

# TEST EFEKT

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## 1. INTRODUCTION

The test EFEKT can be used to evaluate achievement motivation that is close to real life. The test is inspired by several areas of psychology:

- A. Work of Kurt Lewin and his theory of motivational field
- B. Research on level of aspiration and achievement motivation
- C. Research in the area of intelligence

### A.

The test is based on the dynamic theory of personality by Kurt Lewin and his school (Lewin, 1935). The theory supposes that each person and his/her surrounding form a psychological field. The field consists of material and virtual objects, people and a particular person itself. Each object in this field has its own value, valence. This valence depends on momentary configuration of a field that results from the interaction of a particular person (his/her personality, motivation, needs, mood) and the rest of the field. Psychologists are interested in, among others, which objects have the highest value in a particular person.

### B.

EFEKT follows the line of research of level of aspiration started by Dembo (1931). It was a by-product of her investigation of anger. She concluded that people set easier goals when required goals are too difficult. She called it momentary level of aspiration. The study was followed by Hoppe. He considered level of aspiration to be important personality diagnostic criterion. According to him feelings of success or failure are determined upon set goals rather than the performance itself. Both authors represented qualitative approach.

The first author performing quantitative approach was J.D. Frank (1935). He defined the level of aspiration as “*the level of future performance in a familiar task which an individual, knowing his level of past performance in that task, explicitly undertakes to reach*”. He also investigated the reliability and validity of methods. He suggested involvement of ego needs to the explanation of level of aspiration. He distinguished three needs which the ego is determined by three needs (Frank, 1935):

- a. to keep the level of aspiration as high as possible
- b. to make proper prediction so as close as possible to the real performance
- c. to avoid failure

Rotter was another author concerning this topic. He noticed unusual shifts of some participants (increase of their level of aspiration after failure and conversely decrease after success) in his research. He considered it to be an indicator of emotional instability. He distinguished three determinants of setting level of aspiration – adequacy of adjustment to success and failure and flexibility of the level of aspiration (Rotter, 1942a, 1942b, 1943, 1945). Jucknat used mazes to study level of aspiration. He found that level of aspiration in one domain can determine the level of aspiration in another domain (Jucknat, 1937). Based on this conclusion, level of aspiration seems to be a stable personality trait.

Level of aspiration is related to the topic of achievement motivation. Atkinson established the avoid–approach theory which is based on the assumption that achievement motivation can be divided into two separate tendencies – to avoid failure and to achieve success. Thus, avoid or approach motive determines the behaviour according to what motive is stronger in particular person at particular time (Atkinson, Raynor, 1978).

### C.

Next area of inspiration comes from work of Robert J. Sternberg and his theory of intelligence, the concept of practical intelligence in particular (Sternberg, 1985). The emphasis of the concept is on real life abilities which are called tacit knowledge. This knowledge is hard to explain by words; it is learned by life experience. Significant differences between less and more successful people in terms of their tacit knowledge in variety of domains were shown (Wagner, Sternberg, 1985; Hedlund et al., 1998; Insch, McIntyre, Dawley, 2008).

## 2. DESCRIPTION OF THE TEST

The method was made by a head of Psychological laboratory of Sport research institute of Czech armed forces in 2000, Miloslav Stehlik, Ph.D.

The test is intended to overcome difficulties which psychologists face in using classical intelligence tests. These tests do not correspond with real life very much. They predict school performance very well but they fail in prediction of real life success (Chamorro-Premuzic and Furnham, 2006). Contrary to them, the method EFEKT assesses achievement motivation, particularly response to success and failure which is more related to real life situations.

A client is put into the artificial psychological field which consists of ten times ten tasks of different difficulties and of different motivational values because of different point evaluation from 1 to 10. A person has to harmonize a desire to be given as many points as possible and his/her own abilities. The choice of a task is continuously confronted with the performance in chosen tasks. A tested client makes his/her own decision to achieve the best results. The way how he/she makes it depends on a personality of a client and his/her motivation.

He/she is forced to assess his/her capabilities and to decide which strategy he/she will use. He/she can get more points by solving more difficult task but this task is less probable to be solved. On contrary, less difficult tasks are more probably to be solved but they are valued by fewer points. The test contents verbal as well as nonverbal tasks.

The difficulties of the tasks are determined by the percentage of people who are able to respond them correctly. Thus, task number ten is solved by 10% of people, task number one by 90 % of people.

Time used to answer to a particular task is recorded as well. It can be used for qualitative analysis of a particular client.

First, a client agrees with the assessment procedure by filling in the form asking about demographic data. By this, the ability of the client to communicate with a computer by mouse and keyboard as well as the ability to understand instructions is assessed.

Next, a client is familiarises with the test itself – with the manipulation of the tasks. The client is said this test assess his/her intellectual abilities. The client is emphasized to choose ten times the level of difficulty of the tasks. Tasks number one are the easiest one, tasks number ten are the most difficult ones. The aim is to achieve as many points as possible.

The test starts after a rehearsal. The test includes 10 tasks. Example of a task and illustration of a screen is shown on figures 1 – 2 (nonverbal tasks were selected for easier understanding).

$$\frac{271+273+275+272+274}{5} =$$

271  
272  
273  
274  
275

Dále...

75 vteřin, zbývá 63

Figure 1 Example of a task

Which point moves fastest?

A  
B  
C  
D  
E

Dále...

Celkem 90 vteřin, zbývá 76

Figure 2 Example of a task

## 2.1 Assessment procedure

The strategy chosen by a particular client is assessed. It includes:

1. reactions of a client on correct and incorrect answers
2. number of shifts

Based on Rotter's research we distinguish usual and unusual shifts (Rotter, 1942) after correct and incorrect answers. On the contrary to Rotter, we divided unusual shifts into two types. To sum up we distinguished three tendencies:

1. Conformity – It is a usual shift. A person is behave in concordance with the rule – he/she chooses more difficult task after correct answer and less difficult one after incorrect answer.
2. Attractiveness – It is an unusual shift. A person is attracted by most difficult tasks, by big profit of points. Even after incorrect answer he/she chooses more difficult task.
3. Refusal – It is an unusual shift. A person is afraid of difficulty of a task and he/she chooses less difficult one after correct answer.

Each shift in difficulty is scored regarding the skipped number of levels of difficulty. The examples of scoring are shown in Table 1. The total score shows how dynamic a person is, how many shifts in difficulty level he/she made and how big these shifts were.

Table 1 Examples of scoring

Answer	Level of a task	Level of next task	Tendency	Number of points
correct	6	7	conformity	1
correct	6	4	refusal	2
incorrect	8	5	conformity	3
incorrect	2	6	attractiveness	4
correct	7	7	0	0
incorrect	3	3	0	0

First, these strategies were evaluated qualitatively. Nearly 5000 participants have been examined by the test so far. This amount enables us to use mathematical modelling to distinguish types of strategies used.

## 3. STUDY SAMPLE

4987 professional soldiers and military cadets of the Army of the Czech Republic participated in the research concerning types of behaviour in method EFEKT. Basic demographic data of the sample are summarised in the Table 2.

Table 2 Demographic data of study sample

		N	%
<b>Sex</b>	♀	1444	29,0
	♂	3543	71,0
<b>Education</b>	Non-high-school graduate	3601	72,2
	High school graduate	1296	26,0
	University	90	1,8
<b>Age</b>	<20	3942	79,0
	20-25	557	11,2
	26-30	277	5,6
	31-35	130	2,6
	>35	81	1,6
<b>Residence</b>	Country	1848	37,1
	Town	2544	51,0
	City	595	11,9
<b>Family status</b>	Single	4147	83,2
	Married	705	14,1
	Divorced	124	2,5
	Widowed	11	0,2
<b>Occupation</b>	Military cadet	4140	82,0
	Army service	847	18,0

348 professional soldiers were examined also by Intelligence structure test to compare results in different types of behaviour by EFEKT. Basic demographic data of the sample are summarised in the Table 3.

Table 3 Demographic data of participants who were examined by Intelligence structure test

		N	%
<b>Sex</b>	♀	2	0,5
	♂	346	99,5
<b>Education</b>	Non-high-school graduate	118	33,9
	High school graduate	187	53,7
	University	43	12,4
<b>Age</b>	<20	0	0
	20-25	87	25
	26-30	135	38,8
	31-35	88	25,3
	>35	38	10,9
<b>Residence</b>	Country	115	33,0
	Town	196	56,3
	City	37	10,7
<b>Family status</b>	Single	115	33,0
	Married	222	63,8
	Divorced	10	2,9
	Widowed	1	0,3
<b>Occupation</b>	Military cadet	0	0
	Army service	348	100

## 4. METHODS

EFEKT – computer examination is used in the method. The method is described in details above.

Intelligence structure test – this test is made by Rudolf Amthauer. The test was first published in 1953. We used the Czech third renewed version of the test I-S-T 2000 R. The test consists of nine sets of tasks including verbal and mathematical intelligence and intelligence of shapes. Results are given in IQ formats. This is a paper and pencil test.

### 4.1 Statistical procedure

We used a cluster analysis procedure to group a person of similar kind of tendencies into respective types according to the tendencies described above. We used K-means procedure. Number of types was verified by Hierarchical trees.

## 5. RESULTS

5 types were distinguished by grouping analysis (see Figure 3) – three conforming, one attracted, and one refusing. Conforming types are different in their dynamics that means how many times a person keeps the same level of a task.

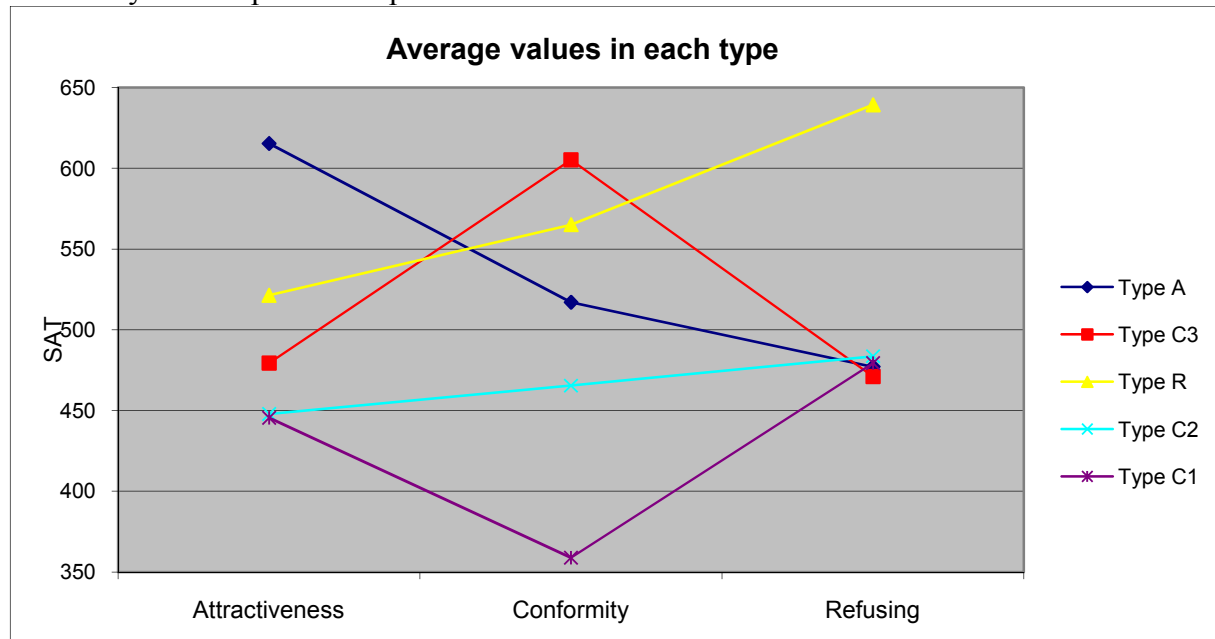


Figure 3 Average values in tendencies in each type

### 5.1 Types of behaviour

#### A. Attracted

These clients choose more difficult tasks despite their failure in easier ones. They are very ambitious, with high level of aspiration.

They are motivated more by the effort to achieve success than to avoid failure. They tend to risk; they are less able to assess their own abilities. They do not adjust their behaviour according to the external signals. They are more led by their own ideas than by the external information. They can behave impulsively, their behaviour reflect their mood. They are attracted by tempting offers very easily.

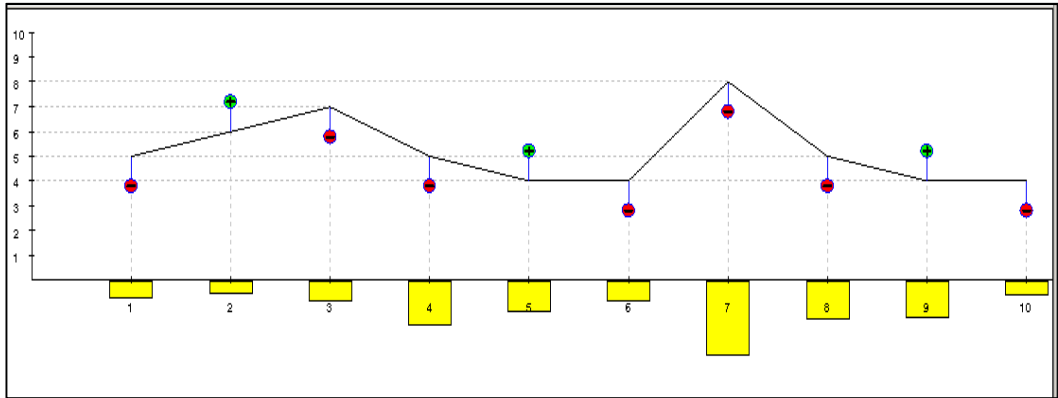


Figure 4 Example of the type A

This profile is classified as the type A, because a person chooses more difficult tasks after incorrect answers on tasks number 1 and 6.

(There is a level of difficulty of a task on vertical axe and a number of a task on horizontal axe.)

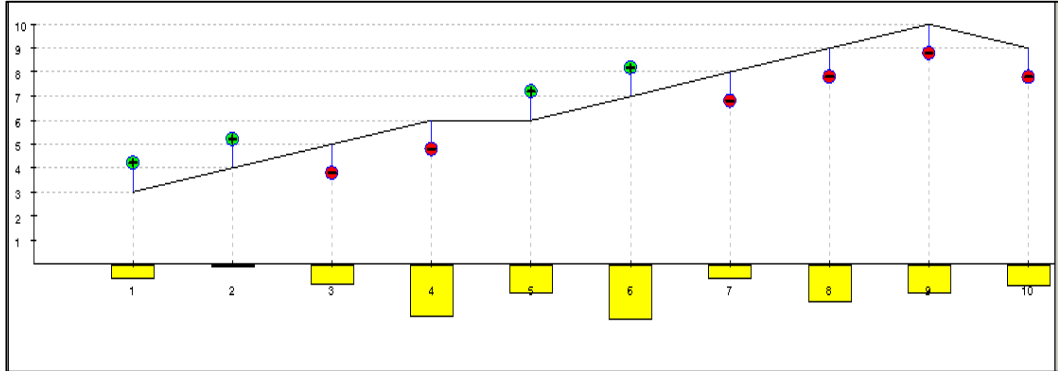
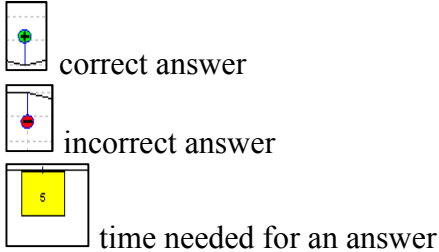


Figure 5 Example of the type A

This profile is classified as the type A, because a person chooses more difficult tasks after incorrect answers on tasks number 3, 7 and 8.

### R. Refusing

These clients choose easier tasks despite success in more difficult task. They are not ambitious; they can be more anxious and they fear of failure. It is more important for them to avoid failure than to achieve success.

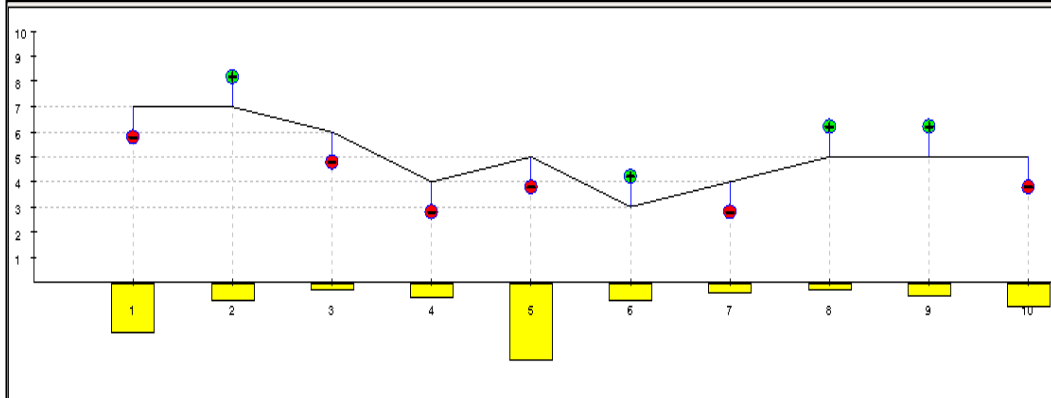


Figure 6 Example of the type R

This profile is classified as the type R, because a person chooses less difficult tasks after correct answers on tasks number 2 and 6.

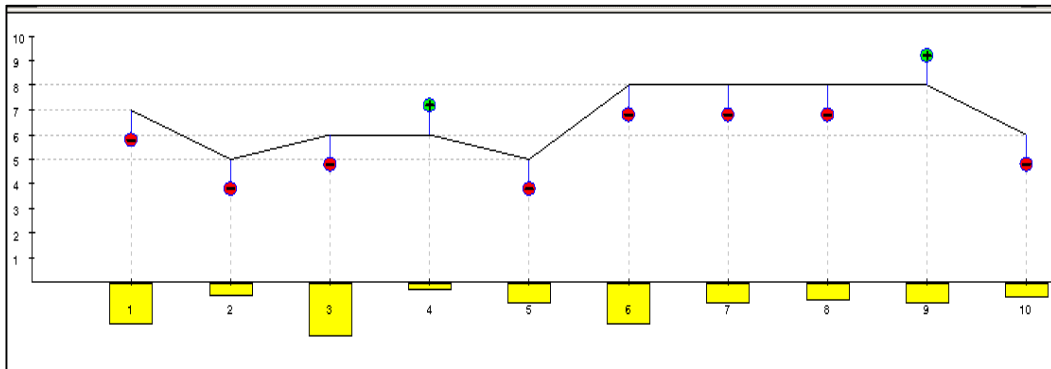


Figure 7 Example of the type R

This profile is classified as the type R, because a person chooses less difficult tasks after correct answers on tasks number 4 and 9.

### C3. Conforming 3

These clients behave reasonably. They adjust their aspiration according to the feedback given from outside. They are not attracted by tempting offers very easily. They are able to assess their own abilities. They are flexible.

This type is the most dynamic one from the conforming types. That means a person keeps the same level of a task no more than 2 times.

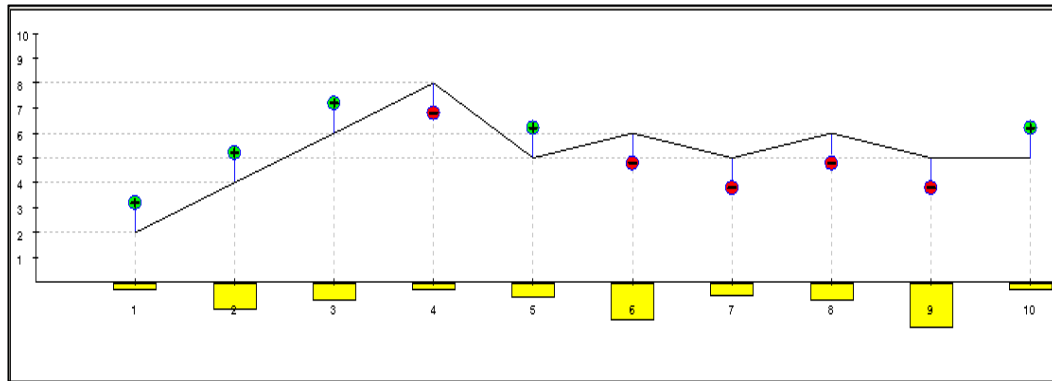


Figure 8 Example of the type C3

This profile is classified as the type C3, because a person chooses less difficult tasks after incorrect answers on tasks number 4, 6 and 8 and a person chooses less difficult tasks after correct answers on tasks number 1, 2, 3 and 5 and he/she keeps the same level of a task only once.

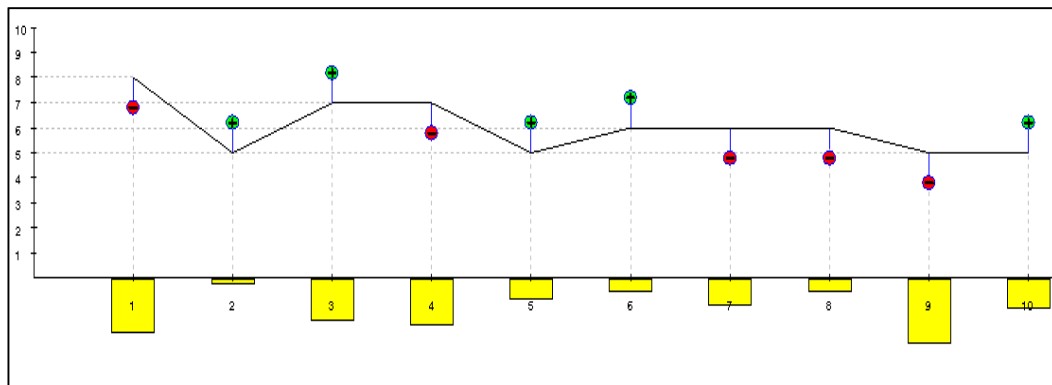


Figure 9 Example of the type C3

This profile is classified as the type C3, because a person chooses less difficult tasks after incorrect answers on tasks number 1, 4 and 8 and a person chooses less difficult tasks after correct answers on tasks number 2 and 6 and he/she keeps the same level of a task only twice.

## C2. Conforming 2

These clients behave reasonably; they do not move very much in the motivational field, they choose more or less the same level of difficulty of the tasks. They use the feedback but they still keep their own stable ideas. They are not impulsive.

This type is medium dynamic. That means a person keeps the same level of a task 3 to 6 times.

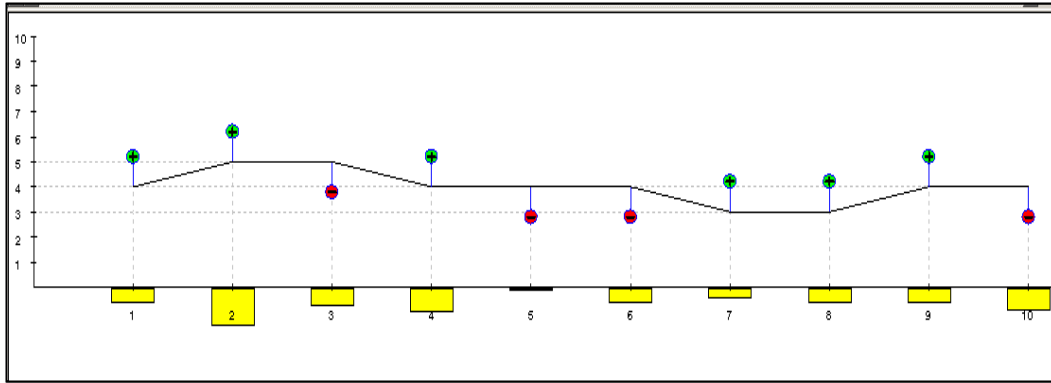


Figure 10 Example of the type C2

This profile is classified as the type C2, because a person chooses less difficult tasks after incorrect answers on tasks number 3 and 6 and a person chooses less difficult tasks after correct answers on tasks number 1 and 8 and he/she keeps the same level of a task five times.

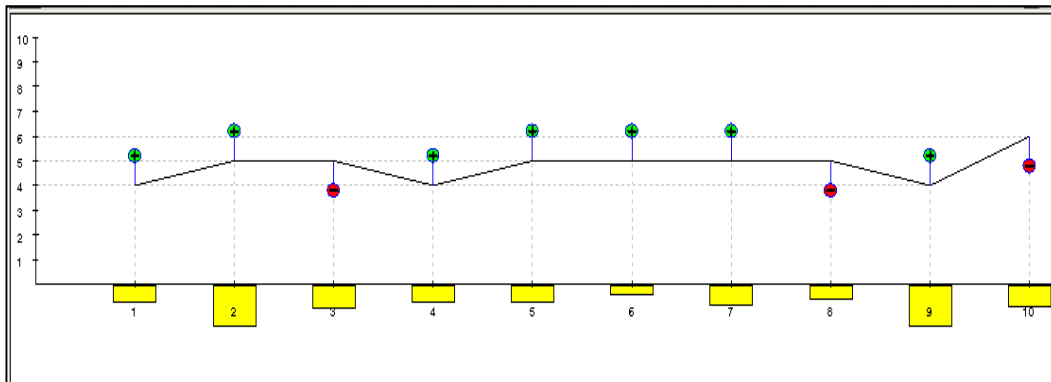


Figure 11 Example of the type C2

This profile is classified as the type C2, because a person chooses less difficult tasks after incorrect answers on tasks number 3 and 8 and a person chooses less difficult tasks after correct answers on tasks number 1,4 and 9 and he/she keeps the same level of a task four times.

### C1. Conforming 1

These clients are rigid. They keep their own ideas, attitudes and it is difficult for them to change them. They do not use the feedback. They rely on themselves. They are not influenced from the outside, they are very stable. These characteristics can be a result of low motivation, apathy.

This type is the less dynamic one from the conforming types. That means a person keeps the same level of a task at least 7 times.

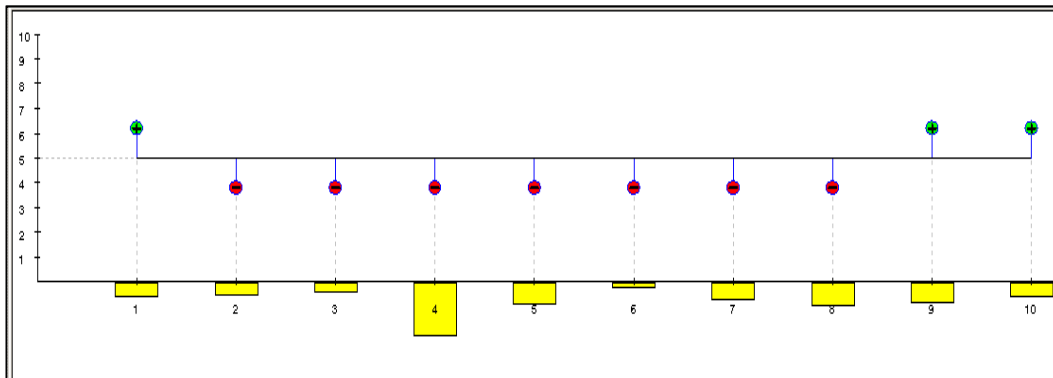


Figure 12 Example of the type C1

This profile is classified as the type C1, because a person keeps the same level of a task each time.

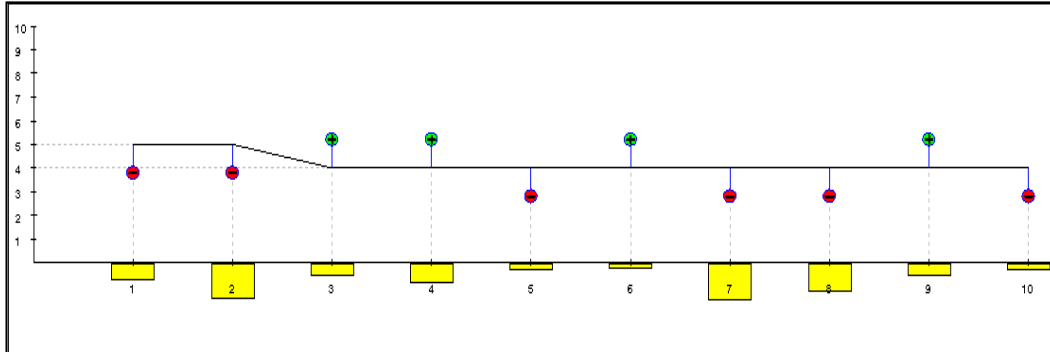


Figure 13 Example of the type C1

This profile is classified as the type C1, because a person keeps the same level of a task nine times and he/she chooses less difficult task after incorrect answer on a task number 2.

## 5.2 Difficulty of tasks

Difficulty of chosen task is a sum of difficulties of each task. The test ANOVA shows statistically significant differences among the types ( $F = 12,395$ ;  $p < 0,001$ ). The most difficult tasks are chosen by the type A. On contrary, the less difficult tasks are chosen by the type C1 (see Table 4 and Figure 14). Post hoc analysis reveals that the type A (and R  $p = 0,020$ ; and C2  $p = 0,001$ ; and C1  $p < 0,001$ ) and C1 statistically significant differ from the other ones (and C3  $p < 0,001$ ; and R  $p = 0,031$ ; and C2  $p = 0,021$ ) with the exception of A and C3 ( $p = 0,512$ ).

Table 4 Difficulty of chosen tasks of each type

Type	Difficulty mean	Difficulty standard deviation
R	51,75	13,66
A	57,08	14,08
C3	54,18	13,75
C2	51,24	14,48
C1	47,02	17,09

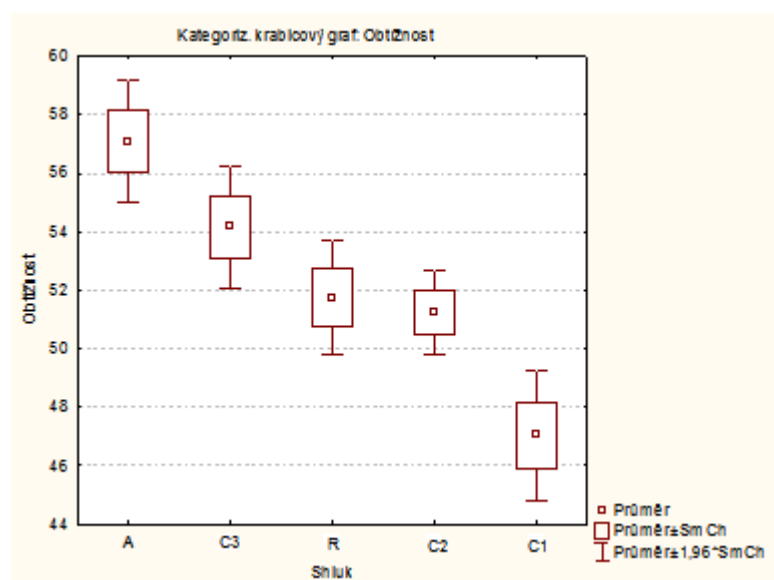


Figure 14 Difficulty of chosen tasks of each type

## 5.3 Results in IST 2000 R

The analysis showed statistically significant differences among the types in terms of results in IST 2000 R ( $F = 3,436$ ;  $p = 0,009$ ). The best results were achieved by the type R, the worst by the type A (see Table 5 and Figure 15).

Table 5 Results in IST 2000 R of each type

Type	IQ mean	IQ standard deviation
R	82,00	23,10
C3	92,12	17,41
A	95,33	17,77
C2	92,00	18,32
C1	90,08	16,24

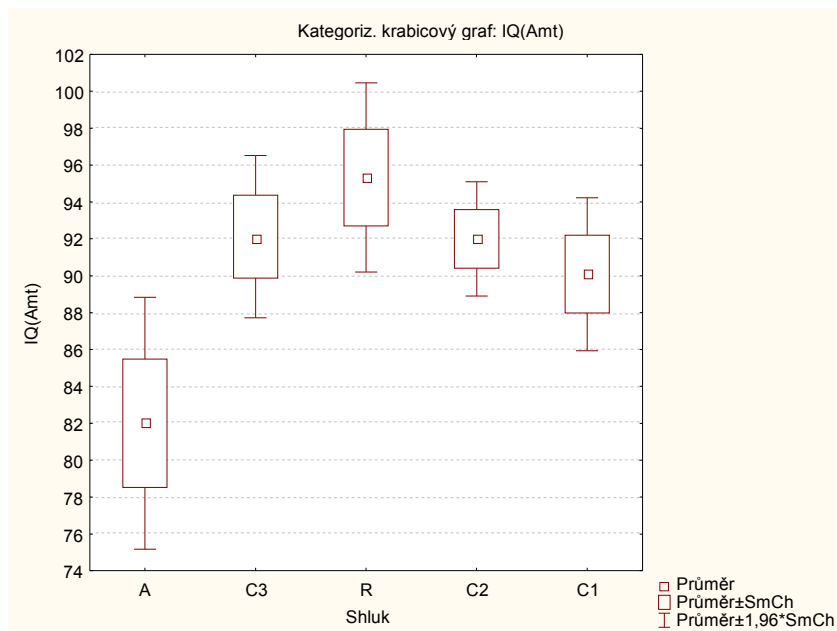


Figure 15 Results in IST 2000 R of each type

## 6. APPLICATION

Tendency to behave in a risky way is very dangerous among soldiers. That is why we consider the method EFEKT as a usable tool for military psychologists.

The method represents the objective tests of personality. Big advantage of these methods is a client thinks his/her performance is assessed. The client is said this test assess his/her intellectual abilities. Therefore, he/she pays attention to how many points he/she gets but not on the way he/she chooses the difficulty level of tasks and he behave in a more natural way.

Social desirability is a big problem in using questionnaires because clients are able to figure out what a particular question is aimed to and they are able to adjust their answers in concordance with the expectations. On contrary, if they are not aware of what they are assessed for, their ability not to respond truthfully.

The test can be also used to test a stability of a soldier. People who are very dynamic in the artificial psychological field, who shift the level of difficulty often, are probably less stable. They are more impacted by information from the outside and they rely less on their own ideas and attitudes.

The most stable ones are probably people of the Conforming 1 type. They rely on themselves. They do not use the feedback at all. On contrary, the less stable ones are probably clients of attracted type. They are not able to adjust their aspirations to their abilities and they still try to achieve very difficult goals, even though they are given feedback that they are not capable to make it.

The big advantage of the method is also its length. It takes only 30 minutes including demographic questionnaire.

## 7. CONCLUSION

5 types of behaviour by the reaction to their correct and incorrect answer were distinguished. These types are not only different in these reactions but also in difficulties of chosen tasks and in performance in Intelligence structure test.

The analysis showed that clients of refusing type perform the best in IST. It seems contra intuitive. They are probably more motivated to avoid failure than to achieve success. They do not risk at all and they can profit from this way of behaviour. It might seem this type represents the most intelligent type of behaviour because the most intelligent people are gathered in it. This conclusion needs more validation studies. Moreover, only professional soldiers were examined by the test, not military cadets. Results can be different.

Type A chooses the most difficult tasks, which corresponds to its characteristics. People in it are ambitious; they want to achieve high goals.

It should be also emphasized that despite the effort to gather people of similar way of behaviour into one type, these types are still quite heterogeneous. Thus, a qualitative analysis is recommended to use for deep understanding.

EFEKT seems to be a convenient method for risky behaviour assessment and for evaluation of emotional (in)stability.

In conclusion, in this paper we wanted to present the method EFEKT. We are aware of limits of the method. More validation studies are needed. But we are convinced that it is a hopeful method especially in armed forces.

## 8. LITERATURE

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