Revista Mexicana de Análisis de la Conducta
Núm. monográfico, "Las diferencias individuales en humanos"
1990, vol. 16, pp. 55-70

The Einstellung-effect. Theory and experiment

(El efecto de Einstellung. Teoría y Experimentación)

George A. Nizharadze[1]

D. Uznadze Institute of Psychology, Georgian Academy of Sciences,
Tbilisi, USSR

RESUMEN

Se investigaron algunos fenómenos de rigidez en solución de problemas. Según los datos obtenidos experimentalmente (experimento 1), puede afirmarse que por lo menos existen dos tipos de rigidez: 1) La rigidez motivacional (el efecto Einstellung y fenómenos afines), la cuál tiende a aumentar con la ansiedad; y 2) La rigidez intelectual que surge durante la solución de problemas de discernimiento y que no se caracteriza por la tendencia antes mencionada, pero que muestra una correlación significativa con el cociente intelectual.

En el experimento 2 se puso a prueba la hipótesis que afirma que la tendencia de evitación al fracaso puede ser uno de los posibles determinantes de la rigidez motivacional. Los datos obtenidos muestran que los sujetos con tendencia al logro muestran un efecto Einstellung considerablemente menor que los sujetos con una tendencia de evitación al fracaso. Este estudio se basó en la teoría "Ustanovka" como fundamento conceptual.

Descriptores: Rigidez, efecto Einstellung, disposición, "Ustanovka", motivación de logro, solución de problemas.

Abstract

Some phenomena of the problem-solving rigidity have been investigated. Considering the experimentally obtained data (experiment 1) it can be stated that there exist at least two types of rigidity: 1. The motivational rigidity (the *Einstellung-effect* and the like), which tends to increase in anxiety; 2. The intellectual rigidity, which is awoken during the solution of insight problems and which is not characterized by the above-mentioned tendency, but manifests the significant correlation with the Intelligence Quotient. In the experiment 2 the hypothesis has been tested, according to which the failure-avoidance tendency may be one of the possible determinants of the motivational rigidity. The obtained data has shown that the subjects with prevailing success-achievement tendency manifest considerably weaker *Einstellung-effect* than the subjects in whom the failure-avoidance tendency prevails. Uznadze's Theory of *ustanovka* as served as a theoretical background for the research.

1 George A. Nizharadze, 380079, Atenski per. 18, Tbilisi, USSR

Descriptors: Rigidity; einstellung-effect; set; ustanovka; achievement motivation; problem-solving.

1. EXPERIMENT

a) Preliminary notes. Hypothesis 1.

In 1939 A. J. Luchins had developed a new method for problem-solving investigation. This method stimulated a great deal of future research. The method was rather simple and a kind of a paper-and pencil test. The subjects were told that there are three water jars of different capacities and unlimited quantity of water at their disposal. By means of manipulating jars and water definite quantity of water was to be obtained.

E. g. The capacities of jars: A = 18 1; B = 43 1; c= 10 1. Required to obtain: 5 1.

Solution: 43 - 18 - (2 x 10) = 5 (B - A - 2C)

Such type of problems (called *water-jar problems*) has been applied earlier in different kinds of intelligence tests. Luchins'es novelty consisted in the following: first 5 problems could be solved by means of one formula (B-A-2C). After that problems, having two solutions have been presented: an old one (B-A-2C) and a much simpler new one (e.g.: A-C; 2A etc.). It was ascertained that most of the subjects solve the critical series in the old way, whereas the control subjects who had not solved the *Einstellung* series, as a rule, use the 'direct' (Luchins'es term) solutions. When, after the *Einstellung* series, the problem with the one, direct solution was presented ('the extinction problem'), the solving time considerably increased and some of the subjects were unable to solve the problem at all (Luchins, 1942).

This phenomenon dubbed the *Einstellung-effect*, encouraged a series of experimental studies. It was found that motivational and stress factors (time limite, anxiety etc.) increase the effect (Cowen, 1952; Van de Geer, 1957). It was also shown that the *Einstellung-effect* does not reveal any correlation with intelligence (Van de Geer, 1957).

Since then the Luchins'es *Einstellung-effect* has fallen in the same category as Dunker's 'functional fixedness' (Dunker, 1945), Maier's 'direction' (Maier, 1930), Rees & Israel's 'set' (Rees & Israel, 1935) etc. It can be considered to be a classical method designed to investigate problem-solving rigidity.

Rokeach's definition of behavioral rigidity seems to be a most comprehensive and precise one. According to it, "rigidity is an inability to change the set or the structure of the field" (Rokeach, 1948). Along with

the *Einstellung-effect* some other effects, occurring during the solution of the *insight* problems, also fall under the same definition.

For example, the 'six matches puzzle' is often used in different tests. Using six matches the subject has to construct four equilateral triangles. The only solution consists in constructing a tetrahedron, which presupposes the application of the third dimension. The overwhelming majority of the subjects fail to find an adequate solution, since they work on the plane (i.e. using two dimensions) and thus, demostrate the inability to change "the structure of the field".

It is logical to ask whether we can attribute the *Einstellung-effect* and the failures in the insight problems solution to analogous phenomena having the same causes.

Let us consider the *Einstellung-effect*. In most cases the goal (i.e. the solution) is achieved, though in an indirect way. According to Luchins, "the subjects with strong set spend the most time on calculation, whereas the 'direct' subjects spend relatively long time on the searching for a solution. In both cases the expenditure of time is nearly equal. A shortcoming of the rigid method becomes obvious only during the presentation of the 'extinction problem'" (Luchins, 1942, p. 56).

In this context I should like to cite a curious case happened to an outstanding American mathematician John Von Neumann. Somebody showed him a problem having two solutions: a "difficult" one (to integrate the infinite series) and an "easy", but not so obvious (to multiply 75 by 2). After having read the conditions of the problem, Von Neumann almost inmmediately gave a correct answer. When asked, how he could find the answer so quickly, mathematician replied with surprise: "Of course I've integrated the series" (Smullyan, 1978, p.185). Thus the indirect solution can be even more rapid than the direct one.

That is why, the *Einstellung-effect* can not be considered as an absolutely negative phenomenon. In special cases it works quite adequately. There exist a lot of well-adopted algorithms, by means of which we deal with various life problems. A conflict, and even a dramatic one, usually arises, when an old algorithm fails, but an individual or a whole group or people cannot or do not discard it because of various reasons. The *Einstellung-effect* and the similar phenomena have one essential feature in common, i.e. that the rigidity manifested by a present behavioral pattern shows close connection with its subjective value, which, in its turn, dependes on motivational factors.

It is not the case with insight problems. A subject is repeating again and again his trials, but cannot find the solution. As Dunker notes, an individual is chained to the perceptual field (Dunker, 1945, p.203). By analogy

with the *Einstellung-effect* one can suppose that exactly this kind of method (ineffectivein this particular case) has been successfully used in the past. In case of the 'six matches puzzle' this hypothesis looks fairly probable, for practically everyone is familiar with numerous match-puzzles solved on the plane. But there is a number of insight problems, which cannot be solved in any orthodox manner. In the case of insight problems it seems to be logical to search for roots of failures in cognitive abilities of an individual.

Thus the hypothesis, underlying the first research can be formulated as follows:

In problem-solving at least two types of rigidity can be distinguished:

1. Motivational rigidity— consists in a disability to abandon the already found algorithm, despite the availability of an easier way. This type of rigidity depends on a subjective value of the algorithm once found. In this case the intellectual potential of a person may be high enough, but it is limited to the 'narrow channel', formed by motivational factors.
2. The intellectual rigidity— consists in a disability to think in an unorthodox way. In this case the channel is 'wide' enough, but the intellectual potential is poor.

It must be noted that both types of rigidity can be displayed simultaneously.

I personally believe that there exists one more type of rigidity —'the rigidity of objectification', which consists in a disability to notice a problem in a problematic situation (according to D. Uznadze objectification is an act which triggers high cognitive functions). To illustrate this statement let us turn to a well-known case: Isaac Newton, who noticed the deepest problem in the most ordinary natural phenomenon— the falling of an apple — manifested complete absence of the mentioned type of rigidity.

But the rigidity of objectification has never been a subject of experimental investigation.

b) Experimental procedure

The hypothesis has been tested in the following way: it is common knowledge that the heightened anxiety results in an increased *Einstellung-effect.* If it could be demostrated in an experimental way that the factor of anxiety influences the solution of insight problem in some other way, or does not influence it at all, the existence of at least two rigidity types would be proved.

The subjects were 3-4 year students of Tbilisi University (departments of physics and biology; 242 subjects). Experiments were carried out individually.

In the first series of an experiment the *Einstellung-effect* has been studied. An experimental group consisted of 61 subjects, a control one - of 60 ones. After the presentation of 5 *Einstellung* problems, 5 critical problems were presented to the control group. The problems have been adopted from Van de Geer's (Van de Geerm 1947. chap.5) investigation (table 1). Such kind of the *Einstellung* solution has been preferred because of Van de Geer's remark, according to which Lucjoms'es formula encourages the tendency to use all three jars. The magnitude of the effect was measured by the number of indiect solutions.

Tabla 1

No.	Jars			Task	Solution
	A	B	C		
1	14	13	11	17	2A-C
2	12	11	5	19	2A-C
3	20	17	12	28	2A-C
4	16	14	10	22	2A-C
5	11	8	5	17	2A-C
6	17	14	6	28	2B or 2A-C
7	11	8	7	15	B+C or 2A-C
8	17	8	21	13	C-B or 2A-C
9	14	9	23	5	A-B or 2A-C
10	21	11	14	28	2C or 2A-C

Table 1. The water-jar problems used in the experiment 1.

Before the *Einstellung* series were presented, the experimentator demostrated on the blackboard an example of 'water-jar problem' solution (formula of solution: A+C).

It was necessary to raise the anxiety level in the experimental group. For this purpose 'the mild stress method' has been applied: the subjects had to fill out a special, Cattell-type quesstionnaire. They were told that after analyzing their responses "the individual coefficient of personal maturity" would be determined, and this "coefficient" would be deduced from their fundamental personality traits, excluding the intelligence. They were also told that in the next experiment their intelligence was to be tested. The result would be considered very poor if the 'coeficient" was less than 0.5.

A week later the experimenter privately reported to every subject their "individual coefficient". Everybody was told that he had been rated 0.43. Directly after that, subjects were presented with 'the water-jar pro-

blems'. At the end of the experimental procedure the experimenter apologized to the subjects and explained the real purpose of the experiment.

121 subjects took part in the second series of the experiment. 64 of them made up the experimental group, 57 - the control group. In these series 'the two-riders-puzzle' was used (fig. 1). According to the instructions, three cards had to be arranged in such a way that both the riders would appear riding the horses.

As a rule the subjects are confused by superfluous aspects of the horses' bodies (deformed trunks) and are trying to place the card with the riders perpendicularly to the cards with the horses, whereas the right solution consists in parallel arrangement of the cards.

The 'two-riders-puzzle' has been chosen because of its less complicated character (as compared e.g. to the six-matches-puzzle); in the long run most of subjects solve it.

In the second series the subjects of the control group were presented with the 'two-riders-puzzle' and time spent on the solution has been fixed. In the experimental group, before the puzzle presentation, the level of anxiety has been elevated by means of the foregoing method.

At the end of the experiment, all subjects had taken an intelligence test. SCAT-type test, commonly used in the USSR, has been applied. Next, the IQ values were compared to the magnitude of the *Einstellung-effect* on the one hand, and to the time spent on 'two-riders-puzzle' solution- on the other hand.

c) Results and discussion

Results, obtained in the first series of the experiment complety conform to the earlier researches of the *Einstellung-effect*:

1. The *Einstellung-effect* has fully revealed itself (this is emphasized, because of the unusual information —Radfor & Burton, 1974, p.55—, according to which English students do not display the *Einstellung-effect* at all).
2. Elevation of anxiety increased the magnitude of the *Einstellung-effect* (table 2).

Tabla 2

Groups	N	N. of indirect solutions
experimental	61	3.71
control	60	2.35

Table 2. Median values of the Einstellung-eJJect in experimental and control groups (Note: The values differ significantly)

In the second series of the experiment the average time spent by the experimental and the control groups was found to be practically equal (table 3).

Tabla 3

Groups	N	Time
experimental	64	461 "
control	57	456 "

Table 3. Average time spent on the two-riders puzzle in experimental and control groups

As it was expected, IQ did not show any correlation with the *Einstellung-effect.* As for the time spent on the puzzle solution, it appeared to highly correlated with IQ:

$$r = 0.67 \qquad p<0.05$$

Thus, the hypothesis, according to which two types of the problem solving rigidity —a motivational and an intellectual ones— can be distinguished, has been experimentally confirmed.

2. EXPERIMENT

a) Theoretical issue. Hypothesis 2.

According to the experimental data, individuals, being in approximately identifical conditions, manifest a different magnitude of the *Einstellung-effect.* Considering the dependence of the *Einstellung-effect* on the level of motivation, it seems reasonable to suppose that one must look for the explanation of this fact in personality traits. Because of the difference in per-

sonality features one and the same problem represents different degrees of threat, of subjective opportunity to self-realization, etc., for different individuals.

Here I find it necessary to state some principal propositions of D. Uznadze's theory, which served as a basis for the following research. Set out as briefly as here, the theory may seem to have a speculative character, but in fact it does account for a big number of the diverse phenomena and is confirmed by solid experimental arguments (in details see: Uznadze, 1966; Sherozia, 1978; Nadiraschivili, 1988).

The basic concept of Uznadze's theory is *ustanovka*p. 12, the last paragraph: The term *ustanovka* is traditionally translated into English as 'set', and more seldom - as 'attitude'. But the usual meaning of these English terms does not completely overlap with the one of *ustanovka*. That is why I prefer to use the Russian term, the integral modification of personality, its readiness to perceive the future events and perform definitely directed actions; *ustanovka* serves as a foundation for purposeful and selective activity. Put in other way, any goal-directed behavioral act is preceded by the formation of a specific psychophysical structure, which represents a disposition of the whole personality at a given moment.

Ustanovka is formed through the concurrence of two following factors:

a. The need factor (the concept of need is taken in its broad sense) — that is the subjective factor of *ustanovka*;
b. The situational factor —i.e. external conditions necessary for need satisfaction (objective factor).

Nadirashvili (1988) distinguishes the third factor of *ustanovka* —individual abilities.

After the goal of action is achieved and the need is satisfied, *ustanovka* becomes inactive, it turns into the fixed entity and serves as material, as a ready functional block, for new *ustanovkas*. Generally speaking, any ready response to definite motivational or environmental demands can be considered as *fixed ustanovka* (FU). A pleasant posture when reading, social attiude, as well as extraversion (i.e. a fundamental personality disposition) — all of them fall under the same category of FU.

According to Uznadze a spontaneous striving towards activity is a specific feature of an organism. Everything that is acquired through phylogeny or ontogeny by an individual organism (separate organs, receptors, mental formations etc.) possess a functional tendency (FT) towards activity. Spontaneous motions of an infant, on the one hand, and dreams — on the other, are the examples of FU manifestations. Obviously, FT is characteristic of FU too.

FT, being specific to a given FU, could be defined as relative easiness of its including into *ustanovka* structure.

The magnitude of FT depends on several factors. The mains are listed below:

1. Frequency of repetition of similar behavioral acts. The more frequent the repetition, the stronger FT of corresponding FU.
2. Strong FT is peculiar to *ustanovka* underlying the unfinished action (the *Zeigarnik-effect*).
3. Strong FT is peculiar to *ustanovka*, which determines successul realization of most subjectively valuable motive (self-actualization, elevation and preservation of one's own status in a group, affiliation etc). In this case one may speak of a subjective value of FU.

Subjective value greatly determines one more feature, specific to FU-irradiation. The most valuable FU-s, which determine personality-style, are, at the same time, the most irradiated ones. Almost every behavioral act of an individual is somehow marked by such FU-s.

The most valuable, irradiated Fu-s, taken together with underlying motives, form the "center", the "core" of a personality. "Peripheral" FU-s are of less value and less irradiating. It must be emphasized that any lowering of FU status (loss of value) is connected with considerable expenditure of mental energy. One may say that every FU (behind of which there stands the whole personality, striving to preserve it integrity) resists to lowering its status in the hierarchy. The higher the FU value, the stronger is the resistance and more potentially rigid is given FU [or, using K. Lewin's terminology, the greater is its topological rigidity (Lewin, 1936)].

FU acquires high personal value because of the following reason: it helps an individual to find the way out of problematic situations without threatening his personality. But because of its high value, FU can be easily actualized in an inadequate situation. In such cases we speak of rigidity phenomenon, which, according to our classification, must be atributed to motivational type.

One can hardly think of a person, less predisposed towards rigidity than Albert Einstein. But until end of his life the great physicist could not accept Heisenberg's Principle of Uncertainty. The belief in a strict determinism of all processes in the Universe ("The Lord does not play dice") was so deeply personal and valuable for Einstein that he was not able to abandon it (Prigogine & Stengers, p.228)

Thus, the high value of FU at the same time signifies its high potential rigidity. Relative rigidity of a person depends on his tendency (which, in turn, can be considered as FU) to attach high value to successful behavioral act. In concrete situation *ustanovka* of a rigid person includes in its

structure only one FU from several available ones, that could be applied to given situation. Namely, FU, because of its high value, predominates over the other FU-s and, also, blocks cognitive mechanism by means of which a new behavioral pattern can be developed. In the same situation a nonrigid individual has several FU-s at his disposal, which are of nearly equal value. owing to that the behavior of a nonrigid person is more adequate. But is has to be noted, that in some spheres of activity a nonrigid individual can display high rigidity (see above the example with Einstein).

According to the given standpoint, individual differences in susceptibility to the *Einstellung-effect* can be explained by unequal subjective values of the success and, therefore, the successful method, for different individuals. Besides, there is a direct connection between subjective value of successful method and the degree of threat, which given problem represents for an individual. This indicates that the *Einstellung-effect* must correlate with personality disposition, or, using our terms, with FU that determines specific perception of a problematic situation.

Such kind of disposition is well known in personality psychology. I mean so called failure-avoidance tendency, which, together with success-achievement tendency, makes up the basic strategies of a personality in the case of achievement behavior (McClelland, 1958).

Comprehensive survey and analysis of most important researches in achievement can be found in Heckhausen, 1980, chapters 6,9.

In this context I am interested in the essence of above mentioned tendencies. An individual, in whom the success-achievement tendency prevails, in similar conditions, will be inclined to more risk-taking behavior than a person with prevailing tendency towards failure-avoidance. Thus, we may suppose that a failure-avoidance oriented individual would be more attached to such behavioral pattern, that has proved to be successful in analogous situation.

The hypothesis 2 can be stated as follows:

The individuals with prevailing failure-avoidance tendency would be more susceptible to the *Einstellung-effect* than the individuals in whom the success-achievement tendency prevails.

b) Experimental procedure

In this experiment the success-achievement and failure-avoidance tendencies were not measured by traditional methods (TAT). Instead, recording of specific features, while choosing the problems of different difficulty, has been used. As it was repeatedly shown (Atkinson, 1957; Heckhausen,

1980, chap. 9), individuals with one of the prevailing tendencies, faced with problems of different subjective probability of success (P^s), behave in different fashion. Subjects, directed into success-achievement, are guided by 'common sense': they choose first the problem with P^s near to 0.5. After successful solution such subjects evenly raise their level of aspiration, and after the failure — evenly reduce it.

A subject directed to the failure-avoidance behaves in a different manner. He avoids the problem with P^s near to 0.5 and chooses either the easiest problem or the most difficult one. The reason of choosing the easy problem is quite obvious — the probability of failure is very low. The choice of the most difficult problem can be explained this way. The subject does not perceive the failure *per se*. It looks so as if has found such an explanation for himself: "The problem is so difficult that it's almost impossible to solve. I did fail but, at least, I've been brave enough to choose it'" [detailed analysis of behavioral patterns manifested in above mentioned situation see in: Heckhausen, 1980, chap.9)]. If the subject unexpectedly solves the dificcult problem, the failure-avoidance tendency paradoxically increases. In that case the subject behaver as if intentionally fails in order not to meet a stronger threat in the shape of a next problem of a higher order. But more often the subject comes down by a leap and takes the easy problem. When a subject, that chose the difficult problem, fails, in most cases he takes a even more difficult problem, that gradually reduces the avoidance motivation. If a subject cannot solve the easiest problem, P^s decreases, and the avoidance motivation increases. That is why the most difficult problem would seem the most attractive, or, rather, less threatening to him and he will choose namely that one the guaranteed failure reduces the avoidance tendency.

The subjects were senior pupils of secondary schools. The results of 114 subjects have been recorded.

The first series was carried out in the following way: in front of the subject lay 10 numbered cards; the numbers 1-3 were written in green, 4-7 —in yellow, 8-10— in red. The subjects were given the following instructions:

In front of you there are ten numbered cards. On the other side of each card conditions of a problem is written. The difficulty of the problems increases with the number of cards. The first three problems are easy, the next four —of medium difficulty, and the three last ones are difficult. You may take a problem of any number. After being acquainted with conditions try to solve the chosen problem. Then try any other one, — it does not matter whether you have solved the first one or not. After first three obligatory trials you can

choose whether continue or not. If you solve the tenth problem, you may ask for the eleventh, even more difficult one.

It must be noted that the type of problems in present case had minor importance, for the focus of interest was not the problem-solving itself, but the numbers of chosen problems.

The problems have been proved on the broad contingent of students on practical works in psychology in Tbilisi University.

The test problems used in the experiment:

1. A coach harnessed with three horses has ridden 15 km in one hour. What distance has each horse covered?
   The answer: 15 km each.
2. A turtle needs one hour and half to pass the stadium track moving clock-wise, and 90 minutes moving counter clock-wise. How can you explain the lack of coincidence in results?
   The answer: One hour and half = 90 min.
3. There are 7 brothers in a family, each one has one sister. How many children are there in the family?
   The answer: 8.
4. I have two coins that add up 15 copecks (cents). One of these coins is not a *pyatak* (nickel). What coins have I?
   The answer: 5 and 10 cop. (cents).
5. In a bag there are 24 red and 24 black socks. What is the least number of socks you most take out without looking, to get undoubtedly one pair of the same color?
   The answer: 3.
6. A book costs a rouble (dollar) and a half of its price. What is the price of the book?
   The answer: 2 roubles (dollars).
7. A surface of a pond is covering with algae. Every day the green area redoubles. On the sixth day a half of surface becomes green. On which day the whole surface would get green?
   The answer: On the seventh.
8. A hundred of houses stay along the street. A craftsman must make numbers for every house, from 1 to 100. How many nines would he need?
   The answer: 20.
9. In eight absolutely similarly looking details one is a bit lighter. How one can find the light detail by only two weighings on a two-scaled balance?
   The answer: Weigh gy three, then by one.

10. At 3 o' clock the clock strikes three strokes in 12 sec. In how many secons would strike the clock six strokes at 6 o'clock?

The answer: In 30 sec.

11. The son of a colonel's father is talking with the father a colonel's son. Who is talking to whom if the colonel himself is absent?

The answer: The colonel's brother is talking with the colonel's husband. The colonel is a woman.

In the second series the 'water-jar' problems were presented. The experimental procedure was similar to one used in the experiment 1.

c) Results and discussion

As it was noted above, the prevalence of one of the two tendencies can be judged according to two parameters:

1. The number of the problem first chosen. When a subject chooses a problem of P^s near tp 0.50, it indicates the relative prevalence of the success-achievement tendency; and when a subject takes too easy or too difficult problem, one may consider the prevalence of the failure-avoidance tendency.
2. 'Logicality' in choising the following problems. 'Logicality' means the choice of the more difficult problem after cuccess and the easier one — after failure. The logical choices indicate the achievement motivation.

First it was necessary to look for the correlation between those two parameters. For this purpose the 'logicality index' was calculated. Next, the median values of the index was compared in the three zones of difficulty (zone 1 -the problems 1-3; zone 2 - 4-7; 3 - (-11). Logicality index is represented by the following formula:

I^L = Number of logical choices / Total number of choices.

It is clear that the index value may vary from 0 to 1.

The results are presented in table 4.

Tabla 4

Difficulty zones	N	Median value of I_L
1	30	0.45_a
2	60	0.73^b
3	24	0.51_a
1 +3	54	0.48_a

Table 4. The distribution of median values og logicality index acoording to the difficulty zones (Note: Median values, the letter indexes of which do not coincide, differ significantly)

Thus, the data indicate that the two parameters are closely connected with each other.

Next, the two parameters were compared separately with the *Einstellung-effect* manifestation.

The Logicality index and the *Einstellung-effect* showed to be highly correlated:

$$r = -0.7 \quad (-0.696) \qquad p<0.001$$

The high negative correlation conforms to the stated hypothesis.

The difficulty zone- the *Einstellung-effect*. The data are presented in table 5.

Tabla 5

Difficulty zones	N	Median value *of Einst.-eJJ*
1	30	4.1 a
2	60	2.25 b
3	24	3.0 c

Table 5. Median values of the Einstellung eJJect acoording to the difficulty zones (Note: Median values, the letter indexes of which do not concide, signifficantly differ).

In this data the difference between groups 1 and 3 must be noted. The difference shows that the subjects with too high and too low initial levels of aspiration are not absolutely identical. This fact needs the following investigation.

On the last stage of the data analysis all the subjects were divided in three groups. The group A was formed by the subjects, which manifested the high achievement tendency on both parameters ($I_L = 1$; the initial choice from the middle zone) the group B the subjects with high avoidance tendency ($I_L = 0$; the initial choice from zones 1 or 3); group C - the subjects of intermediate type. Then the median value of *Einstellung-effect* for each group was calculated (table 6).

Tabla 6

Groups	N	Median value *of Einst.- eJJ*
A	47	1.62 a
B	19	4.33 b
C	48	3.40 c

Table 6. Dependance of the Einstellung-eJJect manifestation on prevalance of the success--archievemnt to the failure avoidance tendencies (Note: Median values, the letter indexes of which do not coincide, differ significantly).

Thus it may be concluded that the experimental data confirm the hypothesis 2: the subjects, directed on the failure avoidance, manifest considerably higher susceptibility to the *Einstellung-effect* that the subjects directed on the success achievement.

Finally it must be emphasized that the failure-avoidance tendency is not considered to be the only source of the motivational rigidity. For instance, rigidity of that type can be determined by anal traits of personality (in Freudian sense). For the anal personality the given behavioral pattern would possess a high value because of his intellectual energy invested in it. This may be illustrated by the exclamation of White Knight (L. Carroll, Through the Looking-glass): "It's my own invention!" where the stress falls on *my own*. This (as well as some other) assumption needs the further experimental investigation.

REFERENCES

Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review, 64,* 224-228.

Cowen, E. L. (1952). The influence of varying degrees or psychological stress on problem-solving rigidity. *Journal of Abnormal and Social Psychology, 47,* 512-529.

Dunker, K. (1945). *On problem-solving.* Washington, DC.

Hechausen, H. (1980). *Motivation und Handeln [Motiation and activity].* Berlin-Heidelberg-New York: Springer.

Lewin, K. (1936). *Principles of topological psychology.* New York.

Luchins. A. S. (1942). Mechanization in problem-solving. *Psychological Monographs, 54,* No. 6.

Maier, N. R. F. (1930). Reasoning in humans. 1. On direction. *Journal of Comparative Psychologyt, 10,* 115-143.

McClelland, D. C. (1958). Methods of measuring human motivation. In J. W. Atkinson (Ed.) *Motives in fantasy, action and society* (pp. 7-48). Princenton, NJ.

Nadirashvili, S. A. (1988). *Psikhologia ustanovki [Psychology of set*]. Tbilisi, USSR: Metsniereba.

Prigogine, I. & Stengers, I. (1984). *Order out of Chaos.* London: Heinemann.

Radford, J. & Burton, A. (1974). *Thinking. Its nature and development.* London: Wiley.

Rees, H. & Israel, H. (1935). An investigation of the establishment and operation of mental sets. *Psychological Monographs, 46,* No.6.

Rokeach, M. (1948). Generalized rigidity as a factor of ethnocentrism. *Journal of Abnormal and Social Psychology, 43,* 259-277.

Sherozia, A. E. (1978). Psichoanaliz i teoria neosoznavaemoi ustanovni: itogi i perspektivi [Psychoanalysis and the theory of unconscious set: Findings and prospects]. In A. S. Prangishvili, A. E. Sherozia, F. V. Bassin (Eds). *The unconscious: nature, functions, methods of study:* Vol. 1 (pp.37-64). Tbilisi, USSR: Metsniereba.

Smullyan, R. M. (1978). *What is the name of this book.* Englewood Cliffs, NJ: Prentice Hall.

Uznadze, D. N. (1966). *Psychology of set.* New York.

Van de Geer, I. P. (1957). *A psychological study of problem-solving.* Haarlem: De Toorts.