

Controlled Anxiety for Stress Management and HR Innovation in Creative Industries (Measurement by Biometrics in a Controlled Stressor Environment)

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Abstract: *This report focuses on the impact of controlled anxiety on the innovativeness of human resources working in creative industries. The study investigates the influence of the psycho-physiological factor anxiety on coping with stress and generating new ideas, changes in performance, and increased levels of work motivation and achievements. The authors define the category of "controlled anxiety" related to stress management and present the results of a social experiment involving employees working in creative industries. They developed an algorithm for conducting biometric research and verified their hypothesis that controlled anxiety stimulates the innovativeness of human resources in creative industries. The results of this study provide valuable insights into managing personnel, stress, change, and risk in sectors dependent on creativity.*

Keywords: *controlled anxiety; social innovation; human resources; creative industries.*

Introduction

Nowadays, business organizations are increasingly confronted with various stressors that can be unfavorable to their development. A number of research efforts have been devoted to the study of stress and its effects on human resources in business. It is no coincidence that the problem of occupational stress is the focus of much research today and is considered a particularly relevant topic and a common challenge for organizations and institutions worldwide. The importance of the topic is indisputable, both in terms of scientific theory and practical application. It is important insofar as business is unthinkable without the human factor. The development and strengthening of human capital is a key issue and at the same time a significant prerequisite for the competitiveness of business organizations.

In this regard, perhaps the most important investment a manager can make for the prosperity of his business is to educate and prepare his staff, and to have the necessary qualities and skills as a manager. The relevance of the topic is even more emphasised in the context of dynamic markets, global business and emerging contingencies that generate a constant variety of stressful situations. In many sectors, human labour is fundamental to organisational development and will remain an indispensable factor. For this reason, the ability to manage stress effectively is an important function in the management of human resources in business organizations.

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In recent years, science and practice in the direction of human resource research have developed very dynamically, but the search for arguments for the existence of an impact on the productivity and innovativeness of human resource groups by incorporating "controlled anxiety" as a tool for assessing the effectiveness and efficiency of work in the workplace is a previously unexplored topic.

In this regard, in 2022, a social experiment was conducted by a team of the University of Rousse to identify the impact of the psycho-physiological factor anxiety on the creativity and innovativeness of human resources by observing seven focus groups in two stages - in a stressor environment and in a normal working environment. This paper examines the impact of controlled anxiety on the innovation potential of human resources working in creative industries. The sample includes employees working in a creative industry who rely heavily on the creativity, innovation and inspiration of their human resources. They work in an environment with rapidly changing technology, high uncertainty and stressors. For the purpose of this study, we have developed a biometric research algorithm that includes six phases to track biometric indicator pairs under controlled anxiety conditions.

In this article, we have defined "anxiety" as an individual's natural emotional and behavioral response to stressors, but we do not identify it with "stress." For the purposes of this study, we have introduced a specific category of 'controlled anxiety' to determine how exposure to stressors in a controlled environment can stimulate the generation of new ideas to improve staff performance, motivation and achievement.

The sample includes employees working in creative industries that rely heavily on the creativity, innovation and inspiration of their human resources. They work in an environment with rapidly changing technology, high uncertainty and stressors.

Literature review (The relationship between controlled anxiety and social innovation)

In modern society, stress and its manifestations are among the major biological, social and managerial problems faced by business organizations, and its generation is directly dependent on a multitude of societal, familial and personal factors. Research on stress and its manifestations in work environments has received considerable attention in the psychological, organizational, and educational literature. Different definitions of the stress factor exist in the scientific literature. According to H. Sellier, stress is a physiological reaction to certain threatening events of the environment in which we find ourselves (Riggio, 2006; Baer, & Oldham, 2006; Bader, 1970; Balkundi, & Harrison, 2006). The Canadian physician defines stress as "a nonspecific response of the organism to any demand made upon it" (Sellier, 1982). A similar view is shared by researchers such as (Christina G. L. Nerstad et. al. 2023; Cates, 1985; Conti, Amabile & Pollak, 1995) according to whom stressful situations arise when there is an imbalance between the demands of the work environment and the employee's resources, when the demands do not match their knowledge and skills a challenge to their ability to cope with the task at hand occurs (Tzenova, 2010). It is this imbalance and mismatch that is observed is perceived as a threat to his wellbeing. There are other claims about the impact of stress in the research field on this topic. Again according to Sellier (1982) stress and its manifestations represent the energy that drives people to take the necessary actions to accomplish their goals and objectives. Through his writings, he shows us that it may not always be represented by a negative sign, but can have what he calls a "mobilizing effect" - eustress (Sellier, 1982). Stress can be adaptive to human factors as it has the ability to

promote learning and growth, and viewed through the lens of management, when the manager has a sense of control over the situation, stress can prove to be a motivating rather than a threatening factor and can become a stimulator through which creative and innovative decisions can be made that would be highly successful for business organizations. That is, it is important for management to be able to recognize and manage stressful situations, as well as to provide training opportunities for their employees in order to respond appropriately to stressors in carrying out their duties in a work environment.

As we said at the beginning human resources are a major factor in the successful policy of any business organization. Competent and highly motivated people are the driving force for achieving strategic goals and in creative industries, including their adaptation to environmental changes, development and high performance. The development and consolidation of the human factor is a key issue and a significant prerequisite for the competitiveness of the creative industries and therefore it is important to invest in its improvement. The behavior of human resources under different levels of stress and anxiety and the degree of their creative productivity in organizations in terms of their creativity and innovativeness is a hot topic in the scientific space. The most promising thing in the innovation process is the ability to realize an idea into a successful concept. The basis of the innovation process is the creative idea, which is the work of man and goes through various stages until it reaches the final result of the innovation process, namely a new product, process, method or service (Antonova & Stoycheva, 2016; Kostadinova & Ahmedova, 2019). According to some authors (DeMartini, 1980; Cheek & Stahl, 1986; Amabile, Goldfarb, & Brackfield, 1990; Dickerson & Kemeny, 2004) stress (including anxiety) are major factors that reduce creative performances. According to them, stressors are the active factors that lead to the limitation of cognitive resources, and hence the latter cannot be used as generators of creative thinking (Byron, Nazarian, & Khazanchi, 2010). Contrary to these views, other authors suggest positive interactions between stress and creativity (Baer, 1998).

According to the authors Andrews & Farris (1972), the presence of stress can act to motivate human resources to an active thought process and create the conditions for the generation of adequate creative and innovative solutions (Andrews & Farris, 1972). The above authors define creativity as the production of new or original ideas with useful value, and as an integral part and distinctive component of the first generative phase of the innovation process (Udwadia, 1990; Antonova, 2009). The relationship between creativity and innovation, how they depend and work together, is critical to business success especially if in an environment prone to creating stressful situations. From the theoretical analysis, we found what the relationship between creativity and stress is.

Methodology

The experimental study includes seven focus groups with representatives of organizations from the secondary (automotive) and tertiary economic sectors (including education, science, communications and messaging). Each group consists of 15 respondents who voluntarily agree to cooperate in the social experiment.

Fieldwork is conducted in a limited temporal plan on the last day of the working week for the specific focus group and within a 3-hour time range – 1st phase 45 min. and 2nd phase – with the introduction of a stressor in the form of shortening the technological process for solving test tasks by $\frac{1}{2}$ of the initial time, i.e. we define two different work situations – a normal work environment (situation A) and an environment with a stressor (situation B).

The survey instrument included in the methodology is based on a 4-step self-assessment questionnaire. Its components are:

- anxiety tests (Test 2 "Are you anxious?");
- creativity (Test 43 "Are you a creative person?"); and
- innovation, represented by an intelligence test (Test 1 "Intelligence") and creative intelligence ("Bucket Test").

The instruments are borrowed from the tests developed for the purposes of the Mensa club by the team of Prof. Robert Allen (Allen, R., E. Fulton, H. Gale, K. Scat, 2017). The social experiment involves the use of a subjective approach to establish the baseline level of innovation and creativity of respondents, placed in a normal work environment and subsequent re-testing in a stressor environment with the introduction of controlled anxiety as a way to cope with stress.

In parallel with this, the Neuroeconomic Test (practical testing and distributed practice) is also being conducted through biometric research of the parameters pulse and stress, as an element of the algorithm of the experimental part of the study is included in parallel with the questionnaires. To conduct the biometric research, 15 Smart bracelets (Huawei Band 6) are used, supporting the "Health" application for measuring the "Stress" and "Pulse" factors using certified technology-source of the Institute of Psychology of the Chinese Academy of Sciences. The devices have a wide range of sensors for measuring blood pressure, stress, pulse, position in space, etc., and this makes them suitable for the purpose of the social experiment. For the implementation of each of the experimental studies with focus groups, an algorithm was followed, which consists of six individual phases.

Results and discussions

In Tables 1, 2, and 3, we present the results of a social experiment that shows the impact of controlled anxiety as a way of coping with stress on HR innovativeness in creative industries as measured by biometrics in a stressor environment.

Table 1. Creative industries group correlation coefficients

Model Summary^a

R	R Square	Adjusted R Square	Std. Error of the Estimate	
,531	,282	,226	6,955	

The independent variable is Biometrics (P/S).

a. Anxiety = Situation B, Group = Creative Industries (CI)

Source: Authors' own research.

Table 2. ANOVA table with regression model characteristics of the Creative Industries group

ANOVA^a

	Sum of Squares	df	Mean Square	F	Sig.
Regression	246,551	1	246,551	5,097	,042
Residual	628,882	13	48,376		
Total	875,433	14			

The independent variable is Biometrics (P/S)

a. Anxiety = Situation B, Group = Creative Industries (CI)

Source: Authors' own research.

Table 3: Coefficients in the regression model and estimation of their significance for the Creative Industries group

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Biometrics (P/S)	65,011	28,797	,531	2,258	,042
(Constant)	-25,909	19,562		-1,324	,208

a. Anxiety = Situation B, Group = Creative Industries (CI)

Source: Authors' own research.

The correlation coefficient was $R=0.531$ and the coefficient of determination was $R^2=0.282$ (Table 3). The correlation has a positive sign, which means that there is a positive trend - as the biometrics increase, the innovativeness increases. From Tab. 3 shows that $\text{sig.}=0.042$, which is less than the chosen significance level $\alpha=0.05$ and means that the coefficient of determination is statistically significant. The coefficient in front of the variable is 65.01 and this should be interpreted that with a unit increase in biometrics, innovativeness increases by about 65.01 points. This coefficient is statistically significant $\text{sig.}=0.042 < \alpha=0.05$. The free term in the model has a value of -25.909 (Table 3). It is statistically insignificant. Fig. 1 presents the values of innovativeness in relation to controlled anxiety measured by biometrics in a stressful situation for the Creative Industry group.

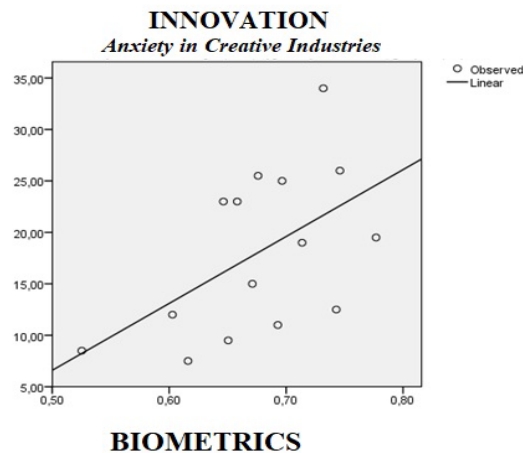


Figure 1. Innovativeness values as a function of controlled anxiety as measured by biometrics in a stressor environment at FY Creative Industries and regression line

Source: Authors' own research.

From the data presented, it can be seen that innovativeness increases with an increase in anxiety as measured by biometrics in the study group. This gives us reason to accept as true the claim that controlled anxiety as a way of coping with stress affects the innovativeness of the creative industries group as measured by biometrics in a stressor environment.

Conclusions

Based on the results presented, we can say that the achievements of this research have a high degree of applicability in the formulation of innovative models for the management of personnel, stress,

change and risk for sectors that rely on creativity. Creative industries, rely heavily on the creativity, innovation and inspiration of their human resources. They operate in an environment of rapidly changing technology, high uncertainty and stressors. For this reason, their professional training and their ability to cope with a variety of stressful situations is crucial.

The impact of "Controlled Anxiety" as a way to cope with stress can be defined as a stimulator to help manage human resources by making creative decisions to improve them. Of course only if it is within normal limits. Creative and original solutions would be extremely successful for both the human factor (personality plan) and human resource groups and for the future development of the business organization. Thus, a correlation is found between two leading factors in the process of human resource management in innovation activities. Understanding that we live in a unified social world allows us to typify our actions and this greatly simplifies our work activities and daily life. Innovation is the motor and makes the connection between controlled anxiety and its root cause - the stressor that gives rise to it.

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