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Book

Deep resilience : towards a working definition

Deep Resilience

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Towards a Working Definition

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1 Introduction: a context of poly-crises and the need for defragmenting resilience

Crises, which are often difficult to predict, seem to be becoming a “new normal”. Extreme weather events, threats to critical infrastructures, waves of migration, pandemics, blackouts due to power grid overload or the direct consequences of hybrid conflicts are now realistic crisis scenarios. It cannot be ruled out that more and more dangers of a hitherto unknown nature will emerge.

In the face of increasingly frequent and severe extreme events, it has become paramount for individuals and organizations to enhance their preparedness and resilience. The primary objective of this paper is to introduce a new theoretical framework for organizational resilience, centered around the concept of "deep resilience." This renewed framework aims to address the fragmented understandings of resilience, particularly at the local level, by providing a more cohesive and comprehensive approach

The paper is structured as follows. The next section delves into the existing academic literature to present resilience as a complex and multifaceted concept. Section three focuses on identifying and addressing the fragmented visions of resilience that currently prevail. Sections four to six present three key proposals outlining what the concept of deep resilience should encompass. The final section concludes by developing a working definition of deep resilience, synthesizing the insights and proposals presented throughout the paper.

2 Resilience: a multifaceted concept

Academics have not yet achieved a consensus on the definition and components of resilience, largely due to the diverse array of disciplines involved in its study. Even when excluding the natural sciences and focusing on social sciences such as psychology, economics, management, sociology and political sciences, the concept of resilience remains multifaceted and increasingly utilized across these fields (cf. Carpenter et al. 2012, Southwick et al., 2014, Raymond et al. 2020). In the context of this paper, the discussion of resilience is confined to its relationship with extreme events, whether these events are seen as the result of foreseeable risks or the consequence of unexpected or unforeseeable causes. Unlike related concepts such as flexibility and agility, resilience is distinctively concerned with the response to crises or shocks and encompasses the potential for post-crisis strengthening or growth.

Resilience can be viewed from various perspectives, each offering a distinct insight into its nature and application. From a performance-oriented perspective, resilience is often associated with the ability of systems to maintain their output despite environmental pressures. For example, Horne (1997) emphasizes "resilient performance," focusing on the outcome rather than the adaptation process. According to this view, resilience enables systems to withstand challenging situations through the recombination of structural components, ensuring continued performance. In contrast, a process-oriented perspective, as outlined by Sutcliffe and Vogus (2003), defines resilience as the ongoing process by which organizations achieve desirable outcomes

despite adversity. Additionally, resilience can be seen as rooted in individual-level knowledge, skills, and abilities that enable individuals to overcome the negative consequences of disruptive shocks. This perspective is supported by research such as that of Lengnick-Hall et al. (2011), which highlights the importance of individual capacities in resilience.

Focusing on organizations, Hillmann and Guenther (2021) propose what they call an integrated definition of resilience resulting from a systematic review of the literature: "*Organizational resilience is the ability of an organization to maintain functions and recover fast from adversity by mobilizing and accessing the resources needed. (…) The result of an organization's response to adversity is growth and learning*." (Hillmann and Guenther, 2021, p. 31). Furthermore, Duchek (2020) stresses the combinatorial nature of organizational resilience and consider it as a meta-capability: "(…) *we define organizational resilience as an organization's ability to anticipate potential threats, to cope effectively with adverse events, and to adapt to changing conditions.*" (Duchek, 2020, p. 220).

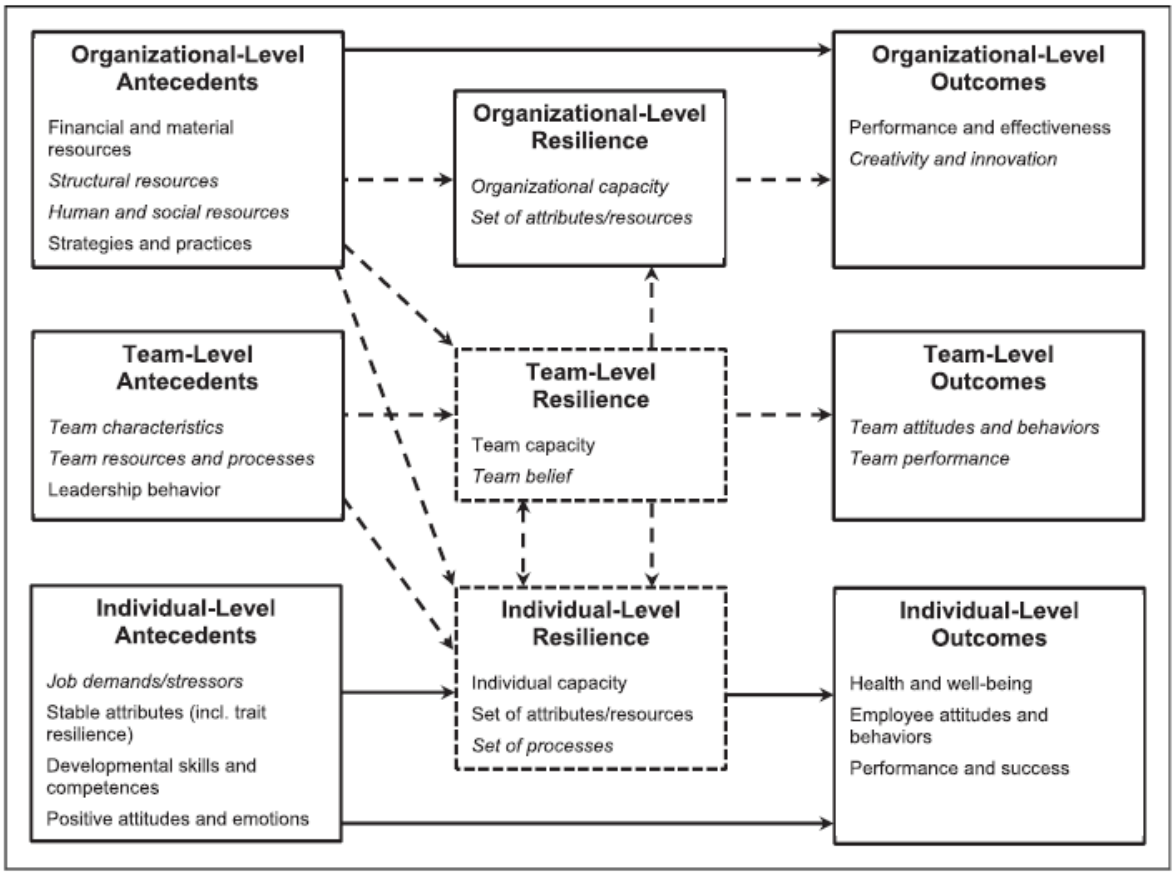
As summarized by Gnamm (2024), resilience can be conceptualized in three distinct ways, highlighting its multifaceted nature, encompassing proactive preparation, robust recovery, and adaptive evolution. :

- Anticipation : Resilience can be viewed as an expression of anticipation, involving the proactive identification and mitigation of potential future dangers. This approach focuses on preparing for and preventing or minimizing the impact of adverse events through forward-looking strategies.
- Recovery : Resilience can also be understood as a form of recovery, where the emphasis is on withstanding shocks and aiming to return to a normal or stable state. This involves the capacity to absorb and cope with disruptions, with the ultimate goal of restoring functionality and equilibrium.
- Adaptation : Lastly, resilience can be seen as a form of adaptation to a new environment. This perspective involves further developing and evolving in response to challenges, allowing systems or individuals to adjust and thrive in changing conditions. This adaptive resilience enables continuous growth and improvement, even in the face of adversity.

3 Deep resilience and the need to overcome fragmented visions

This section aims to transcend the limitations of single-level approaches to resilience and overcome the fragmented forms of resilience strategies that currently exist. In this context, the concept of deep resilience can be viewed as an extension and generalization of the theoretical framework proposed by Raetze et al. (2021). While their work provides a valuable foundation by focusing exclusively on intra-organizational resilience, as illustrated in Figure 1, it does not address the critical aspects that extend beyond organizational boundaries.

Figure 1 : A multilevel framework for organizing research on resilience in organizations



Source : Raetze et al. (2021), p. 611

In contrast to the perspectives outlined above, this paper aims to explore the concept of deep resilience without predefining the level of observation (individual, organizational, systemic) or restricting itself to single units of analysis (such as a single individual, firm, or public institution). This approach allows for a more flexible and inclusive examination of resilience, acknowledging the complex interdependencies and multi-layered nature of resilient systems. To facilitate the development of a working definition of deep resilience, the following three proposals are presented, i.e. deep resilience i) requires the integration of multiple layers; ii) deep resilience emerges from an effective multi-actor systemic governance; and iii) deep resilience should be viewed as a meta-capability.

4 Deep resilience requires the integration of multiple layers

What is striking about the works reviewed in the previous section is that resilience is often examined and conceptualized at a single level, such as individuals in psychology, firms in economics, or public institutions in political science. However, it is implausible to think that companies could effectively cope with shocks if their employees were severely emotionally affected or, in the worst case, deceased. Similarly, it is unlikely that citizens could remain resilient without any support from public institutions during a collapse of private companies. Furthermore,

the efficiency of public authorities would be severely compromised if a territory were to be largely abandoned by its population, and essential economic resources were no longer available. While these scenarios may seem alarmingly unrealistic, they are already being addressed in research projects that combine resilience and foresight, particularly in the context of the climate crisis. This crisis is exacerbating the occurrence of extreme events and massive disruptions, making such considerations increasingly relevant and critical[1].

As an answer to this, *deep resilience* can be understood as the integration of characteristics from individuals, public and private organizations, and systemic governance. For instance, the resilience of electricity generation and distribution can be exemplified through local energy transitions (see Muller and Drewello, forthcoming). This holistic approach recognizes that individual resilience, organizational capabilities, and systemic governance all play critical roles in building and maintaining overall resilience. Likewise, the COVID-19 pandemic underscored the critical importance of local resilience, revealing both the unpreparedness of local institutions, such as local administrations and elected representatives, for exceptional situations, and the significant creative potential within municipalities. This crisis demonstrated that local authorities could harness this creativity to respond effectively, as observed by Seker and Muller (2023). Despite initial shortcomings, the pandemic highlighted the capacity of local communities to innovate and adapt in the face of adversity.

5 Deep resilience emerges from an effective multi-actor systemic governance

Building on their analysis of the pandemic's impact on the public sector, Ansell et al. (2021) emphasize the necessity for public administrations to develop what they term “robust” strategies in response to crises. These strategies are particularly characterized by the activation of networks that include partners external to the relevant public institution, such as those from the private sector or civil society.

Eckhard et al. (2021) introduce the concept of "latent hybrid resources," which public authorities can mobilize to address extreme situations. This approach involves integrating businesses—enhancing response flexibility—and non-governmental organizations—augmenting human and other resources on a voluntary basis—into public action.

Both perspectives converge on the need to transcend conventional reactions and frameworks by incorporating additional stakeholders whose primary functions typically lie outside public authority. As a consequence, robust systemic resilience strategies are encompassing the inter-

[1] Refer to Muller et al. (2024) for an exploration of post-2050 dystopian scenarios within the context of a European pilot project focused on energy and mobility. Additionally, numerous post-apocalyptic series have been available for viewing on platforms like Netflix and Amazon Prime for decades. A common theme among these series is that unforeseen disruptions become increasingly plausible when framed within a narrative context. However, what is particularly alarming is how the end of the world can become surprisingly boring after just two or three episodes of many series since they copy each other...

actions and dependencies between different levels of governance and stakeholders. This includes the ability of public institutions to support citizens, the resilience of private companies to maintain economic stability, and the overall governance structures that facilitate coordination and resource allocation during crises. Effective systemic governance ensures that resources are utilized efficiently and that responses to disruptions are well-coordinated.

6 Deep resilience should be viewed as a meta-capability

In line with Duchek's (2020) conceptualization, deep resilience can be understood as a meta-capability that encompasses three critical dimensions. These dimensions, which include anticipation, coping, and adaptation, are essential for a comprehensive understanding of organizational resilience.

The first dimension is the ability to anticipate. This involves preparing response strategies that enhance the effectiveness of interactions among various stakeholders, rather than simply guessing what might happen. By developing these reaction schemes, individuals, organizations and local systems can better prepare for potential crises and improve their overall readiness.

The second dimension is the ability to withstand or absorb shocks. This capacity hinges on the ability to acknowledge and assess the severity of extreme events without resorting to denial or a wait-and-see approach. Timely recognition and response are critical in crisis situations. This dimension involves also creatively mobilizing and recombining resources to develop effective solutions.

The third dimension is the ability to adapt to a new and potentially disturbed environment. This dimension is about managing crises over the long term, facilitating necessary adjustments, and integrating innovations that arise from necessity. It involves the ability to adapt and evolve in response to challenges, ensuring that individuals, organizations and local systems can sustain themselves and potentially thrive despite ongoing adversity.

7 Conclusion: towards a working definition of deep resilience

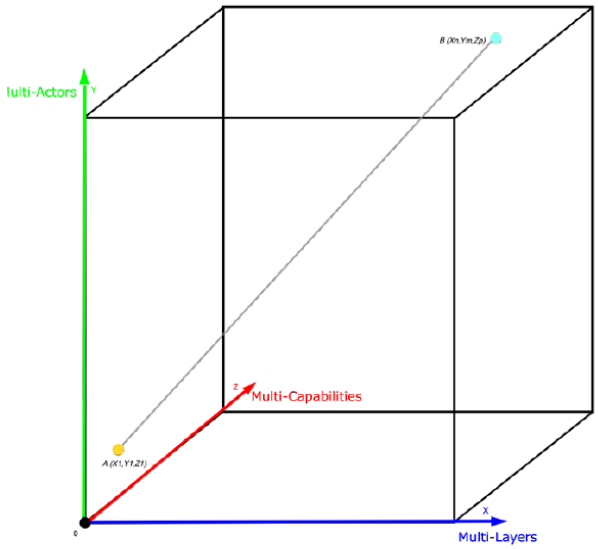
The working definition of deep resilience proposed hereafter is founded on the integration of multiple layers, diverse capabilities, and the interconnection of actors from various sectors at the local level.

Deep resilience **: a working definition**

Deep resilience is achieved through a multi-actor, multi-layered, and multi-dimensional approach. This approach combines resources, capabilities, and information to leverage the strengths of individuals, public and private organizations, and systemic governance. By doing so, it enables effective preparation for, response to, and recovery from disruptions.

As illustrated in Figure 2, the ultimate objective of deep resilience is to transform a local system from a state of low resilience - depicted by initial three-dimensional coordinates with low values (e.g., x1,y1,z1x1,y1,z1) - to a significantly enhanced state, represented by coordinates with elevated values (e.g., xm,yn,zpxm,yn,zp). This schematic captures the transition process, highlighting the systemic progression from vulnerability to strength.

Fig 2 The deep resilience cube



The next step involves examining potential methodological advancements that can enhance deep resilience by integrating technological tools, collaborative approaches, and the emergence of new knowledge. This examination seeks to identify and discuss innovative methods that can leverage these elements to foster greater resilience across various contexts. As previously discussed, enhancing deep resilience requires the adoption of a multi-actor, multi-layered, and multi-dimensional approach. This comprehensive strategy may involve several key components:

- Technological integration (utilizing advanced technologies such as data analytics, artificial intelligence, and simulation tools to enhance predictive capabilities, real-time response, and adaptive management).
- Collaborative approaches (fostering cooperation among diverse stakeholders, including individuals, organizations, and governmental entities, to ensure a unified and coordinated response to challenges.

- Emergence of new knowledge (encouraging continuous learning and the integration of new insights from various disciplines to stay ahead of evolving threats and opportunities).

By combining these elements, innovative methods could be developed that not only strengthen resilience but also promote sustainable and adaptive systems capable of navigating complex and dynamic environments. This integrated approach will be crucial in enhancing deep resilience and ensuring the long-term viability of various systems and communities.

Despite the unpredictability of disruptive events, one certainty remains: crises will inevitably occur. Cultivating deep resilience is a crucial, if not the most effective, way to prepare for the worst, rather than simply hoping for the best.

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