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Contents

Theoretical concepts of consumer resilience to online privacy violation

Abstract:
Resilience is a multifaceted concept used to explain both system and individual behavior across disciplines. Although definitions and research concepts of resilience vary significantly, resilience has become a boundary object in diverse academic fields calling for a holistic approach. This work aims to elaborate the theoretical concepts that might be applied in the research of consumer resilience to online privacy violation, a new and unexplored aspect of consumer behavior in the digital environment. It contributes to the privacy resilience debate and lays the groundwork for developing a conceptual model of online consumer resilience that would explore how individual behavior is affected after online privacy violation occurrence.

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Keywords: resilience, theoretical concepts, consumer behavior, online privacy
JEL classification: D12, D91

Teorijski pojmovi u istraživanju otpornosti potrošača na narušavanje privatnosti u *online* okruženju

Sažetak:
Otpornost je višeznačni koncept koji se koristi za opisivanje ponašanja sustava i pojedinaca u različitim akademskim disciplinama. Premda se definicije i koncepti otpornosti razlikuju, otpornost je pojam koji povezuje istraživanja iz različitih područja, zbog čega istraživanje otpornosti zahtijeva holistički pristup. U ovom se radu prikazuju teorijski koncepti koji se mogu primijeniti u istraživanju otpornosti potrošača na narušavanje privatnosti u *online* okruženju što predstavlja novi i do sada neistraženi aspekt ponašanja potrošača u digitalnom okruženju. Rad doprinosi raspravi o otpornosti i definira osnove na kojima treba razviti konceptualni model otpornosti potrošača u *online* okruženju na narušavanje privatnosti kojim će se ispitati kako se ponašanje pojedinca mijenja nakon što je došlo do povrede privatnosti u *online* okruženju.

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Ključne riječi: otpornost, teorijski koncepti, ponašanje potrošača, *online* privatnost
JEL klasifikacija: D12, D91

1 Introduction

Resilience is a multifaceted and multidisciplinary concept that attracts a great deal of research across numerous and diverse academic disciplines - from ecology, engineering and computer sciences (e.g. Brand and Jax, 2007; Klein, Nichols and Thomalla, 2003; Callister and Rethwisch, 2018; Trivedi, Kim and Ghosh, 2009; Hiller and Russell, 2015), across psychology, medical sciences and social work (e.g. Herrman et al., 2011; Johnson et al., 2010; Greene, 2002; Wagnild and Young, 1993), to marketing, management and accounting (e.g. Luthans, 2002; Deans and Garry, 2013; Ollier-Malaterre, 2009; Bhamra, Dani and Burnard, 2011; Ledesma, 2014). Consequently, there is no straightforward definition of resilience or overview of used concepts.

Nowadays, resilience attracts increasing research interest in the new domains, such as in the context of information security, digitalization of trade and services, and extent of internet usage. On the other hand, related privacy issues are still under-researched, knowledge about consumer behavior, specifically individual resilience to privacy violation, is limited and studies on consumer resilience to online privacy violation are missing. We believe that this aspect of consumer behavior is worth exploring, since people who experienced online privacy violations might change their subsequent online behavior and intentions to adopt new online services and/or technologies. If an equilibrium after online privacy violation is not achieved or is established at the lower level of consumer online activity, the implications might be disturbing for business and public policies. At an individual level, resilience is conceptualized as the capability of individuals to recover from adversities or as the process of adaptation to adversity (e.g. Luthar et al., 2000; Luthans et al., 2006; Bourbeau, 2013). Sparse studies of consumer resilience conceptualize resilience at an individual level and explore how consumers recover or adjust their consumption habits after experiencing some form of adversity situation. However, the concept of adaptive responses is not developed in these studies, while antecedents and consumer behavior consequences remain under-explored. This is particularly valid for the online context which is gaining importance with increasing digitization of the entire value chain. Although research on privacy and resilience certainly has its applicative value in everyday life, the phenomenon of resilience to privacy violations still remains largely under-explored.

In order to assess consumer resilience to online privacy violation, one should find an appropriate theoretical concept and proceed with building and testing the developed model. This paper aims to review resilience concepts and definitions across disciplines, which may be adapted for the specific purpose of researching consumer resilience to online privacy violation. The remainder of the paper is organized as follows: Section 2 introduces the concept of resilience across various disciplines; Section 3 presents the application of resilience in contemporary security and smart city context and issues related to consumers' resilience; Section 4 elaborates an individual approach to researching consumer behavior

related to privacy violation in an online environment; Section 5 identifies key issues for future research and offers suggestions on how to develop a research model of consumer resilience to online privacy violation.

2 The Concept of Resilience

Conceptualizing resilience across diverse academic disciplines resulted in variety of its meanings, as represented in the definition of resilience provided by the Oxford English Dictionary: "The action or an act of rebounding or springing back; rebound, recoil. Elasticity; the power of resuming an original shape or position after compression, bending, etc. The energy per unit volume absorbed by material when it is subjected to strain; the value of the elastic limit. The quality or fact of being able to recover quickly or easily from, resist being affected by, a misfortune, shock, illness, etc.; robustness; adaptability."

The term resilience originates from the Latin word *resilire*, meaning to spring back. It was first used in physics and technical sciences to describe the stability of materials and their resistance to external shocks. However, in order to utilize the concept of resilience in social and related research, one must first answer the question "the resilience of what to what?" (Carpenter et al., 2001). A brief systematization is provided in the following chapters.

2.1 Resilience as a Holistic Concept

Resilience has become a 'boundary object' across disciplines which share the same vocabulary, but with different understanding of the precise meaning of resilience. However, as Brand and Jax (2007:9) noted, resilience as a boundary object is "open to interpretation and valuable for various scientific disciplines or social groups, (…), and can be highly useful as a communication tool in order to bridge scientific disciplines and the gap between science and policy". Most of the resilience literature develops resilience as a theoretical concept in their relevant fields, but empirical research, such as case studies, modelling and in particular surveys, which would test the theoretical approaches, are rather rare.

An older definition of resilience refers to the robustness or resistance on the one hand, versus adaptive capacity on the other (Holling, 1973). However, from these two approaches it is not clear if a resilient system resists adverse conditions or adapts to them, i.e. if the new balance is achieved by "bouncing back" (Wildavsky, 1988) or by "bouncing forward" to a more desirable state (Davoudi et al., 2012), and in what time span it occurs. Manyena (2006) considered resilience as recovery, yet it remains undetermined whether a resilient system resists adverse conditions, adapts to them or is simply able to fully recover from damage by bouncing back.

Resilience is a broad application of failure-sensitive strategies that reduce the potential for and consequences from erroneous actions, surprising events, unanticipated variability, and complicating factors (Patterson et al., 2006). Ponomarov and Holcomb (2009) identified three elements of resilience: readiness and preparedness, response and adaptation, recovery or adjustment. Longstaff, Koslowskib and Geoghegan (2013), in their attempt to translate holistic resilience concepts across disciplines, describe four types of resilience, relating them to different resilience research traditions:

a) Resilience defined as the *capacity to rebound and recover* is predominantly adopted in traditionally engineered and other designed systems where resilience is seen as a system property or measure of stability.
b) Resilience defined as the *capability to maintain a desirable state or to bounce back to an approved equilibrium or assumed normal state* is predominantly employed in business, psychology and other social sciences disciplines.
c) Resilience defined as the *capacity of the systems to withstand stress where high resilience implies sufficient robustness and buffering capacity against a regime shift* and/or the ability of system components to self-organize and adapt in the face of fluctuations.
d) Resilience defined as the *capability to adapt and thrive* is often conceptualized in social systems and psychology as a skill that an individual or group can use when facing disturbance and that will allow them to reach a level of functionality which has been determined to be 'good'. The disciplines in this box acknowledge the existence of multiple possible states, but also explicitly call for a successful adaption before or after a disturbance occurs. Hence, a positive adjustment can involve different desirable states ranging from a worse, but acceptable level to an even better post-disturbance state. Managing resilience as a normative activity or outcome involves human capabilities such as anticipation, sense-making and learning.

Using the example of social-ecological definitions and different concepts of resilience, Strunz (2012) discusses whether conceptual vagueness is an asset or a liability in the resilience research. Arguments in favor of precision prevail in traditional philosophy of science, emphasizing it is a proven scientific method establishing the validity of concepts and empirical testability. On the other hand, vagueness allows for creativity and for interdisciplinary and transdisciplinary approaches that lead to problem-solving. Strunz (2012) argues that a trade-off between vagueness and precision exists, depending on the research context. In some contexts, resilience research benefits from conceptual vagueness, while in others it depends on precision. To conclude, a variety of resilience definitions can exist as long as they are acknowledged.

In their review paper, Hosseini, Barker and Ramirez-Marquez (2016) identified four domains of resilience: organizational, social, economic, and engineering. While resilience

has a clear definition within engineering and psychology, this is not the case within the complex adaptive systems research domain or the economics. Several conceptual and review papers were written to clarify resilience in various fields, for example Klein, Nicholls, and Thomalla (2003) review resilience in natural hazards; Brand and Jax (2007) and Martin-Breen and Anderies (2011) review ecological resilience (or ecosystem resilience) in sustainability sciences and Norris et al. (2008) in community resilience[1].

In this paper definitions and concepts of resilience are systemized across disciplines as they evolved in theoretical and empirical research. Having in mind the vast research area in which resilience is assessed, it is just a sketch of an ample resilience definitions and concepts, and some of them would reappear under multiple titles and categories. However, the ultimate aim is to introduce concepts that could be used in consumer resilience to online privacy violation.

In his seminal work, Holling (1973) defined engineering resilience as the ability of a system to return to an equilibrium or steady-state after a disturbance, measuring how long it takes for a system to bounce back after a shock. His aim here was to distinguish resilience from stability of ecological systems. In contrast to the engineering resilience measured by the speed of recovery, about two decades later, Holling (1996) defined the ecological resilience as the magnitude of the disturbance that a system can take and absorb before it changes its structure, i.e. the system's ability to persist and adapt. Here, resilience is defined not just according to, but also by how much disturbance it can take and remain within critical thresholds. Ecological resilience focuses on "the ability to persist and the ability to adapt" (Adger, 2003:1).

For ecologists, resilience is the capacity of an ecosystem to tolerate disturbance without collapsing into a qualitatively different state that is controlled by a different set of processes. A resilient ecosystem can withstand shocks and rebuild itself when necessary. The ecosystem would not look exactly as it was before the disaster, because individual species would adapt (Longstaff, Koslowskib and Geoghegan, 2013). A variety of definitions proposed for resilience within sustainability science is classified by Brand and Jax (2007) and presented in Table 1.

Resilience is widely seen as a desirable system property in environmental management. Human resilience in disaster planning implies the ability to bounce back and even to grow in the face of threats to (biological) survival (Reich, 2006). A resilient system has to prove key abilities to provide emergency response in the event of a crisis. Klein, Nicholls and Thomalla (2003) explore the concept of resilience to natural hazards, using weather-related hazards in coastal megacities as an example. Four typical activities of disaster operations management are mitigation of risks, preparedness for the future response, response in terms

[1] See https://www.ecologyandsociety.org/vol12/iss1/art23/.

of managing the on-going events during the crisis, and recovery (regardless if it considers bouncing back or moving forward) (Altay and Green III, 2006). Despite efforts to build systems that possess resilient capabilities, no system could be completely safe or resilient (Lundberg and Johansson, 2015).

However, due to the research on resilience in human development, planning disaster response and recovery is nowadays much improved compared to five decades ago. Masten and Obradovic (2007) pointed out that resilience theory across the developmental and ecological sciences was rather similar and that findings from the developmental theory and human resilience research were instructive for both individual and community resilience. Adaptive systems are crucial for the resilience of people, including their intelligence, behavior regulation systems, and social interactions with family, peers, school, and community systems. Adaptive systems for human resilience are regulatory systems, personal intelligence and motivation to adapt, macrosystems (such as governments, the media), as well as knowledge, memories, and experience of individuals, families, and communities.

In developmental theory, resilience following disaster could take multiple forms, including stress resistance, recovery, and positive transformation. Norris et al. (2008) define community resilience in disasters as a process of adaptation after a disturbance or adversity. Here the community adaptation is valued by population wellness, mental and behavioral health, functioning, and quality of life.

To conclude, economic development, social capital, information and communication, and community competence are four pillars of community adaptive capacity. In order to build collective resilience, communities must reduce risk and resource inequities, engage local people in mitigation, create organizational linkages and social support, which requires flexibility, decision-making skills, and trusted sources of information that function in the face of the unknowns (Norris et al., 2008).

Resilience also has its application in organizations (for an overeview see e.g Duchek, 2020). A resilient organisation is the one that is still able to achieve its core objectives in the face of adversity (Seville et al., 2006) and thrives despite experiencing conditions that are surprising, uncertain, often adverse, and usually unstable (Lengnick-Hall, Beck and Lengnick-Hall, 2011). This means not only reducing the size and frequency of crises (vulnerability), but also improving the ability and speed of the organisation to manage crises effectively (adaptive capacity).

Hind, Frost and Rowley (1996) were among the first to employ the concept of resilience in organizations. They proposed that the concept of resilience indicated cultural factors within organizations which served as a protective shield against the negative impact of organizational change. Mallak (1998) proposed seven principles for implementing

resilience in organizations in order to have individuals who would, inter alia, have positive adaptive responses to the situations they faced and who possessed a high tolerance for uncertainty.

An organization's capacity for resilience is developed through managing human resources strategically to create competencies among core employees (Lengnick-Hall, Beck and Lengnick-Hall, 2011). Research of resilience in human organizations emphasizes the ability of organizations to rarely fail and to maintain their performance despite encountering unexpected events (Linnenluecke and Griffiths, 2010). Systems, however, operate in complex and uncertain environments, which makes them fragile to shocks. Longstaff, Koslowskib and Geoghegan (2013) summarize the characteristics of resilient organizations. Those are the organizations which encourage diversity, successfully diversify risks, build knowledge on problem solving, increase options and create opportunities for self-organization, including strengthening of local functions, building cross-scale links and networks. A resilient organization (or its specific functions) should possess a set of traits such as experience, intuition, improvisation, expecting the unexpected, examining preconceptions, thinking outside the box, and taking advantage of fortuitous events (Nemeth, 2008). To effectively manage crises, organisations also need to recognize and evolve in response to the complex system within which the organisation operates (situation awareness) and to seek out new opportunities even in times of crisis (Seville et al., 2006).

2.2 Resilience Thinking and Definitions

Resilience thinking represents a conceptual vagueness of the definition of resilience and reveals blurred boundaries among concepts used in the research of resilience of (social) ecological systems. Resilience thinking deals with the dynamics and development of complex social–ecological systems addressing three central aspects: resilience itself, adaptability, and transformability (although there is no clear distinction among them) (Folke et al., 2010). In order to better understand the application of resilience concepts in 'non-traditional' fields, the main terms used in the resilience thinking will be explained according to Martin-Breen and Anderies (2011).

System *resilience* means maintaining a system function in the event of disturbance. It is the appropriate framework to be applied to conditions prevailing in dynamic systems that undergo permanent internal changes. In such systems there is no fixed normal state, only functions of the systems are fixed and known. Therefore, after the disturbance, a resilient system will have its functions restored, yet not at the same level or in the same way as it was before the disturbance. Application in the literature is mostly in ecology and developmental psychology, specifically in child development.

Resilience in complex adaptive systems is best defined as the ability to withstand, recover from, and reorganize in response to crises. Adaptability is the key feature of complex adaptive systems which, if resilient, maintain their functions after the disturbance, but, due to the adaptability, not the same structure as before the crisis. Complex adaptive systems may also assume new functions, so transformability is also often a feature of complex adaptive systems.

The concept of resilience in systems is mostly developed in the context of ecological and environmental systems. The focus on system properties that emphasizes constant change and reorganization has been a great strength of this concept of resilience. Resilience thinking is very valuable in framing and discussing aspects of sustainability and sustainable development. Furthermore, this concept of resilience is highly flexible and can be applied to a range of systems across a range of scales from individuals to households, communities, regions, and nations.

In the resilience literature, *vulnerability* denotes the opposite of resilience. *Vulnerability and adaptation* have been used to refer to individuals. Terms such as adaptive capacity, transformability, and robustness, on the other hand, are traditionally used to refer to collectives of decision-making units (villages, cities, nations, etc.). Similarly, individual vulnerability is the antonym of individual resilience. Resilience means the speed at which a person returns to normal, while sensitivity is the degree of disturbance they are subject to when facing a certain magnitude of crisis. Both resilience and sensitivity are determinants of engineering resilience in individuals.

Robustness, like resilience, refers to the capacity of a system to continue functioning after experiencing external shocks, but in a short period of time. Resilience, on the other hand, emphasizes learning and transformation that occur over long periods.

Sustainability is a broader concept than resilience; sustainability is about preservation.

Adaptation is adjustment in the face of change. It may be positive, negative or neutral. Change may be based on immediate conditions, knowledge of past conditions or new information about predicted conditions. A person, society or species can adapt. As opposed to adaptation, coping is the process of individual intentional change in response to a stressor.

Adaptive capacity is closely related to resilience. According to Dalziell and McManus (2004), adaptive capacity is a mechanism for resilience since it reflects the ability of the system to respond to external changes, and to recover from damage. System characteristics that enhance resilience are diversity, efficiency, adaptability, and cohesion (Fiksel, 2003), but it remains unclear how to connect these system characteristics with the characteristics

of an individual. Adaptive capacity and transformability are two aspects of resilience. Adaptive capacity refers to the capability of a particular system to effectively cope with shocks. Increased adaptive capacity would facilitate adaptation to changes, thus increasing resilience.

As variety of resilience definitions exist (Table 1), research of consumer resilience to privacy violation online is exploring resilience at the intersection of an individual and psychology, and in engineering contexts. In order to assess this research issue, one should examine the capacity of an individual to recover from adversity, depending on their individual characteristics. In the specific context of exploring resilience to online privacy violation, it should be considered that resilient individuals possess three common characteristics: an acceptance of reality, a strong belief that life is meaningful, and the ability to improvise (Coutu, 2002). One should consider definitions from organizational and disaster management pointing out the importance of the period of regressive behavior, as well as accounting for previous experiences.

From an individual's point of view, resilience is an interactive concept that is concerned with the combination of serious risk experiences and a relatively positive psychological outcome, despite those experiences (Rutter, 2006). Early studies on individual resilience focused on child development in adverse settings, especially poverty, where the traditional approach included identifying risk-factors. The risk-approach aims to identify psychological, familial, and environmental factors to reduce these risks. Consumer behavior is inevitably determined by psychological factors. Application of resilience in psychology can be found in two streams. One originates from the study of the impacts of crises and abrupt changes that impact families; the other looks at child development after a traumatic event. In developmental psychology, to determine resilience one chooses outcomes and risk factors to be measured. In some studies, resilience is observed if good outcomes are achieved despite the threats to adaptation or development. However, defining what is good or normal is not precisely set. Studying resilience as a positive adaptation in the context of significant adversity seems to be more applicable to different psychology research. Resilience is then defined as an ongoing process of continual positive adaptive changes to adversity, which enable future positive adaptive changes. Such a definition assumes bidirectional interactions, as well as recognition that history, including previous adaptations, determine (positive) adaptive outcomes. Since the introduction of adversity and positive adaptation concepts to the resilience literature (Luthar, 2006; Luthar and Cicchetti, 2000; Luthar, Cicchetti and Becker, 2000), most researchers agree that, for resilience to be demonstrated, both adversity and positive adaptation must be evident (Masten, 2001; Rutter, 2006).

After having systematized definitions and concepts of resilience in different fields of research, in the following chapters, we describe the use of the concepts of resilience in practical contexts, as well as approaches in social sciences to assess consumer resilience.

Table 1 **Types and definitions of resilience**

Type of resilience	Definition of resilience	Reference
Physical resilience	The ability to store strain energy and deflect elastically under a load without breaking or being deformed.	Gordon (1978)
	The speed with which a system returns to equilibrium after displacement, irrespective of how many oscillations are required.	Bodin and Wiman (2004)
Ecological and eco-systems resilience	Measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables. The persistence of relationships within a system; a measure of the ability of systems to absorb changes of state variables, driving variables, and parameters, and still persist.	Holling (1973)
	The ability to maintain the functionality of a system when it is perturbed or the ability to maintain the elements required to renew or reorganise if a disturbance alters the structure or function of a system.	Walker et al. (2002)
	The capacity of a system to absorb a disturbance and reorganise while undergoing change while retaining the same function, structure, identity and feedback.	Walker et al. (2004)
	The magnitude of disturbance that a system can absorb before its structure is redefined by changing the variables and processes that control behavior.	Gunderson (2000)
	The speed at which a system returns to a single equilibrium point following a disruption.	Tilman and Downing (1994)
	Positive adaptation in response to adversity; it is not the absence of vulnerability, not an inherent characteristic, and not static.	Waller (2001)
	Quantitative property that changes throughout ecosystem dynamics and occurs on each level of a co-system's hierarchy.	Holling (2001)
	The underlying capacity of an ecosystem to maintain desired ecosystem services in the face of a fluctuating environment and human use.	Folke et al. (2002)
	The magnitude of disturbance that can be absorbed before the system changes its structure by changing the variables and processes that control behavior.	Gunderson and Holling (2002)
	The ability of a system that has undergone stress to recover and return to its original state; more precisely: (i) the amount of disturbance a system can absorb and still remain within the same state or domain of attraction; and (ii) the degree to which the system is capable of self-organization.	Kleinet et al. (2003)
	The capacity of a social-ecological systems to absorb recurrent disturbances (…) so as to retain essential structures, processes and feedbacks.	Adger et al. (2005)
Sociological and community resilience	The ability by an individual, group, or organization to continue its existence (or remain more or less stable) in the face of some sort of surprise. Resilience is found in systems that are highly adaptable (not locked into specific strategies) and have diverse resources.	Longstaff (2005)
	The ability of groups or communities to withstand external shocks to their social infrastructure.	Adger (2000)
	The capacity of a system to experience shocks while retaining essentially the same function, structure, feedbacks, and therefore identity.	Walker et al. (2006)
	The ability of social units to mitigate hazards, contain the effects of disasters when they occur, and carry out recovery activities in ways that minimize social disruption and mitigate the effects of future earthquakes.	Bruneau et al. (2003)
	The ability to recover from or adjust easily to misfortune or sustained life stress.	Brown and Perkins (1996)
	The process through which mediating structures (schools, peer groups, family) and activity settings moderate the impact of oppressive systems.	Sonn and Fisher (1998)
	The capability to bounce back and to use physical and economic resources effectively to aid recovery following exposure to hazards.	Paton, Millar and Johnston (2000)

	The ability of individuals and communities to deal with a state of continuous, long term stress; the ability to find unknown inner strengths and resources in order to cope effectively; the measure of adaptation and flexibility.	Ganor and Ben-Lavy (2003)
	The development of material, physical, socio-political, socio-cultural, and psychological resources that promote safety of residents and buffer adversity.	Ahmed et al. (2004)
	Individuals' sense of the ability of their own community to deal successfully with the ongoing political violence.	Kimhi and Shamai (2004)
	A community's capacities, skills, and knowledge that allow it to participate fully in recovery from disasters.	Coles and Buckle (2004)
	The ability of community members to take meaningful, deliberate, collective action to remedy the impact of a problem, including the ability to interpret the environment, intervene, and move on.	Pfefferbaum et al. (2005)
	The magnitude of disturbance that a system can tolerate before it transitions into a different state that is controlled by a different set of processes.	Carpenter et al. (2001)
Psychology and individual resilience	The process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances.	Masten, Best and Garmezy (1990)
	The capacity for successful adaptation, positive functioning, or competence (…) despite high-risk status, chronic stress, or following prolonged or severe trauma.	Egeland, Carlson and Sroufe (1993)
	Good adaptation under extenuating circumstances; a recovery trajectory that returns to baseline functioning following a challenge.	Butler, Morland and Leskin (2007)
	Resilient individuals possess three common characteristics. These include an acceptance of reality, a strong belief that life is meaningful and the ability to improvise.	Coutu (2002)
	The developable capacity to rebound from adversity.	Luthans et al. (2006)
	Protective factors which modify, ameliorate or alter a person's response to some environmental hazard that predisposes to a maladaptive outcome.	Rutter (1987)
	A dynamic process encompassing positive adaptation within the context of significant adversity.	Luthar et al. (2000)
	A class of phenomena characterized by good outcomes in spite of serious threats to adaptation or development.	Masten (2001)
	The personal qualities that enable one to thrive in the face of adversity.	Connor and Davidson (2003)
	The ability of adults in otherwise normal circumstances, who are exposed to an isolated and potentially highly disruptive even,t such as the death of a close relation or a violent or life-threatening situation, to maintain relatively stable, healthy levels of psychological and physical functioning, as well as the capacity for generative experiences and positive emotions.	Bonanno (2004)
	The capacity of individuals to cope successfully with significant change, adversity or risk.	Lee and Cranford (2008)
	Complex repertoire of behavioral tendencies.	Agaibi and Wilson (2005)
	An individual's stability or quick recovery (or even growth) under significant adverse conditions.	Leipold and Greve (2009)
Disaster management	The ability of social units to mitigate hazards, contain the effects of disasters when they occur and carry out recovery activities that minimise social disruption and mitigate the effects of future earthquakes.	Bruneau et al. (2003)
	Resilience describes an active process of self-righting, learned resourcefulness and growth. The concept relates to the ability to function at a higher psychological level, given an individual's capabilities and previous experience.	Paton et al. (2000)
Economic	The ability of a system to withstand either market or environmental shocks without losing the capacity to allocate resources efficiently.	Perrings (2006)
City	A sustainable network of physical systems and human communities, capable of managing extreme events; during disaster, both must be able to survive and function under extreme stress.	Godschalk (2003)
Engineering	The ability to sense, recognise, adapt and absorb variations, changes, disturbances, disruptions and surprises.	Hollnagel et al. (2006)

Organizational resilience, its capacity and potential	Resilience is a fundamental quality (…) to respond productively to significant change that disrupts the expected pattern of event without engaging in an extended period of regressive behavior.	Horne III and Orr (1997)
	Resilience is the organizational capacity to absorb the impact and recover from the actual occurrence of an extreme weather event.	Linnenluecke and Griffiths (2012)
	Resilience conveys the properties of being able to adapt to the requirements of the environment and being able to manage the environments variability.	McDonald (2006)
	Resilience is the maintenance of positive adjustment under challenging conditions such that the organization emerges from those conditions strengthened and more resourceful.	Vogus and Sutcliffe (2007)
	Resilience is the incremental capacity of an organization to anticipate and adjust to the environment.	Ortiz-de-Mandojana and Bansal (2015)
	Resilience is a firm's ability to effectively absorb, develop situation-specific responses to, and ultimately engage in transformative activities to capitalize on disruptive surprises that potentially threaten organization survival.	Lengnick-Hall, Beck and Lengnick-Hall (2011)
	Resilience is more than mere survival; it involves identifying potential risks and taking proactive steps to ensure that an organization thrives in the face of adversity.	Somers (2009)
Reconstruction	Resilience refers to the capacity of continuous reconstruction.	Hamel and Valikangas (2003)
Recovery resilience	Recovery resilience means bouncing back to a state of normalcy.	Boin and Eeten (2013)
Resilient companies	Resilience is the capability to self-renew over time through innovation.	Reinmoeller and van Baardwijk (2005)
Precursor resilience	Precursor resilience prevents budding problems from escalating into a full-blown crisis or breakdown.	Boin and Eeten (2013)

Sources: Adapted from Norris (2008:129); Brand and Jax (2007:3-4); Bhamra, Dani and Burnard (2011:5379-5380); Duchek (2020); Penezić (2020) and authors' compilation.

3 Consumers and Resilience

Resilience engineering is a concept focusing on adaptive capacity to stay in control when facing unforeseen disturbances or events in contrast to the 'old' technical concept of safety engineering (Hosseini, Barker and Ramirez-Marquez, 2016). The concept of resilience engineering needs to be explained within the context of consumer resilience, because it is used and implemented in complex systems facing problems, unexpected disruptions, and unexampled events (Thoma et al., 2016). An individual subjective notion of online privacy violation is complex as well, and a privacy intrusion is a stressful event in which occurrence cannot be predicted in a specific point in time and its scope and consequences are not known in advance. Therefore, both resilience engineering and studying consumers' resilience to online privacy violations apply a holistic approach to similar phenomena.

In today's world, threats to complex systems grow exponentially with increasing system complexity. Information security, as the foundation of security for the digital society, provides various techniques for the protection of information that are exchanged on a daily basis inside and outside the system. Systems theory is based on the relationships between

parts that connect them to the whole. Complex systems are subject to a wide range of threats from malicious actors, including privacy breaches. Such threats, vulnerabilities, security management issues and compliance system, bring the concept of information security into focus. Data protection and privacy protection are subject to strict policies and a matter of the highest concerns for the information security authorities and companies. Resilience engineering (Lugović, 2020) is considered as an alternative to conventional risk management (Steen and Aven, 2010) and this new approach "aims to provide support for the cognitive processes of reframing an organization's model of how safety is created before accidents occur by developing measures and indicators of contributors to resilience such as the properties of buffers, flexibility, precariousness, and tolerance and patterns of interactions across scales such as responsibility-authority double binds." (Woods, 2017: 24).

One of the specific fields where resilience has been applied is urban resilience and the smart city concept. The smart city concept has gained importance in recent years (Bartoli et al., 2011), due to the increasing rate of digitalization. The concept of a smart city implies the use of information and communication technologies (ICT) with the aim of increasing efficiency in the public sector. According to Schaffer et al. (2011: 434), the concept of smart cities focuses "on the latest advancements in mobile and pervasive computing, wireless networks, middleware and agent technologies as they become embedded into the physical spaces of cities." Not only national economies, but also economies at the global level, have become more and more networked and dependent on secure flow of data. E-services are becoming a more and more important part of urban development and smart cities are part of the transition to digital economy (Dubbeldeman and Wart, 2015). Smart cities collect information and data about citizens, places and activities and use them in urban planning (Martin-Breen and Anderies, 2011) in order to provide services more efficiently and to strengthen resilience in cities (Hiller and Blanke, 2017). As noted by Hiller and Blanke (2017), in these dynamic changes, how to protect individual privacy is a great challenge.

Resilience, within the concept of smart cities, can be observed from different angles. The first is urban resilience. Levels of urban resilience show how urban system, smaller units within the system (buildings, utilities, transportation networks, enterprises, etc.) and people (different groups of citizens, politicians, planners, etc.) respond to disturbances and critical events (Martin-Breen and Anderies, 2011). Some urban services, such as electricity, water, transportation, etc., are increasingly dependent on technology (Dubbeldeman and Wart, 2015). The urban Internet of Things, as an integration of various technologies and communications solutions (Atzori et al, 2010), brings benefits in the management and optimization of public services by enabling interactions with a wide variety of devices and home appliances (Zanella et al., 2014).

The other point of view refers to the behavior of citizens as users and customers of public services. The literature indicates many factors influencing whether citizens are willing to use services through advanced ICT given, among other things, the fact that large databases are then created. Smart cities bring many challenges, especially those related to technological issues, and great attention should be paid to security and privacy issues, which is necessary to protect citizens' identities and data. People's concern about privacy online and their behavior are different depending on the kind and purpose of data collection (Anić et al., 2018; van Zoonen, 2016; Cranor, Reagle and Ackerman, 2000). Therefore, services in the city, within the concept of the smart city, should be adjusted to characteristics of each user depending on their expectations, preferences and behavior (Bartoli et al., 2011), at the same time keeping in mind cyber security and surveillance concerns of citizens.

Once the wide variety of resilience concepts across disciplines and practical applications have been introduced, the principal question is which field of resilience is appropriate to research consumer resilience to online privacy violation, so naturally one has to look back at the research of resilience in social sciences. Research from the social sciences suggests three core principles of resilience, the 'three Cs': control, coherence, and connectedness (Reich, 2006). Raab, Jones and Székely (2015) explore societal resilience to the threats to democracies posed by the current mass surveillance of communications and other applications of surveillance technologies and practices. The authors use an example of public goods to illustrate the distinction between the concepts of resistance and resilience. They describe different outcomes of reactions to shocks in the course of time: resistance prevents deviations from the ideal state so no recovery is needed, while resilience helps to recover after stress. There are two possible outcomes of resilience: full recovery, which is the return to the previous ideal state, and partial recovery, where the real state after recovery is not equal to the ideal state before the shock. In distinction to resistance which implies invulnerability to stress, resilience implies an ability to recover from negative events (Garmezy, 1991) and the ability of a system to experience some disturbance and still maintain its functions.

Two streams of research are particularly important for the context of consumer resilience to online privacy violations. The first stream of research explores the complex inter-relationship between privacy and resilience. Resilience is here conceptualized at the system-wide level, ranging from an individual information system to the entire social system. Studies within this research stream mainly deal with the question of how to maintain resilience of the system when its privacy is endangered (Crowcroft, 2015; Hiller and Blanke, 2017). Another related field of research, with the same system-wide conceptualization of resilience, explores the relationship between surveillance and resilience, and how surveillance (and privacy as its antipode) contributes to or hampers resilience of societies to various threats (Raab, Jones and Székely, 2015; Jones, Raab and Székely, 2018).

The second stream of research deals with consumer resilience. Studies within this body of literature, although still rather rare, mainly conceptualize resilience at the individual level and explore how consumers recover or adjust their consumption habits after experiencing some form of adversity situation (Deans and Garry, 2013; Bhattacharyya and Belk, 2019). These studies can be broadly categorized into two groups of approaches (Bourbeau, 2013). The first group explores resilience at the individual level and conceptualizes it as the capability of individuals to recover from or adjust to various adversities and misfortunes or as the process of adaptation to adversity (Bartone, 1989; Cicchetti and Garmezy, 1993; Dyer and McGuinness, 1996; Connor and Davidson, 2003; Visser, 2007; Kotzé and Nel, 2013; Luthar et al., 2000; Luthans et al., 2006). The main fields that apply this conceptualization of resilience are psychology, medical sciences, criminology, social work, and business studies (Olsson et al., 2003; Rumgay, 2004; Gilgun, 2005; Gwadz et al., 2006; Deans and Garry, 2013).

The second group of researchers conceptualize resilience at the broader, system-wide level (Klein, Nicholls and Thomalla, 2003; Brand and Jax, 2007; Crowcroft, 2015; Jones, Raab and Székely, 2018). The main fields within this group are ecology, engineering, computer sciences, and political sciences (Nathan, 2016; Lentzos and Rose, 2009; Walker and Cooper, 2011; Omer, Mostashari and Lindemann, 2014; Sterk, Van de Leemput and Peeters, 2017). Resilience in this context is mainly seen as the capacity of a system to return to its equilibrium state after some disturbance displaced it from its steady state. In computer sciences, resilience is normally present with redundancy, and this approach might be explored in the context of human behavior. Social resilience is defined as a social system's property of avoiding or withstanding disasters, depending on adaptive capacity of communities or the entire society to prevent future disasters, its coping capacity related to the past events, and its participative capacity denoting the ability of the social system to change its own structures (Lorenz, 2010).

Literature on consumer behavior is abundant (for a historical overview see Pachauri, 2001; Solomon et al., 2013) and more recent studies explore consumer behavior online (e.g. integrated model of e-consumer behavior developed by Dennis et al. (2009) or recent model of online privacy concern by Anić et al. (2018)). Consumer behavior studies in the online environment, such as online shopping (Demangeot and Broderick, 2007), e-commerce (Oliveira and Toaldo, 2015), and m-commerce (Sharif et al., 2014), gain importance due to the development of the online marketplace. Recently, Islam (2019) stated that cultural and social factors, demographics (gender, age, education and income), motivation, perceived risk, trust, and attitude of consumers affect their buying intentions online. However, behavior consequences in the online environment remain under-explored, although they are more complex than in the offline environment (Ginosar and Ariel, 2017). National and local governments across different countries are continuously adopting digital technology in different spheres, from collecting data to providing different

digital services with the goal of improving the quality of citizens' lives. In this context, citizens' concerns about online privacy and their behavior are different depending on the kind and purpose of data collection (Anić et al., 2018). In addition to that, digitalization raises consumer protection issues for the future development and implementation of e-services in the public sector or implementation of the smart city concept (van Zoonen, 2016), and requires improved consumer skills, awareness, and individual engagement that would result in sustainable buying decisions (Gazzola et al., 2017). Twenty years ago, back in 1999, consumers were not willing to provide personal information online when asked, and this rate exceeded 95%. This rate was highly affected by the privacy concerns, which was in turn highly influenced by skills of consumers (Hoffman, Novak and Peralta, 1999). As complexity for protecting of the digital consumer rose, movements for simplifying and defining explicit statements on how consumer data will be used and directives on how to improve consumer skills increased (Mosco, 2017; European Commission, 2011b). Internet skills diminish as the population age increases, and that affects overall consumer activities over the Internet (Hargittai and Dobransky 2017). An important characteristic of digital consumerism is that digital goods are not effective for structuring social relationships, as everyone can have everything (Lehdonvirta, 2015).

4 Privacy in Online Environment

Thus far, we have delved into the concept of resilience, so now we switch focus to the other fundamental concept in our research, and that is privacy in general and privacy in an online environment.

The notion of privacy is very individual; it differs from person to person and from one situation to another. Thus, it is not surprising that an abstract term such as privacy is viewed and researched in many different scientific fields and disciplines. The concept of privacy has also been described through its various dimensions and the approaches may vary depending on the context of studying privacy issues across disciplines.

Among the most cited definitions of *general privacy* is the one by Alan Westin, who defines it as "claim of individuals, groups or institutions to determine for themselves when, how, and to what extent information about them is communicated to others" (Westin, 1970). Buchanan et al. (2007) go into more detail and emphasize different dimensions of the privacy concept: (1) *informational privacy* refers to a concept of controlling how personal information is collected and used, and is especially pronounced in the digital age when the Internet made personal information easy to collect, store, process and use by multiple parties; (2) *accessibility privacy* overlaps with informational privacy in cases where "acquisition or attempted acquisition of information involves gaining access to an individual", but it also extends to cases where physical access is at stake; (3) *physical privacy*

is defined as the degree to which a person is physically accessible to others; (4) *expressive privacy* "protects a realm for expressing ones' self-identity or personhood through speech or activity"; and (5) *social/communicational privacy* refers to an individual's ability and effort to control social contacts. Similarly, Clarke (2009) distinguishes four dimensions of the privacy concept: (1) privacy of the person, concerned with the integrity of the individual's body, (2) privacy of personal behavior, concerning sexual preferences and habits, political activities and religious practices, (3) privacy of personal communications, referring to the freedom to communicate without routine monitoring of their communications by third persons; and (4) privacy of personal data which covers the issue of making the data about individuals automatically available to third parties.

Moving on to a somewhat more recent concept of online privacy, Gellman and Dixon (2011) emphasize the importance of the intertwinement of online and offline privacy issues by noting that what happens offline affects what is done online and vice versa, especially in the age of the fourth industrial revolution when the entire supply chains are becoming predominantly digitized. The Oxford dictionary defines 'online' as "controlled by or connected to a computer" and as an activity or service which is "available on or performed using the Internet or other computer network". Similarly, Gellman and Dixon (2011) define 'online' as connections to the Internet in very broad terms and in its most technical sense refers to computers or devices that connect to the Internet and the World Wide Web.

Online privacy has a different dynamic than offline privacy, because online activities do not respect traditional national and/or conceptual borders. Online privacy involves the rights of an individual concerning the storing, reusing or provision of personal information to third parties, and displaying of information pertaining to oneself on the Internet. In the digital era, the online privacy concept focuses on personal information shared with family, friends, businesses and strangers, while at the same time engaging in self-protection of sensitive information (Markos, Labrecque, and Milne, 2012). Before the digital era, securing personal information and maintaining privacy simply meant safeguarding important documents and financial materials in a safe 'material' place, but with the rise of the Internet, an increasing amount of personal information is available online and vulnerable to misuse (Pauxtis and White, 2009; Allen, 2015). Even a simple online activity such as using search engines can be potentially misused for consumer profiling. Reed (2014) introduces the term 'digital natives' to describe new generations of children who have grown up with the Internet as a presence throughout their entire lives, and are accustomed to these online activities from very young age. Walther (2011) emphasize that most people, including these 'digital natives', fail to realize that, once uploaded, information stays online more or less forever, and as such can be retrieved or replicated, despite subsequent efforts to remove it.

Finally, it is important to distinguish between privacy and data protection. European Commission (2020) defines data to be classified as personal data for "any information that

relates to an identified or identifiable living individual. Different pieces of information, which collected together can lead to the identification of a particular person, also constitute personal data. Personal data that has been de-identified, encrypted or pseudonymised, but can be used to re-identify a person, remains personal data and falls within the scope of the GDPR." Furthermore, under Article 4 of the General Data Protection Regulation (GDPR), personal data is defined as "any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person." Flaherty (1989) argues that *privacy* is a broad and an all-encompassing concept that contains concerns about various forms of intrusive behavior, while on the other hand *data protection* is a subset of privacy that deals solely with the control of a collection, use and dissemination of personal information. This is also in line with Clark's (2009) privacy dimensions presented above. Currently, data protection is believed to be the most critical component of privacy protection, as more and more aspects of everyday lives are being automated and digitized.

Past research concentrated on privacy issues from many perspectives (as is to be expected given its broad range of applicability), ranging from defining the meaning of privacy, analysing public opinion trends regarding privacy, evaluating the impact of surveillance technologies, consumers' responses to privacy concern, causes and different behavior of privacy protection, and the need for balance between government surveillance and individual privacy rights (Kumaraguru and Cranor, 2006; Goold, 2009; Wirtz, Lwin and Williams, 2007). Previous research has shown differentiated effects on privacy concerns based on various factors such as culture (Dinev and Hart, 2005; Chiou, Chen and Bisset, 2009; Ur and Wang, 2013), trust in online companies or institutions (Bansal, Zahedi and Gefen, 2010; Škrinjarić, Budak and Rajh, 2019) or different demographic characteristics (Wirtz, Lwin and Williams, 2007; European Commission, 2011a) and personality traits (Škrinjarić, Budak and Žokalj, 2018).

In a modern society, privacy is recognized as an individual right, but also as a social and political value (Raab and Goold, 2011; Solove, 2008; Goold, 2010). With the coming of the fourth industrial revolution and the emergence of technology-based surveillance, a galloping volume of online transactions and collection and usage of private client data in developing business strategies, both state and private sector are holding, processing and sharing a large amount of personal information. Thus, many governments have put in place privacy protection policies to meet the demands for safety, security, efficiency, and coordination in the society. The flip side of the coin is that governments themselves, in the process of securing individual privacy, might gain too much power over individuals, in terms of profiling behavior and purchasing habits. Thus, there is a certain need to balance

the privacy of individuals against the legitimate societal need for information (Zureik, 2004). For this need to be positively perceived in the eyes of the public, it has to be done in a professional and transparent way. Solove (2008) argues that in a modern society the value of privacy must be determined on the basis of its importance to society, and not in terms of individual rights. Goold (2010) argues that citizens would demand a decrease in state surveillance if they perceived it as a threat to their political rights and democracy in general. Several papers have also shown that privacy concerns or previous privacy violations act as a hindrance to the growth of e-commerce (Miyazaki and Fernandez, 2001). Companies have realized that protecting consumers' private information is an essential component in winning their trust and is a must in facilitating business transactions (Bélanger, Hiller and Smith, 2002). Wirtz, Lwin and Williams (2007) indicate that citizens who show less concern for internet privacy are those individuals who perceive that corporations are acting responsibly in terms of their privacy policies, that sufficient legal regulation is in place to protect their privacy, and have greater trust and confidence in these power-holders. However, sometimes too much information about privacy policies can also have a negative effect on consumers. For example, Ziesak (2012) studies a link between different types of data collection and concerns for online privacy and shows that privacy concerns actually increase when an online seller informs customers about gathering personal and/or behavioral information. Therefore, the attempt to lower privacy concerns by informing users has actually provoked a contrary effect.

Returning now to balancing the need for information with individual privacy concerns and violations, Smith, Dinev and Xu (2011) explain two interesting concepts: privacy paradox and privacy calculus. The former is a phenomenon where an individual expresses strong privacy concerns, but then behaves in a contradictory way, for example, by sharing personal information online. On the other hand, privacy calculus can be explained as a trade-off between privacy concern 'costs' and 'benefits' in the form of the service obtained. Rational expectations theory in this concept states that users are willing to disclose personal information as long as their perceived benefits outweigh the perceived privacy concerns. When weighting potential benefits and losses of disclosing personal information, people think of three types of information privacy benefits: financial rewards, personalization, and social adjustment benefits (Awad and Krishnan, 2006).

Several authors also emphasize that too much individual privacy may by harmful for the society and might be used to promote polarization and help reproduce and deepen inequality within society. Etzioni (1999) emphasizes that excess individual privacy can undermine common goods and positive externalities, as it promotes an individual agenda and possessive individualism. Fuchs (2012) argues that we should be more concerned with whose privacy should be protected, rather than how privacy can be protected. His research shows that anonymity of wealth and incomes (profits) makes inequalities between the rich and the poor invisible or at least less visible, thereby offering no incentives for reducing

these gaps. Thus, privacy is posited as undesirable in those cases when it protects the rich from public accountability, but as desirable when it tries to protect citizens from corporate surveillance.

Similar to the concept of privacy, the concept of privacy violations is extremely difficult to define. Increased demand for information and the spread of new technologies that gather personal information indeed limit the purely private spaces and increase the number of privacy violation cases. The violation of privacy on the Internet includes an unauthorized collection, disclosure or other use of personal information (Wang, Lee and Wang 1998). Solove (2006) identifies four principal groups of "socially recognized privacy violations": (1) information collection, i.e. the way data is gathered – surveillance, interrogation; (2) information processing, i.e. storing, analysis and manipulation of data – aggregation, identification, insecurity, secondary use of information and exclusion; (3) information dissemination – breach of confidentiality, disclosure, exposure, increased accessibility, blackmail, appropriation of someone's identity, defamation before the public in false light; and (4) invasions – intrusion into someone's private sphere and decisional interference which is connected to information privacy. However, perceptions of privacy violations can be very subjective and therefore difficult to be legally defined and protected, especially when it comes to implementation (Benett, 2011).

Online privacy violations became a real threat that should be addressed by both the government (Chang et al., 2018) and businesses (Beke, Eggers and Verhoef, 2018) in order to increase trust of consumers and to seize down the perceived risk (van Schaik et al., 2018). While privacy theft can be carried out on the systems that are easily fooled by spoofing (Wolfond, 2017), these thefts have a large impact on consumers' feeling of security. There is also an enormous impact if the financial position of a consumer is affected from the privacy theft, such as online payment, without the consumer's consent. These situations occur because traditional systems (e.g. banking) require a consumer to be authorized using only his/her own information, such as a username and password (Cai and Zhu, 2016), but new technologies such as Artificial Intelligence (AI) can be leveraged to secure consumers' positions on the market, as well as their identity (Contissa et al., 2018).

Since the offset of the fourth industrial revolution, information privacy has been in the focus of e-commerce and marketing strategies towards consumers when the government and different online companies want to collect consumer information (often times not allowing them to proceed with their purchase without providing some sensitive personal information), and consumers often view this practice as a privacy violation. Information privacy concerns and violation present a significant obstacle to more people engaging in e-commerce (Wang and Emurian, 2005; Pavlou and Fygenson, 2006).

As a response to previous privacy violation experiences or as a means of preventing privacy violation, individuals adopt different strategies to make them more secure online. Gurung and Jain (2009) list the suggested typologies of individuals regarding their online privacy violations: (1) privacy aware, referring to being knowledgeable and sensitive about risks associated with sharing personal information online; (2) privacy active, referring to active behaviors adopted by consumers in regards to their privacy violation concerns; and (3) privacy suspicious, referring to concerns about particular company's or individual's behavior regarding their privacy practices. In terms of protection against privacy violation, Yao (2011) and Gurung and Jain (2009) posit that, from an individual perspective, it can be either passive or active. Passive protection involves reliance on a government or other external entities, and it is beyond the direct control of an individual. The level of this protection is also dependent on collective actions and institutional support, as well as on cultural and socio-political norms. On the other hand, active protection relies on individuals themselves actively adopting various protective strategies. Examples of these strategies may include abstaining from purchasing, falsifying information online, and adjusting security and privacy settings in the Web browsers (Chen and Rea, 2004).

5 Framing Future Research

In researching consumer resilience to online privacy violation, one could borrow and adapt theoretical concepts used in studying resilience in diverse academic diciplines. Researchers should primarily consider approaches used in resilience of individuals, taking into account individuals' protective factors in addition to risk factors. Individual resilience is not only about relatively rigid personality traits, but it also includes broader environmental factors. Previous studies that explored resilience at an individual level identified a number of contributing factors or antecedents that lead to resilience (Polk, 1997; Joseph and Linley, 2006; Herrman et al., 2011). In general, there are three broad groups of antecedents to resilience at an individual level: personal, environmental, and biological. Some of personal antecedents to resilience include various psychological attributes (personality traits, locus of control, self-efficacy, self-esteem, optimism) (Joseph and Linley, 2006; Nakaya, Oshio and Kaneko, 2006; Carver, 1998), while others are socio-demographic factors, such as age, gender, education (Campbell-Sills, Forde and Stein, 2009; Bonanno et al., 2007). Carver, Scheier and Segerstrom (2010) have identified optimism as an individual difference variable that reflects the extent to which people hold generalized favorable expectancies for their future. Also, different aspects of psychological well-being should be analyzed and related to different aspects of resilience, because those who have higher resilience are effective in improving psychological well-being (Fredrickson, 2001). Finally, there is evidence that personality traits in general have high impact on resilience. Some studies showed that among different personality factors, honesty, humility and openness to experiences occured in a stressful situation prior to other personality factors, thus affecting

the development of resilience, while extraversion and agreeableness affected innate and acquired resilience. Emotionality, in particular, influenced innate resilience, and conscientiousness affected acquired resilience.

Environmental antecedents to resilience should include various micro-environmental factors (social support, family relationships, peers, stability), as well as macro-environmental factors (community, institutions, cultural factors) that affect resilience (Luthar and Cicchetti, 2000; Luthar, Cicchetti and Becker, 2000). Finally, biological antecedents to resilience include various biological factors that can affect developing brain structure, function, and neurobiological systems (Luthar and Brown, 2007; Curtis and Cicchetti, 2007).

Resilience differs from traditional concepts of risk and protection in its focus on individual variations in response to comparable experiences (Rutter, 2006). Accordingly, the focus of future research needs to be on those individual differences and causal processes that they reflect, rather than on resilience as a general quality. There are two sets of research findings that provide a background to the notion of resilience. First, there is the universal finding of huge individual differences in people's responses to all kinds of environmental hazard. Before inferring resilience from these individual differences in response, there are two major methodological artifactual possibilities that have to be considered. To begin with, apparent resilience might be simply a function of variations in risk exposure. Resistance to (environmental hazards) may come from exposure to risk in controlled circumstances, rather than avoidance of risk. This possibility means that resilience can only be studied effectively when there is both evidence of environmentally mediated risk and a quantitative measure of the degree of such risk. The other possible artifact is that the apparent resilience might be a consequence of measuring a too narrow range of outcomes. The implication is that the outcome measures must cover a wide range of possibly adverse consequences. Second, there is evidence that, in some circumstances, the experience of stress or adversity sometimes strengthens resistance to later stress — the so called 'steeling' effect. Although literature on individual differences in response to environmental hazards is more abundant, there are some empirically-based examples of stress experiences increasing the resistance to later stress. Risk and protection both start with a focus on variables, and then move to outcomes, with an implicit assumption that the impact of risk and protective factors will be broadly similar in everyone, and that outcomes will depend on the mix and balance between risk and protective influences. Resilience requires a prior study of risk and protection factors. Resilience starts with a recognition of a huge individual variation in people's responses to the same experiences, and considers outcomes with the assumption that an understanding of the mechanisms underlying that variation will cast light on the causal processes and, by so doing, will have implications for intervention strategies with respect to both prevention and treatment.

Adaptive responses of resilient individuals to various adversities and misfortunes are mainly explored in literature as possible indicators of resilience (Wagnild and Young, 1993; Sinclair and Wallston, 2004; Tomás et al., 2012). Described adaptive responses in medical literature are mainly in the domains of social activities, morale, and health (e.g. Wagnild and Young 1990; Caplan, 1990; Byrne et al., 1986). Previous studies also described the process by which resilience affects adaptive responses as identification of stressful events, appraisal of an individual's own abilities to take action, and effective problem solving (e.g. Rutter, 1985; Beardslee, 1989; Caplan, 1990). Specifically, in the context of resilience in research on consumer behavior, the concept of adaptive responses is not developed. The closest concept that might be applied is that of adaptive capacities which include preventative strategies to avoid particular event and impact-minimising strategies, which seek to facilitate recovery (Jabeen, Johnson and Allen, 2010).

To conclude, developing a conceptual model of consumer resilience to online privacy violation that would include a set of individual and environmental variables, will countribute to the existing understanding of resilience at the intersection of psychology, economics, and privacy studies. Furthermore, it will also contribute to the understanding of adaptive responses of resilient individuals to privacy breaches in an online environment, as well as to the understanding of processes by which resilience affects adaptive responses of individuals in the specific context of online privacy breaches.

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