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*Oles Honchar Dnipropetrovsk National University***VALIDATING A COMPUTER-BASED TECHNIQUE
FOR ASSESSING STABILITY TO FAILURE STRESS**

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 [5]), 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 and prior to it, the failure being elicited by varying the information load, exceeding at one of the stages of the activity the limited short-term memory capacity. An empirical confirmation of the validity of the technique is presented.

Key words: personality stability vs. susceptibility to stress, information-processing technique, self-regulation efficacy, implicit assessment.

Розглянуто можливість розпізнавання особливостей поведінки, притаманної індивідуумам, стійким до стресу, на відміну від стресовразливих, динаміку якої можна прослідкувати на рівні індивідуального випадку. Наводиться описання комп'ютеризованої моделі (запатентованої в Україні як винахід [5]), за допомогою якої стійкість чи вразливість до стресу розпізнається шляхом порівняння ефективності виконання інформаційно-перероблювальної діяльності в ситуаціях, коли обсяг інформації перевищує можливості короточасної пам'яті людини, що провокує неуспіх, або відповідає їм. Розглядаються результати емпіричної перевірки валідності моделі.

Ключові слова: стійкість/вразливість до стресу, інформаційно-перероблювальна модель, саморегуляція ефективності, імпліцитна діагностика

Рассмотрена возможность распознавания особенностей поведения индивидуумов, обладающих устойчивостью к стрессу, по сравнению со стрессонеустойчивыми, динамику которой можно проследить на уровне индивидуального случая. Приводится описание компьютеризованной модели (запатентованной в Украине на уровне изобретения [5]), с помощью которой устойчивость к стрессу распознается путем сравнения эффективности выполнения информационно-перерабатывающей деятельности в ситуациях, когда объем информации превышает возможности кратковременной памяти, что провоцирует неуспех, или соответствует им. Рассматриваются результаты эмпирической проверки валидности модели.

Ключевые слова: устойчивость/уязвимость к стрессу, информационно-перерабатывающая модель, саморегуляция эффективности, имплицитная диагностика

Introduction. Since human behavior, particularly under stressful situations, is likely to be governed by both reflective and impulsive mechanisms [9; 31] and only the reflective mechanisms can be tapped more or less adequately with the explicit methods of diagnostics, a growing number of studies have recently focused on the process-oriented approach to personality assessment [7; 16; 17]. It refers to the person as an active agent and decision-maker who actively adapts to the changing conditions of life thanks to voluntary self-regulation [8]. The efficacy of the approach, as we have been trying to demonstrate lately [1; 4–5; 24–25], can be assessed implicitly in the framework of the process models of investigating personality functioning. The new approach is capable of overcoming the obvious limitations of the explicit methods of diagnostics caused by the public self-consciousness of the respondent [10].

The process-oriented approach to personality assessment in the two, well-known by now manifestations of it – the Implicit Association Test [15; 18; 30] and the Implicit Association Procedure [31] has already yielded fruitful results in tapping inner motives and causes, that determine interindividual differences in behavior and attitudes to social objects [13–14]. But there have been no attempts so far to design a technique for the implicit assessment of the individual's stability vs. susceptibility to stress, based on the analysis of the efficacy of self-regulation in the course of fulfilling a goal-oriented activity under different conditions. This paper presents a brief description and the substantiation of the validity of a new process-oriented approach to studying voluntary self-regulation efficacy displayed by the individual after an unavoidable failure as a predictor of his/her stability vs. susceptibility to one of the commonest stressors in human life – failure [3; 29] (a more detailed description of the method for the English-speaking readers is presented in the International Journal of Advances in Psychology to be published by SEP in May, 2013).

Theoretical background of this study.

Stability vs. susceptibility to stress can be best interpreted, as our extensive review of the related literature and our own empirical findings showed [2; 6; 26–27; 29], as a contextualized integral dynamic personality trait that manifests itself in the stable disposition of the individual either to *retain* or to *lose homeostasis* under complicated conditions of professional activity or in difficult life situations. We define this contextualized dynamic trait in terms of the psychic states, 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 [19; 29]. The state of optimal functioning is 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 [22], 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, individuals tend to experience under certain types of life situations as an indicator of the psychological traits pertinent to them.

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 [21]. 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 [13]. 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 turn into the state of 'maximum functioning'. While with the help of the explicit methods of personality assessment the researcher can identify (if to 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 is likely to bring 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 this project we have made an attempt to identify a unified set of behavioral measures, 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, allows to tap 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.

To fully account for the state-specific behavioral manifestations we resorted to the descriptions of the self-regulation phenomenon as a vital aspect of human adaptation to the possible changes in life, without which the individual would be a helpless spectator of events [8]. Though there is a range of variations in defining the principles of self-regulation in different theoretical approaches to its investigation, all of them, nevertheless, share two basic properties [11]: 1) self-regulation is viewed as a dynamic motivational system of setting goals and developing and enacting strategies to achieve those goals, and 2) self-regulation is also concerned with the management of emotional responses, which are seen as crucial elements of the motivational system and are intricately linked with cognitive processes.

In designing our computer-assisted technique for studying self-regulation efficacy in the course of fulfilling a modeled information-processing activity we accounted for the key properties of self-regulation, singled out in its different models. Thus, in accordance with the Cybernetic Control Theory [12] we considered, that identification of goals and behaving in ways aimed at attaining them, is central in this theory.

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 to assess, as was 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.

Description of 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 of two geometrical figures of 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 series of information exchange exceeds the short-term memory capacity (the location of *three* figures instead of *two* is required to be identified).

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 or orally.

When performing the first set of assignments the recipients have to process information the amount of 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 [20]; 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 [23; 28].

The above described approach to designing the computer-simulated method of assessing stability vs. susceptibility to failure stress allows to assess 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.

Experimental testing of the validity of the method.

Participants. The prognostic validity of the method was tested on two samples of the Dnipropetrovsk University undergraduates [1; 24–25]. One of the samples included freshmen in the period of their adaptation to the new conditions of studies. It consisted of 80 participants predominantly females, aged 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 females, junior students, aged 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, 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 first and then to identify the location of the figures by specifying their rows and columns in their answers. 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 amount of information requested exceeded the human short-term memory capacity. In the third set of 20 assignments the initial conditions were restored.

Since we 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 test-

ing 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 were: State-Trait Anxiety Inventory (Spielberger, C. D., 1972), Ambiguity Intolerance Inventory (Norton, R., 1970), Coping Inventory for Stressful Situations (Endler, N., and Parker, J., 1990), Psychological Well-being Scales (Ryff, C. D., 1989), Action Control Scale (Kuhl, J., 1990), Purpose-in-Life Orientation Test (a Russian version of the test by Crumbaugh and Maholick, modified by D. Leontiev, 1992), Personality Adaptation Potential (Maklakhov, A., 2001).

Results and Discussion

Study 1. Figure 1 shows the results of the performance characteristics of 80 participants (Dnipropetrovsk University undergraduates).

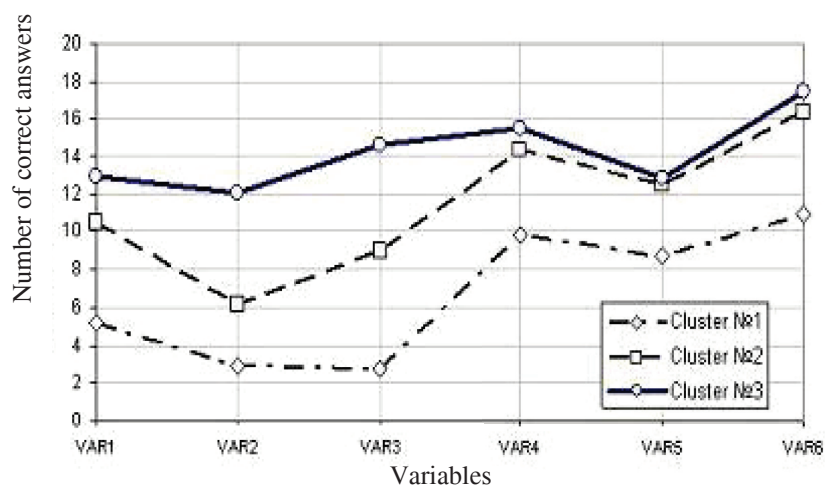


Fig. 1. Results of clusterization of the sample

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	$p < .001$
Var2	2.94	6.21	$p < .001$
Var3	2.72	9.02	$p < .001$
Var4	9.89	14.35	$p < .001$
Var5	8.37	12.47	$p < .001$
Var6	10.95	16.43	$p < .001$

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 < .001
Var2	2.94	12.08	p < .03
Var3	2.72	14.6	p < .001
Var4	9.89	15.52	p < .001
Var5	8.37	12.82	p < .001
Var6	10.95	17.43	p < .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 < .001
Var2	6.21	12.08	p < .03
Var3	9.02	14.6	p < .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 $p < .001$, $p < .03$. This allows to conclude 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 to make 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.

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 of the efficacy of performance after failure demonstrated by the subjects of this group.

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 < .01
	2	2.94	
	1	5.22	p < .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	

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 < .001
	2	6.21	
	1	10.47	p < .01
	3	9.02	
	2	6.21	p < .001
	3	9.02	
Geometrical figures	1	14.35	p < .01
	2	12.47	
	1	14.35	p < .001
	3	16.43	
	2	12.47	p < .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 included into 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 < .001
	3	14.6	
	2	12.08	p < .001
	3	14.6	
Geometrical figures	1	15.52	p < .001
	2	12.82	
	1	15.52	p < .001
	3	17.43	
	2	12.82	p < .001
	3	17.43	

Figure 2 and table 7 show differences in the modes of information processing operationalized 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.

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

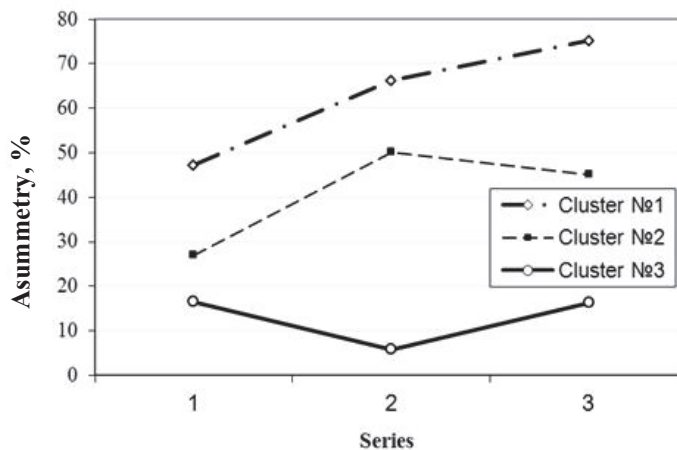


Fig. 2. Asymmetry characteristics in clusters with different levels of performance efficacy

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 more measure of susceptibility 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.

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<.05	p<.01	p<.01	p<.05	Not significant	p<.06

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

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.

Table 9

Between - cluster differences in the continuity of speech utterances, uninterrupted by hesitation pauses

Clusters compaired	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<.001	p<.001	p<.03

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 [23], it was shown that the state of emotional tension causes 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.

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 ϕ^* Fisher criterion for two «opposite» clusters of participants, who had maximum differences in their information processing efficacy characteristics assessed implicitly.

The above mentioned clusters of participants differed: 1) on the preference they showed for resorting to the 'task-focused' strategy of coping with stress: 68 % resorted to this strategy in cluster 3 and 38 % – in cluster 1 ($\phi^*_{emp} = 2.01, p<.02$); 2) on the psychological-well-being (C. D. Ryff, 1989) 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 ($\phi^*_{emp} = 2.05, p<.02$).

Study 2.

In the second sample of the participants (junior 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.3).

As evident from this figure, 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.

Fig 4 shows that their asymmetry characteristics drastically differed for 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 most susceptible to failure stress and most stable to it.

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 decided to assess (mainly explicitly) the integrated dynamic trait which was called the «self-initiated behavior regulation activity» [32]. Studying this trait-characteristic features was the subject-matter of their selective course, taught by our colleague Olga Glushko, who substantiated the notion of the «self-initiated behavior regulation activity» in her Ph. D. thesis. The participants of this sample took part in the empirical research for a credit in this course.

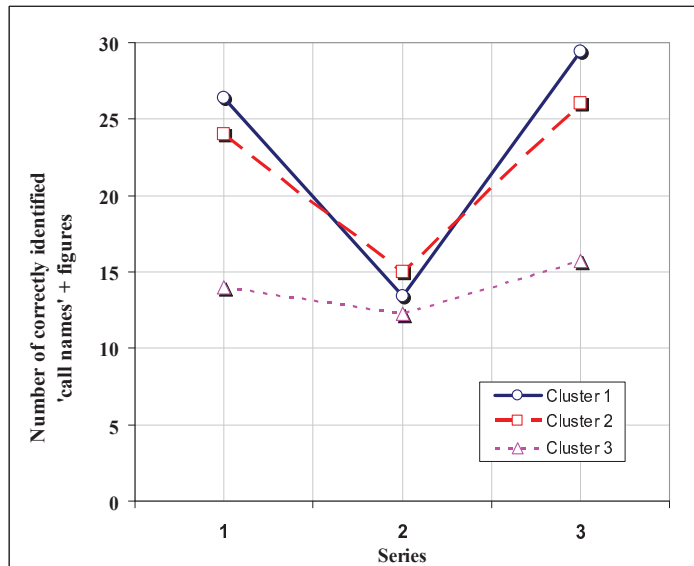


Fig. 3. Between-cluster differences in the implicitly assessed information-processing efficacy

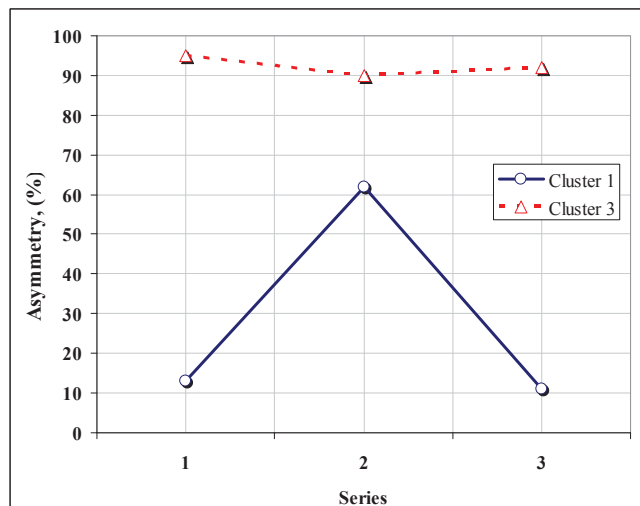


Fig. 4. Asymmetry characteristics in clusters with different levels of performance efficacy

For assessing the self initiated behavior regulation efficacy' the following psychodiagnostic inventories were used, as suggested by the author of the course: Coping Inventory for Stressful Situations (Endler, N. & Parker, J.,1990), Psychological Well-being Scales (Ryff, C. D.,1989), Action Control Scale (Kuhl, J.,1990), Purpose-in-Life

Orientation Test (a Russian version of the test by Crumbaugh and Maholick, modified by D. Leontiev, 1992),

The corresponding personality measures of the self-initiated behaviors regulation activity 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.

As clear 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 to consider the hypothesized of the research confirmed.

Table 10

Explicitly assessed significant differences in personality characteristics of the participants with the highest and lowest information processing efficacy measures

List of Inventories and their scales		Mean values		t	p
		Cluster 1	Cluster 3		
Psychological Well-Being (Ryff, 1989)	self-acceptance	12.421	10.357	2.932	.006284
	the establishment of quality ties to other	12.263	9.643	3.648	.000961
	the ability to manage complex environments to suit personal needs and values	11.842	9.286	3.306	.002397
	the pursuit of meaningful goals and a sense of purpose in life	12.421	10.143	2.667	.012057
	Cumulative level of Psychological Well-being	70.842	59.571	4.494	.000
Purpose-in-life test (adapted by D.Leontiev, 1992)	Sense of life	36.105	30.286	2.905	.006714
	Life integrity	35.947	30.357	3.638	.000989
	Self-determination satisfaction	29.316	25.214	3.503	.00142
	Locus of self control	23.947	20.714	2.756	.009705
	Locus of life control	36.368	31.071	3.354	.002115
	Overall level of Purpose-in-life	149.737	111.000	5.245	.000
CISS (Endler & Parker, 1990)	Emotion-focused coping	38.947	48.786	-2.789	.008956
ACS-90 (Kuhl, 1990)	Action control under failure	5.368	3.286	1.99	.045354

With the help of the CISS the key role of the emotional component 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.

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 about 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 finding 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.

References

1. **Arshava I. F.** A reflected behavioral manifestation of the human emotional stability / I. F. Arshava // Abstracts of the XXIX International congress of Psychology, International journal of psychology. – 2008. – Vol. 43(3/4). – P. 622–623.
2. **Arshava I. F.** Role of active stress coping strategies in human being emotional stability prognosis / I. F. Arshava // Abstract 4th International interdisciplinary congress «Neuroscience for Medicine and Psychology». – Sudak, Crimea, Ukraine. – 2008. – P. 49–50.
3. **Arshava I. F.** Aspects of the Implicit Emotional Stability Diagnostics / I. F. Arshava, E. L. Nosenko. – Dnipropetrovsk : University Publisher, 2008. – 468.
4. **Arshava I. F.** Behavioral manifestations of the memory and cognitive deterioration on caused by stress / I. F. Arshava, E. L. Nosenko // Materials of the 1st World Congress of Psychophysiology. – St. Petersburg, Russia. – 2008. – P. 284–285.
5. **Arshava I. F.** Method of Predicting Human Emotional Stability / I. F. Arshava, E. L. Nosenko, A. L. Khizha / Patent of Ukraine, № 91842. – Bulletin of Inventions № 17, September, 10, 2010.
6. **Arshava I. F.** Cross-situation Consistency of the Behavior Self-regulation as an Evidence of the Trait-like Nature of Coping Strategies / I. F. Arshava, E. L. Nosenko, I. F. Ponomareva // Materials of 15th European Conference on Personality. – July 20–24, 2010. – Brno, Czech Republic. – P. 225.
7. **Asendorpf J. B.** Double dissociation between implicit and explicit personality self-concept: The case of shy behavior / J. B. Asendorpf, R. Banse, D. Mücke // Journal of Personality and Social Psychology. – 2001. – № 83. – P. 380–393.
8. **Baumeister R. F.** The Cultural Animal: Human nature, meaning, and social life / R. F. Baumeister. – New York : Oxford University Press, 2005. – 464 p.

9. **Brendl C. M.** Indirectly measuring evaluations of several attitude objects in relation to a neutral reference point / C. M. Brendl, A. B. Markman, C. Messner // *Journal of Experimental Social Psychology*. – 2005. – № 41. – P. 346–368.
10. **Buss A. H.** *Self-consciousness and Social Anxiety* / A. H. Buss. – San Francisco : W. H. Freeman, 1980. – 270 p.
11. **Cameron L. D.** Self-regulation, health and illness: An overview / L. D. Cameron // *The Self-regulation of Health and Illness Behavior* / L. D. Cameron and H. Leventhal (Eds). – London : Routledge, 2003. – P. 1–13.
12. **Carver C. S.** Stress, coping, and self-regulatory processes / C. S. Carver, M. F. Scheier // *Handbook of Personality Theory and Research* / L. A. Pervin & J. P. Oliver (Eds). – New York : Guilford, 1999. – P. 553–575.
13. **Cervone D.** Explanatory models of Personality: Social–Cognitive Theories and the knowledge and appraisal model of Personality architecture / D. Cervone // *The SAGE Handbook of Personality and Assessment*. – Vol. 1. Personality Theories and Models / Eds. Gregory J. Boyle, Gerald Matthews, Donald Saklofske. – Los Angeles; London; New Delhi; Singapore : SAGE Publication Ltd, 2008. – P. 80–100.
14. **Cervone D.** Self-efficacy beliefs and the architecture of personality / D. Cervone, N. Mor, H. Orom // *Handbook of Self-regulation. Research, Theory and Applications* / R. F. Baumeister & K. D. Vohs (Eds). – New York : Guilford, 2004. – P. 188–210.
15. **Egloff B.** An Implicit Association Test for assessing anxiety: Findings and Perspectives / B. Egloff, S. Schmukle // *Conference Abstracts of the 12 European Conference on Personality*. – Netherlands: July, 18-22, 2004. – P. 103.
16. **Greenwald A. G.** Implicit social cognition: Attitudes, self-esteem, and stereotypes / A. G. Greenwald, M. R. Banaji // *Psychological Review*. – 1995. – № 102. – P. 4–27.
17. **Greenwald A. G.** A unified theory of Implicit attitudes, stereotypes, self-esteem and self-concept / A. G. Greenwald, M. R. Banaji, L. A. Rudman // *Psychological Review*. – 2002. – № 109. – P. 3–25.
18. **Greenwald A. G.** Measuring individual differences in implicit cognition: the implicit association test / A. G. Greenwald, D. E. McGhee, J. L. Schwartz // *Journal of Personality and Social Psychology*. – 1998. – №74. – P. 1464–1480.
19. **Illyin Y. P.** *The Psychophysiology of Human States* / Y. P. Illyin. – StPetersburg : Piter, 2005. – 412 p. (published in Russian).
20. **Kuhl J.** An Information-processing perspective on motivation: Intrinsic task-involvement, problem-solving, and the complexity of action plans / J. Kuhl, J. Wassiljev // *Cognition, Information Processing, and Motivation* / G. D. Ydewalle (Ed). – Amsterdam : North-Holland, 1985. – P. 505–522.
21. **Lomov B. F.** *Methodological and Theoretical Issues of Psychology* / B. F. Lomov. – Moscow : Science, 1984. – 446 p. (published in Russian).
22. **Maksymenko S. D.** *Psychological Nature of the Personality* / S. D. Maksymenko. – Kyiv : KKM, 2007. – 240 p. (published in Russian).
23. **Nosenko E. L.** *Emotional State and Speech* / E. L. Nosenko. – Kyiv : Higher School, 1981. – 194 p. (published in Russian).
24. **Nosenko E. L.** A computer-based information-processing technique of predicting proneness to emotional stress / E. L. Nosenko, I. F. Arshava // *Abstracts of the XXIX International congress of Psychology. International journal of psychology*. – 2008. – № 43(3/4). – P. 586.
25. **Nosenko E. L.** Prognostic Value of a Computer-based Information – Processing Technique for Studying Voluntary Self-regulation After an Unavoidable Failure / E. L. Nosenko, I. F. Arshava // *Materials of 15th European Conference on Personality*. – July 20– 24, 2010. – Brno, Czech Republic. – P. 229.
26. **Nosenko E. L.** Subconscious inhibition/activation of behavioral responses to significant stimuli as psychophysiological mechanism of consciousness / E. L. Nosen-

ko, I. F. Arshava // Materials of the 1st World Congress of Psychophysiology. – St Petersburg, Russia. – P. 276–277.

27. **Nosenko E. L.** Implicit assessment of proneness to emotional stress through foreign language anxiety / E. L. Nosenko, I. F. Arshava, D. V. Nosenko // Abstracts of the XXIX International congress of Psychology, International journal of psychology. – 2008. – №43(3/4). – P. 646.

28. **Nosenko E. L.** Memory and Emotional State / E. L. Nosenko, S. N. Egorova. – Dnipropetrovsk : University Publisher, 1996. – 145 p. (published in Russian).

29. **Nosenko E. L.** Theoretical Foundations of a Computer-simulated assessments of Human Emotional Stability / E. L. Nosenko, I. F. Arshava. – Dnipropetrovsk: University Publisher, 2006. (published in Russian).

30. **Schmukle S. C.** Does the Implicit Association Test for assessing anxiety measure trait and state variance? / S. C. Schmukle, B. Egloff // European Journal of Personality. – 2004. – №18. – P. 483–494.

31. **Schnabel K.** Employing automatic approach and avoidance tendencies for the assessment of Implicit Personality Self-concept. The Implicit Association procedure / K. Schnabel, R. Banse, J. B. Asendorpf // Experimental Psychology. – 2006. – № 53 (1). – P. 69–76.

32. **Tatenko V. A.** Psychology in the Subject's Dimensions / V. A. Tatenko. – Kyiv : Prosvita, 1996. – 406 p. (published in Russian).

Надійшла до редколегії 01.03.2013.

УДК 159.942

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ЕМОЦІЙНА ЗРІЛІСТЬ ОСОБИСТОСТІ: ПРАКТИЧНІ ПРОБЛЕМИ ПСИХОЛОГІЧНОЇ ДІАГНОСТИКИ

Розглянуто теоретичні основи вивчення емоційної зрілості особистості, наведено її характерні ознаки. Розглянуто й проаналізовано деякі методики психологічної діагностики, які вимірюють емоційну зрілість у різноманітних контекстах: як самостійний конструкт; як компонент у складі певних параметрів особливостей особистості (в якості окремої шкали); як характерну ознаку в описі досліджуваних показників.

Ключові слова: емоційна зрілість особистості, шкала емоційної зрілості.

Рассмотрены теоретические основы изучения эмоциональной зрелости личности, приведены ее характерные признаки. Рассмотрены и проанализированы некоторые методики психологической диагностики, которые измеряют эмоциональную зрелость в различных контекстах: как самостоятельный конструкт; как компонент в составе определенных параметров особенностей личности (в качестве отдельной шкалы); как один из характерных признаков в интерпретации отдельных факторов (шкал).

Ключевые слова: эмоциональная зрелость личности, шкала эмоциональной зрелости.

Постановка проблеми. Емоційна зрілість дорослої людини є необхідною умовою для здійснення ефективної професійної діяльності, для побудови гармонійних міжособистісних відносин, для підтримки психоемоційного та сома-