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Structural Flexibility of Thinking in the Context of Dialectical Approach in Psychology

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Abstract

This article covers a number of thesis concerning actual problematic of creative and productive thinking examination. Brief analysis of the concept of creative thinking in the context of structural dialectical thinking is provided as well. Notions of structure and multidimensionality are discussed when applied to examination of intellectual creation. New concept is introduced in the framework of dialectical thinking theory – this is structural flexibility of thinking (SFT). Also one can find results of the study dedicated to experimental examination of the interconnection between dialectical thinking and SFT (through usage of authorial diagnostic tools). The conclusion indicates that the presence of ability to perform dialectical transformations determines the ability to “turn the problem into an opportunity” by means of mental putting of the problematic object to the context of different structural interconnections.

Keywords: Dialectical thinking, Structural flexibility of thinking, Multidimensionality, Creativity, Productiveness.

1. Introduction

What is creative solution and how does it appear? We consider following attempts horizonless: a) to present the process of intellectual creation as spontaneous, unstructured and hardly-ever-possible to examine, phenomena, depending mostly on inspiration; b) to develop some sets of “prescriptions”, “technologies”, “operations” resulting in creative solution of a problem. Due to the specific features of the problems described earlier, as far as there is no correct answer, there’s no correct solution (i.e. way of solution, known before giving the task). Every time a person is completing such a task, the method is created individually. One can state that intellectual creation is both a unique and universal process. Universality lies in the fact that anyway the problem

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demands fixation and transformation of a contradiction. And uniqueness means that the content of the contradiction, oppositions that form it and the method of transformation (solution) always depends on concrete problem and the situation where initial problem occurred.

1.2. Theoretical framework

Our study has been performed in the framework of structural dialectical approach in psychological science. Researchers acting in the framework of structural dialectical approach usually distinguish two relatively independent lines of cognitive development – dialectical thinking and formal logical thinking. Structural dialectical approach considers dialectical thinking to be creative and productive. Within this theory the notions “creative” and “productive” are understood as synonymous as creation is a process of bringing to life something new. This is its most crucial and essential characteristic, not the aesthetic aspect or originality.

Creation of new content takes place through transformation of contradictive structure of a problematic situation. One can work with contradictions by means of dialectical logic only, because what stands behind formal logic is the rule of non-contradiction.

The article by Nikolay Veraksa and Sergey Zadadaev [1] says: “The object is so to say interlaced into different structures of oppositional relations. While examining it, researcher finds him/herself in one of the points of the space of opportunities. In fact, the analysis executed on the basis of the logic of opportunities means moving within the space of opportunities of this very object”.

Further: “…the object cannot always be described with one pair of oppositions. On the contrary, there is a multitude of other pairs, i.e. other cycles. Therefore it is important to be able to pass from one pair of contradictions to the next one. This transition is performed through the analysis of the object’s features and is linked to dialectical action of change of alternative”.

In another article Nikolay Veraksa indicates [2]: “…dialectical thinking provides movement within dialectical structures which describe the space of opportunities or possible transformations of objects. Successfulness of this process is determined by successfulness of selection of units of the content as oppositions and the skill of figuring out oppositions between and inside of these units on the substantial level”.

Therefore in order to change the object productively, it is necessary to see different pairs of oppositions contained by it, be able to pass from one pair to another and choose necessary units of content as oppositions.

Now one should switch for a while from structural dialectical approach to other concepts examining creativity. The majority of them addressed the notion of flexibility in one way or another [3]. This term is strongly associated with the concept of creativity developed by J. Guilford [4] and E. Torrance [5]. However other researches also pointed at the necessity to “change position”, “point of view” or the “context”, “turn to the most improbable variants” etc with the target to get new open minded solution. Still, unfortunately, no theoretical model of solution of problematic situation is proposed. It appears to be just going through all possible variants. We assume that in order to create such a model, the notion of flexibility should be complimented with the notions of structure and multidimensionality.

Lev Vygotsky indicates [6] that if we want a real productive act of thinking bringing thought to a totally diverse point, it is “necessary that X being a problem of our examination and included into the structure A, suddenly enters the structure B. Therefore, elimination of the structure where the problematic point X initially exists and transition of this point to a completely different structure is the main term and condition of productive thinking”.

Similar idea has been expressed by G.S. Altshuller [7], the author of the theory of Inventive Problems (TRIZ). Main feature totally essential for talented thinking, from his point of view, is the multidimensionality. “First characteristic of talented thinking is the ability to pass from the system to supersystem and subsystems… Behind a tree we should see not only the forest but the whole biosphere; not only the leave but the cells of the leave.
This complex, dynamical and dialectically developing world needs to be matched with its complete model – also complex, dynamical and developing in a dialectical way”.

Therefore, it seems to us purposeful to introduce a new notion to the field of scientific research. This notion is structural flexibility of thinking.

Structural flexibility of thinking is a characteristic of thinking which implementation allows figuring out opportunities of productive transformation of a problematic situation through putting it to the context of various structural interconnections. Examination of the structural flexibility seems challenging exactly in the interconnection with dialectical thinking, as productive transformations of the structure where the problematic object is involved, become possible through implementation of the operations of dialectical thinking only.

2. Study

2.1. Research Hypothesis

There is a significant positive interconnection between the following parameters: dialectical thinking and structural flexibility of thinking processes.

2.2. Participants

Diagnostic study has been conducted in Moscow City University of Education, Pre-school Education faculty. 53 4th year students of the day course took part in the experimental part of present study.

2.3. Methodological Toolbox

“What cannot be simultaneously?” technique, a method being an authorial modification of technique “What can be simultaneously” developed by Nikolay Veraksa [8]; [9]. This technique is dedicated to examination of mental strategies of handling with oppositions. Using this method allows us to answer the following questions:

1) If the respondent is able to handle with oppositions or he/she refuses to perform any mental actions with the latter.
2) Which mental strategy of handling with oppositions is mostly implemented by the respondent? This very method offers a whole specter of formal logical and dialectical actions to select from.

Technique of alteration of structural flexibility of thinking (SFT) – this is an authorial method of diagnostics of the general ability to analyze and change the situation putting it in the context of different structural interconnections. This technique has passed approbation in Moscow City University of Psychology and Education and Moscow City University of Education.

TTCT (verbal battery) – a method developed for diagnostics of creativity on the basis of 4 parameters: fluency, flexibility, originality and elaboration.

2.4. Diagnostic procedure

The study has been performed in writing in the group form. Forms for the techniques have been provided to the respondents consequently with a week break.

We used well-known standard Torrance technique without amendments. The method “What cannot be simultaneously” has been developed by Anastassia Belolutskaya [10]. The first stage of this study includes
proposing various actions with pairs of oppositions, so that the respondent may refuse performing the operation or choose any of the strategies.

Here is an example of a task. How do you think, can we call simultaneously black and white the following: zebra, bread, envy, grey color? What can be black and white simultaneously? Propose your idea and explain it.

Responses like “zebra”, “bread” or “envy” are examples of implementation of non-productive strategies of handling with oppositions where one either can find “formal mediation” (opposite features are united in an object mechanically and really exist separately), or “association under generic notion” (one finds a term that appears common for both objects but they are not integrated), or “metaphorical association” (the features appear to be imaginary).

Indication of “grey” as an answer is an example of productive strategy with usage of mental operation called “dialectical mediation”. It means, one object has been chosen to integrate opposite characteristics.

The respondent might decline all proposed options as well as refuse creating his own response. Therefore such a case is qualified by the interviewer as “refuse” from handling with oppositions.

Respondents are provided with some tasks of the same kind, i.e. they have to handle with the following pairs: “big-small”, “light-heavy”, “alive-dead”, “hot-cold”.

To calculate final score we needed to take in consideration both answers demonstrating implementation of some strategy and the share of refuses.

The method of measurement of structural flexibility of thinking has been developed and described by Anastasia Belolutskaya [11]. It has been designed to diagnose if the respondent is able to mentally put given situation to the context of various structural interactions.

Here are the examples of tasks:

1) In Russian fairytale “Repka” (turnip), this enormous vegetable is being pulled out of the soil by the grandpa, grandma, their granddaughter, a doggie, a cat and a mouse. Please, suppose what could be the sense for each of the personages to participate in this action? Meanwhile we all know perfectly well that above mentioned animals are not fond of turnip. Moreover, the grandpa has plenty of it stored in the cellar.

2) In fairytale “Cinderella” we all get the impression that the fairy is a good person (she helped Cinderella to marry her prince), and the stepmother is bad (treated the child really badly). Still the truth can be rapidly changed if we discover some new additional circumstances.

We know it very well, that Cinderella is a illegitimate daughter of the king of this country has one weak and frail child who hardly ever lives for long. Moreover, some weeks before the great ball Cinderella became full-aged.

The following company is aware of the whole story: the Stepmother, the Fairy, adoptive father of Cinderella. And those are who know nothing: Cinderella herself, the prince and the king of Yesland where the story is taking place. Please, try to presuppose what could be the sense of actions of:

The Stepmother and the Fairy, if they play against each other;

The Stepmother and the Fairy, if they hang together.

3) Help the Kolobok (the hero of Russian fairytale) and invent the way of persuasion of the Grandpa and Grandma to let him play in the forest. Try to find at least 5 arguments.
3. Comments and interpretation criteria

First task (based on “Repka” fairy tale) we meant to check if the person can go beyond present situation and fill the same actions with different meaning, i.e. to put the activity to the context of various structural interconnections. The interviewer gave points to the answers assuming that the sense of personages’ actions was not in the turnip only and appears to be distinct from each other. Here we enclose successful answers:

- The Grandpa wants to pull out the Turnip as it’s too big and could become a big sensation in the world; the Grandma did something wrong yesterday and wants to soothe the Grandpa somehow, the Mouse wants to demonstrate it’s power and make the Cat know that it, the Mouse, has a certain significance for the household too – so that the Cat does not pursue it anymore.
- The Grandma supposes the Grandpa to be stuck in the ground mud and wants to separate him from the Turnip; the Granddaughter hurt the Doggie some time ago, and the latter wants to tear the girl’s dress with her teeth; the Mouse is pulling because there’s a stock of corns hidden underneath of the Turnip.
- The Turnip is too huge for the garden, and needs to be moved away; the Grandma intents to sell the vegetable and buy some house stuff.

Examples of successful answers:
- The Fairy helps Cinderella to marry the prince so that she does not claim the throne and power in the neighboring kingdom – and the Fairy could make one of the Stepmother’s daughters the queen of that state.
- The Stepmother has been hiding the girl all those years so that she could not be traced and killed by the servants of legitimate heir of Noland.

In the second “Cinderella task” we wanted to find out if the person can, preserving the basic plot of the story, see opposite meaning of the personages’ actions, i.e. imagine such relations where the Stepmother becomes the good one and the Fairy turns into bad. We gave points for this very kind of answers.

Examples of successful answers:
- I will go to bring some firewood.
- I’ll pop round the remote market to buy some food;
- I’ll bring a heap of curing herbs enough for a year; it’s getting hard for my olds to pick it up themselves;
- I will go to bring some firewood.

4. Research Findings.

In order to analyze results of the diagnostics, we figured out the following significant parameters:

1. The share of dialectical answers in the “What cannot be simultaneously?” technique
2. The share of refuses to handle with oppositions in the “What cannot be simultaneously?” technique
3. The share of productive answers in SFT measuring technique, when the respondents had to demonstrate their ability to analyze the situation while putting it into the context of various structural interconnections.
4. “Flexibility” index in the test by E. Torrance.

In order to check our hypothesis we calculated correlation index for the pairs of above mentioned parameters.

Significant positive correlation has been discovered between the share of dialectical answers in “What cannot be simultaneously?” technique and share of productive answers in the SFT measuring technique \( r = 0.572 \).
Significant negative correlation has been discovered between the share of refuses to handle with oppositions and the share of productive answers in the SFT measuring technique ($r = -0.576$).

Herewith, it is crucial for our study that there was no statistically significant correlation between such parameters as “Flexibility (in TTCT)” and “Structural Flexibility of thinking” ($r = -0.142$).

5. Discussion

The absence of statistically significant correlation between the structural flexibility of thinking and “flexibility” described by works devoted to the phenomena of creativity, confirm the fact that the meaning of newly introduced term SFT does not duplicate the feature explored in the studies of J. Guilford and E. Torrance, even despite the lexical similarity.

Such a parameter as “refuse from handling with oppositions” seems to us an index of rigidity of thinking. Thus, significant negative correlation looks reasonable and indirectly confirms the hypothesis.

What directly confirms the hypothesis is significant positive correlation between the share of dialectical answers and SFT. Therefore we can state that if a person has the ability to dialectical transformations determines his/ her ability, saying it in two words, to “turn the problem into an opportunity” through putting it mentally to a context of various structural interconnections. So, this interrelation of SFT and dialectical mental action of change of the alternative seems to be the most future-proof subject of further examination.

6. Conclusion

Initial hypothesis has been empirically confirmed. There is a statistically significant positive interconnection between the ability to perform dialectical mental actions with oppositions and structural flexibility of thinking. Obtained results can be helpful for elaboration of educational programs and series of trainings designed for formation and development of dialectical thinking of adults. The issue concerning similar interrelations in the thinking of children and adolescents needs additional research.

References