

STRESS QUESTIONNAIRE MEASURING EMOTIONAL TENSION, EXTERNAL STRESS, INTRAPSYCHIC STRESS, FIGHT-OR-FLIGHT, AND MOBILIZATION

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Abstract: In the context of stress measurement, the sources of stress, the levels of stress intensity, consequences of stress, strategies and styles of coping, are very important. The article presents detailed information on the Stress Questionnaire, which comprises five factors. The first is Emotional Tension, characterized by the experience of anxiety and excessive nervousness. The second is External Stress - it manifests itself as a reaction to external situations that the individual cannot cope with. The third factor is Intrapsychic Stress - it has its source in the individual's mind, thoughts, beliefs, judgments, and appraisals. The next factor is the so-called Fight-or-Flight, which occurs in situations of sudden threat, the presence of an enemy, or when escape from threat is necessary. The last factor is Mobilization, or the activation of the organism in, among others, difficult situations or situations of competition. R. Lazarus and S. Folkman's (1987) transactional theory of stress was the theoretical foundation. The article presents analyses on the questionnaire's items and scale reliability (Cronbach's alpha or coefficient alpha was used), validity (factor and criterion validity) and test-retest reliability. A sample of 1371 women and men was studied. The final part of the article describes the scales, score calculation, and the questionnaire in English.

Keywords: *stress, threat, mobilization, transactional theory of stress.*

Introduction

The topic of stress and coping has enjoyed great popularity for many years, and it is researched not only by psychologists, but also representatives of other disciplines, in particular medicine, pedagogy, sociology, or sports science.

In the last few decades, focus has shifted from the experience of stress itself to the behaviors individuals consciously undertake to cope with stressful situations. The consequences of stress are decided to a greater extent by the coping efforts rather than by the objective characteristics of the stressor. Most of the studies in this area is based on the transactional conceptualization of stress, created by Richard Lazarus and Susan Folkman (1987). It assumes that stress is the disruption of a transaction between the individual and their environment. This conceptualization underscores the role of the subjective appraisal of the experienced events. Confronting the demands of the environment with the individual's own capabilities involves the processes of cognitive appraisal of personal meaning (primary appraisal) and the capabilities of using the available resources to cope with the demands of the stressor (secondary appraisal) The transaction between the individual and the environment can be stressful,

but it can also be beneficial, positive, or without any significant meaning. In the latter two cases, the situation does not endanger personally significant values and does not threaten the individual's wellbeing. However, if the individual appraises the transaction as surpassing their coping capabilities, the result is distress.

Stressful transactions can have the character of harm/loss, threat, or challenge. Harm/loss appraisals are related to the sustained loss in the form of losing valued objects, and it usually involves the experience of such emotions as anger, regret, or sadness. Threat appraisals are related to the possibility of experiencing harm or loss and cause fear, anxiety, and worry. In turn, challenge appraisals involve both the possible losses as well as benefits, and causes both negative emotions characteristic of threat (fear, anxiety, worry) as well as positive ones - hope, eagerness, arousal.

Harm/loss, threat, or challenge appraisals may be situational or dispositional. The former considers intersituational changes and depends on the features of the current stressful situation, such as controllability, uncertainty, or the duration of the stressor. On the other hand, dispositional appraisals, understood as styles of cognitive appraisals, occur in identical form across many different situations and are an expression of a

constant tendency to appraise one's relations with one's environment in a given way. Dispositional appraisals point to the importance of individual differences in perceiving and interpreting situations. It also helps explain why different individuals perceive the same situation differently, and why the same individual may perceive different situations in a similar way.

Despite its popularity, Lazarus and Folkman's theory of stress also raises some concerns. Subjective appraisals by the individuals make it difficult to establish what is and what is not stressful, as this may differ for each individual. Such an understanding of stress complicates its measurement. More precisely, how can the relationship between an individual and their environment be measured?

In the context of stress measurement, all four of its aspects seem important: 1) sources of stress, 2) levels of stress intensity, 3) consequences of stress, and 4) strategies and styles of coping.

The first is sources or causes of stress. These so-called stressors can be external or internal to the individual. There are many categorizations of stress-provoking factors in the literature (Ogińska-Bulik et al., 2021; Kovács et al., 2022). Detailed analysis of stressors is a significant aspect of stress measurement and reduction technique. The second aspect refers to stress levels - the "how much" of stress rather than the "what." If an individual has experienced strong negative emotions or their health has worsened, it can be inferred that their relationship with the environment was of a stressful character. Such measurement is always biased by a high degree of subjectivity and by state mood. Thus, such information is usually obtained when measuring the consequences of stress. In other words, when measuring stress levels, respondents usually give the emotional, behavioral, cognitive, and physiological consequences it causes.

Finally, knowledge on the strategies or styles of coping with stress also seems important in the context of stress measurement. Questions about the so-called secondary appraisal - will I be able to cope with this situation? - are significant. Such data aids in the selection of specific techniques or methods of stress reduction.

Researching stress from the psychological perspective involves gathering data on all its aspects. On the one hand, its sources and causal mechanisms, and on the other, its consequences and strategies of coping, are analyzed. Below, selected measures of (subjective) stress levels are given: PSS-10 (Cohen et al., 1983, Polish adaptation by Juczyński & Ogińska-Bulik, 2009),

Perceived Stress Questionnaire (Levenstein et al., 1993), Stress Rating Questionnaire (*Kwestionariusz Oceny Stresu*, Włodarczyk & Wrzesniewski, 2010), Psychological Stress Measure (Lemyr et al., 1990), Holmes-Rahe Stress Inventory (1967), Modifiers and Perceived Stress Scale (Linn, 1986), Symptoms of stress inventory (Leckie & Thompson, 1979), The Multidimensional Acculturative Stress Inventory (Rodriguez et al., 2002), Sense of Stress Questionnaire (Plopa & Makarowski 2010).

The questionnaire was based on the theoretical assumptions on the validity of researching a multidimensional structure of stressful experiences. Analyzing both the theory as well as various empirical studies carried out by the Author over the years, justifies focusing stress research on three core areas: **emotional tension**, **intrapsychic stress** (resulting from a confrontation with the self), and **external stress** (resulting from a confrontation with the demands of the social, external world) (Plopa & Makarowski 2010). These three scales allow for measuring stress levels regardless of an individual's gender, occupation, or physical health.

The current questionnaire contains two additional scales for physically active individuals. They measure situational appraisal, namely: **Fight-or-Flight** and **Mobilization**.

Methodology

The aim of the current research is to present detailed data on the Stress Questionnaire, which comprises five factors (which will be described below), thus providing researchers with a new tool for measuring stress.

A total sample of 1371 women and men was studied (minimum 18 years old): in the first study 317 women and men have participated (see Table 1), in the second study there were 612 participants, while 442 individuals (261 women and 181 men) took part in the study in order to verify the existing correlations between the five scales of the new/current stress questionnaire and personality (neuroticism, extraversion), resilience and self-efficacy (criterion validity, see Table 4).

Participation in the research was voluntary (respondents could withdraw from the study at any time without negative consequences), study participants gave their informed consent - the research complies with international ethical guidelines on anonymity and confidentiality of data (see Descombe, 2014; Predoiu, 2020).

First, properties of individual questionnaire items and scale reliability was investigated, then factor

validity, criterion validity and test-retest reliability analysis were performed. The final part of the article describes the scales, score calculation, and the questionnaire in English.

Results

After appropriate statements were created, competent raters who were professional psychologists modified the proposed dimensions of the test. Next, an exploratory factor analysis was carried out.

The first study was carried out on a sample of 317 women and men. The second study comprised 612 participants.

Construction and psychometric characteristics of reliability for the dimensions, item discriminant power

Table 1 shows the reliability coefficients for the five scales (dimensions) and discriminant power for each item, obtained in a sample of 317 participants. The results show that the reliability of the distinguished scales is highly satisfactory for both genders.

Table 1 Properties of individual questionnaire items and scale reliability

Variable	Number of items	Total sample (N = 317)		Women (N = 185)		Men (N = 132)	
		Cronbach's alpha	Mean r	Cronbach's alpha	Mean r	Cronbach's alpha	Mean r
Emotional tension	5	0.833	0.50	0.811	0.44	0.799	0.62
External stress	5	0.844	0.53	0.841	0.53	0.846	0.55
Intrapsychic stress	5	0.870	0.61	0.877	0.56	0.857	0.68
Fight-or-flight	5	0.843	0.53	0.827	0.47	0.852	0.63
Mobilization	5	0.641	0.28	0.565	0.25	0.689	0.32

Table 2 shows Pearson's r correlations between the scales in a sample of 317 women and men.

Table 2. Means, standard deviations, and correlations between the stress scales

Variable	M	SD	Emotional tension	External stress	Intrapsychic stress	Fight-or-flight	Mobilization
Emotional tension	9.78	3.88					
External stress	11.28	4.31	0.64***				
Intrapsychic stress	9.66	4.15	0.80***	0.71***			
Fight-or-flight	10.80	4.09	0.57***	0.63***	0.57***		
Mobilization	14.39	3.63	0.23***	0.29***	0.14***	0.61***	

Note: ***p<0.001; **p<0.01; *p<0.05

Factor validity

The factor validity analysis of the Stress Questionnaire was carried out using confirmatory factor analysis, which allows for verifying hypotheses about a good fit of the theoretically assumed structure of stress types to the data observed in empirical research. In the above model, the existence of five latent factors describing the experience of stress was assumed: 1. Emotional tension, 2. External stress, 3. Intrapsychic stress, 4. Fight-or-flight, 5. Mobilization. Each of the stress factors was identified as a cause of specific, observable behavioral indices.

Factor validity allows for estimating the structure (simplified model) of the construct in question, as well as the degree to which this structure reflects the multifactorial, complex relationships inherent in the construct, described by the latent variables. A confirmatory factor analysis using the maximum likelihood method was carried out. There is a lack of agreement on which measure is the best to assess model fit, so several model

fit tests are used. Most standard model indices only allow for comparing models, not rating their fit objectively, with the exception of the commonly recommended RMSEA, GFI, and AGFI.

Table 3. Model fit indices in two independent samples

Fit index	χ^2	df	p	RMSEA	p-Close	GFI	AGFI
First sample (N = 317)	187.15	190	<0.001	0.056	<0.001	0.925	0.935
Second sample (N = 612)	72,14	186	<0.001	0.063	0.142	0.945	0.910

In sum, it can be concluded that for both samples - models, the model fit tests presented in Table 3 positively answer the question of whether the hypothetical model can be verified on the basis of the data distributions from the data matrices.

Criterion validity - Stress and personality, resilience and self-efficacy

The table below presents the correlation results between the five factors of the Stress Questionnaire and the PSS-10 stress measure - Cohen et al. (Polish adaptation by Juczyński & Ogińska-Bulik, 2009), neuroticism and extraversion levels (Costa & McCrae - Polish adaptation by Zawadzki et al., 2007), resilience (Smith et al., 2008) and self-efficacy (Schwarzer & Jerusalem, 1995).

For this part of the study, four hundred and forty-two individuals (261 women and 181 men) took part in the study. The participants' mean age was 27.82 years ($SD = 5.11$; minimum age was 18 years, maximum was 63).

Table 4. Pearson's r correlations between stress scales and selected factors influencing stress levels

Variable	Perceived Stress Scale-10 (PSS-10)	Neuroticism	Extraversion	Self-efficacy	Resilience
Emotional tension	0.68***	0.51***	ns.	-0.32***	-0.50***
External stress	0.52***	0.64***	-0.22***	-0.36***	-0.52***
Intrapsychic stress	0.65***	0.39***	ns.	-0.42***	-0.55***
Fight-or-flight	0.45***	0.48***	-0.22***	-0.21***	-0.35***
Mobilization	ns.	0.47***	-0.24***	0.31***	0.16**

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

The analyses show that average-to-high correlations occur between the scales of the new Stress Questionnaire and the Perceived Stress Scale-10, and neuroticism. Average, negative correlations occurred for resilience and self-efficacy. A negative correlation was also observed between extraversion and external stress and mobilization.

Test-retest reliability analysis

For the next part (test-retest reliability analysis), one hundred and twenty extramural female nursing students ($Mean$ age = 32.43; $SD = 5.10$) at The Academy of Applied Medical and Social Sciences in Elbląg took part in the study. The investigation was carried out at the beginning and the end of the 2021/2022 academic semester (February - June; five months). The stability coefficient for all scales ranged from 0.65 to 0.72, with $p < 0.01$. It can be concluded that

measurement with the Stress Questionnaire is relatively stable.

Scale description

Emotional tension

Characterized by a feeling of anxiety and excessive nervousness. Emotions such as anxiety, fear, anger, frustration, irritation, or being keyed up are frequently experienced. Individuals with high emotional tension also exhibit excessive irritability in various interpersonal relationships. This type of tensions is experienced when the limbic system, particularly the amygdala, is activated. The psychological reaction may involve generalized anxiety or fear of something specific, for example, debt collectors, health problems, or war, and so forth.

External and intrapsychic stress differ only with respect to the source of the stressors. This is

decided by a stressor (something that causes stress) from the outside or from the inside of the organism (the psyche).

External stress

Appears as a reaction to an external situation that the individual cannot cope with. It is related to situations of threat due to loss of health, harm to significant others, financial loss. The threat may stem from the belief that the individual will not be able to overcome the emerging problems. A feeling of helplessness, worry, and increasing exhaustion is related to the occurrence of external obstacles which may cause harm. Plain bad luck or inopportune circumstances may cause the external obstacles to exceed personal resources and capabilities. The threat may be caused by a belief that these obstacles and problems cannot be avoided or overcome.

Intrapsychic stress

The source of stress is the individual's mind, thoughts, beliefs, judgments, and appraisals. Worry, helplessness, and hopelessness is caused by personal problems. A sense of harm, loss, or threat causes suffering and regret (mental suffering). Thoughts about the future cause anxiety, withdrawal tendencies, and pessimism in viewing the self and the world. Negative emotions are exhibited when the individual recalls memories which cause symptoms, dread, and even fright over what the future may hold. A sense of loss of someone or something important causes self-blame and intrusive thoughts: what did I do wrong, why did this happen. Awareness of having personal problems leads to a belief that everything surpasses the individual's resources to cope with the stress.

Fight-or-flight

W. Cannon used the term "stress" to describe the fight-or-flight response (see Walter Cannon: Stress & Fight or Flight Theories). In a situation of being suddenly attacked, noticing an enemy, or necessary escape from danger, neurotransmitters initiate the stress reaction through the nervous system. After a few minutes, the hormonal system is engaged, leading to the production of stress hormones. Stress stimulates the production of cortisol from the adrenal glands, which, in turn, causes adrenaline and noradrenaline to be secreted into the blood - hormones which allow the body to remain in a state of high alert. All unnecessary processes such as digestion, ovulation, sperm production, growth, or antibody production, are halted. The mobilization of the organism during stress, especially during attack, defense, or escape is characterized by, among others, increased heart rate, increased blood pressure, rapid

breathing, musculoskeletal tension, widened pupils, and faster cognitive processes.

Mobilization

Mobilization is an activity, activation of the organism. The process of mobilization can be initiated, for example, before a difficult task or during dangerous situations. In turn, motivation can be intrinsic or extrinsic. The first lies in the person, the second in the environment. Intrinsic motivation leads to mobilization to, for example, get up early in the morning to engage in physical exercise. Extrinsic motivation can involve *good weather* or a reward in the form of placing high in a competition. Here, competing leads to an increase in motivation, and, subsequently, mobilization. Thus, to mobilize is to turn motivation into mobilization. Individuals with high mobilization levels can also exhibit higher stress (emotional tension) in difficult situations. On the other hand, mobilization in sports competitions causes higher stress which, in this case, prepares the organism to intensified physical and mental exertion. To overcome obstacles, the individual needs to mobilize. This means that an optimal level of stress facilitates performance in sports competition (and not only).

Score calculation

Each item is given the following numerical value (Points): Definitely NOT = 1; Rather NOT = 2; Hard to say = 3; Rather YES = 4; Definitely YES = 5. Each scale is comprised of five items, as follows:

- Emotional tension - Items 1, 4, 7, 10, 13;
- External stress - Items 2, 5, 8, 11, 14;
- Intrapsychic stress - Items 3, 6, 9, 12, 15;
- Fight-or-flight - Items 16, 18, 20, 22, 24;
- Mobilization - Items 17, 19, 21, 23, 25.

Discussions and conclusion

The Stress Questionnaire is a measure which responds to questions on behaviors in stressful situations, among different populations, including athletes. The questionnaire can be used both in individual as well as group measurements. The first three scales of the questionnaire are similar to those in the Sense of Stress Questionnaire (Plopa & Makarowski, 2010). The additional two scales (Fight-or-flight and Mobilization) can be used, among others, in sports contexts. Studies can also employ only some of the five scales, for example: emotional tension, external stress, and intrapsychic stress. We mention that the Sense of Stress Questionnaire (with the first three scales) was used in previous research, including in impact factor articles (see, for example, Piotrowski et al.,

2021; Makarowski et al., 2021), aspects that underline the quality and value of the instrument analysed.

The questionnaire is intended for participants over 14 years of age. It can be used by everyone interested in researching stress, including athletes, physiotherapists in working with patients, sports managers, sport psychologists and coaches in various sports disciplines. The questionnaire can be used, for example, in business, to expand

knowledge on a given individual or group's behaviors when making decisions in stressful situations. When studying individuals working in situations of high emotional tension, for example, police officers, soldiers, paramedics, firefighters, and so forth, their individual predispositions towards working in situations of threat can be measured. The questionnaire can be used without seeking the author's specific permission in research and individual measurement.

STRESS QUESTIONNAIRE

measuring emotional tension, external stress, intrapsychic stress, fight-or-flight, and mobilization (R. Makarowski 2022)

INSTRUCTION: We are interested in what you think about your problems and the ways you experience them. Please describe your thoughts, behaviors, feelings, anxieties, and hopes such as you feel them now . Please read each statement carefully and think to what degree it applies to you. Some of the statements are similar, but they are included here to examine even slight differences in your feelings. Please remember that there are no right or wrong answers. What matters is that you respond honestly. Please cross out your response.		Definitely NOT	Rather NOT	Hard to say	Rather YES	Definitely YES
1	I feel irritated	1	2	3	4	5
2	I feel threatened because my health could worsen suddenly and I could become crippled.	1	2	3	4	5
3	I feel threatened because my worried overwhelm me.	1	2	3	4	5
4	I am irritated.	1	2	3	4	5
5	I feel threatened because something bad could happen to my closest family.	1	2	3	4	5
6	I feel hurt and I constantly think about what I have done wrong.	1	2	3	4	5
7	I am furious because I am helpless and I cannot do anything.	1	2	3	4	5
8	I worry I could lose someone close to me.	1	2	3	4	5
9	I feel a sense of loss and I am suffering mentally.	1	2	3	4	5
10	I am keyed up.	1	2	3	4	5
11	I feel threatened because I could suddenly lose everything I have.	1	2	3	4	5
12	I feel threatened because everything surpasses my capabilities.	1	2	3	4	5
13	I could explode at any moment.	1	2	3	4	5
14	I feel threatened because I will not manage to overcome every obstacle and problem.	1	2	3	4	5
15	I feel threatened because of my sense of helplessness and hopelessness.	1	2	3	4	5
16	I am mobilized, as if I had to suddenly defend myself.	1	2	3	4	5
17	I am mobilized because I have a lot of tasks to carry out.	1	2	3	4	5
18	I am mobilized, as if I had to hide from an enemy.	1	2	3	4	5
19	Competing with someone always mobilizes me.	1	2	3	4	5
20	I am mobilized, as if I suddenly heard a strange noise in the night.	1	2	3	4	5
21	I am mobilized and motivated.	1	2	3	4	5
22	I am mobilized, as if I saw an apparition or a ghost.	1	2	3	4	5
23	I mobilize myself intensely before a difficult task.	1	2	3	4	5
24	I am mobilized, as if I had to suddenly attack my enemy.	1	2	3	4	5
25	I like competition, because I feel like it gives me wings.	1	2	3	4	5

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