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CITY AS A POTENTIAL SOURCE OF STRESS

This article will present an analysis of a psychological reaction which may occur in people living in big cities, the so-called urban stress. The paper will concentrate mainly on describing the influence of strong sensory input (e.g. noise and pollution), which is characteristic of a big city, as well as social issues on the cognitive, emotional and behavioural functioning of individuals. What is more, various consequences of the emergence of stress will be discussed. The summary of the article includes conclusions drawn from a review of research and theories.

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Psychological stress is an ambiguous concept; its understanding has been modified over the course of time as research develops. However, even without the interpretation of meaning, the influence of the external environment on the appearance of stress reaction has been confirmed in many conceptions. In the initial phase of the analyses, stress was defined as a reaction to stimuli, according to Walter Cannon and Hans Selye. Cannon coined a term "fight or flight", and it was a reaction which was supposed to restore the disturbed balance in a body. This model did not assume individual differences in giving the meaning to the stimuli; rather it concentrated on the reaction of an organism which was to protect it from negative consequences.

The person who continued Cannon's idea was Selye, according to whom stress is "a state manifested by a specific syndrome which consists of all the nonspecifically induced changes within the biological system"¹. Another def-

¹ H. Selye, *Stres życia*, Warszawa 1963, p. 70.

inition formulated by the same author bring more clarity: “*Stress is the non-specific response of the body to any demand for change*”². When harmful agents act on a person, for instance, infection, noise, injury, certain changes occur. Some of these changes are non-specific and general, the so-called GAS – General Adaption Syndrome. The changes are not dependent on the type of impulse nor its place. GAS, according to Selye, has three stages³:

- alarm reaction, when general resistance drops below normal range; it is divided into two phases: the shock phase, when the organism can endure changes such as decreased blood pressure or body temperature, and the anti-shock phase in which the body starts to defend itself; the result is, for example, increased blood pressure or body temperature,
- resistance stage, in which resistance increases above the normal range,
- exhaustion stage, which is characterized by resistance dropping below normal range once again. It occurs when negative impulses affect an organism too intensively or in the long term.

The third stage does not always occur.

Moreover, Selye is an author of an already classic distinction between two types of stress, namely “*distress*” (negative stress) which indicates overstrain, deprivation and leads to illnesses. About this type of stress Selye wrote in his early works. Later, he introduced a concept of positive stress, so called “*eustress*”. It is a kind of stress which causes the feeling of contentment; it mobilizes without inducing frustration or aggression⁴. Additionally, Selye noticed that stress not only is a result of overstimulation, but also may appear as a consequence of deprivation, i.e. the lack of stimuli⁵.

Another approach to the concept of stress was to put it into a category of impulse or situation. A consequence of their appearance is tension and the need to adapt. What is important, it was assumed that people react very similarly to the same impulses, so stress can be measured by assessing these impulses. On the basis of this idea Holmes and Rahe’s Social

² H. Selye, *Stres okiełznany*, Warszawa 1977, p. 25.

³ H. Selye, *Selections from The Stress of Life*, [in:] A. Monat, R. Lazarus (eds), *Stress and Coping*, New York 1977, pp. 17- 35.

⁴ H. Selye, *Stres okiełznany*, pp. 29-31.

⁵ H. Selye, *Stress without stress*, New York 1975, p. 21.

Readjustment Rating Scale was created⁶, according to which stress is an experience of changes in one's life.

In consonance with such an approach to stress, tension may also be caused by environmental stimuli, like noise, dust or crowding. It is important to emphasize that these stimuli need not to be very strong since even minor but chronic strains may accumulate.

The different approaches contributed to the development of psychological concepts of stress, and a new meaning of it was presented in a transactional model. The authors, Richard Lazarus and Suzan Folkman, defined stress as a relation between a person and the environment, which is perceived as upsetting one's balance and affecting one's well-being⁷. The authors of the idea claimed that emotions are the results of recognition, and they distinguished two types of cognitive appraisal: primary and secondary. Primary appraisal is a person's judgment about the significance of a stimulus as stressful or not. During this evaluation it is decided if a stimulus is a stressor or a positive. When an event is perceived as a potential threat, tension is triggered in the organism and specific psychophysiological processes, as well as their emotional correlates, occur. There are three categories of stressors:

- harm or loss, the assessment of the damage that the event has already caused,
- threat, possible future damage that the event may cause,
- challenge⁸.

The above distinction is very important for the process of coping with stress.

The second type of appraisal is called secondary appraisal. It addresses what one can do about the situation to remove and alleviate the effects of stress. It is an assessment of a person's coping resources, options and strategies. The secondary appraisal is crucial for dealing with stress⁹. Primary and secondary appraisals co-decide about the occurrence of stress. This way of thinking about stress contributed to the creation of the concept of urban stress.

⁶ T.H. Holmes, R.H. Rahe, *The social readjustment rating scale*, *Journal of Psychosomatic Research* 11 (2) / 1967, pp. 213-218.

⁷ R. Lazarus, *Paradygmat stresu i radzenia sobie*, *Nowiny Psychologiczne*, Nr 3-4/1986, p. 19.

⁸ *Ibid*, pp. 18-9.

⁹ *Ibid*, pp. 22-3.

Considerable input to the discussion presented in this article is also the Conservation of Resources Theory, proposed by Stevan Hobfoll. In this theory psychological stress is understood as a situation when an individual's resources may actually be lost or at risk of being lost. What is important is that the loss does not to be real; even a threat is enough. A human being engages the resources which are left to transform them in others, perceived as more valuable, in order to compensate losses¹⁰. Moreover, Hobfoll noticed that people strive to promote what they value, so psychological stress will also appear when there is lack of gain, following resource investments¹¹.

In Hobfoll's theory, resources include material ones, i.e. objects or items having additional value connected with rareness, purchase costs, status, self-esteem and survival; and state resources, including preferred circumstances, marriage, job, seniority, health, which concern mainly social roles performed by humans. Resources are particularly important because using them we often have access to other values, such as personal resources, personality features which make one resistant to stress, professional, social and leadership skills, self-esteem, optimism, self-efficacy, and hope. As well, energy resources including time, money, knowledge or credit capacity are relevant in gaining other resources as they can be exchanged¹². Individuals with larger resources are less vulnerable to resource loss and, at the same time, more capable of resource gain. In contrast, those with limited resources are more vulnerable to resource loss and less capable of resource gaining because after they encounter resource loss they cannot mobilize and deploy resources. Scarcity of resources not only increases the risk of first loss, but also leads to numerous further losses since an individual has to use available resources in order to deal with loss. When resources are meagre, the likelihood of coping with potential future problems is small and, what is more, a loss spiral is launched which increases in speed. People possessing resources are more likely to gain, and when it happens, they still produce new resources. Persons who lack resources often become defensive, and consequently they protect their goods because it allows them to retain as many resources as possible in case they need to

¹⁰ S.E. Hobfoll, *Stres, kultura i społeczność. Psychologia i filozofia stresu*, Gdańsk 2006, pp. 34-35.

¹¹ *Ibid.*, pp. 71-72.

¹² S.E. Hobfoll, *Zachowanie zasobów - nowa próba konceptualizacji stresu*, *Nowiny Psychologiczne*, Nr 5-6/1989, pp. 24-48.

counter the effects of significant losses¹³. Also environmental resources are subject to the same rules. They include a sense of security, access to various types of public services, a peaceful life, mobility, a flat, a house, energy, and time. All of them are elements of the environment or are determined by the environment.

It seems reasonable that stress is dependent on individuals' need for stimulation which depends mainly on temperament. Two basic features of temperament exist: reactivity and activity. They describe the energy level of given behaviour¹⁴. Reactivity is reflected in the intensity of reactions to stimuli; it co-determines sensuous and emotional sensitivity, as well as the endurance of an organism. It indicates a relative constant tendency of reaction to impulses. Individual differences exist in the level of reactivity; people who are closer to the ends of the continuum are called low-reactive or high-reactive. Low-reactive individuals have decreased sensitivity and increased endurance, whereas high-reactive people are characterized by a great sensitivity and low endurance. Activity, however, can be seen as speed or the way how one starts new actions¹⁵. We can distinguish direct and indirect stimulation. The direct stimulation is defined as a human's motor activity, performing acts which have a specified stimulus value determined by emotions, level of complexity or difficulty. Indirect stimulation, on the other hand, is a stimulation provided by the environment which has a certain novelty, intensity or changeability rate. Relations between activity and reactivity are the following: high-reactive individuals will attempt to avoid stimulation, while low-reactive persons will actively seek stimulation.

Life in a big city is for a human being a source of a wide spectrum of stimulation, from information stimulation, often consisting of contradictory messages, to stimulation connected with the need to play multiple roles, demands or social limits¹⁶.

Stress appears in high-reactive people when they experience stimulus overload, whereas in the same situation, low-reactive persons may interpret the stimuli as optimal. However, stimuli deprivation may be stressful in low-reactive individuals¹⁷.

¹³ S.E. Hobfoll, *Stres, kultura i społeczność*, pp. 97-100.

¹⁴ J. Strelau, *Temperament i inteligencja*, [in:] T. Tomaszewski (ed.), *Psychologia ogólna*, Warszawa 1992, pp. 64-5.

¹⁵ *Ibid.*, pp. 65-6.

¹⁶ A. Elias, *Psychologia ekologiczna*, Warszawa 1993, p. 114.

¹⁷ J. Strelau, *Temperament i inteligencja*, p. 70.

The theoretical basis of environmental stress originates from classic stress theories. It was already present in Selye's ideas because he proved that environmental stimuli (of a chemical type) may cause the same reaction in a body as psychological stimuli¹⁸.

The concept of environmental stress was introduced by David Glass and Jerome Singer. It referred to predicting and explaining reactions to living in a city¹⁹. According to this approach, when confronted by negative input such as noise or crowding, people become more vulnerable to stress. Eventual negative consequences depend on the manner of coping with a stressor. In fact, cognitive processes moderate or mediate the impact of environmental factors on human behaviour (cognitive assumption). The psychological environmental stress model proposed by Glass and Singer clearly emphasises this relation. The authors define accumulated effects of adaptation to the physical environment as "cognitive fatigue". Reactions to stress are mediated in their influence on people's reactions through cognitive and evaluation processes of environmental stimulus, i.e. cognitive processes connected with emotional reactions, features of personality (model A) and a sense of control. Moderators of environmental stress are factors which are beyond an individual's cognitive system but are directly related to it, for instance, fatigue, exhaustion and lack of sleep²⁰.

Life in a city is very different from life outside the city in terms of, for example, the number of citizens, public, cultural or scientific institutions, shopping malls, and traffic. The city is also better connected with the rest of the country. Therefore, material parameters of the city environment are different. According to Augustyn Bańka, it includes organization of public space and facilities in a given place, a range of physical parameters like light, noise, vibrations, electromagnetic radiation, heat, and toxins²¹.

Also Freeman and Stansfeld show that there is a great number of stimuli which are characterized by great physical strength, cognitive complexity and ambiguity, which leads to negative consequences because an individual does not have any possibility to control those stimuli cognitively or

¹⁸ H. Selye, *Stres życia*, Warszawa 1963.

¹⁹ D.C. Glass, J.E. Singer, *Urban stress: Experiments on Noise and Social Stressors (Social psychology)*, New York 1972, from: P.A. Bell, Th.C. Greene, J.D. Fisher, *Psychologia środowiskowa*, Gdańsk 2004, p. 419.

²⁰ A. Bańka, *Spoleczna psychologia środowiskowa*, Warszawa 2002, p.187.

²¹ *ibidem*, p. 184.

behaviourally²². Additional stimulation in an urban environment is provided by social anxiety, resulting from violating preferred distances.

One of the major stressors in an urban environment is noise which is an acoustic phenomenon of varied intensity, individually perceived as disturbing and uncomfortable. Mental attitude decides whether noise is interpreted as unpleasant. Adaptation to noise is impossible, only pseudo-adaptation may occur. It is a distraction which leads to extreme fatigue. A great amount of information received by a human is auditory. Mishearing and misunderstanding, which is very likely to happen in noise, may result in communication breakdown. It is worth mentioning that noise also handicaps thinking, i.e. internal speech, and this causes a decrease in attention span, a discontinuation of thinking, a distraction from current activities, irritability, mood instability, apathy, and melancholy. It may result in increased blood pressure, hyperactivity, insomnia or other somatic problems. Furthermore, there are frequent vibrations coming from, for example, aircraft engines or working machines which disturb the balance in a human body²³.

In an urban environment, due to the presence of many different factories or heavy traffic, there is more pollution, mainly from fumes. They are inhaled by people or absorbed by the skin. In cities they are most often carbon dioxide, sulphur dioxide, hydrogen sulphide, benzene, tetraethyl lead, mercury vapour, and various organic and inorganic dusts. Another harmful element in an urban environment may be electromagnetic radiation, coming from industrial and telecommunication sources. It also depends on the number of cell phones²⁴.

Consequences of the impact of various environmental stressors on humans can be estimated by taking into consideration their features and one's attitude to the stressors. The features are distinctiveness, the ability to notice and identify a given stressor, a type of adaptation, assigned value for a given aspect of the environment, control over a stressor, predictability of a stressor, recognizing sources of stressors as important and necessary, a degree in which a stressor is equated with other people's behaviour, duration and frequency of a stressor²⁵.

²² H.L. Freeman, S.A. Stansfeld, *Psychosocial effects of urban environments, noise and crowding*, [in:] A. Lundberg (ed.), *The environment and mental health: A guide for clinicians*, Washington 1998, pp. 147-73.

²³ A. Bańka, *Spółeczna psychologia środowiskowa*, pp. 189-90.

²⁴ *Ibidem*, pp. 193-94.

²⁵ G.W. Evans, S. Cohen, *Environmental stress*, [in:] D. Stokols, I. Altman (eds.), *Handbook of environmental psychology*, New York 1987, pp. 571-630.

Psychological consequences of urban stress may be manifested in psycho-vegetative reactions, for instance, anxiety, which is a result of breaking social distances. This is seen, for example, in public means of transport or queues. Using public transport, looking for a way, and coping with a dynamic communication system may cause confusion in citizens. Functioning in a city is extremely complex and requires a lot of cognitive activity (that is why Americans use automatic gearboxes more often than Europeans). What is more, as a consequence of urban stress, people's behaviour evolves²⁶.

Due to stimuli overload, people start to protect themselves by changing their behaviour. They minimize the sequence of behaviours necessary to perform a social role, such as distancing themselves; this isolation is manifested by the fact that one cannot hear or see. Therefore, kindness and openness to others do not develop. However, it does not mean that a person living in a city has fewer friends or acquaintances who can help him/her if necessary. A city dweller recognizes fewer people each day than a person living outside a city. It is caused by cognitive adaptation²⁷.

A large amount of people in a small territory in a city leads also to rivalry in order to gain various goods. Another consequence is a high level of crime, homelessness or prostitution. City centres are often occupied by impecunious, low-skilled people, where crime develops. Humans have a natural tendency to protect themselves using distance. As a consequence, people from the middle class migrate to the suburbs in order to gain prestige and feel safe; consequently, they have to commute to work. Therefore, they spend much of the day in a car, in traffic jams (in San Francisco even up to three hours)²⁸. The situation leads to an inevitable stress reaction²⁹.

Gary W. Evans's and Rachel Stecker's studies demonstrate that both acute and chronic exposure to noise, crowding, traffic and pollution may cause a learned helplessness effect in adults and children. One of the features of learned helplessness is failing to respond even though there are opportunities to help themselves in unpleasant circumstances, resulting

²⁶ A. Bańka, *Spoleczna psychologia środowiskowa*, pp. 222-23.

²⁷ S. Milgram, *The Experience of Living in Cities Adaptations to urban overload create characteristic qualities of city life that can be measured*, *Science*, vol. 167/1970, pp. 1462-1465.

²⁸ A. Bańka, *Spoleczna psychologia środowiskowa*, pp. 223-24.

²⁹ R.W. Novaco, *Stokols Daniel, Campbell Joann, Stokols Jeannett, Transportation, Stress, and Community Psychology*, *American Journal of Community Psychology*, vol. 7, No 4, pp. 376-78.

from a high exposure to uncontrolled environmental stressors. Other factors are, for instance, depression or demotivation³⁰.

In spite of negative stressors, people have aimed to live in cities since the dawn of civilization. First, they ensured their safety, and later on they became centres of local or national life – depending on the size of the city. The next stages of urbanization go hand in hand with the economic and cultural development of societies. And thus, a person is either exposed to great stress living in the middle of the action or leads a peaceful life outside the city.

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³⁰ G.W. Evans, R. Stecker, *Motivational consequences of environmental stress*, Journal of Environmental Psychology, vol. 24, Issue 2 / 2004, pp. 143-65.