

Architecture as a set of instruments for shaping a friendly and safe living environment

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Language Verification: Timothy Churcher,
Merlin Language Services

Typesetting: Anna Pawlik, Cracow
University of Technology Press

Received: December 22, 2020

Accepted: February 28, 2022

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Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Competing interests: The authors have declared that no competing interests exist.

Citation: Kręska-Pyrz, M. (2022). Architecture as a set of instruments for shaping a friendly and safe living environment. *Technical Transactions*, e2022003. <https://doi.org/10.37705/TechTrans/e2022003>

Abstract

One of the basic human needs is the need for security. As a primary objective, it has both a direct and an indirect impact on architecture. The elimination of threats and protection against them is the basis for shaping contemporary architecture.

Since the beginning of history, man has sought refuge from animals and nature. This covers everything from the basic feats of providing warmth and shelter from rain and animals to creating an environment in which one can develop their personal needs and preferences. This article presents aspects of security in architecture. It is related to human needs. The classification of stress factors in urbanised space is also presented. In addition, the analysis of spatial systems in architecture and the ways of marking the space are described. Based on the conducted analyses, conclusions are drawn concerning the methods of ensuring human safety in the built environment.

Keywords: safety, environmental stress, threats, built-up area, security

1. The concept of security

In the age of modern globalisation, we need a new definition of security in architecture. Each generation defines the sense of calm differently. The absence of danger and protection from dangers is a dynamically change over the years.

From people through communities, security breaches introduce anxiety and a state of insecurity. As a result, individual cells interact with each other in their environment and internal current needs. Security, therefore, is characterised by dualism; first of all, it gives rise to a negative feeling of wanting to be free from threats, focusing on protection from threats, and secondly, positive aspects help shape the space of survival, defining the spatial framework and the freedoms of mutual relations in space. The guarantee of peace of mind ensures that the condition for survival is met, thereby ensuring stability and, consequently, security.

The guidelines for fire safety, building use or construction is an attempt to eliminate the threat to protect people. Is it possible that providing security, will save both the physical and mental zone of each of us? By analysing the risks, can we shape the urban environment as well as the building itself in such a way that it fully responds to human needs?

2. Risks and the need for safety

By treating architecture as a safety indicator, we can treat it as being conservative, correct or changing bad habits. First of all, it is conservative, which means that it does not cause stress, does not evoke bad associations and allows the individual to function peacefully. The correct solution may be in conflict with the current way of life of a human being, but it is nevertheless in accordance with the current way of functioning. The last above requires changes in the current environment, forcing people to change their current behaviour so as to create a friendly environment for living in the future. All the aspects that make up security in architecture can be divided into two physical and mental groups.

When analysing physical safety, ergonomics is a fundamental issue. It determines the parameters of the space from room dimensions to the whole building as well as the urban space. Ergonomics is the response of each element of space to the needs of an individual, resulting directly from its proportions so as to 100% respond to his or her needs. Other standards determining physical safety are all the government regulations concerning buildings. These are defining the way of shaping individual elements of the world around us. In opposition to physical needs, there are needs arising directly from the psychological sphere of man. These are both the needs of the individual and the needs of the environment in which they asked themselves. Moreover, we still have a spiritual zone which fills the space between what is material, what is ergonomic and what results from the individual's mental and internal needs. Analysing these two poles of physical and mental safety, we find many stressors.¹

Ergonomics defining the surrounding environment simultaneously introduce a lack of free movement. All regulations introduce bans and restrictions. When we compare this with the psychological sphere of man, we notice how many stress factors affect safety. Changes in the external environment, the updating of human needs and the ensuing spiritual changes throughout life are also the evolution of the sense of stability.

By placing architecture at the centre as a regulator of human social relations and as an instrument for shaping the living environment for the person, it becomes worth analysing the person as a user. His image is currently in opposition to his imagination and seeing the present in opposition to the future and past. Being aware of the diversity of individual human being, we can see the enormity

¹ The so-called 'stressor' – a stimulus that provokes a state of stress (Niezabitowski, 1996).

of architectural parameters which affect human safety. Architecture as a science that defines the conditions of space design creates defensive mechanisms for human beings as individuals and also for each group in the built environment (Czyński, 2008: 158). And so from the basics of design, small forms through buildings design and urban design, we notice many antagonistic solutions. Frequent opening and closing of spaces, lit and dark areas, sharp edges and rounded areas – all this is intended to evoke certain emotions in people. Seeing this, it is easy to see how important architecture is for safety.

3. Determinants of security architecture

To start shaping the built-up area from ergonomics and basic architectural design rules to achieve the desired level of safety, a variety of technical safeguards are used. The first level of safety results from the need to guarantee fire protection. All fire protection systems and devices are designed to eliminate the consequences of failures resulting directly from the regulations, but moreover have a positive impact on the psychological comfort of users. Another level is specialist personnel protection in the field of access control. This results from the parameters of service of individual elements of the building or space in which a person moves. Nowadays, we have many devices and systems which, at the level of physical and behavioural needs of a human being, are supposed to provide him or her with safe use of particular parts of architecture and urban planning. In addition to technical and personal insurance, we also have environmental safeguards. The existence of such safeguards results from the specific nature of individual elements of a building or urban space. The monitoring of environmental parameters ensures safe use of the designed spaces. This highly specialised security has become more frequently permeated into our everyday life. Systems which examine the temperature levels and air pollution are not only used in hospitals or cleanrooms, they have also become a crucial part of our everyday life.

When analysing safety in architecture and living in a certain space, we often need to be able to view the external parameters of the environment at all times. Although the most important thing is what is visible – our environment, peace, home or city – there is a need for security of the environmental sphere which individual spaces fill. Despite the fact that for years many devices have been used to monitor the environment both outside and inside buildings, the last few months have shown how important it is to maintain a proper balance between what is outside and what is inside.

One of the space theories that can be defended is that of urban architect Oscar Newman (1972), which includes the concept of crime prevention and safety in the neighbourhood. Decades have passed since the theory was announced, and today we are particularly seeing how architectural and environmental design plays a key role in reducing crime and thus increasing safety. Today in particular, when analysing this theory, it is easy to relate it to the area of the responsibility and personal control of each and every one of us.

Oskar Newman formulated a proposal describing how a person should behave in a built environment – for residents to feel safe they must be responsible for the area they occupy, starting with their own house, through the street, the city and the country embracing the whole world. An individual's awareness that acting together and caring for his or her space, a building in the global perspective, will ensure the safety not only of the individual but also of the entire community.

The theory of defensive space applies to every type of planned space, from small dwellings to tall buildings to areas occupied by housing estates and cities. The idea of creating a defence space is to ensure people's safety. Control over space protects not only private property but, as a result, protects all residents more widely.

4. Individual stress cells of architecture and urban planning

In order to recognise the stress factors, it is necessary to analyse the architectural environment that directly affects the well-being of the individual as well as that of larger groups. I will analyse the stress of an individual in both physiological and deep psychological aspects. Elements of both architectural and urban space have a significant impact on human well-being and health. Small-scale architecture, starting from design, through to the architecture of buildings, cities and urban assumptions is a source of many stimuli, the so-called stressors. Many of these factors cause not only a psychological reaction, but also a physiological one, forcing people as individuals to behave in a certain way. This often results from very individual predispositions, experience gained and expected or unexpected reactions to the situation. Often the function and form intended by the architect can trigger various reactions in people, both positive in some people and negative in others, although the form itself does not change.

These two poles of the architect and the recipient cause individual reactions to specific types of built environment that are very difficult to define. This shows how difficult it is to directly define the concept of environmental stress. Focusing on the individual, we can state that all stressful situations arise as a result of imbalance between what results from the individual and what the built environment offers at a given moment.

The general classification of stressors is divided into four groups: disasters and catastrophes, life events, everyday existential problems, ambient stressors. The final stressor include elements of the built environment. The human response to the stressors inflicted by the environment is considered at two levels: physiological and psychological. In both the first and second levels, we can consider the role of architecture. The psychological sphere is often dominant (Bańka, 2002). The key is physiology, the response to stimuli. It is often the physiology that provides the basis for psychological stressors.

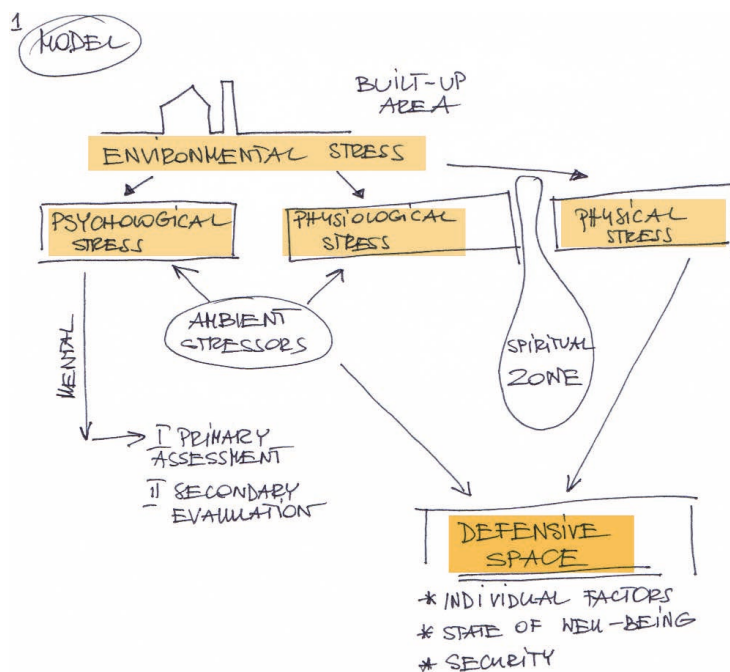


Fig. 1. Model – environmental stress (prepared by author)

According to research into the psychological phenomenon of environmental stress, it can be reduced to two fundamental processes (Niezabitowski, 1996). The first process results directly from an individual's interpretation of the process and the second from his or her personal ways of dealing with stress. The first is a primary assessment. This assessment depends mainly

on personal characteristics and the details of a given situation. The second stage of behaviour in a stressful environment is a secondary evaluation. At this stage, the appropriate behavioural options to deal with the stressful factor are analysed. By placing an individual in a built-up environment surrounded by a spatial structure, stressors can be ranked in several basic dimensions (Bańka, 2018: 144). The first dimension is identification. At this point, the individual notices and recognises elements of the built environment. Although they are negative, a person can tolerate them without showing a high level of stress or reaction. The second dimension is how to deal with stress. The third dimension is the perception of a given element of the environment whether it causes a positive or negative reaction. The fourth level is the ability of the individual to control the course of events in the environment, specifically whether it is possible to change the environment or to eliminate the total stress factor. The fifth dimension is the predictability of events – the way to shape the space and the possibility of earlier preparation for contact with the stressor. The sixth dimension is the importance of the stressor and the necessity of its occurrence, which is often perceived in an individual way as more or less onerous. The seventh element is related to human activity and the interpretation of whether a given stressor results from human activity or lack of human intervention. The eighth group illustrates the duration. The last ninth element determines the intensity of action.

Analysing all these planes, it is easy to see how difficult it is to satisfy basic human needs in the architectural space. The subjective impressions and needs of each individual often cause the balance between the correct and negative reception of the built environment to be disturbed.

What is the basic cell of the built environment? A dwelling which satisfies basic human needs such as safety, comfort and peace.

The concept of home in the basic sense refers to the space occupied by a human being as being closest to him/her throughout his/her life. It is possible for it to mean an actual flat, a whole building, or a city or an area that meets human needs. According to Ch. Norberg-Schulz, there are four spatial attributes that characterise the concept of a place – a house of living (Norberg-Schulz, 1971: 31). These are closeness and closure, which means the need to stay indoors. The last attribute is centrality. Due to globalisation and the ever faster development of technology, the transformations and relations between the building and its surroundings are becoming more dynamic. Time, once understood as a measure of distance between objects, is losing its importance.

A different vision of a place is presented by psychology, in which the notion of place indicates that it is not only physical parameters, especially spatial ones, but also specific features which are sufficient. One of these features determine the human activity undertaken in a given space; the next are the psychological needs that connect an individual with space; the last are the physical parameters that characterise a given space.

Most of these cognitive-spatial stressors are influenced by the architect through design. As a result, he forms a later perception of the space by the user. When designing, we pay special attention to improving the sense of security. It is essential to shape the right spatial orientation, whether in the flat, house, office, hospital or city, in such a way that it is correctly read by individual users. To get lost in space is undoubtedly one of the most negative sensations perceived by humans in the built environment. At this stage, we can see how important it is to have clear and legible spatial structures in order to create a living space. When shaping the built environment, it is important to remember about all groups of people, from small children to disabled people and the elderly. New spaces should be shaped in a way that reduces environmental stress as much as possible. Properly designed architecture and urban planning is a composition of landmarks, dominant, which are like signposts for people. They help people to move freely according to their needs. When space is conducive to man, it will not confuse him. Then his perception of space, whether inside his flat or

through a walk in the city, will not cause him to experience negative emotions or environmental stress. When people get lost in their surroundings mistakes become apparent in every space from the smallest to the whole city.

Another important element of the spatial structure is the treatment of opening and closing spaces. Perception of open or closed structures as friendly or negative often results from the individual perception of a person. It is impossible to say unequivocally whether the open idea of cities or housing estates is positive or negative in opposition to the idea of creating closed structures.

For some, the feeling of open space is a denial of shelter, and therefore of a safe zone. However, placing people in a space where they cannot escape in the face of danger is also a factor which causes stress and negative emotions. By examining these two issues, we can see how important a role is played by the architect in shaping the space and how the solutions he offers are causing certain behaviours and emotions. This means that the correct shaping of spatial dimensions by the architect is in effect illustrated by the behaviour of individuals in a given space. Behaviour of people in a particular environment is in a way a reflection of the environment in which they find themselves at a given moment.

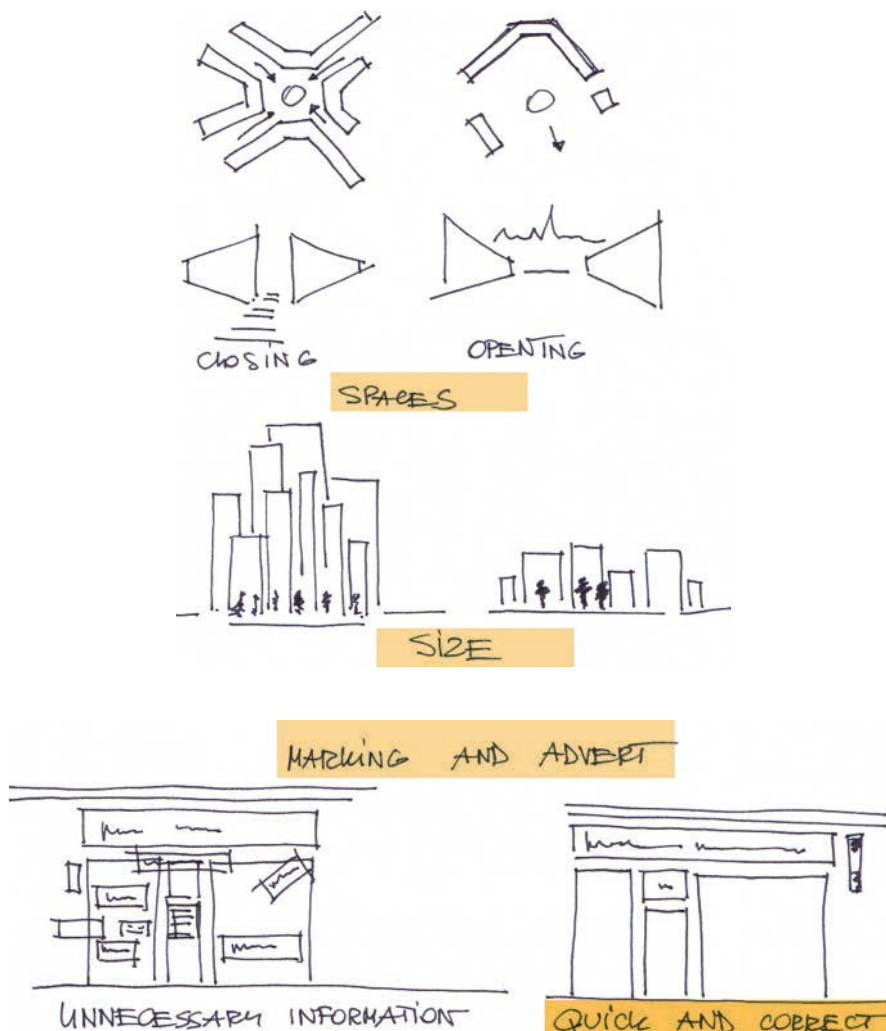


Fig. 2. Model – environmental closing, opening, sizes (prepared by author)

Fig. 3. Building elevation – unnecessary and correct (prepared by author)

Another parameter that can cause negative emotions is the size of the building. It is not only about the image of a city centre with tall buildings, but often also of individual buildings, which against the background of their surroundings have a stressful effect by disturbing the scale and having a lack of interaction with the surroundings.

To determine the size of buildings we use the height parameter. It is one of the basic and particularly important parameters both in building regulations and the individual perception of each person. Depending on age, health or experience, individual customers perceive and react to the height of the building in different ways from both the external and internal side of the building. Often being at a high height is connected with breaking the basic human need, which is connected with having the proverbial ground under one's feet. Lack of subconscious and real control results in negative stimuli. Depriving people of control over the vast space of a high-rise building, its complicated communication solutions, and the lack of the possibility of a quick escape in a narrow cage or lift, often brings negative associations to mind. Going further, a large building is perceived by people from the outside as dominating its small silhouette. The size of the building is overwhelming and may cause helplessness.

Among the groups of stressors (opening, closing, height and closeness) another factor is revealed, which is the feeling of overwhelming the individual. Often this is due to the overload of a certain space, both the open spaces between the buildings and the spaces inside the buildings. It's about the interior of a flat or house. The intrusion of one person into another's private space due to lack of space causes an imbalance between private and public areas. This gives rise to frequent conflicts and sources of stress as well as extensive negative effects and criminal threats. Undoubtedly, one of the overriding aims of today's safe architecture is to find answers like a balance between private and public space. Faced with the need for closure, we must not forget to preserve the comfort zone of each family member or community.

5. Advertisements and the lack of advertisements

Another stressful factor is the erroneous and excessive fragmentation of the space, which means that the recipient is not able to read it quickly and correctly and adapt his behaviour to it. This is mainly about the incorrect marking of the space. An example of this is the unclear marking of public buildings, another is the reloading of advertisements and information unnecessary on building facades. As a result, all this leads to a destabilization of human stability in built-up areas. Ultimately, it causes stress, disorientation and often boredom and lack of interest in the environment. Many cities have decided to introduce additional regulations and to put their image in order. This, as a long-term action, will shape the proper creation of the urbanised environment for the next generations.

6. The last level

Finally, the external characteristics of the individual elements of the built environment are an extremely important stressor. Colour and material

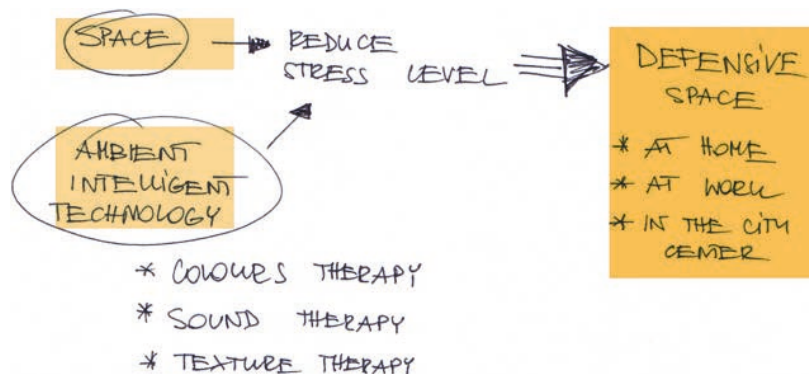


Fig. 4. Defensive space – how to reduce stress level (prepared by author)

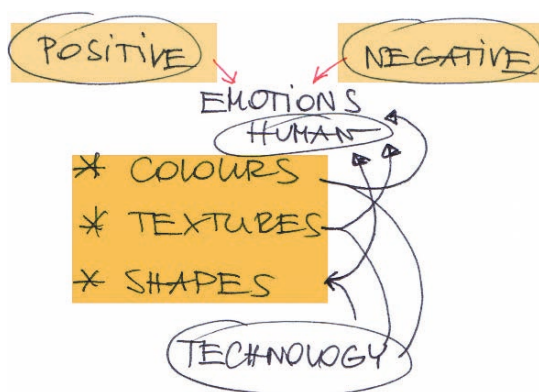


Fig. 5. Human and technology – how to reduce negative emotions (prepared by author)

parameters are special and very visible impulses. These features concern both everyday objects and buildings and the spaces between them. Colours, textures and shapes are the top layer of all levels of architecture. They are the last level influencing the audience's psyche, differentiating the level of positive and negative emotions. Although they are small on the scale of stressors, they are extremely important because they directly affect and influence people. By relying on simple basic impulses with the help of modern technology, many programmes are created to increase people's sense of peace and security. In the midst of everyday life, colour and sound therapy spaces are available to reduce stress. Room capsules that are quiet and full of colours are used not only for people with mental disorders or in the form of childish play but also by every human being in order to release a sense of security.

7. Conclusion

The basis for taking concrete actions is to realise how complex the issue of architecture is in shaping a friendly and safe environment for living. How many behavioral aspects and type of human behavior is due to architecture. For many of us, urban spaces and places of residence are not a source of safety. What is more, they are a daily field for negative emotions and tensions. Both architects and urban planners strive to adapt their surroundings to make them human-friendly and meet their expectations. From an early age, concrete education teaches everyone to recognise disturbances in the peace and quiet. As a result, it helps to reduce stress and makes it possible to create an urbanised space harmonised with people.

However, it is the responsibility of the designers to identify the areas of architectural risk on the basis of their experience and risk awareness at the design stage. Sensitizing participants of the design process to the enormity of the issues related to safety in architecture would contribute to increasing the quality and conditions of human life in the built environment.

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