CITY RESILIENCE VS. RESILIENT CITY: TERMINOLOGICAL INTRICACIES AND CONCEPT INACCURACIES

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ABSTRACT: The concept of resilience has in recent years been one of the more commonly used urban development concepts. In the social sciences, the term is understood as a dynamic process that reflects a relatively good adaptation, irrespective of the hazards or traumatic experiences. It is linked with the concepts of risk, vulnerability and positive adaptation. The concept of resilience as used in the social sciences has been adapted by other disciplines, including research on the city, where the term is ambiguously and sometimes inconsistently defined. The aim of this study is to explain the term resilience, its reference to the city and to clear up ambiguities of the terminology related to the two lines of research on resilience in relation to the city as presented by the relevant literature: city resilience and the resilient city. Analyses show that both these terms, despite their widespread application, are at present imprecisely defined in the relevant literature and generally speaking used interchangeably, which makes their precise application difficult. In addition, the assumption that city resilience can be treated as a process that leads to a desired state of the resilient city, has not been confirmed. The correctness of the application of the second of these concepts (the resilient city) raises doubts, because it will probably never be possible to develop a city not vulnerable or fully resistant to various types of development perturbations.

KEY WORDS: resilience, city resilience, resilient city, organicist concept of the city

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Introduction

Since the spread of the idea of sustainable development, new models and concepts of this development in different spatial scales have been sought. Due to the increasing role of cities in the modern world, they are paid a great deal of attention to, with a view to making their development efficient, safe, resistant to various types of risks, and thus more permanent, stable and sustainable. One such concept, which is gaining in importance in recent years in research on urbanisation processes and the city, is the concept of resilience, adapted to a large extent from the social sciences.

The term resilience is one of those English-language concepts that cannot be fully translated into Polish. It is usually translated as *elastyczność, sprężystość, prężność, odporność, zdolność regeneracji* (flexibility, elasticity or the ability of regeneration) (Borucka, Ostaszewski 2008). Because of the ambiguity of translation, more and more often scientific literature in Polish has used the term's polonised version which is not clear enough, *i.e. rezyliencja* (Curtis, Cicchetti 2004). The ambiguity of the concept of resilience causes difficulties of

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interpretation. Usually, however, it is tied with a skill or process of adjusting to changing conditions, and thus with adaptation, but also with the ability to survive despite adverse conditions and with a quick return to optimal functioning, or a kind of resistance to crisis situations (Curtis, Cicchetti 2004). Yet, new approaches to this problem are continuously appearing in the literature (Barnett 2001; Foster 2007; Martin et al. 2016).

With respect to the city, the concept of resilience develops in many different directions. Two of them seem to play a particularly important role. These are: city resilience and the resilient city. The question of the similarities and differences between the two concepts remains open, however.

The aim of this study is to explain the term 'resilience', its reference to the city and to clear up the ambiguities of terminology between the two lines of research on resilience in relation to the city: city resilience and the resilient city, existing in the relevant literature.

The article is theoretical and is based on inferences preceded by an analysis and evaluation of the content of publications dedicated to the topic of resilience in different scientific disciplines, in particular in the social, economic and geographical sciences. The text is divided into several parts. The first one explains the origins and scope of the term resilience as used by the social sciences. The second part is devoted to the implementation of this term for research on the city, which justifies a treatment of the city in systemic categories and adopting its organicist concept. The principal, third part of the study, depicts the different ways of understanding city resilience and the resilient city in order to determine the relationship and similarities between these concepts. Because it is assumed that city resilience should be understood as a process leading to achieving the desired ideal state, i.e. the resilient city, the study also focused on the identification of the distinction between the two terms in the relevant literature. The conclusions of the analysis are presented at the end.

Resilience – selected ways of dealing with terminology

The term 'resilience' has in recent years been used in many different areas of science, from physics, medicine and psychology, from ecology to the science of management. However, it is hard to find out a shared interpretation of the concept in the different domains (Galderisi 2014). "From an engineering perspective, resilience is defined as the property of a specific material to absorb energy when it is deformed elastically lockable and the recovery of this energy when returning to its original state" (Chelleri 2012: 290, after Avallone 2007). Hence the trend has been adopted by the social sciences, specifically in research involving the observation of the development of disadvantaged children and young people. The term was used for the first time in social studies by Block in the early 1980s; it concerned a set of features that reflected perseverance in coping with stress and problems, strength of character and a flexibility to adapt to varying living conditions (Luthar et al. 2000). Important in determining its scope was a study, carried out for more than 30 years, by psychologist E. Werner and her team. The scholars examined the development of a group of children born in 1955 on one of the Hawaiian Islands; some of the children grew up in very difficult conditions. An analysis of these children's lives constitutes classical research on positive adaptation, taking place in spite of past or current adversities (Werner 1994, 2000; Borucka, Ostaszewski 2008). As a result of these studies, resilience is defined in the social sciences as a dynamic process that reflects the relatively good adaptation of an individual, irrespective of the risks or traumatic experiences (Luthar 2006; Luthar, Zelazo 2003; Craig et al. 2003; Sameroff, Rosenblum 2006; Kumpfer, Summerhays 2006; Borucka, Ostaszewski 2008). This process involves the interplay of a whole spectrum of risk factors, vulnerabilities and protective factors (Yates et al. 2003). Three groups of aspects of resilience can be identified (Masten, Powell 2003):

1. A far better operation than expected on the basis of knowledge about the effects of risk factors,
2. Continuation of proper operation despite stressful situations presenting themselves,
3. Recovery after traumatic events.

The concept of resilience in the social sciences is linked in a special way with the concepts of risk and positive adaptation. Risk is treated as a reflection of the nature and degree of hazards for the health and operation of the individual, while

positive adaptation is linked to all of these behaviours and their expressions which testify to overcoming these difficulties (Borucka, Ostaszewski 2008). The risk factors include non-specific and specific factors as well as those related to the development stage. Adaptation is a multidimensional concept that refers to qualitative transformations of various functions and properties of the individual that allow the individual to move through successive development periods and stages. It is defined as positive adaptation, despite the risks and adversities (Luthar 2006; Luthar, Zelazo 2003). It was observed, however, that in some cases the occurrence of the same risk factor may trigger the intensification of risk or protection processes. Therefore, more important than the mere risk factor are the processes triggered by its occurrence. Many authors indicate that underlying the resilience process are different models of interaction of protective measures and risk factors. The result of these interactions is not predetermined and depends on the co-occurrence and intensity of multiple factors. However, it would be a mistake to believe that resilience means a lack of vulnerability or some extraordinary immunity which protects against everything, no matter what (Borucka, Ostaszewski 2008).

We should bear in mind that coping with stress or overcoming adversity is a dynamic process (not established once and for all) (Borucka, Ostaszewski 2008). Resilience should not be understood as characteristics of the individual, though it is revealed through the individual's behaviour (Luthar et al. 2000; Masten, Powell 2003). We can therefore say that someone demonstrates (or not) resilience rather than they "are" resilient (Masten, Powell 2003). This concept should be understood more as a positive process to reduce the individual's ill-adjustment in the face of adversity (Greenberg 2006).

Resilience is therefore not a permanent feature of the individual, but a multifaceted process taking place in accordance with one of the hypothetical models. In psychology three such models were proposed by N. Garmezy et al., namely (Garmezy et al. 1984):

1. The compensatory model,
2. The immunity or protective model, and
3. The challenge model.

The first of these (the compensatory model) assumes that some of the protective factors operate directly, offsetting the impact of the risk factors. The protective model assumes that the protective factors interact with the risk factors and reduce their impact on behaviour, acting like a buffer or a protective shield. The third, challenge model is based on the assumption that a moderate level of risk can immunise the individual and prepare them for new and tougher challenges (Borucka, Ostaszewski 2008). In addition to the above three models, two others are worth paying attention to. Fergus and Zimmerman (2005) describe two additional variants of the protective model. In the first variant, called the protective-stabilising model, the protective factor reduces the risk impact, stabilising it at a steadily low level. In the other variant, i.e. the protective-reactive model, the presence of the protective factor reduces the frequency of the undesired behaviour, but is unable to keep it at a constant, low level (Borucka, Ostaszewski 2008).

The concept of resilience, originating in the social sciences, has been adapted by other disciplines, too, especially those considering the subject of research in systemic categories, mainly as a living organism affected by unfavourable factors undermining its development stability. It is used, among other things, in economy, ecology, geography, including the study of phenomena and processes taking place in cities, also in Polish literature (Lipka 2016, 2017; Drobniak (ed.) 2014; Drobniak 2017; Świątek 2015 et al.).

Implementing the concept of resilience to urban studies

The adoption of the concept of resilience in relation to the city, developed as part of the social sciences, justifies the possibility of treating this kind of territorial unit as a system, and also as a living organism and, therefore, the adoption of the organicist rather than a mechanistic concept of the city, although other systemic approaches are certainly possible. Analogies between the city and a living organism have been sought by many researchers. They pointed out the similarity between the processes that occur in the city to those that take place in a living body (Jacob 1961; Haken 1993; Parysek, Mierzejewska 2013). The city, as a functional whole (system), meets all the conditions attributed to living organisms

(Parysek, Mierzejewska 2013). Five such conditions were indicated by Gánti (1986). These are as follows: (1) a comprehensive and individual character, (2) metabolism, (3) homeostasis, i.e. maintaining a state of inner balance, (4) a subsystem of information storage and processing, and (5) an internal system of operation regulating. A living organism is moreover characterised by specific vital processes. This means that the city is characterised by continued existence, development and evolution, but also by mortality, as discussed in depth by Parysek and Mierzejewska (2013).

In order to function properly, the city must demonstrate an equilibrium of all of its components. This condition is ensured by the metabolic processes, namely the correct operation of the elements of the urban system, including the regulatory subsystem, i.e. first of all the municipal authorities: the local city government (Parysek, Mierzejewska 2013). In the city system, as in other living organisms, the equilibrium will always be dynamic, a result of a number of threats or problems that may disrupt the balance with which the body must cope in the development process. It will also have, as every city, an individualised character.

Changes taking place within the system along with the emergence of new needs and challenges in the environment, often destabilising the system organisation, necessitate the formation of a new organisation, which in the new context may prove to be more adaptive than the previous one. Some believe that the process of transition from the old to the new organisation and the structure of the system takes place in accordance with the pattern described in the theory of self-organisation, and periods of relative stability and imbalance are intertwined. Numerous studies suggest, however, that early experience and prior levels of adaptation to the new conditions of development neither doom the individual to a continuous operation without adaptation nor protect the individual from future problems (Curtis, Cicchetti 2004).

With regard to the urban context, the concept of resilience was initially used to test the vulnerability of urban systems to natural disasters, especially related to climate change (Cutter et al. 2003; Vale, Campanella 2005; Colten et al. 2008; Coaffee et al. 2008). However, application capabilities have broadened the interest in this concept to include other systems operating within the city. Studies have been conducted on the resilience of the social system (Adger 2000, 2003; Pelling, Leichenko 2011), of the economic system (Rose 2004; Pendal et al. 2010; Pike et al. 2010; Simmie, Martin 2010; Lipka 2016; Drobniak, Plac 2015; Drobniak 2017), of security systems, mainly due to the growing terrorist threat (Harrigan, Martin 2002; Coaffee 2006, 2009), of spatial systems (Gunder, Hillier 2009; Cumming 2011; Desouza, Flanery 2013; 2013 Jabareen, Świątek 2015), of city development policies (Betsill, Bulkeley 2007; Bulkeley, Newell 2010; Bulkeley 2010; Okereke et al. 2009), and of the governance model (Healey 2007; Healey, Upton 2010; Melkunaite, Guay 2016; Klein et al. 2017), playing a major role in the development of city/urban resilience. The resilience level of urban systems in different parts of the world was also measured (Hill et al. 2010; Wink 2012; Drobniak (ed.) 2014 et al.).

As ambiguous as the very concept of resilience is, the understanding of city/urban resilience in the relevant literature points to the ambiguity, if not to the internal incoherence of the concept of resilience (Meerow et al. 2016). Traditionally, this concept was used to determine the sustainability of the development of the city and the period during which a system returns to equilibrium after the occurrence of developmental disorders (perturbations). It was thus mainly tied with the concept of equilibrium (Godschalk 2003; Hamilton 2009; Lamond, Proverbs 2009). However, more emphasis has been placed in recent years on the adaptive component of the concept, emphasising the dynamic character of the city, city resilience and the pliability of its structures in the face of the evolving development conditions (Ahern 2011; Desouza, Flanery 2013; Ernstson et al. 2010, Melkunaite, Guay 2016). Attention is drawn to the need for a comprehensive, flexible and multi-sectoral approach to urban development, which must take into account such characteristics which help to meet emerging challenges as redundancy, flexibility, capacity to reorganise, and the capacity to learn being integrated into the urban systems (Melkunaite, Guay 2016). A need for a simultaneous consideration of the concepts of resilience, sustainability and governance has been emphasised (Tompkins, Hurlston 2012; Desouza, Flanery 2013).

It can be assumed, after Melkunaite and Guay (2016), that the resilience in relation to the city is geared to making cities more capable to respond to shocks (perturbations), to improving the capacities of cities to perform basic functions and to providing services both on a daily basis and in times of crisis. Activities undertaken by various functional entities in the city including, above all, urban authorities play a major role in it.

Developing urban structures which are appropriate from the point of view of resilience requires that local authorities (including city residents and other stakeholders that can be included in a city's regulatory system) be aware of the development risks, prepare their urban systems for such risks (including those which are hard to predict or completely unpredictable) and develop skills of a rapid and efficient response when such risks occur. It is important that the adopted strategies take into account different timescales. In a short run, important at the time of a perturbation, what is at stake is first of all saving human lives and protecting human health. In the medium and long run, the priority is to transform urban systems (system incremental change and system reconfiguration towards resilience (Chelleri 2012). Properly planned and implemented strategies give cities a chance to become more resilient.

City/urban resilience or the resilient city

According to Galderisi (2014), "despite the huge literature produced in the last decades on resilience and the numerous initiatives aimed at building up resilient cities undertaken by international organisations (UN-ISDR, ICLEI), it is still hard to find out a shared definition of the term and the different approaches are still struggling to find a common view" (p. 3). Many scholars use the concept of resilience in reference to development processes in the city, but often do not define too precisely what city resilience or the resilient city is in reality. Table 1 lists some ways of understanding both of these terms with a view

Table 1. Selected approaches to the resilient city and city resilience.

City/urban resilience	Resilient city
"The Urban Resilience Model, structured as a cyclical process and **capable** to take into account environmental, social, economic, functional and spatial aspects of urban systems' resilience" (Galderisi 2014: 53)	"Not only must teams of ecologists and designers be engaged in continuing dialog aimed at implementing designs that contribute to resilient cities, they must help educate their constituencies to any novel requirements of this integrated approach to design for ecological resilience" (Pickett, Cadenasso, Grove 2004: 380).
"Urban resilience therefore can be defined in evolutionary terms as a proactive rather than reactive view to planning, policy-making and strategic steering in which communities play a vital role for resilient place shaping through their capacity for active learning, robustness, ability to innovate and adaptability to change" (Mehmood 2016: 8)	"The term «resilient cities» often refers only to the capacity to maintain functions and structures" (Chelleri 2012: 287).
"Urban resilience refers to the ability of an urban system and all its constituent socio-ecological and socio-technical networks across temporal and spatial scales to maintain or rapidly return to desired functions in the face of a disturbance, to adapt to change, and to quickly transform systems that limit current or future adaptive capacity" (Meerow, Newell, Stults 2016: 44).	"The resilient city as one that would be capable of withstanding severe shock without either immediate chaos or permanent harm … While they might bend from hazards forces, they would not break. Composed of networked social communities and lifeline systems, resilient cities would become stronger by adapting to and learning from disasters" (Beatley, Newman 2013: 3332, after Godschalk 2003: 22).
"Urban resilience should be framed within the resilience (system persistence), transition (system incremental change) and transformation (system reconfiguration) views" (Chelleri 2012: 287).	"A resilient city is defined by the overall abilities of its governance, physical, economic and social systems and entities exposed to hazards to learn, be ready in advance, plan for uncertainties, resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions" (Jabareen 2013: 227)

Source: own compilation (on the basis of literature).

to identifying the dependencies between them and thus bases for their differentiation. This comparison was made on the basis of the literature included in Table 2. Analysis of Table 1 indicates that the city resilience is understood generally as (Table 1):

- a process, which includes a proactive approach to planning and decision making, requiring simultaneous consideration of environmental, social, economic, spatial, and functional aspects of the system,
- an ability to maintain and quickly return to the desired functioning, to adapt to changes and quick transformations of the system, in which its capacity for learning, robustness and ability to innovate plays a significant role.

The resilient city is mainly seen as follows (Table 1):

- having a capacity to maintain functions and structures,
- being stronger by adapting to and learning from disasters,
- having abilities of its governance, physical, economic and social systems,
- being ready in advance, plan for uncertainties, resist, absorb, accommodate to and recover from the effects of a hazard.

It is difficult to see in this list significant differences between both these concepts (city resilience and the resilient city). Both have many features in common and are linked to issues like capacity, ability, learning, and adaptation. What is more, many publications make no attempt at all to define the subject of analysis, i.e. what city resilience or the resilient city means. Different ways of understanding the concept of resilience are usually described, depending to a large extent on the direction of the researcher's scientific interests (emphasis on physical, ecological, social aspects, etc.).

It remains a separate issue whether, with the passage of time, one can observe a change in the research approach: from city resilience towards the resilient city or vice versa, especially

Table 2. Selected publications on the resilient city and city resilience.

Author	Year	Title
Harrigan J., Martin P.	2002	Terrorism and the **resilience of cities**.
Godschalk D.R.	2003	Urban hazard mitigation: Creating **resilient cities**.
Pickett S.T.A, Cadenasso M.L., Grove J.M.	2004	**Resilient cities**: meaning, models, and metaphor for integrating the ecological, socio-economic, and planning realms.
Bogunovich D.	2009	From planning sustainable cities to designing resilient urban regions.
Coaffee J.	2009	Terrorism, risk and the global city: Towards urban resilience.
Leichenko R.	2011	Climate change and urban resilience.
Chelleri L.	2012	From the «**resilient city**» to **urban resilience**. A review essay on understanding and integrating the resilience perspective for urban systems.
Serre D., Barroca B.	2013	Natural hazard **resilient cities**.
Beatley T., Newman P.	2013	Biophilic cities are sustainable, **resilient cities**.
Desouza K.C., Flanery T.H.	2013	Designing, planning, and managing **resilient cities**: A conceptual framework.
Jabareen Y.	2013	Planning the **resilient city**: Concepts and strategies for coping with climate change and environmental risk.
Galderisi A.	2014	**Urban resilience**: A framework for empowering cities in face of heterogeneous risk factors.
Melkunaite L., Guay F.	2016	Resilient city: Opportunities for cooperation.
Mehmood A.	2016	Of resilient places: Planning for **urban resilience**.
Meerow S., Newell J.P., Stults M.	2016	Defining **urban resilience**: A review.
Drobniak A.	2017	Theoretical and empirical aspects of the **urban resilience** − Between papers and findings for Polish and Czech cities.
Klein B., Koenig R., Schmitt G.	2017	Managing **urban resilience**. Stream processing platform for responsive cities.

Source: own compilation (on the basis of literature).

interpreting (according to the principles of semantics) the first approach in process categories and the second as the target state. The list, presented in Table 2, of a dozen or so relevant publications devoted to resilience issues in relation to the city, highlighting the year and the title of the publication, is meant to clarify these issues. The analysis of the table shows that it is difficult to find any regularity in this respect. Both concepts are present at one time, although city/urban resilience is more common. What is more, some publications emphasise a direction different than the assumed direction of changes in the research approach, e.g. in Chelleri's (2012) article "From the «Resilient City» to Urban Resilience."

Similar conclusions arise from bibliometric studies carried out by Meerow, Newell, and Stults (2016) on the definition of urban resilience. The authors believe that "a reading of these definitions and the publications in which they appear confirms that urban resilience is a contested concept and lacks clarity due to inconsistencies and ambiguity" (p. 40).

Therefore, it seems reasonable to fear that the concept of resilience, probably due to the heterogeneity of approaches and different research perspectives, may become – from overuse and ambiguity – a vacuous buzzword (Galderisi 2014; Serre, Barroca 2013). It is therefore necessary to intensify research on the theoretical and applicable approaches to the concept of resilience, useful in research on the city, in particular via a systemic approach, which comprehensively covers the complexity of the questions this concept embraces.

On the other hand, it is difficult to unambiguously assess the legitimacy of the term 'resilient city'. The experience of the social sciences shows, as already indicated, that 'resilience' is neither susceptibility nor resistance which protects against everything and regardless of everything (Borucka, Ostaszewski 2008). In this context, the resilient city can be treated as an unrealistic, or even a utopian approach, and attempts to develop a resilient city seem doomed to failure.

Conclusion

In the last decade, resilience has become a fashionable concept that has gradually spread in various scientific disciplines. Nevertheless, the term remains controversial due to the variety of approaches and definitions, the difficulty of its translation into other languages and problems with its operationalisation. In the social sciences, it is understood as a dynamic process associated with flexibility in adapting to changing conditions, as a positive adaptation, covering the entire spectrum of risk factors, vulnerabilities and factors protecting against adverse effects (Werner 1994, 2000; Luthar 2006; Luthar, Zelazo 2003; Borucka, Ostaszewski 2008; etc.). It is emphasised that resilience does not mean a lack of compliance or full resistance to threats and development perturbations (Borucka, Ostaszewski 2008). This point of view can be applied in research on the city, particularly if this unit is treated in systemic categories as a living organism (an organicist concept of the city).

With regard to the city, the concept of resilience functions in the context of city/urban resilience and the resilient city. The analyses conducted so far show that the distinction between these concepts is blurred and many publications devoted to this subject do not fully explicate them. The multiplicity of research approaches and points of view, on the other hand, is the source of numerous inaccuracies, often leading to the aforementioned contradictions and controversies, making the operationalisation of this concept difficult. It can be assumed that city/urban resilience should be treated as a process of active, positive adaptation of urban systems to changing development conditions, to phenomena and processes that may constitute more or less predictable developmental threats, including natural disasters. However, the use of the term 'resilient city' raises doubts; it can be understood as the ultimate stage of the process of developing city resilience. Observations conducted within the social sciences, however, show that it is not possible to immunise a given individual against developmental threats and challenges, although the activities for increasing its immunity and reducing susceptibility to perturbations should be undertaken. Immunity is not guaranteed even by previous similar experience (Borucka, Ostaszewski 2008). There are indications, therefore, that it is impossible to achieve such a state, although certain conclusions should be drawn from any disturbance that dislodges the urban system from the state of

equilibrium. These conclusions should then be used to eliminate or at least reduce the vulnerability of urban systems to adverse situations (proactive activities) as well as to plan and take action to reduce the adverse effects of possible perturbations (reactive activities). Responsibility in this respect rests mainly with municipal authorities, but also with city residents and other stakeholders operating in urban areas.

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