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A NEW INSTRUMENT FOR OPERATIONAL STRESS ASSESSMENT

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ABSTRACT

This paper aims to be an overview of the scientific approach on the development of an inventory of operational stress assessment, specific to the military operations theatre, in order to make it available to practicing psychologists. Conclusive scientific data and evidence have been obtained from empirical studies over several years, and the resulting tool can be used with confidence.

KEYWORDS: military operations theatre, hostility environment, operationalization of the concept of operational stress, validation of the assessment inventory

1. Military Operations Theatre – An Environment of Hostility and Psychological Confrontation

It is well known that the military environment as a whole, but especially the military operations theatre in particular, abounds in activities of a deeply hostile nature and psychic confrontation for its members. Although the professional personnel of the military organization becomes a member of the organization by free and voluntary option, and access to the organization is preceded by several stages of psychological assessment aimed at adjustment, there are still obvious discrepancies between the involvement needs required by the organization and the level of individual expectations, which leads to a form of *"psychological confrontation"*.

Through the participation of personnel in various activities in military operations theatres, such as Bosnia, Afghanistan, Iraq, etc., it has become a priority to study the environments of hostility and psychological confrontation for a fair and complete understanding of specific characteristics.

Based on these considerations, there is an interest in the study and the explanation that some persons develop certain manifestations specific to disorders related to stress and traumatic events, and in others the confrontation becomes a factor of development. The studies take into account the results of psychological assessments carried out before, during and after the operations.

2. Taxonomies of Stress and Stressors

According to Selye (1956), stress is a biological and general reaction: *"a condition that translates into a specific syndrome, corresponding to all non-specific changes, induced in a biological system"* (p. 76), and Jonas and Crocq (1996) propose a more developed definition: *"stress is a physiological and psychological reaction of alarm, mobilization and defence of the body against an aggression, a threat or even an unusual situation"* (p. 25), but for Lazarus and Folkman (1991) stress is *"a cognitive and behavioural effort to reduce, control, or tolerate external or internal stresses that go beyond personal resources"* (p. 191).

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We opt for a definition-conclusion: *"a qualitative state experienced negatively by the individual, as discomfort, which has detrimental consequences on mental and physical health, the result of inadequate coping with internal or external stressors in the psychosocial field"* (Prisăcaru, 2016, p. 146).

The heterogeneity of individual responses to stress has given rise to a diverse picture of its forms. As the previous definitions show, stress is interpreted as a state of the body, resulting from the interaction, the unique or repeated confrontation of the individual with the situation. A situation can be stressful for most people, but it may not be evaluated and experienced in the same way by one person or another.

Some people are able to adapt more effectively, so a stressor enables them to buy more and can structure their lives in a very interesting way. Other people do not adapt so well and this results in poor performance and productivity or even illness and homeostasis disorder.

Therefore, depending on the action on the body, stress can have both positive and negative effects, being found in two forms:

• *Positive stress or eustress,* is the one that acts as an energizing factor helping the person to approach situations as challenges, in a much more effective way.

• *Negative stress or distress*, in which the overworked body refuses to return to normal state due to the fact that the individual is irritable and nervous, ready to react, with high blood pressure and tense muscles.

On the other hand, the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V, 2016) refers to two forms of stress:

• *Acute stress,* in which the main element is the development of characteristic manifestations lasting from three days to a month, following exposure to one or more traumatic events experienced directly, which may include exposure to some war-specific acts, violent personal aggression, natural disasters, severe accidents, etc.

• *Post-traumatic stress*, as a severe form of the disorder, involves direct or indirect personal experience of an event that involves actual death or threat of death, or serious injury or threat to bodily integrity. Post-traumatic stress reactions can also occur as a result of witnessing an event that involves the death, injury, or threat of another person's bodily integrity, or learning about the violent and unexpected death of a family member.

To outline the conceptual framework, we also present some concepts that we will operate with, as they are presented in the scholarly literature. For example, Popa (2012), referring to combat stress, states: *"Depending on the conceptual model and tradition of each army, combat stress is recognized in one of the following situations: clinical symptoms, which require evacuation from battlefield; requesting evacuation due to the presence of clinical symptoms; requesting evacuation, without the existence of physical injuries"* (p. 139).

The author also draws attention to three other types of stress, specific to the theatre of military operations, namely: basal stress, cumulative stress and traumatic stress (Popa, 2012, pp.157-160).

• *Basal stress* is determined by daily experiences, the monotonous and routine nature of some activities, as well as the restrictions on leaving the dislocation area.

• *Cumulative stress* is the result of intense, repeated, and lasting stresses to which participants are subjected on a daily basis.

• *Traumatic stress* is caused by the action of a single stressor that acts suddenly and violently.

This classification responds best to our study, given that it provides a perspective for expressing stress on a continuum, in which cumulative stress is the operational stress or combat stress generated by a series of multiple stressors, specific to the military operations theatre,

such as: extreme geographical conditions, low quality of life, prolonged separation from family and limited communication, long missions, etc.

Based on the previous assessments and taking into account that in the literature we find tools for assessing basal and post-traumatic stress, but less for cumulative stress, we appreciate that it is interesting to develop an appropriate tool for assessing operational stress, in order to make it available to practitioners.

3. Methodological Guidelines and Frameworks

The study on the design of a standardized inventory for the assessment of operational stress, equivalent to cumulative stress, started from the need to measure it with an instrument adapted to the reality of military operations theatres and tasks involving personnel, so its development has become a priority.

In order to fulfil the purpose stated above, we have clarified the defining aspects for the approach of design and methodological validation of the instrument, through the following objectives:

• *Objective no. 1* – definition, operationalization and investigation of the dimensions targeting the stressors of the hostile environment specific to the military operations theatre;

• *Objective no. 2* – elaboration of the initial form of the inventory and carrying out experimental studies for its completion;

• *Objective no. 3* – elaboration of the final form of the inventory for the assessment of the influence of some types of stressors and its validation.

3.1. Definition and Operationalization of Stressors

To achieve the objective no. 1, the working definition for the concept of stressor was established, presented below, and the requirements for the operationalization of the concept and data collection requirements were set.

Stressors are stimuli capable of altering, even temporarily, the state of psychic balance, generating psychic stress under certain conditions. Even if some of them would be able to trigger a syndrome in most of the people involved, the degree of damage is different from one person to another, depending on the context, their peculiarities and personality traits (Prisăcaru, 2013, pp. 47-50).

An indirect way was followed to operationalize the concepts of stressors, by using an open-ended question and a specific record note, transposed into a protocol for answer. It was applied to a number of 50 people participating in the theatre of military operations, with different ages, experience and training, according to the model presented in Table no. 1.

Table no. 1

Protocol for answer (excerpt)

PROTOCOL FOR ANSWER
Stressors represent stimuli... (the definition above is presented).
With the phrase "military operations theatre-specific stressor" in mind, please list five expressions/sentences/words that you consider most important:
1. …….....
2. …….....
3. …….....
4. ...…….....
5. …….....

Following the application of the protocol, all assertions made by the staff requested to answer were collected, resulting in a number of 250 assertions, without intervening in their content. Subsequently, a group of 5 psychological experts with experience in developing psychological assessment tools compiled the list of correctly formulated assertions, eliminating only those that did not meet the requirements of the established concept, quality and record note, as well as those that were repeated, resulting in a list of 51 assertions.

In order to achieve the objective no. 2, the expert psychologists used the assertions mentioned above for the elaboration of the items from the structure of the initial inventory for the assessment of operational stress, presented in Table no. 2.

In order to give its shape, content and characteristic structure, the general guidelines were designed, the fields for recording the identification data, the answer variants on a 5-step Lickert scale and the meaning of the answers were established.

Table no. 2

Initial inventory of operational stress assessment (excerpt)

OPERATIONAL STRESS ASSESSMENT INVENTORY

The following are a list of stressors (stimuli) that may affect you differently, cognitively, emotionally, and behaviourally.
Please read each statement (stressor) carefully and honestly assess the level of influence it has on you, then mark with an "X" next to the chosen answer, using the following meanings: 1 – to very small extent; 2 – to a small extent; 3 – to some extent; 4 – to a large extent; 5 – to a very large extent.
The answers to this tool are not considered right or wrong.

No.	Stressors (stimuli)	1	2	3	4	5
1.	Sleep deprivation					
2.	Fear of death					
3.	Conflict situations within the subunit					
4.	Prolonged thirst					
5.	Action at night					

The initial inventory was experimentally applied to a sample of 380 persons, consisting of probabilistic principles, representative of the target population, composed of participants in the fourth month of activities in theatres of military operations in Afghanistan and Iraq.

3.2. Analysis and Interpretation of Data Obtained

The most important stage aimed at the analysis and interpretation of data in order to develop the final form of the inventory, specific steps to objective no. 3. The data thus obtained were entered into a database in the SPSS software and subjected to statistical analyses.

The "normality" of the distribution of answers for each item was analysed, knowing that the average expresses the central tendency of a group of results, and the standard deviation indicates the value of data scattering around the central trend, then the factorial analysis was performed to verify the consistency between items and constructs, how they are grouped and the analysis of the internal consistency of the items within each factor.

In order to perform the factor analysis, the technique of *"explanatory factor analysis"* was used, for a general variability greater than 50 %. Some of the results are presented in Annex no. 1. Through the performed analysis, we obtained the grouping of the items by factors, as well as

the value of the correlation coefficients between each item and the factor in which it was included/grouped. There were 3 significant factors, each with a different number of items. The qualitative analysis of the items distributed outside the 3 factors concluded that some of them refer to aspects common to those of significant factors, considered to be important.

The forced grouping of all items that have a correlation coefficient greater than 50 % led to the definition of the 3 factors, and the analysis of the content of each item contained in factors, as well as the common elements that define them, led to the formulation of conclusions on the name, definition and description of each factor highlighted, as follows: factor 1, called *"physical-biological stressors"* (Ph.B.); factor 2, called *"psycho-organizational stressors"* (P.Org.) and factor 3, called *"intrapsychic stressors"* (I.P.).

We appreciate that through the approach carried out, the consistency of the answers or patterns in the response mode of the persons was verified, as well as a first verification of the validity of the content. The way of grouping the items is not considered at this stage to be absolute but only indicative, because it is possible that a close correlation between two factors to arise, but to refer to different aspects of the main construct. Also in this stage, the operation of isolating the items that are not part of the 3 factors was performed, following that in the intermediate analysis of the inventory to decide which to supress.

At the same time, referring to the normal distribution curve, the items that meet the requirements or that prove to be discriminatory and do not induce significant errors, generated by the orientation of the answers predominantly towards acceptance or rejection, were analysed.

Since the theoretical average for a 5-step Likert scale is 3, it has been estimated that 9 of the 51 items in the inventory have calculated average values one point lower than the theoretical average. Of these, only 6 were included in the factorial groups, respectively: 9, 14, 32, 39, 42 and 51. The analysis of the calculated statistical averages and the content of the listed items argue the decision to eliminate them. The remaining items thus grouped according to the factorial analysis follow the stage of the analysis of the internal consistency, respectively of the Alpha Crombach coefficient, which is considered decisive and relevant as a psychometric indicator.

The performance of the internal consistency analysis provides us with scientific support and the guarantee that we dispose of a set of consistent items, which refer to the same psychological construct. Also, by performing the analysis of the internal consistency, respectively of the Alpha Crombach formula, we have the certainty that we have verified the homogeneity of the set of items. The values obtained are presented in Table no. 3.

Table no. 3

Values of internal consistency coefficients

RELIABILITY ANALYSIS – SCALE (ALPHA)					
Item-total Statistics Corrected		Item-total Statistics Corrected		Item-total Statistics Corrected	
Item Alpha Total Correlation	Alpha if Item Deleted	Item Alpha Total Correlation	Alpha if Item Deleted	Item Alpha Total Correlation	Alpha if Item Deleted
STRES OP.1 .4716	.9112	STRES OP.19 .5634	.9068	STRES OP.2 .6632	.8932
STRES OP.7 .6147	.9057	STRES OP.20 .7149	.8974	STRES OP.5 .6084	.8971
STRES OP.12 .6515	.9035	STRES OP.21 .7637	.8942	STRES OP.6 .7004	.8907
STRES OP.26 .7229	.9000	STRES OP.22 .7559	.8949	STRES OP.10 .6056	.8974
STRES OP.27 .6435	.9039	STRES OP.23 .7214	.8971	STRES OP.11 .7924	.8830
STRES OP.35 .5942	.9060	STRES OP.24 .6459	.9017	STRES OP.13 .6899	.8912
STRES OP.36 .7160	.9005	STRES OP.34 .7757	.8934	STRES OP.28 .7318	.8881

RELIABILITY ANALYSIS – SCALE (ALPHA)					
Item-total Statistics Corrected		Item-total Statistics Corrected		Item-total Statistics Corrected	
Item Alpha Total Correlation	Alpha if Item Deleted	Item Alpha Total Correlation	Alpha if Item Deleted	Item Alpha Total Correlation	Alpha if Item Deleted
STRES OP.37 .7600	.8994	STRES OP.40 .6570	.9011	STRES OP.29 .6279	.8960
STRES OP.46 .6730	.9024	STRES OP.43 .5367	.9089	STRES OP.31 .6582	.8941
STRES OP.47 .6812	.9021	STRES OP.45 .5985	.9045	Reliability Coefficients	
STRES OP.49 .5637	.9075	Reliability Coefficients		Nof Cases = 380.0	
STRES OP.50 .6851	.9018	N of Cases = 380.0		N of Items = 9	
Reliability Coefficients		N of Items = 10			
N of Cases = 380.0					
N of Items = 12					
Alpha factor 1 = .9110		**Alpha factor 2 = .9092**		**Alpha factor 3 = .9032**	

Analysing the values of the coefficients, we notice that all factors have values higher than 0.90, and each item has a value over 0.80, which means that it refers to the same construct.

Also, the calculation of the internal consistency coefficient as a characteristic of the "fidelity" of a standardized assessment tool, as well as the high values obtained, over 0.80, lead us to the conclusion that we have a good, reliable tool and that for repeated applications, under the same conditions and on the same individuals, we will get identical or very close scores.

The extracted factors become the scales of the Operational Stress Assessment Inventory, as follows:

– The scale of "physical-biological stressors" (Ph.B.) aims at stimuli that have a special influence on the resistance and physical and biological integrity and the primary needs of each individual, and through them on the psyche, being composed of 12 items, as follows: 1, 5, 8, 16, 17, 22, 23, 24, 28, 29, 30, 31.

– The scale of "psychological-organizational stressors" (P.Org.) refers to the stimuli that have influence and effects on meeting of social, interrelational, solidarity, cohesion and affiliation needs, being composed of 10 items, as follows: 10, 11, 12, 13, 14, 15, 21, 25, 26, 27.

– The scale of "intrapsychic stressors" (I.P.) aims at stimuli that have influence and effects on individual mental balance (emphasizing certain psychic tensions and emotional feelings), hypersensitivity, feelings, behaviours, emotional response capacity and moral beliefs, consisting of 9 items, as follows: 2, 3, 4, 6, 7, 9, 18, 19, 20.

The inventory is scored using the answer grids specific to each scale, respectively the distribution of items on each scale presented above, by taking into account and summing the value of each significant answer, obtaining the gross score (G.S.). The gross score refers to the inventory standard, presented in Table no. 4.

Table no. 4

Operational Stress Assessment Inventory Standard

Class	Meaning	Gross values for inventory scales			Total inventory
		Ph.B.	P.Org.	I.P.	
1	To a very small extent	0-14	0-9	0-10	0-38
2	To a small extent	15-20	10-16	11-20	39-60
3	To some Extent	21-31	17-25	21-30	61-85
4	To a large extent	32-45	26-37	31-37	86-119
5	To a very large extent	46-60	38-50	38-45	120-155

4. Conclusions and Future Research Directions

This research, briefly presented, was concluded by designing the Operational Stress Assessment Inventory, presented in Annex no. 2 and the standard. Its elaboration is part of a laborious scientific endeavour, carried out over several years, starting from a need felt by the author in a period in which he participated directly, as a psychologist, in operations carried out in a hostile environment, and the data used were obtained directly from the persons to whom psychological assistance services were provided, targeting both those of prevention or prophylaxis, and those of specialized intervention.

Subsequently, the inventory was used to conduct a study on a representative sample of the specific population, together with two other assessment tools, to study the accumulated stress level, following the theoretical model presented in sub-point 2, respectively the assessment of *basal stress*, determined by the daily experiences, the *cumulative stress,* as a result of the intense, repeated and lasting stresses specific to the theatre of military operations (operational stress), and *the traumatic stress,* caused by the action of a single stressor acting suddenly and violently. The results obtained will be the subject of a future paper, and the research will be multiplied by conducting another study using the same tools to assess basal stress, operational stress and post-traumatic stress.

Annex no. 1

Factor analysis data (grouping by 3 factors)

	Compound		
	1	2	3
stress op item 36	**.737**		.258
stress op item 37	**.701**	.222	.242
stress op item 27	**.700**		.205
stress op item 50	**.697**	.186	.242
stress op item 12	**.694**		.208
stress op item 51	**.688**	.207	.262
stress op item 26	**.624**	.245	.362
stress op item 32	**.614**	.189	.304
stress op item 39	**.607**	.234	.159
stress op item 35	**.591**	.261	.137
stress op item 7	**.575**	.130	.235
stress op item 46	**.569**	.434	.242
stress op item 47	**.551**	.360	.408
stress op item 49	**.526**	.101	.296
stress op item 1	**.500**	.124	.126
stress op item 38	.496		
stress op item 25	.488	.412	.451
stress op item 44	.472	.449	.147
stress op item 41	.444	.307	.218
stress op item 4	.437	.210	.276
stress op item 3	.422	.409	
stress op item 17	.193		.153
stress op item 22		**.811**	.216
stress op item 34	.214	**.810**	.146
stress op item 21		**.803**	.215
stress op item 20	.182	**.750**	
stress op item 23	.201	**.728**	.161
stress op item 40	.379	**.653**	
stress op item 24		**.648**	.420

	Compound		
	1	2	3
stress op item 43		**.605**	
stress op item 42	.318	**.573**	.199
stress op item 19	.133	**.560**	.241
stress op item 45	.412	**.515**	.304
stress op item 18	.397	.456	.395
stress op item 30	.307	.397	.379
stress op item 16	.350	.363	.222
stress op item 33	.300	.351	.233
stress op item 11	.244	.124	**.802**
stress op item 13	.142	.256	**.731**
stress op item 2	.253		**.702**
stress op item 6	.439		**.687**
stress op item 10	.100	.330	**.645**
stress op item 28	.372	.405	**.614**
stress op item 31	.239	.348	**.597**
stress op item 5	.407		**.574**
stress op item 9	.418	.186	**.550**
stress op item 14	.493	.190	**.542**
stress op item 29	.339	.343	**.512**
stress op item 48	.374	.330	.485
stress op item 15	.401	.365	.449
stress op item 8	.279	.304	.341

Extraction method: analysis of main components.
Rotation method: Varimax with Kaiser type normalization;
The rotation was completed after 6 iterations.

Annex no. 2

Operational stress assessment inventory

The following are a list of stressors (stimuli) that may affect you differently, in cognitive, emotional, and behavioural terms. Please read each statement (stressor) carefully and honestly assess the level at which it affects you, then mark „X" next to the chosen answer, using the following meanings: **1 – to a very small extent; 2 – to a small extent; 3 – to some extent; 4 – to a large extent; 5 – to a very large extent.**

The answers to this tool are not considered right or wrong.

No.	Stressors (stimuli)	1	2	3	4	5
1.	Sleep deprivation					
2.	Fear of death					
3.	Action at night					
4.	Fear of the unforeseen and the unknown					
5.	Restriction of the freedom to use weapons by rules					
6.	Effects of material damage caused by the opponent					
7.	Fear of injury/mutilation					
8.	Diet with another specifics					
9.	Opponent's weapon (unconventional) power of destruction					
10.	Possibilities to rescue any wounded in the area of military operations					
11.	Low professional skills of commanders					
12.	Mood (morale) of the group / team / platoon					
13.	Lack of confidence in the fighting ability of the comrades					
14.	Limited access to information needed by the micro-group to perform tasks					

No.	Stressors (stimuli)	1	2	3	4	5
15.	Distrust of the combat equipment / technique provided					
16.	Long stay inside the battlefield					
17.	Special climatic conditions					
18.	Fear of being isolated from the rest of the group					
19.	Use by the opponent of unknown types of weapons					
20.	Fear of being taken prisoner / hostage					
21.	Low cohesion of the subunit you belong to					
22.	Circulation of rumours (of unconfirmed information)					
23.	Relief features of the area (lack of vegetation, dust, hard to reach land)					
24.	Prolonged use of protective equipment					
25.	Failure of leaders to resolve staffing issues in a timely manner					
26.	Desire to honour the professional obligations towards the comrades-in-arms					
27.	Existence of contradictory information regarding the military operations in the area					
28.	Repeatedly accumulated physical fatigue					
29.	Repeated threat with reference to attacks by the opponent					
30.	Longing for loved ones at home					
31.	Prolonged state (need) of vigilance					

Scale	Ph.B.	P.Org.	I.P.	Total inventory
G.S.				
Class				

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