

Analysis of Resilience on Leadership and Work Flexibility Around the SDGs

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Abstract

Resilience is a factor observed in contingent, exceptional and risky situations, but the objective of this work investigates its regulatory function of these externalities that determine leadership and work flexibility. A cross-sectional, correlational and psychometric study was carried out with a sample of 100 students assigned to institutes and organizations that have survived crises. The results suggest that resilience inhibits the impact of risks, but not as an emergent factor but as a mediating factor. It is recommended to investigate the emerging function of resilience in order to compare both functions and establish a comprehensive model of adaptation to change.

Keywords: Contingency, Mediator, Model, Resilience, Risks

1. Introduction

The history of resilience and the Sustainable Development Goals (SDGs) in relation to climate change is a topic that has gained importance in recent decades as the world faces unprecedented environmental challenges [1]. The term "resilience" began to be used in ecology to describe the ability of a natural system to absorb disturbances and reorganize while maintaining its essential function. The notion of resilience expanded beyond ecology into disciplines such as psychology, sociology, and economics. It began to be applied to human communities, describing the ability to adapt and recover from crises such as natural disasters. During the Earth Summit in Rio de Janeiro, the United Nations Framework Convention on Climate Change (UNFCCC) was established, marking a global recognition of the threat of climate change.

The Millennium Development Goals (MDGs) were adopted by the UN, highlighting the need to address sustainable development [2].

However, climate change was not yet a prominent priority. The 17 Sustainable Development Goals (SDGs) are adopted as part of the UN Agenda 2030. SDG 13, "Climate Action," highlights the need to take urgent action to combat climate change and its impacts. Resilience became a central theme within the SDGs, especially in vulnerable contexts where communities must adapt to the impacts of climate change.

The SDGs have driven global policies and actions focused on increasing climate resilience [3]. This includes adopting sustainable technologies, promoting resilient agricultural practices, and strengthening infrastructure to withstand extreme weather events. Linked to the SDGs, the Paris Agreement establishes global commitments to limit global warming and promote adaptation to climate change, highlighting resilience as a key strategy. Resilience has been integrated into many national and international policies. Current efforts focus on strengthening the capacity of communities

and ecosystems to adapt to new climate realities, ensuring that progress towards the SDGs is not compromised. Technological innovations, such as renewable energy and early warning systems, are being developed to improve resilience to climate change.

The most vulnerable communities, especially in developing countries, continue to face significant challenges in their ability to adapt to climate change [4]. Despite progress, greater international collaboration is needed to meet the SDGs related to resilience and climate change. The story of resilience and the SDGs in the face of climate change is an evolving narrative, marked by a growing recognition of the interconnection between sustainable development and climate adaptation. Resilience theory, in the context of the Sustainable Development Goals (SDGs) and climate change, is a conceptual framework that addresses how systems, communities and ecosystems can adapt and recover from disturbances or crises [5]. Below is a detailed explanation of how this theory intertwines with the SDGs in the fight against climate change. Resilience refers to the ability of a system, whether ecological, social or economic, to absorb disturbances, reorganize and continue functioning without altering its fundamental characteristics. In ecology, resilience relates to the ability of ecosystems to resist and recover from extreme events, such as fires, droughts or floods, while maintaining their biodiversity and ecological functions. This objective focuses on taking urgent measures to combat climate change and its effects. Resilience is key to achieving this, since it involves strengthening the capacity to adapt to climate risks and natural disasters. Resilience is also applied in the fight against poverty and hunger, by promoting resilient agricultural systems, improving food security and ensuring sustainable livelihoods for vulnerable populations.

Climate change is an example of a systemic challenge that affects multiple levels of organization, from individuals to ecosystems and economies [6]. Resilience theory offers a way to understand how these systems can adapt to new climate realities. Within the framework of resilience theory, adaptation refers to strategies to adjust human and natural systems to climate change. Mitigation,

on the other hand, involves actions to reduce greenhouse gas emissions, which also strengthens resilience by preventing extreme climate scenarios. Resilience theory emphasizes the importance of diversity (biological, economic, cultural) and redundancy (having multiple ways of performing a function) to absorb shocks and avoid collapses. In the context of the SDGs, this means diversifying energy sources, agricultural practices and development strategies. Maintaining and strengthening connections between different actors (governments, communities, companies) is essential to share resources, information and responses to climate change.

Resilience includes the ability to learn from past experiences, which is crucial for developing more effective policies and practices in implementing the SDGs and adapting to climate change [7]. Build infrastructure that can withstand extreme weather events, such as transportation systems and buildings designed to withstand floods or earthquakes. Promote agricultural practices that improve soil health, conserve water and reduce dependence on external inputs, making agricultural systems more resilient to climatic variations. Strengthen the capacity of communities to plan and respond to natural disasters, through education, preparedness and inclusive policies that consider the most vulnerable groups. A key challenge is how to measure resilience effectively, as it is a multifaceted concept that varies depending on context. Some critics argue that resilience theory may not adequately address the structural inequalities that make certain communities more vulnerable to climate change.

Resilience is not only a response to climate change, but a comprehensive strategy that supports the achievement of all the SDGs [8]. By strengthening resilience, a more sustainable and equitable development is promoted, capable of facing the environmental, social and economic challenges of the future. Resilience theory provides a powerful framework for understanding and addressing climate change within the 2030 Agenda. Its focus on adaptation, resilience and transformation is essential to ensure that progress towards the SDGs is durable and equitable in the face of climate change. to climate challenges (see Table 1).

Aspect	Resilience	Sustainable Development Goals (SDG)
Definition	Capacity of a system to absorb disturbances, adapt and continue functioning without losing its essential identity.	Set of 17 global goals adopted by the UN to eradicate poverty, protect the planet and ensure prosperity for all by 2030.
Main Focus	Adaptation, recovery and transformation in the face of crises or changes, especially environmental and climatic.	Sustainable development in multiple dimensions: social, economic and environmental, including climate action.
Application	It is applied to ecological, social and economic systems to confront natural disasters, climate changes and other crises.	Specifically in SDG 13 (Climate Action), but also in other SDGs related to sustainability and social justice.
Performance Level	Focused on local and regional systems, but applicable at all levels (individual, community, global).	Global, with specific goals for each country, but with impact at all levels (local, national, international).
Strategies	<ul style="list-style-type: none"> - Diversity and redundancy - Ability to learn and adapt - Flexibility and transformative change 	<ul style="list-style-type: none"> - Specific actions to mitigate climate change (reduce emissions) - Sustainable development policies - International and local cooperation

Connection with Climate Change	It focuses on how systems can adapt and continue to function despite climate impacts.	SDG 13 seeks to take urgent measures to combat climate change and its effects, promoting resilience as part of the solution.
Measurement	Difficult to quantify, as resilience varies depending on context and scale; It is measured through indirect indicators such as response capacity or post-disaster recovery.	Each SDG has specific targets with measurable indicators (e.g. reduction of CO2 emissions, access to clean energy).
Challenges	<ul style="list-style-type: none"> - Measurement and evaluation of resilience - Inclusion and social justice in resilience strategies - Risk of focusing on adaptation instead of prevention 	<ul style="list-style-type: none"> - Global implementation - Compliance with goals within the established deadline (2030) - Coordination and cooperation between multiple actors and countries
Application Examples	<ul style="list-style-type: none"> - Development of disaster-resistant infrastructure - Promotion of resilient agricultural practices - Community preparation and response to natural disasters 	<ul style="list-style-type: none"> - Implementation of emissions reduction policies - Promotion of renewable energy - Biodiversity and ecosystem conservation projects
Temporal Focus	Short to long term, with a focus on immediate responsiveness and continuous adaptation.	Term until 2030, with short, medium and long-term goals that seek a lasting and sustainable impact.

Table 1: Comparison between resilience and SDG against Climate Change.

However, the relationship between resilience and OD has not been analyzed from its mediating link with respect to climate change. That is, resilience as a factor that regulates the execution of the SDGs, since in an increasingly extreme environment, resilience emerges as a predominant factor among those who seek to carry out the SDGs. Therefore, the objective of this work is to compare the theoretical structure of resilience associated with the SDGs with respect to the observations of this work with a sample of students assigned to institutes and organizations that are distinguished by their resilience in the face of crises, imponderables and the contingencies. Are there differences between the theoretical structure of resilience reported in the literature with respect to the empirical structure observed in the present work with a sample of resilient people?

The premise that follows this work suggests that resilience regulates the impact of climate change on the execution of the SDGs. Consequently, significant differences are expected between the theoretical structure of resilience compared to the observations of the present work.

2. Method

Design. A cross-sectional, correlational and psychometric study was carried out with a sample of 100 students selected for their affiliation to institutions and organizations that specialize in adapting to changes in terms of their organization and permanence. Instrument. The resilience scale was used (see annex) which

includes the dimensions of adaptive capacity, knowledge and awareness, resources and infrastructure, and social support. Each item includes response options ranging from 0 = “it's not like my situation” to 5 = “it's quite similar to my situation.” The reliability of the instrument reached an alpha value of 0.789 and omega of 0.760, the validity ranged between 0.324 and 0.546.

Procedure. The students were contacted through institutional email in order to be able to invite them to focus groups to homogenize the contents of the resilience scale. They were informed about the objectives of the study and the functions of each project manager. The surveys were administered in the students' classrooms and they were asked to send the results to their email. At all times, it was made clear to them that their participation would not imply remuneration or any monetary or in-kind perks. **Analysis.** The data were captured in Excel and processed in Google Colab (see Annex B). Regression and mediation coefficients were estimated in structural equation models using the Lavan algorithm. Values close to unity were assumed as evidence of non-rejection of the hypothesis.

3. Results

The mediational analysis suggests the degree of regulation of the impact of exogenous variability on the mediating factors and these on the target variability (see Fig. 1). The results demonstrate the negative regulatory impact of resilience on leadership based on risks (-0.11).

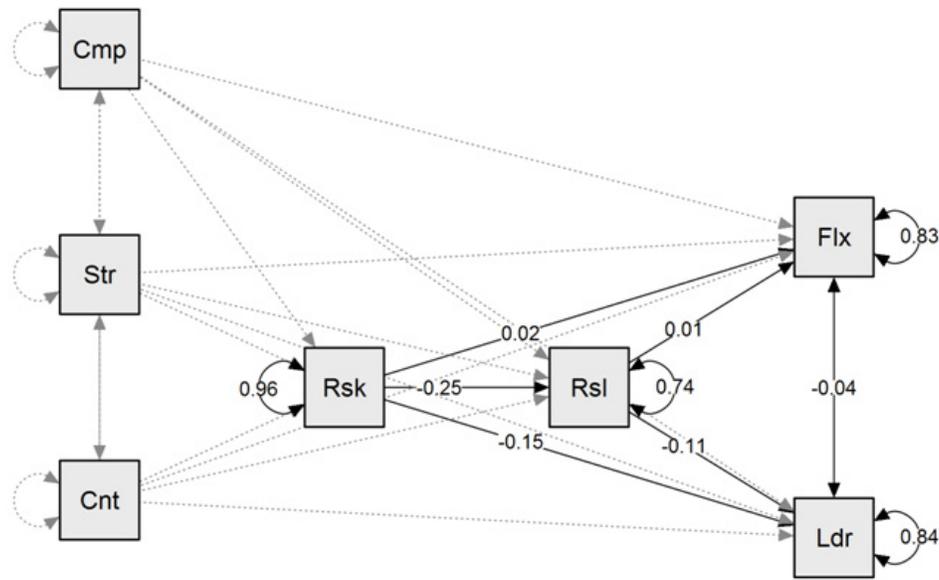


Figure 1: Mediator factor analysis of resilience

The mediational values suggest the non-rejection of the hypothesis related to the significant differences between the theoretical structure of resilience as a mediating factor with respect to the observations of the present work.

4. Discussion

The contribution of this work to the state of the art lies in the establishment of a regulatory model for the risks of labor flexibility and the emergence of leadership. In such a process, resilience inhibits the incidence of risks. The literature on risk and resilience in the context of the Sustainable Development Goals (SDGs) spans various studies and perspectives [9]. It highlights the need to increase efforts in disaster risk management and building urban resilience to disaster risk management and reduction, with the aim of aligning with the SDGs and the Sendai Framework for Disaster Risk Reduction [10]. The importance of risk assessment for the sustainability of communities is emphasized. coastal areas, and noted the critical status of Guangdong Province in terms of achieving SDG-13 [11]. The health impacts of water-related disasters were analyzed globally and gaps were identified. the SDG indicator framework to monitor these impacts [12]. highlights the role of technology in building resilience in smart cities, particularly in the context of COVID-19.

The role of youth in achieving disaster resilience goals within the SDGs emphasizes the need to expand youth participation programs [13]. The importance of establishing connections through resilience indicators to address global challenges related to the SDGs, disaster risk reduction (DRR) and climate change adaptation (CCA). They focus on informal cadastres as facilitating tools for disaster risk management, in line with SDGs 1 and 3 [14]. The impact of climatic and hydrological factors on flood hazards and resilience, using modified UNDRR indicators.

Overall, the literature review on risk and resilience in the context of the SDGs highlights the importance of addressing disaster risks, building urban resilience, assessing the sustainability of coastal communities, monitoring disaster impacts on health, harnessing technology for resilience in smart cities, engaging youth in disaster resilience efforts, establishing connections through resilience indicators, using informal cadastres for disaster risk management, and understanding the impact of disasters. climatic and hydrological factors on flood hazards and resilience [15]. These studies collectively contribute to ongoing efforts to achieve the SDGs and improve global resilience to various risks and challenges.

Unlike the state of the art in which resilience is an annex of the SDGs, this work highlights its regulatory function of the risks in compliance with the SDGs, such as the leadership and flexibility required to carry out the objectives. That is, the area of opportunity of the study lies in the observation of the SDGs in the face of risks or contingencies, but the advantage of the study lies in the observation of the mediating function of resilience. In this sense, it is recommended to establish a model that measures the impact of the SDGs on resilience and its regulation in leadership and labor flexibility.

5. Conclusion

The objective of the present work was to compare the theoretical structure of resilience as a factor derived from the SDGs against the observations of the present work in which resilience is appreciated as a regulatory factor of the impact of risks on leadership and work flexibility. In relation to the state of the art where resilience is a derivative of the SDGs, the present work suggests that more bin is a regulator of risks and thereby anticipates the achievement of the SDGs.

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