

Implicit Assessment of the Individual's Stability vs. Susceptibility to Failure Stress as a Dynamic Trait

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Abstract

Current observed upsurge of interest in the implicit personality assessment, based on employing automatic approach and avoidance tendencies in human behaviour to tap its inner motives and causes, has opened up new vistas in determining interindividual differences. This paper investigates the possibility of specifying comprehensive within-person process pertinent to the individual's stability vs. susceptibility to stress, the dynamics of which can be captured at the level of an individual case. It describes a computer-based information-processing technique (patented as an invention (Arshava, Nosenko & Khizha 2010)), with the help of which stability vs. susceptibility to failure is detected by comparing the individual's self-regulation efficacy displayed in the course of the modelled information exchange with a virtual partner after experiencing an unavoidable failure which is elicited by varying the information load, exceeding at one of the stages of the activity the limited short-term memory capacity and prior to it. An empirical confirmation of the validity of the technique is presented.

Keywords

Personality Stability vs. Susceptibility to Stress; Information-processing Technique; Self-regulation Efficacy; Implicit Assessment

Introduction

In the last ten years a growing number of studies have focused on the process-oriented approach to personality assessment as a key contemporary methodology of the implicit personality diagnostics (Asendorpf, Banse & Mücke 2002; Greenwald & Banaji 1995; Greenwald et al 2002). There are two different variants of theoretical substantiation of the new approach. One of them is based on employing automatic approach and avoidance tendencies in

assessing personality functioning, since the latter is considered to be governed by both reflective and impulsive mechanisms (Brendl, Markman & Messner 2005; Schnabel, Banse and Asendorpf 2006) and only the reflective mechanisms are likely to be tapped more or less adequately with the explicit methods of diagnostics. The other approach refers to person as an active agent and decision-maker who adapts and accommodates to the changing conditions of life thanks to voluntary self-regulation (Baumeister 2005), the efficacy of which, as we have been trying to demonstrate lately (Arshava, Nosenko & Khizha 2010; Arshava 2008; Nosenko, Arshava 2008; Nosenko, Arshava 2010), can be also assessed implicitly in the framework of the process models of investigating personality functioning - both variants of substantiation of the feasibility of the process- rather than product-oriented models of personality assessment might signal the emergence of the so called 'affective turn' within the humanities, social sciences and psychology - a contemporary movement, which is described as a renewed and growing interest in studying the role of affect, emotions and feelings in various aspects of personality functioning (Rothman, Baldwin & Hertel 2004). The new approach calls for the new methods and techniques of personality assessment capable of overcoming the obvious limitations of the explicit methods of diagnostics, based on the self-report measures, specifically: social desirability concerns, caused by the public self-consciousness of the respondent; an apprehension attitude of the respondent to the content of questionnaires, reflected in the attempts to guess what the 'appropriate' response to a test item should be; self-reflective limitations; low confidence and the like.

And this is only 'the peak of the iceberg' of the plethora of the problems that arise when it comes to assessing the psychic phenomenon, chosen for the investigation in this project, – stability vs. susceptibility to failure stress.

This paper presents the description and the substantiation of the validity of a new process-oriented approach to study voluntary self-regulation efficacy displayed by the individual after an unavoidable failure as a predictor of the individual's stability vs. susceptibility to one of the commonest stressors in human life – failure.

Theoretical Substantiation of the Approach to the Implicit Assessment of Self-regulation Efficacy as a Form of Behavioral Manifestation of Stability vs. Susceptibility to Stress

Stability vs. Susceptibility to Stress as a Contextualized Dynamic Trait

Recently postulated claims as to the psychological reality of the so called 'new dynamic contextualized' personality traits (Campbell 2008; Matthews 2008. Nosenko & Kovriga 2001) which signal a shift in personality research from the structural models of personality to the dynamic ones, open up new vistas for studying personality in different contexts.

Stability vs. susceptibility to stress can be best interpreted in this light, as our extensive review of the related literature and our own empirical findings showed (Arshava 2008; Nosenko, Arshava 2008; Arshava, Nosenko, Ponomareva 2010; Nosenko, Arshava, Nosenko 2008), as a contextualized integral dynamic personality trait that manifests itself in the stable disposition of the individual either to retain or to loose homeostasis under complicated conditions of professional activity or in difficult life situations. It seems reasonable to operationally define this contextualized dynamic trait in terms of the psychic states, and the individual is predisposed to experience under certain (emotionally charged) contexts, and differentiate between an optimal psychic state and the state of emotional tension (stress) as the forms of the trait-specific manifestation. The state of optimal functioning can be claimed to be indicative of the retention of homeostasis while that of the emotional tension – of its loss. The assumptions are based on the theoretical arguments, substantiated by key Ukrainian methodologist in personality research Sergey

D.Maksymenko (2007), and empirical evidence of some Ukrainian researchers in accordance with which a psychic state is regarded not only as a chain that links psychic processes with personality traits, but also as a form of reflection of the individual's appraisal of one's own psychic manifestations. The latter attaches both theoretical and practical significance to the efforts of identifying methods and techniques for the implicit diagnostics of the psychic states, and individuals tend to experience under certain types of life situations, as an indicator of the psychological traits pertinent to them.

A Multi-level Approach to Investigating the Manifestation of the Stability vs. Susceptibility to Stress

The conceptualization of the stability vs. susceptibility to stress in terms of the likelihood of experiencing certain types of psychic states under particular classes of situations entails the necessity to simultaneously analyze the manifestation of the psychic state on the following three levels, singled out for the studies of the multi-level, multi-dimensional psychic phenomena by the proponents of the systems approach to their investigation, Boris F.Lomov, a prominent Russian methodologist, for one. He postulated that a multi-level psychic phenomenon is to be simultaneously analyzed: 1) as a reflection (image) of the situation formed by the individual, 2) as the function of the brain, and 3) as a regulator of behavior. The issue seems to be in line with the contemporary "knowledge and appraisal" models of personality functioning (Cervone 2008) referred to above. If an emotionally charged situation is appraised as a threat to the successful achievement of the individual's goals, the homeostasis is likely to be changed. If the situation is perceived as a challenge, the state of optimal functioning is likely to be retained or even turned into the state of maximum functioning. While with the help of the explicit methods of personality assessment, the researcher can identify (neglect the social desirability considerations of the respondents) the nature of the individual's appraisal of a potentially stressful situation (its image) to find out whether the positive or negative appraisal of the situation has brought about changes in the functioning of the brain and behavioral regulation changes, one has to measure, - following the traditional paradigm of the stress-susceptibility assessment - a) physiological responses, reflecting changes in the functioning of the brain of the individual susceptible to stress; and b) the

corresponding changes in behavior specific to the changes in the psychic state. In line with the above presented considerations A.R. Luria (1976) established, as known, the tradition of assessing susceptibility to stress under the real- life conditions, usually in the course of fulfillment of the appropriate professional activity. Under that approach the major criteria of assessment were: changes in the physiological responses of the organism, indicative of the changes in the psychic state, and the appropriate behavioral changes.

Luria's ideas of the feasibility of studying the so called 'conjugated responses' (physiological and behavioral ones) as a key issue in recognizing changes in psychic states were implemented in designing the lie-detection methodology, which can be regarded the first implicit personality assessment methodology, with the latency of response changes being an objective indicator of the changes in the liar's psychic state. Latency-of-response changes have been recently analyzed in depth in computer attainment testing. J. Beckman and N. Beckman (2005) and other authors (Troche, Rammsayer 2005) referred to the regularity that latencies of the false responses in the attainment tests are longer than those of the correct ones ($F > C$ or $I > C$ phenomenon) which speaks in favor of using time behavior as a possible measure of the self-regulation activity in different types of situations.

In this project we have made an attempt to identify a unified set of behavioral measures, including the latency of responses, which are indicative of the both: physiological and behavioral per se changes in the self-regulative activity caused by the changes in the psychic states of the individuals. The designed method of the implicit diagnostics of the stability vs. susceptibility to failure stress, thus allowing tapping the state specific changes in behavior through the changes in the cognitive and emotional processes, caused by the cognitive and emotional appraisal of the situation.

Description of the Method and the Experimental Testing of its Prognostic Validity.

With account to the above reviewed assumptions as to the properties of the successful vs. unsuccessful modes of self-regulative behavior, we designed a computer-based method that allows assessing, as mentioned above, the susceptibility vs. stability to failure stress by exposing the subjects to an unexpected and

uncontrollable failure in the course of their performing a computer-simulated information-processing activity in the laboratory settings and checking the changes in the efficacy of the so designed activity, if any, after failure and prior to it.

The objectives of the research were: to substantiate theoretically and verify empirically the validity of the method of predicting stability vs. susceptibility to failure stress on the basis of the efficacy of fulfilling a computer-based information-processing activity.

Hypotheses: 1. If the person possess stability to failure stress, the efficacy of fulfillment of the modelled information-processing activity after experiencing failure will not differ significantly from that prior to failure. 2. If the suggested method of the implicit assessment of stability vs. susceptibility to stress is valid, the individuals with higher levels of efficacy of the information-processing activity will significantly differ from those with lower level on a number of personality traits indicative of the emotional stability vs. susceptibility to stress.

The Method

Since originally the method was designed for the specific purposes, namely for predicting information-processing efficacy of flight controllers under different conditions of information presentation (namely, under varying levels of the white noise on the background of which the information was transmitted to the recipients as a stress-eliciting factor) information exchange between imaginary 'pilots' and 'flight controllers' was simulated. The participants, tested with the help of this technique, are instructed to identify the location on a visually-presented map (See Fig. 1) of two geometrical figures with different shapes, sizes and colors by answering questions of a virtual interlocutor whose voice is generated by the computer. Responses can be given either orally or with the help of the mouse.

Different conditions for the fulfillment of the so designed information-processing activity are modeled by varying the amount of information to be perceived, retained, retrieved and conveyed by the subjects to a virtual recipient. An unavoidable failure is elicited by making the subjects process information the amount of which in one of the three 20-question serious of information exchange exceeds the short-term memory capacity (the location of *three* figures instead of *two* is required to be identified).

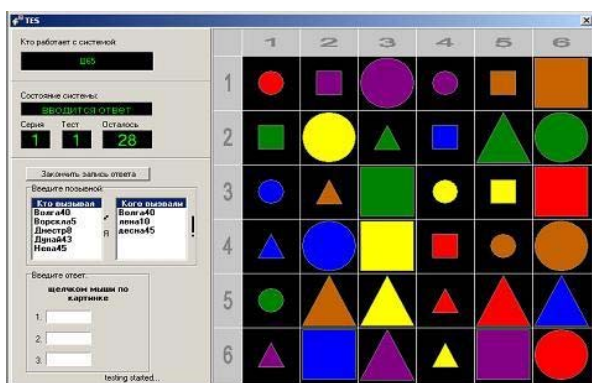


FIG. 1 MULTI-COLORED GEOMETRICAL FIGURES OF 3 DIFFERENT SHAPES, 2 SIZES AND 6 COLORS, PRESENTED TO THE SUBJECTS IN THE VISUAL FORM.

Note: In the left-hand side of the figure, there are two menus to register the user's 'call names' and those of the virtual interlocutor.

The virtual interlocutor asks the recipients prior to identifying the location of the figures displayed on the map to identify their own 'call names' and the 'call name' of the virtual interlocutor either by clicking them in the appropriate menus (See Fig.1) or orally.

When performing the first set of assignments, the recipients have to process the amount of information which does not exceed the human short-term memory capacity.

In the second set of assignments, the amount of information to be processed is increased beyond the maximum short-term memory capacity which dooms the recipients to an unavoidable and hardly controllable failure, likely to elicit failure stress in the individuals susceptible to stress.

In the third set of assignments, the initial conditions of information presentation are renewed.

Susceptibility to failure stress is implicitly assessed on the basis of the statistically significant differences in multidimensional behavioral measures characterizing the efficacy of information processing in the situations after failure and prior to it. The measures include three groups of parameters: 1) quantitative efficacy of performance characteristics: number of correctly identified geometrical figures and call names; 2) modes of information processing chosen by the recipients in the course of the simultaneous enacting of two interrelated types of activities: identifying the locations of the figures on a visually displayed map and reporting call names, the modes being intuitively-simultaneous and reflective-consecutive (Kuhl, Wassiljev 1985); 3) hesitation phenomena in oral speech of the subjects recorded during the oral

exchange of information: latencies of responses, average continuity of a speech utterance pronounced without hesitation pauses, (250 ms and longer) overall duration of performance and the like.

The above described approach to design the computer-simulated method of assessing stability vs. susceptibility to failure stress allows assessing the following aspects of self-regulative efficacy after experiencing an uncontrollable failure: 1) the degree of retention of the structure of goals, 2) frustration tolerance, and 3) the degree of activity manifested towards the achievement of the goals.

We observed in the course of testing the prognostic validity of the designed method which will be described in more detail in the next section of the paper, that individuals demonstrated different patterns of behavior related to their goal-setting and goal-striving 1. Some of them retained the initial structure of the goals prescribed by the instruction in the initial set of assignments, and simultaneously attended to the both interrelated types of activities modeled, namely reported 'call names' and identified the figures on the visually displayed map. When fulfilling the second set of assignments, they quickly realized that the goals were unattainable and either abandoned them altogether or fulfilled the assignments partially. The unavoidable failure did not tell though on their performance efficacy in the third series of assignments. They managed to increase the number of correctly answered questions in the third series of assignments or retained the original efficacy level demonstrated in the first series of assignments.

Other individuals failed to equally distribute their attention between the two interrelated assignments and abandoned one of them either entirely or partially, demonstrating the so called reflective-consecutive mode of information processing (unlike the intuitive-simultaneous one displayed by the subjects who appeared more successful in their self-regulation efforts).

After experiencing an unavoidable failure, less efficacious subjects failed to cope with the assignments presented in the third serious and demonstrated a lower level of efficacy than that prior to failure, despite the fact that conditions for their fulfillment became favorable again. They continued to neglect one of the goals (reporting the call names) and concentrated their attention on the assignment they considered to be more significant- identification of the figures displayed on the map. This mode of self-

regulative behavior signals operational tension. It was observed in the real-life stressful situations and was described in the literature on reactions to professional stress as indicative of the stress vulnerability. The self-regulation patterns of this group of individuals were also characterized under failure – threat conditions either by persistent attempts to cope with an unavoidable failure manifested in the longer latencies of responses, or by the formal imitation of the external activity. Thus, observations at the level of individual cases showed differences in goal-setting (abandoning one of the goals); frustration tolerance (reducing efficacy of performance after failure), setting different standards of activity toward achieving the aims (showing between-subject differences in the quantitative characteristics of performance under similar conditions).

Experimental testing of the prognostic validity of the method

Participants

The prognostic validity of the method was tested on two samples of the Dnipropetrovsk University undergraduates (Arshava 2008; Nosenko, Arshava 2008; Nosenko, Arshava 2010). One of the samples included freshmen in the period of their adaptation to the new conditions of studies. It consisted of 80 participants predominantly female students, aging 17-18 years, faculty of psychology and medicine (specialization 'computer diagnostics in medicine'). Participation in the study was motivated as a means of predicting the participants' ability to use informational technologies in processing information as a domain-specific skill. The second sample included 60 participants (also predominantly female students, aging 20-22, faculty of psychology, who took a selective course and participated in the study for getting a credit in it).

Procedure

The participants were instructed to fulfill three sets of assignments with 20 assignments in each set presented to them individually in a computer laboratory in the oral form. Assignments included questions about the localization on a visually displayed map pairs of different geometrical figures, in which participants had to remember and identify (either orally or with the help of the mouse). The figures differed not only in shapes (triangles, squares and circles) but also in size (big – small) and colors (six different colors). The

questions recorded by the computer interlocutor, were preceded by the call name of the virtual interlocutor and that attached to the participant. The participants were instructed to mention the call names firstly and then to identify the location of the figures by specifying their rows and columns in their answers (See Fig. 1). The figures disappeared as soon as the question about their location was uttered. In the second set of assignments, conditions were more complicated. The participants were to identify the localization of three figures instead of two. The fulfillment of this set of assignments doomed all the participants to an unavoidable failure as the requested amount of information exceeded the human short-term memory capacity. In the third set of 20 assignments, the initial conditions were restored.

Since we have hypothesized that the participants who are stable to stress, unlike those susceptible to failure stress, will act in the third series of assignments as efficaciously as they did in the first series (or might even show higher standards of performance thanks to the acquisition of the skill) we chose the following methodology for testing the prognostic validity of the suggested method of the implicit assessment of stability vs. susceptibility to stress. We clustered both samples of participants (K-means algorithm) by the variables of their information-processing efficacy displayed in the course of fulfillment of each of the three above described series of assignments and then compared the between-cluster differences in their explicitly assessed personality characteristics of emotional stability vs. susceptibility to stress, using various psychodiagnostic techniques known to be related to those characteristics. Among them, there are: State-Trait Anxiety Inventory by C.D.Spielberger, Ambiguity Intolerance Inventory by R.Norton, Coping Inventory for Stressful Situations by N.Endler and J.Parker, Psychological Well-being Scale by C.D.Ryff, Action Control Scale by J.Kuhl, Self-regulation Style Questionnaire by V.Morosanova, Purpose-in-Life Orientation Test (a Russian version of the test by Crumbaugh and Maholick, modified by D.Leontiev), Personality Adaptation Potential by A.Maklakhov.

Results and Discussion

Study 1

Figure 2 shows the results of the performance characteristics of 80 participants (Dnipropetrovsk University undergraduates).

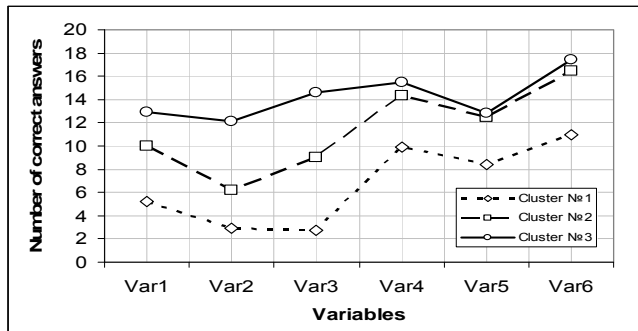


FIG. 2 RESULTS OF CLUSTERIZATION OF THE SAMPLE.

Var 1, 2, 3 – means of the numbers of correctly identified *call-names* in the three 20-question series of assignments,
 Var. 4, 5, 6 – means of the numbers of correctly identified *geometrical figures*, Var. 2, 5 – failure condition

Tables 1, 2, 3 illustrate between-cluster differences in performance characteristics assessed with the help of the computer-based information-processing technique.

TABLE 1 BETWEEN-CLUSTER (1ST VS. 2ND) DIFFERENCES IN PERFORMANCE CHARACTERISTICS

Variables	Cluster 1 M	Cluster 2 M	Differences fit goodness by t-test (for independent samples) at:
Var1	5.2	10.0	$p < 0.001$
Var2	2.94	6.21	$p < 0.001$
Var3	2.72	9.02	$p < 0.001$
Var4	9.89	14.35	$p < 0.001$
Var5	8.37	12.47	$p < 0.001$
Var6	10.95	16.43	$p < 0.001$

Note: Var 1, 2, 3 – number of 'call names' correctly identified
 Var 4, 5, 6 - number of geometrical figures correctly identified

TABLE 2 BETWEEN-CLUSTER (1ST VS. 3RD) DIFFERENCES IN PERFORMANCE CHARACTERISTICS

Variables	Cluster 1 M	Cluster 3 M	Differences fit goodness by t-test (for independent samples) at:
Var1	5.2	12.96	$p < 0.001$
Var2	2.94	12.08	$p < 0.03$
Var3	2.72	14.6	$p < 0.001$
Var4	9.89	15.52	$p < 0.001$
Var5	8.37	12.82	$p < 0.001$
Var6	10.95	17.43	$p < 0.001$

Note: Var 1, 2, 3 – number of 'call names' correctly identified
 Var 4, 5, 6 - number of geometrical figures correctly identified

TABLE 3 BETWEEN-CLUSTER (2ND VS. 3RD) DIFFERENCES IN PERFORMANCE CHARACTERISTICS

Variables	Cluster 2 M	Cluster 3 M	Differences fit goodness by t-test (for independent samples) at:
Var1	10.0	12.96	$p < 0.001$
Var2	6.21	12.08	$p < 0.03$
Var3	9.02	14.6	$p < 0.001$
Var4	14.35	15.52	Not significant
Var5	12.47	12.82	Not significant
Var6	16.43	17.43	Not significant

Note Var 1, 2, 3 – number of 'call names' correctly identified
 Var 4, 5, 6 - number of geometrical figures correctly identified

As shown in Tables 1-3, differences in performance characteristics between cluster 1 vs. 2; 2 vs. 3 and 1 vs. 3 are statistically significant for the number of correctly identified "call-names" at $p < 0.001$, $p < 0.03$. This allows concluding that the subjects belonging to these clusters, differ in their efficacy of performance of the computer-based information-processing activity. These differences can be interpreted as a form of manifestation of different levels of sensitivity to the novelty situation (in the 1st series of assignment); different levels of susceptibility to failure as a potential stress-inducing factor (in the 2nd series of assignments) and to the after-effect of failure stress (in the third assignment). The results of the analysis of the between-series differences in performance of the subjects belonging to different clusters, allowed making the following observations.

As one can judge from Table 4, the subjects belonging to cluster 1, appear to be susceptible to the effect of failure (the number of the correctly identified "call names" decreases in the 2nd series in comparison with the 1st series of assignments almost twice. It remains very low in the third series, which can be interpreted as an after-effect of failure stress.

TABLE 4 BETWEEN-SERIES DIFFERENCES IN PERFORMANCE CHARACTERISTICS FOR CLUSTER 1 (WITH THE LOWEST LEVEL OF PERFORMANCE) IN DIFFERENT SERIES OF ASSIGNMENTS

Variables	Series compared	M	Differences fit goodness by t-test at:
'Call-names'	1	5.22	$p < 0.01$
	2	2.94	
	1	5.22	$p < 0.001$
	3	2.72	
	2	2.94	not significant
	3	2.72	
Geometrical figures	1	9.89	not significant
	2	8.73	
	1	9.89	not significant
	3	10.95	
	2	8.73	not significant
	3	10.95	

The absence of differences between the 2nd and the 3rd series of assignments can be interpreted as an effect of failure stress, as well as the absence of differences in the number of correctly identified figures. The things, the conditions for information-processing in the 3rd series of assignments became more favorable, but the efficacy characteristics did not improve.

As one can see from Table 5, all the differences are significant. But the "direction" of differences, so to

speak, is different from those in the 1st cluster. There is only one instance which might indicate to a certain degree of proneness to failure stress, namely, the decrease of the number of correctly identified “call names” in the third series of assignments as compared to the first one. In other instances, one can observe a statistically significant increase in the efficacy of performance after failure demonstrated by the subjects of this group.

TABLE 5 BETWEEN-SERIES DIFFERENCES IN PERFORMANCE CHARACTERISTICS FOR CLUSTER 2 (WITH THE INTERMEDIATE LEVEL OF PERFORMANCE) IN DIFFERENT SERIES OF ASSIGNMENTS

Variables	Series compared	M	Differences fit goodness by t-test at:
'Call-names'	1	10.47	$p < 0.001$
	2	6.21	
	1	10.47	$p < 0.01$
	3	9.02	
Geometrical figures	2	6.21	$p < 0.001$
	3	9.02	
	1	14.35	$p < 0.01$
	2	12.47	
Geometrical figures	1	14.35	$p < 0.001$
	3	16.43	
	2	12.47	$p < 0.001$
	3	16.43	

Table 6 shows the results of the subjects belonging to cluster 3 (with the highest level of performance). The differences illustrate the situation when all the changes are congruent with the hypothesis and prove high level of emotional stability of the participants including cluster 3.

TABLE 6 BETWEEN-SERIES DIFFERENCES IN PERFORMANCE CHARACTERISTICS FOR CLUSTER 3 (WITH THE HIGHEST LEVEL OF PERFORMANCE) IN DIFFERENT SERIES OF ASSIGNMENTS

Variables	Series compared	Variables values	Differences fit goodness by t-test at:
'Call-names'	1	12.96	not significant
	2	12.08	
	1	12.96	$p < 0.001$
	3	14.6	
Geometrical figures	2	12.08	$p < 0.001$
	3	14.6	
	1	15.52	$p < 0.001$
	2	12.82	
Geometrical figures	1	15.52	$p < 0.001$
	3	17.43	
	2	12.82	$p < 0.001$
	3	17.43	

Fig. 3 and Table 7 show differences in the modes of operationalized information processing as the measures of “asymmetry” between the numbers of

correctly identified “call names” and “geometric figures” in the clusters of our participants (in %). It appeared to be the lowest in the 3rd cluster and the highest – in the first one. High asymmetry indicates the appearance of the psychic state of operational tension specific to the participants susceptible to stress in the conditions, when they anticipate or experience the threat of failure.

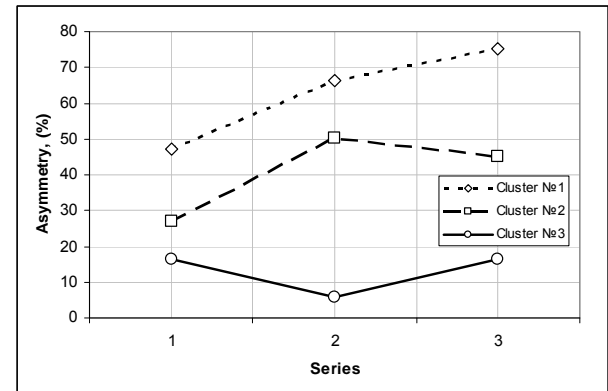


FIG. 3 ASYMMETRY CHARACTERISTICS IN CLUSTERS WITH DIFFERENT LEVELS OF PERFORMANCE EFFICACY

TABLE 7 QUANTITATIVE MEASURES OF ASYMMETRY IN DIFFERENT CLUSTERS

Number of cluster	Series 1 /%	Series 2 /%	Series 3 /%
1	47.19	66.27	75.14
2	27.03	50.17	45.08
3	16.49	5.77	16.25

They “sacrifice”, so to speak, one of the interrelated activities they are to fulfill simultaneously, for the sake of another activity which they subjectively appraise as more significant.

One measure more susceptible to failure stress was operationalized as a degree of inconsistency of the quantitative parameters of performance efficacy. It was computed in terms of the number of deviations in latencies of responses to the assignments from the average value which exceeded 50%. The choice of this parameter was prompted by the description of the so-called “optimal state” of functioning characterized by a low level of deviations in individual characteristics of performance under different conditions.

Besides, measure of continuity of speech utterances computed with account to the number of hesitation pauses interrupting the oral responses of the subjects, also showed between-cluster differences.

They were interpreted in terms of the psychic states differences experienced by the participants in the

course of the experimental study. In the previous research, conducted by one of the authors of this paper, it was shown that the state of emotional tension caused changes in oral speech which is interrupted more frequently with hesitation pauses as one of the state-specific manifestations. So, in this research we tapped the emotional state characteristics through the hesitation phenomena in speech.

TABLE 8 BETWEEN – CLUSTER DIFFERENCES IN LATENCIES OF RESPONSES (LR)

Clusters compared	Latencies of responses in: (in sec.)					
	Series 1		Series 2		Series 3	
	LR1	LR2	LR1	LR2	LR1	LR2
Cluster №1	4.78	2.19	3.78	9.44	4.72	2.29
Cluster №3	7.14	9.63	8.3	11.9	5.4	3.67
Differences fit goodness criterion by t-test at:	p<0.05	p<0.01	p<0.01	p<0.05	Not significant	p<0.06

Note: LR1 – latency of responses when identifying 'call-names',
LR2 – when identifying geometrical figures.

TABLE 9 BETWEEN – CLUSTER DIFFERENCES IN THE CONTINUITY OF SPEECH UTTERANCES, UNINTERRUPTED BY HESITATION PAUSES

Clusters compared	Continuities of speech utterances, (in sec.)		
	Series 1	Series 2	Series 3
Cluster №1	3.9	1.9	3.37
Cluster №3	7.7	4.7	6.3
Differences fit goodness criterion by t-test at:	p<0.001	p<0.001	p<0.03

Since all the participants who took part in the experimental study, aimed at testing the prognostic validity of the computer-based method for the implicit assessment of stability vs. susceptibility to emotional stress, were subjected to psychodiagnostic testing, we could check the validity of the method by analyzing the differences in the personality characteristics of the participants who belonged to different clusters. It was found that the subjects of the three clusters, into which the sample had been split in accordance with the results of fulfillment of the simulated computer-based information-processing activity, appeared to statistically differ on a number of personality variables assessed explicitly with the help of the standardized inventories.

Those differences were assessed with the help of Fisher criterion for two "opposite" clusters of participants who had maximum differences in their information processing efficacy characteristics assessed implicitly.

For example, 67% of the participants in the cluster with the highest values of the implicitly assessed information-processing efficacy (cluster 3), had

moderate plus high trait – anxiety characteristics, while in the cluster with the lowest characteristics of self-regulation efficacy 81% participants had high trait-anxiety characteristics ($\phi^*_{\text{empirical}} = 1,937$, differences are significant at $p<0.02$). The corresponding data for the 'ambiguity intolerance' measured with the help of the median-split technique, are as follows. In the cluster with the highest implicitly assessed value of the information-processing efficacy (cluster 3), the percentage of participants with the lower-than-the-median value of ambiguity intolerance is 56%, while in cluster 1 with the lowest information-processing efficacy, the corresponding measure is 22% ($\phi^*_{\text{emp}} = 2.11$, $p<0.02$).

The above mentioned clusters of participants also differ: 1) on the preference they show for resorting to the 'task-focused' strategy of coping with stress: 68% resort to this strategy in cluster 3 and 38% - in cluster 1 ($\phi^*_{\text{emp}} = 2.01$, $p<0.02$); 2) on the psychological-well-being the percentage of the participants with the cumulative measure for all the six scales, exceeding 315 scores, makes 48% in cluster 3 and 19% - in cluster 1 ($\phi^*_{\text{emp}} = 2.05$, $p<0.02$); 3) on the personality adaptation potential: in cluster 3 there are 92% of participants with the 'higher-than-the median' value of the adaptation potential, while in cluster 1 there are 71% of the participants with similar characteristics ($\phi^*_{\text{emp}} = 1.74$, $p<0.05$).

Study 2

In the second sample of the participants (the 3rd –year university students) we carried out the procedure of cluster analysis by three (instead of six) variables, namely by the unified quantitative characteristics of the information-processing efficacy operationalized through the number of correctly identified figures plus 'call names' in each of the three sets of assignments (see Fig.4).

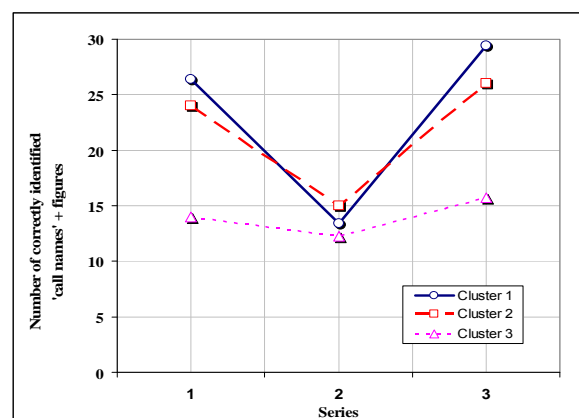


FIG. 4 BETWEEN-CLUSTER DIFFERENCES IN THE IMPLICITLY ASSESSED INFORMATION-PROCESSING EFFICACY

As it is evident from this figures, the participants belonging to cluster 3 in this sample had the lowest information-processing efficacy characteristics practically in all the three series of assignments, while those belonging to clusters 1 and 2 had low efficacy only under failure-threat condition, which they evidently adequately appraised as the condition of an unavoidable failure and which did not tell on their efficacy of performance in the third series of assignments.

Figure 5 shows that their asymmetry characteristics drastically differed from the two 'opposite' clusters: 3 and 1. These data illustrate high prognostic validity of the asymmetry measures which tap the core differences between the participants, hypothetically the most susceptible to failure stress and the most stable to it.

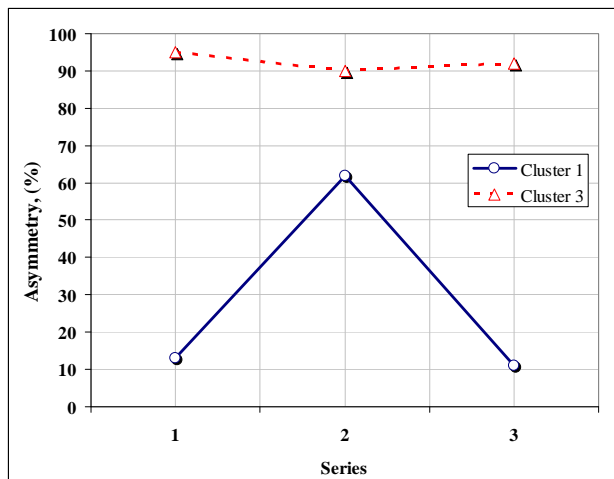


FIG. 5 ASYMMETRY CHARACTERISTICS IN CLUSTERS WITH DIFFERENT LEVELS OF PERFORMANCE EFFICACY

The former give up one of the goals of their information-processing activity which illustrates the phenomenon of operational tension mentioned earlier in the paper.

For this sample of participants, we assessed the self-initiated behavior regulation efficacy with the help of the same inventories which were used for the first sample: Coping Inventory for Stressful Situations, Psychological Well-being Scale, Action Control Scale, Self-regulation Style Questionnaire, Purpose-in-Life Orientation Test.

The corresponding personality measures of the self-initiated behavior regulation efficacy of the participants of cluster 1 and 3 are presented in Table 10.

Comparative personality variables characterize the self-initiated behavior-regulation activity of the participants clustered by their implicitly assessed efficacy of information processing characteristics.

TABLE 10 EXPLICITLY ASSESSED MEASURES OF THE PARTICIPANTS' PERSONALITY CHARACTERISTICS

List of Inventories and their scales	Mean values		t	p
	Cluster 1	Cluster 3		
<i>Psychological Well-Being</i>				
self-acceptance	12.421	10.357	2.932	0.00628
the establishment of quality ties to other	12.263	9.643	3.648	0.00096
a sense of autonomy in thought and action	10.316	9.357	0.934	0.35759
the ability to manage complex environments to suit personal needs and values	11.842	9.286	3.306	0.00239
the pursuit of meaningful goals and a sense of purpose in life	12.421	10.143	2.667	0.01205
continued growth and development as a person	11.579	10.786	1.555	0.12999
Cumulative level of Psychological Well-being	70.842	59.571	4.494	10-05
<i>Purpose-in-life test</i>				
Sense of life	36.105	30.286	2.905	0.00671
Life integrity	35.947	30.357	3.638	0.00098
Self-determination satisfaction	29.316	25.214	3.503	0.00142
Locus of self control	23.947	20.714	2.756	0.00970
Locus of life control	36.368	31.071	3.354	0.00211
Overall level of Purpose-in-life	149.737	111.000	5.245	10-05
<i>CISS</i>				
Task-focused coping	57.684	53.714	1.613	0.1168
Emotion-focused coping	38.947	48.786	-2.79	0.00895
Avoidance coping	48.316	46.714	0.503	0.61878
<i>ACS-90</i>				
Action control under failure	5.368	3.286	1.99	0.04535
Action control under planning	5.895	4.714	1.658	0.10738
Action control under enacting plans	8.421	8.143	0.269	0.78936
<i>Self-regulation Styles Inventory</i>				
Modeling	6.105	4.500	2.924	0.00639
Programming	6.211	4.786	2.133	0.04096
Individuation	4.895	6.857	-3.05	0.00466
Overall level of self regulation	29.632	27.357	1.195	0.24126

As it is evident from Table 10 statistically significant differences in the Purpose-in-life characteristics seem

to be particularly informative for differentiating the participants which have high and low indices of the information-processing efficacy assessed implicitly with the help of the new method, presented in this paper.

It is, in our opinion, a convincing proof of the prognostic validity of the presented method. The fact that 3 out of 6 aspects of psychological well-being, as well as its overall measure, also appeared to differ significantly depending upon the information-processing efficacy of the participants allows considering the hypothesized of the research confirmed.

With the help of the CISS, the key role of the emotional component played in the assessment of stability to failure stress has been proved.

The empirical data have also proved the sensitivity of the Implicit Method as an instrument of predicting efficacy of behavior regulation under failure. It is the 'action control under failure' in the Kuhl's scale that revealed significant differences between the clusters tapped by the Implicit Method of Diagnostics, investigated in this study.

With the help of the Self-regulation Styles measures, we have found that the implicit method of the self-regulation assessment can be informative for assessing planning & modeling abilities of the individuals.

Conclusions

The computer-simulated information-processing technique developed for the implicit assessment of the individual's stability vs. susceptibility to emotional stress can be considered valid.

First of all, its use makes it possible to assess some relevant features of psychic processes, determined by the functional states elicited in the individuals in the course of the dynamics of the simulated activity. The procedure of eliciting an unavoidable failure has worked: the participants assessed as susceptible to stress showed the signs of unsuccessful self regulation vividly manifested by the asymmetry characteristics as a sign of operational tension.

Secondly, operational characteristics suggested for assessing the efficacy of performance of the simulated sensorimotor activity, including those that characterize the phenomena of asymmetry, inconsistency of performance characteristics and the general level of activity of the subjects provide reliable

information for diagnosing differences in the psychic states experienced by the individuals in the course of fulfilling the suggested information-processing activity under failure threat conditions.

Thirdly, the data provided in this paper, which illustrate the relationship between the levels of performance of the sensorimotor activity and some stable features of emotionality in the personality structure of the subjects, substantiate the conclusion on the prognostic validity of the suggested technique for the implicit diagnostics of the human emotional stability.

Our experimental data clearly prove that the deterioration of behavioral characteristics in the post-failure conditions cannot be referred to as a phenomenon of the "learned helplessness", as it appears only in one of the clusters of subjects with low level of dispositional characteristics specific to the individuals susceptible to stress. This findings proves that the phenomenon is rooted in the psychic state of an individual susceptible to stress, which can be best operationalized in terms of the self-regulation efficacy.

The suggested method of the implicit assessment of stability vs. susceptibility to stress through the self-regulation efficacy characteristics has been proved informative for tapping the two major aspects of self-regulation: motivational and emotional. Study 1 illustrates the validity of the method for assessing frustration tolerance, and study 2 – that of goal-setting and goal-striving.

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