown higher achievement motivation and great power to resist. The drive of creators assumes some kind of intense, focused character. Their work predominates over personal ties and civic duties (Gardner, 1993). What is completely unknown is the nature of drive: is it an inborn characteristic or it derivates from role models? All this presents a challenge for upcoming research.

Attention, Interest, and Flow

Related to motivation is the ability to maintain undivided, focused attention. Adult creators focus intensely while working. And in Csikszentmihali's (1993) study, those gifted adolescents who were most able to show undivided attention while at work in their domain of ability were those who made the best progress in their area at the end of high school. Those who were unable to shut out daily distractions of adolescent life and focus were less able to develop their talent.

The ability to focus is also a product of enjoyment. But only creators can combine work and play and it is certainly possible that they become eminent adults. Adolescents in Csikszentmihalyi's (1996) study who reported feeling cheerful, strong, excited, open, and suc-

cessful while working in their domain of endeavor were the ones who remained motivated and did not lose interest and drop out. These were the adolescents who reported flow in the course of working: they reported so passionately concentrated that they noticed nothing except what they were working on. The ability of these adolescents to attain a state of flow while working in their area of gift was far more predictive of commitment than was academic ability, family support, or other personality factors.

Dominance, Confidence, and Tolerance of Competition

Creators are strong, dominant personalities with an unshakable belief in themselves. Gardner (1993) explored ego-concepts of creators, he is prevailed upon the fact that there are many proofs of high self-confidence and low self-doubt while goal achieving. They set challenging tasks for themselves and believe that they can achieve what they aspire to. What doesn't have to be left aside is self-efficacy which must also be able to tolerate competition - some may even thrive on it. The domain of research on creativity accentuates the social skills necessary to sell oneself to the field of interest (Getzels & Csikszentrnihalyi, 1976).

Independence and Introversion

Creators are independent and nonconforming. Fighting against the norms of society is not an exception for them. For a creator challenging an established tradition is equal to exercising one's personality (Helson & Crutchfield, 1970).

Accompanying independence is introversion and high tolerance for solitude (Storr, 1988). As seen earlier, independence, introversion and tolerance for solitude usually characterize gifted children as well. Csikszentmihalyi (1996) observed gifted adolescents. Those who could not put up with solitude dropped out of their talent domain at the end of high school, in spite of high ability in the domain. On the other hand, some have noted that creative people have a tendency toward *both* introversion and extroversion and are able to pass back and forth freely between these two states.

Risk Taking and a Desire to Shake Things Up

Creators have to be willing to risk failure, since anything new is likely initially to be denounced. Moreover, the most successful creators are also those with the most failures to their names. As Simonton (1994) has noted, creators produce as much a masterpiece as they also produce the most failed works. However creators have high self-confidence, which helps not to be destroyed by a vicious review or an ignored composition.

Albert & Runko (1986) expressly stated that the only desire of creators is the imperative to set things straight, to alter the status quo and shake up the established tradition. Creators do not accept the prevailing viewpoint; moreover they are oppositional and discontented.

F.J.Sulloway (1990) documented that birth order plays a fascinating role here. First-borns tend to identify with their parents, and hence with the status quo. They tend to be successful high achievers with a traditional outlook. Later-borns identify less with their parents and are more rebellious, possibly because they are jealous of the privileges accorded to the first-born. This rebellious, antiauthority tendency of later-borns could account for the fact that we find many later-borns in domains in which it is expected that one will be unconventional. Later-borns also are disproportionately more likely than first-borns to become political revolutionaries and to support revolutionary scientific theories.

Thus, it is believed to be an association of factors in this realm that can affect creativity blossom. Those determinants could be cumulated as a multiplex integration of different movers including a variety of personal ones running up to factors of family impact and even luck (role of chance).

Method

Participants

The study was undertaken on the base of Municipal Educational Institution “Comprehensive School nº 22 with profound learning of Foreign Languages”, Perm, Russia. In the investigation two groups of participants took part: the first one comprised of 35 pupils with IQ – 100 and the second group included 24 intellectually gifted participants (IQ – 130 and above), both samples aged 9-10. The investigation lasted within three years.

Procedure ans Instruments

The participants under study were offered three-year-course on "Psychology". To fulfill the tasks of the presented study the course was aimed at forming some psychological knowledge and skills so as to evoke psychological resources supporting successful social adjustment, and assumptive backing creative abilities growth. The course was established in a framework of normal school settings.

In order to study the creative thinking indexes the following tests were administered to the participants:

- Torrance's Test of Creative Thinking in Pictures, figurative form A (fluency, flexibility, originality, elaboration and the general index of creativity);
- Test of Creative Thinking by J.Guilford, verbal form (fluency, flexibility, originality);
- Teachers' and parents' judgement about the creative thinking and behaviours.

On the top of this a number of diagnostics were used to outline personal attributes: Test of School Anxiety by Phillips, Test of Socio-Emotional Relations within Family and Friends by René Jilles, Social Adaptation Inventory by Diamond & Rogers, adaptation-questionnaires, etc.

The program, goals and tasks of the course "Psychology for primary school children"

Nowadays it is thought to be a tendency in the deepening of the rift between knowledge of a growing up person about the social fabric as well as the nature and the gap of the systematized information covering the psycho-physiological structure and personality resources of oneself. That knowledge could be utterly available for the constructive use within the contexts by an individual.

As a matter of fact, pupils of different ages try to analyze somehow their own psychological experiences, but still the interest in the self is blocked by poor possibilities in self-cognition. Evidently, all they desperately need is those capacities which help them to make out all the puzzles of their inner world.

This situation happens to be the ground for inadequate means of the self-cognition as well as the others' cognition and this way may well produce dissatisfaction, ambiguous self-esteem, values and intentions, etc (Moon, 2003). The deeper a child reflects on oneself, per-

sonal interests, abilities, relations, experiences, the more precisely the child develops his/her own ideas about the life span going on.

The most significant properties of the individual are believed to conscionably evolve and stabilize both cognitive and personal ones on the early stages of the elementary school (Kanoy, Johnson & Kanoy, 1980). Therefore self-knowledge contribution into this process is not only the question of special interest but fruitful in breeding valuable qualities of an individual (Fidelman, 2004).

The experimental course "Psychology for the primary school" is to be seen as an initial component to the comprehensive process of learning psychology in the secondary education.

The learning psychology in the elementary school strives for achieving the following goals:

- to present to pupils the elementary set of psychological concepts, first of all basic ones;
- to awake the interest in yourself as well as in others;
- to help a child discover step by step the diversity of his/her own inner world, to show its unique and multifaceted nature.

Thus, the task of the course is not only studying psychology itself but developing the appropriate approaches towards human psychic, self-awareness, capability to self-cognition, communication skills and putting all that into practice so as to facilitate for a child a problem solving within the context. The course is divided into two parts. The first one comprises several themes: Perception, Attention, Memory, Imagination, etc. The second part includes four themes: Thinking, Emotions, Volition, and Speech. All lessons have common teaching stands. Every theme accumulates a deal of paragraphs devoted to each chapter of the theme. A lesson begins with describing a typical situation which a child either really was/might be in or with offering a child some impressive psychological experiments to undertake.

What makes the learning process more rigorous and complicated psychological notions more understandable is a teacher's repeated applying to actual experiences of a child. There is no other possibility to make psychological objects so "vivid", "visible" to children as this way of teaching since one can not touch, see or draw those mental subjects.

Having got acquainted with the novel notions children are taught to analyse their own feelings and mental states in order to conceive resemblance and difference in themselves and others. These revelations contribute to the comprehension of the human inner world complexity and necessity of being careful to deal with it, treating its frail nature kindly, and taking care of it.

Statistics procedure

The results obtained took part in multiple procedures. The descriptive and inductive statistics was used to verify the hypothesis of the research. In the study the zero-and alternative hypothesis approach is presented so that to define the differences between control and experimental groups, i.e. the ordinary and the intellectually gifted, according to the characteristics concerned. In order to find the differentiations the method by Student (T-criterion) was implemented. This one is parametrical and it is available for independent and dependent groups though in relation to those groups T-criterion acts differently.

Independent samples represent two contrast groups of participants (here: control and experimental ones). In addition this method was applied for dependent groups. Dependent group is defined as the same group with the performance "before" and "after" intervention of the independent variable. In this investigation it has been proved that there was the difference between the initial level of creative thinking and its performance after the intervention of the psychological education, separately in control and experimental groups.

Tracing the tasks accomplishment there have been clarified the possible connections throughout all the variables of the study. For this case the correlation matrix was established. The validity of diagnostics set was testified alongside with internal consistency of the creativity concept assigned in the research. The results showed that the correlation indexes varied from 0.35 to 0.79 (index of reliability $p<.05$) in the ordinary aged 9-10, whereas in the gifted they varied from 0.35 to 0.86 ($p<.05$).

The internal consistency of the scales was testified also through stability of the data in the three-year-period (re-test reliability). For instance, the gifted group (already aged 11-12) showed correlation of analogous variables as follows: from 0.49 to 0.95 (index of reliability

p<0.05). As a result, the internal consistency of the variables chosen as creativity conception for this study proved to be correct. The design Statistica 5.0 for Windows was used.

Results

According to the objectives of the exploration the measurements were applied twice: at the beginning and at the end of the longitude (2002-2004). At the first stage of the study Torrance's Test of Creative Thinking (TTCT) was administered to the participants and the expertise scores to estimate creative behaviours as well. The latter were delegated to parents and teachers at this stage of the experiment.

The next stage was meant as studying psychology during three years and it was assumed as *the intervention*. The last stage of the investigation comprised alongside with non-verbal form of TTCT, verbal test of creative thinking by Guilford. Above all a set of adaptive, identity and emotional characteristics of personality were also traced twice: at the first - 2002 and then at the final stage - 2004.

Would any *influence on* creativity progress be unfolded according to the completion of the study, and if so, will it be truly considerable?

Creativity dynamics in non-gifted sample: findings and consequences

Uppermost let's analyze the comparative data of the ordinary which were obtained "before" and "after" the intervention. The children could show some progress in a creative abilities climbing but without any impressive "breakthrough". Generally, the index of creativity surged up three points: from 48 (2002) to 51(2004), as in some cases, e.g. in fluency up to eleven points as much. However, only two variables turned out reliable: fluency ($p< .000$) and flexibility ($p< .019$).

As presumed, the effectiveness of the intervention must contribute to effect for enhancing creativity. To clarify the connections between creativity and identity, emotional and adaptive competences of the participants another statistical procedure was implemented twice: before and after psychological studies. The first correlation matrix was obtained: the correlations varied from - 0.38 to 0.44 (2002).

First of all, it would be interesting to expose those ties which initially had ruled creativity progressing through underlying, perhaps, undercurrent influences. There were revealed

links between adults' estimations of creative qualities and frustration of a need in success (0.41; 0.40). The more highly parents and the teacher estimated creative behaviours, the more frustrated a child's position has been while achieving goals. Overestimation and high expectations are unlikely to be helpful for upheaval of the ordinary's creativity progress.

Further, the teacher and parents were mostly responsible for emotional well-being experiences and, consequently, through these experiences they indirectly affected such basic characteristics of creative thinking as elaboration (-0.43), fluency (-0.38) and the general index of creativity (-0.40). All those variables were dependent on the knowledge-check situations which adults mainly control. In other words, inadequate evaluations of creative abilities given by the parents and the teacher as well as their high standards approach might well block creative capacities of the ordinary participants.

What is more, among the most important correlations there were negative ones between creativity and gender: limitations of the gender roles interfere prevent being creative, and on the contrary, a more freely interpreted gender role, a certain playful approach to its expression is the most appropriate model for functioning as successful creators. To comprehend the changes which followed the three-year-study of psychology one can consider the correlations obtained after the intervention (see Figure 1).

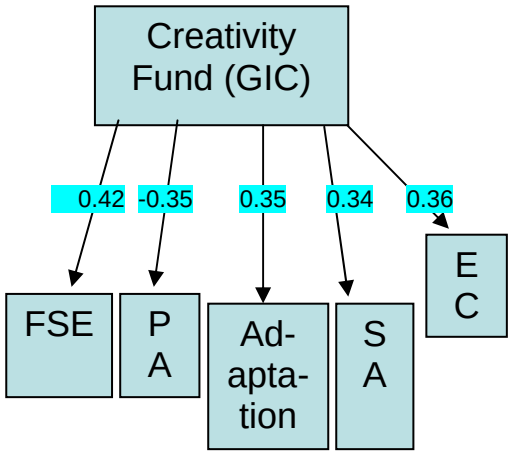

Figure 1. **Correlations of creativity, adaptation, and identification variables in the ordinary aged 11-12 (index reliability p< 0.05)**

Notes: GIC – general index of creativity; FSE – fear of self-expression; PA – personal anxiety; SA – self-acceptance; EC – emotional comfort.

The results of the participants under effect of the psychological studies exhibit that there are some positive correlations of FSE, PA, EC, SA, Adaptation and GIC. These variables include actually not only identity marks, but also adaptive ones and, compared to the previous characteristics considered, appeared to be deeply personal, private, related to identification, i.e. self- acceptance, self-expression, etc. Seemingly, it would be too early for this stage of puberty but having produced such mature stands the ordinary participants demonstrate now visible liberation from dependence on adult attitudes and at the same time they might do away with the previous personal problems.

To conclude, the positive dynamics of creative abilities in the ordinary as well as evolvement of their identity and ample adaptation capacity became possible owing to the psychological enlightenment which aimed at those targets. Basically, the participants aged 11-12 managed to include such tremendously important capabilities as positive self-acceptance, emotional comfort within social context, and adjustment into creativity fund making it boosting a little.

Creativity upswing in the intellectually gifted: foregrounds and backgrounds

Having considered the data of two separately undertaking measurements of creative thinking in the gifted one could find some solid differences concerning “before” and “after” the intervention.

On the subject of the creative thinking growth there must be taken into account its positive dynamics. First and foremost, the final test revealed an intensive upthrow of creative abilities to the level of creative giftedness: from 51 points (2002) to 65 points (2004). The criterion of differentiation is valid for flexibility ($p< .000$), fluency ($p< .02$) and the general index of creativity ($p<.02$).

For conceiving all the connections of creativity with personality variables there a correlation procedure was helpful. In the context of the study it was noteworthy to look into the matters that initially played role in the creativity performance so that to uncover those changes which had been underpinned by the processes that took place before the psychological studies.

The main point is that the correlation matrix displayed a rather stingy picture of correlations between creative indexes, judgements and identity images in the gifted before the intervention (from: -0.39 to 0.66).Due to the parents' estimations of creative behaviours there was revealed negative correlation with a fear of self-expression (-0.43), in addition an experience of social stress had negative correlations with fluency (- 0.39). Apparently, stress and incapability of self-expression are not friendly for boosting creative activity.

Elaboration and the general index of creativity are positively connected with problems and fears related to the teachers. Developing freely, a child tries in vain to establish positive and reliable interactions with adults but creativity gives an individual some kind of compensation. The next group of correlations outlined links between creative variables and identification. For instance, the identity image "ego-friend" (0.46; 0.39) has fruitfully produced an effect on creativity.

Still, what attracts attention most is a negative correlation of creativity and gender roles (-0.43). This outcome ensured a widely assumed fact that creative individuals might well be, strictly speaking, neither "feminine" nor "masculine" in their gender roles representation.As proved, the gifted at this stage of the investigation happened to claim identification capacities for being creative much more than the ordinary did. Compared to the gifted the ordinary participants at that time of the investigation chiefly suffered from anxiety matters and that resulted in adaptive behaviours needed to be improved.

The final correlation matrix shows the changes that took place over the years. It is important to reveal those adjustments which could be doing with the alterations after the intervention (see Table 1). As mentioned, this time the data presented were obtained after the intervention, i.e. following the psychology accomplishment of the gifted. What appeared to be the most eventual and even glaring was a plenty of correlations not only positive, but also negative ones (correlations varied from -0.45 to 0.49). In contrast, a previous matrix of correlations had showed utterly faint quantity of the links.

Table 1. ***Correlations of creative thinking, adaptation, identity and anxiety characteristics in the gifted aged 11-12 (*p<0.05).***

Anxiety and identity indexes	Indexes of Creativity							
	Non-verbal					Verbal		
	Fluency	Flexi-bility	Origi-nality.	Elabo-ration	GIC	Fluency	Flexi bility	Originality
GSA	0.43*	0.22	0.11	0.24	0.26	0.34	0.32	0.13
FSE	0.24	0.05	0.42*	0.07	0.21	0.23	0.27	0.30
PFRT	0.27	0.20	0.24	0.04	0.16	0.49*	0.45*	0.36
GAI	0.39*	0.18	0.45*	0.31	0.39*	0.18	0.23	0.07
PA	- 0.17	- 0.06	-0.43*	- 0.01	- 0.23	0.16	0.11	0.03
Family	- 0.16	- 0.09	-0.40*	-0.43*	- 0.39	- 0.35	- 0.34	- 0.22
Friends	-0.40*	- 0.29	-0.45*	- 0.14	-0.39*	- 0.29	- 0.19	- 0.10
RBS	- 0.26	- 0.24	- 0.23	- 0.15	- 0.18	- 0.33	- 0.34	-0.40*
RGmGf	0.20	- 0.03	0.22	0.44*	0.29	0.09	0.06	0.10
RF	- 0.21	- 0.17	- 0.16	0.11	- 0.11	0.37	0.45*	0.34
Aloofness	-0.33	- 0.32	- 0.18	0.16	- 0.22	0.18	0.20	0.40*
Lie	0.46*	0.39*	0.28	0.11	0.35	0.26	0.19	0.32
EC	- 0.24	- 0.35	- 0.29	- 0.09	- 0.27	-0.45*	- 0.38	- 0.36

Notes: GIC – general index of creativity; GSA– general school anxiety; FSE – fear of self-expression; PFRT – problems and fears in relations with teachers; GAI – general anxiety index; PA – personal anxiety; RBS – relations with brothers and sisters «I'm brother, sister» (René Gilles), RGmGf – relations with grandmother and grandfather «I'm granddaughter, grandson», RF – relations with friends «I'm friend»; EC – experience of emotional comfort (Diamond & Rogers).

The fair place in the matrix is occupied by the concentration of socio-emotional indexes which could mainly attract originality and fluency. Although, the upraised originality demonstrates negative ties with personal anxiety and emotional comfort experience within the family and friends, other creative abilities have positive links with lie, problems with teachers, aloofness and general index of anxiety. These links help understand some particularities of creative abilities development in teens. Creativity in this context may be conceivable accounted as compensation to inability on establishing positive interactions with the family and friends.

There is no surprise at all that originality would initiate conflicts, discordances and even biases within informal realms. It is assumed that anxiety should be taken as a driving force for creativity to upsurge. Moreover, it has been scientifically proven that psychiatric problems are more of the creativity growth than, for example family support (Jamison, 1995; Richards, 1994).

Putting forward the argument that the beneficial effects of the personal adaptation being negatively affected help to develop the creativity upswing in the gifted, should we assume also the fact that a creative individual needs to be a bit suffering one, just to be induced to create with taste and variety?

To take each of the proofs in turn, first of all, age ought to be reckoned with. The participants under study are at this period teenagers and this age proves to be challenging. It is important for teens to be accepted by peers, originality as a pattern of behaviour might be attractive and/or at the same time unwelcome as well. It would appear that there is additional evidence which reassures these reflections. For instance, fluency (Guilford) is negatively connected with emotional comfort: the more creativity qualities are expressed in the behaviour of creative people the more those individuals appear to feel uneasy in social framework. It could be argued that society is fully prepared to accept extraordinary people and tolerate their so to speak unusual conduct.

Thus, identification, and adaptation characteristics have revealed complex connections with the abilities of creative thinking. On the one hand, the participants keep on struggling with the difficulties of social context and there must be evidence that they begin seriously to cope with a wider variety of problems, on the other hand. Afterwards, range of obstacles is generally thought to be solved on a more positive note than it had been before the intervention.

The next step of analysis is a comparison of the data obtained on the whole in the survey concerning the final stage of the experiment. It was presumed that the two samples will show acute differences in the level of improvement.

Will the IQ score matter for discerning in this respect the two samples upgrade?

Comparing results of the two final performances on creativity test one can uncover steady creativity growth of the gifted; in contrast, the ordinary participants could hardly face minor upturn (51 points) than a magnitude the gifted did (65 points). The ordinary failed actually to approach the frontier of the creative giftedness (the creative giftedness is marked from 60+ points).

According to T-criterion of differentiation by Student the indexes of fluency ($p<0.03$), elaboration ($p<0.000$), originality (0.000), flexibility (0.000) and the general index of creativity ($p<0.000$) proved to be reliable. The comparison of the data is presented when verbal and non-verbal creative thinking tests were performed (see Figure 2).

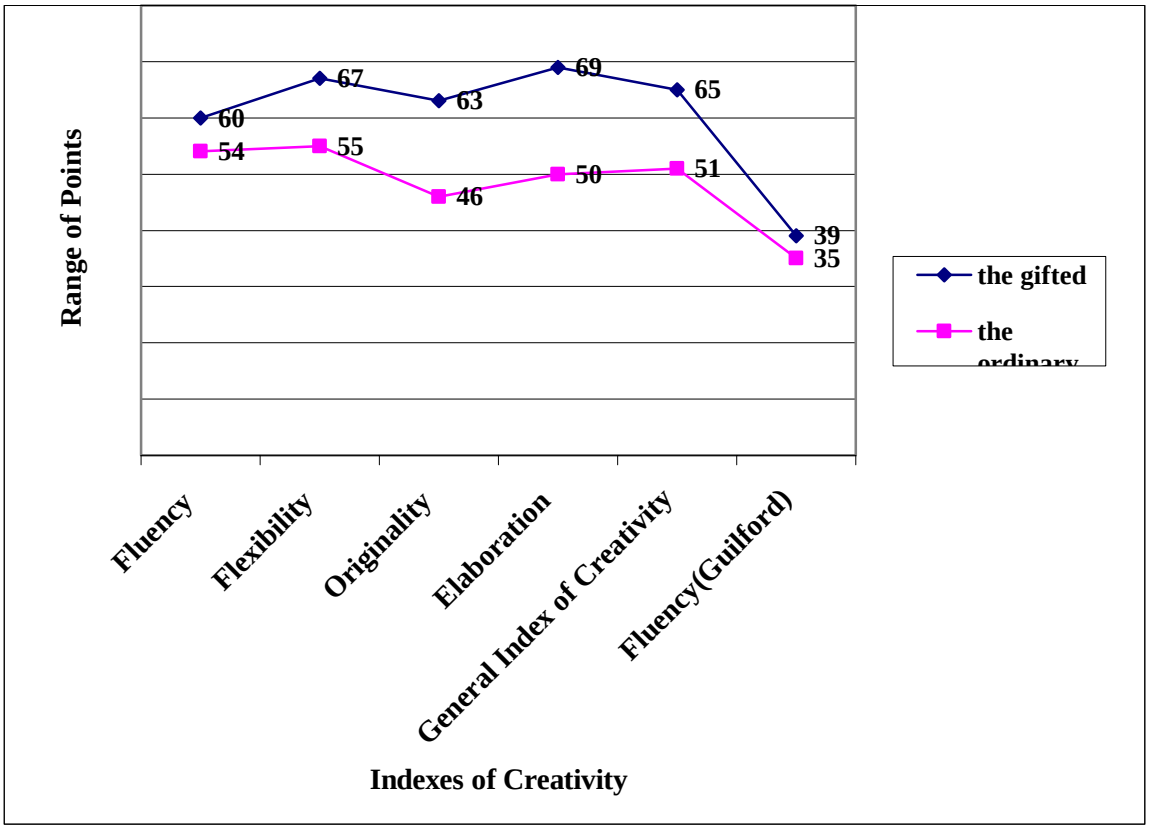

Figure 2. **The measurement points of creativity thinking abilities obtained in the gifted and the ordinary samples aged 11-12**

The results demonstrate strong prevalence of those participants who possess the higher IQ scores; they could easily surpass their peers after studying psychology. Some authors

claim that IQ is thought to be of no importance to facilitate the creativity growth. Nevertheless, precisely because the gifted being in equal conditions of learning psychology in comparison with the ordinary were able to profit fully from their intellectual capacities. That potential turned out more beneficial to make psychological studies efficient for educing personal recourses to surge creativity forward.

In the main, high IQ under conditions to work hard ministers those individuals to attain advantages in learning and achieve goals by mobilizing all inexhaustible possibilities that psychology offers to. It is clear that such promising educating model for growing up creators is due to meet some bold expectations within educators' staff and supporting families.

Conclusion

One of the backbones of creativity research is analysis of the basic creative abilities formation. During a rather long period of time a problem of considerable influence on creativity stable growth received increased amount of researchers' attention. A lot of discussions on a particular kind of the intervention, which might upturn the personal resources so that to get it involved in creativity boom have been extremely popular (Bloom, 1985; Moon, 2003; Renzulli, 1994).

In the undertaken research the dynamics of creative thinking abilities development and their specific marks in the groups of children and teens were studied as well as links between their creative thinking and identification, adaptation, and level of IQ[1].

Besides, the of three-year course of psychological studies was offered to the participants under observation. The effect of this intervention has been thoroughly investigated. As a result, the following conclusions have been drawn:

- the experiment showed that only participants with high IQ could be able to perform on the level of creative giftedness, in contrast the ordinary didn't manage to meet the high standards of a creativity pitch;

[1] The study presented is a part of the devoted to the nurturing of the personal talent in the intellectually gifted comprehensive research-project, which has been completed by the author in 2006.

- the intervention is highly likely to turn out successful to boost indirectly creative activity in gifted and non-gifted samples, the course "Psychology for primary school children" influenced them positively, in particular some personal qualities of self-cognition and ego-conception contribute to creativity upsurge;
- the differences in creativity progressing were outlined as far as the gifted and the ordinary participants were concerned.

Highly gifted participants developed their creative capabilities steadily only under certain specific conditions: tolerating anxiety in school and family contexts, on the one hand, and being astonishingly persistent in attempts to build advantageous interactions with adults, on the other hand.

To sum it up, creative thinking development in the gifted appeared to be dependent to a greater extent on acute experiences while fighting for emotional comfort, surmounting obstacles in communication domain. Their inspiration is believed to stem from exciting moments of a mental battle for themselves.

The ordinary participants could undoubtedly benefit from the psychology studies: their identity matured greatly. Though their creativity dynamics was also positive, it hasn't been as impressive as the gifted showed. Interestingly, the creativity shift in the ordinary projects another trend: it was provided with more or less successful adaptation allowing them to enjoy emotional comfort and freedom of self-expression. Compared to the gifted the ordinary's creativity is much vulnerable: it has been immediately blocked when anxiety becomes real.

All in all, there are two different ways to creativity evolvement "switched on" by psychological intervention: the gifted can be considered to be susceptible to those simulations that are dramatic, even fearsome and rebellious ones while the ordinary are keen mainly on conditions which could be evaluated equal to beneficial and relaxing ones.

How long would such factors be valid for the both to create? In other words, are they temporary factors or stable ones? If either, what features will happen to be essential and predictive for future advantages and fruitful implications? These and lots of other questions are really challenging for explorations to come.

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