

Integrated framework of psychological resilience and performance in intervention teams: A multidimensional theoretical analysis

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Abstract. The paper advances an integrative theoretical framework to explain professional performance and functioning of intervention teams operating in high-risk environments. The model is structured around four interrelated analysis levels, individual, team, organizational and operational, investigating how factors like resilience, communication, organizational culture and environmental pressures interact to influence team performance. The approach draws from systemic and ecological theories of human behaviour, emphasizing that individuals are embedded in complex networks of interdependent influences. From this perspective, performance isn't just the result of traits or skills but emerges from dynamic interplay between context, interactions and decision-making processes. The framework incorporates important theoretical constructs such as the resilient performance model, decision-making under stress, team cohesion, transformational leadership and collective adaptability in high-pressure environments. By synthesizing these perspectives, the suggested model offers a comprehensive understanding of how multiple environmental layers mutually influence one another and shape a team's capacity to respond effectively to extreme challenges. This framework has significant implications for applied organizational psychology, especially where operational risk and psychological strain are inherent. Thus, the paper provides a foundation for future empirical research and a theoretical basis for the development of tailored psychological interventions aimed at sustaining safety and performance in hazardous work environments.

1 Introduction

In work environments characterized by uncertainty, constant pressure and high risk, such as emergency response situations, the ability of intervention teams to function effectively represents an essential factor for preventing critical errors and maintaining safety. Thus, the interest in understanding how psychological resilience and team dynamics influence professional performance has grown in the specialized literature. However, it is our perspective that existing approaches seem to remain fragmented. They are focusing either on individual or organizational level, not fully showing the complexity of interactions between

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these dimensions. The current paper advances an integrative model that provides a unified perspective on these processes. This analysis uses an approach structured across four interconnected levels (individual, team, organizational and operational), in order to highlight the manner in which psychological, contextual and systemic factors influence the ability of teams to act effectively in critical situations.

The contribution of the paper consists in the development of a conceptual framework that integrates four levels of analysis – individual, team, organizational and contextual – and offers a systemic perspective on how resilience relates to occupational safety and health. Unlike previous studies that have often examined these dimensions separately, the proposed approach brings them together in a coherent structure. The model makes a point of showing how the interactions between individuals, teams, organizations and the operational environment may support accident prevention, reduce risks in workplaces and help to maintain activity in hazardous conditions. Along with its theoretical point of view, the framework aims to provide a basis for policies and programs that enhance operational safety and psychological well-being of employees working in risky environments. Thus, the current paper aims to bring contributions to both scientific literature and to practical strategies in the field of occupational safety.

2 Theoretical foundations

2.1 Individual psychological resilience

The concept of resilience, which has a wide applicability, is receiving increasing attention in the specialized literature. Applied to the field of mental and physical health, the concept of resilience [1,2,3] refers to the fact that individuals manage, despite exposure to sometimes extraordinarily high levels of stress, to maintain a state of normal physical and mental functioning and to avoid serious mental disorders. The concept of resilience refers to the individual's capacity to overcome and perhaps even the capacity to undergo development following exposure to traumatic situations.

Many factors contribute to the development and modulation of resilience, including genetic, epigenetic, developmental environment, psychosocial, neurochemical factors and specific neurological circuits [4]. Psychosocial factors are those correlated with the development process: childhood experiences, chronic psychological and social stress, the degree of perceived control over the stressor, learned helplessness, certain cognitive processes, personality traits and active coping mechanisms. Thus, according to Bandura [5], perceived self-efficacy, respectively the confidence in one's own abilities to manage complex situations, plays a central role in strengthening resilience, facilitating orientation towards solutions and reducing feelings of helplessness. Cognitive flexibility, defined as the ability to change mental perspectives or strategies depending on contextual demands, allows individuals to overcome mental rigidity and to identify opportunities in unstable environments [2,3]. Another important factor is the internal locus of control, which reflects the individual's perception of the control they have over events. People with an internal locus of control tend to perceive challenges as learning opportunities, unlike those with an external locus of control, who attribute success or failure to circumstantial factors [2,3]. Emotional self-regulation, the process by which individuals modulate affective responses in stressful situations, contributes to maintaining psychological balance and preventing the escalation of stress [6]. Intrinsic motivation, fuelled by personal interest or deep values, serves as a driver of perseverance, especially in conditions of uncertainty [7]. Speaking of the specialized literature, in particular, the works of Bonanno [1] have revolutionized the understanding of resilience, proposing a processual, contextual and dynamic vision of it. Bonanno argued that

resilience is not a rare or exceptional trait, but a common adaptive response in the general population, a prototypical trajectory, especially in the face of significant trauma and loss (fig. 1). This reconceptualization of resilience as a process, rather than a fixed trait, has allowed for a more complex and nuanced understanding of how individuals adapt to adversity.

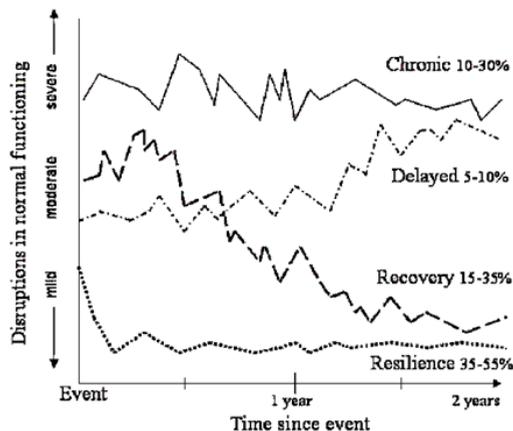


Fig. 1. Prototypical trajectories of disruption in normal functioning during the 2-year period following a loss or potential trauma [1,3]

Developed by S.E. Hobfoll [8], the conservation of resources theory states that individuals strive to obtain, retain, foster and protect what they value most. Following this reasoning, the theory argues that stress occurs [8]:

- when central or key resources are threatened with loss,
- when central or key resources are lost, or
- when there is a failure to obtain central or key resources after significant effort.

This theory also offers a valuable view of resilience, congruent with Bonanno's view [1]. Thus, resource reconstruction and regeneration are considered essential processes in post-traumatic adaptation. In times of crisis, individuals and social groups that can quickly access or regenerate lost resources will exhibit a greater capacity for adaptation. Thus, resilience is not an isolated individual trait, but a process supported by an available resource capital [1].

This theory also has important applications in the organizational environment. In the management of workplace stress, Hobfoll emphasizes the importance of conserving employees' resources [8]. Hence, an organizational climate that supports work-life balance, recognizes effort, provides autonomy and social support contributes to preventing burnout and increasing professional commitment. Therefore, along with Bonanno's vision [1], the conservation of resources theory [8] provides a comprehensive framework for understanding stress, resilience and adaptation. It emphasizes that people do not act in a vacuum, but in a complex context of personal and social resources, which directly influence their ability to cope with challenges. This view implies that resilience can be cultivated and supported through psychosocial interventions and organizational policies. Thus, rather than being seen as a quality that is present or absent, resilience becomes a set of processes and mechanisms that can be developed based on experiences and the environment of the individual.

2.2 Team dynamics in risky situations

As we already mentioned, in the context of emergency interventions, the ability of teams to remain effective in the face of challenges becomes essential. The functioning of teams in

high-risk conditions rises a series of special requirements regarding cooperation, decision-making and real-time adaptation. In such contexts, not only individual skills matter, but also the way in which team members interact under pressure. Thus, team dynamics represent an essential element in ensuring effective and resilient team performance. Most important aspects when we refer to intervention team's dynamics are [9]:

- Trust, the foundation of effective cooperation. Therefore, team members must be able to count on each other, without hesitation, at any given time.

- Real-time communication. Intervention manuals emphasize that, in critical situations, information must be transmitted quickly, clearly and straightforward. Formal channels may become ineffective thus, efficient teams use direct, action-oriented communication.

- Shared leadership. Teams that are efficient have flexible forms of leadership, in which members take the initiative according to skills relevant at a given moment. Thus, resilient teams are characterized by the emergence of informal leadership, equally distributed among members, which ensures fast and decentralized coordination.

The classic model of team development refers to several stages, namely: forming, conflict (storming), normalization (norming) and performance (performing). In high-risk situations, accelerated transition to the performing phase becomes critical, because latency in solving tasks can have serious consequences. Teams may have to move through these stages quickly or even regress temporarily. This process is supported by group [10].

Morgan [11] proposes another theoretical model designed to explain how resilience develops and functions at the team level. They emphasize the collective nature of adaptation, arguing that performance in emergency situations is supported by common psychosocial processes, not just personal traits. The proposed model is based on the idea that resilience, within a team, is not static, but represents a dynamic capacity resulting from interactions between: pre-existing resources of groups, type of adaptation mechanisms activated in critical situations and ways in which teams learn and develop after facing adversity.

Within this model, as in the model presented previously, the emphasis is placed on shared leadership and collective self-regulation. Instead of centralized and rigid leadership, resilient teams distribute their responsibilities according to relevant skills and experiences of their members, flexibly adapting their structure.

2.3 Decision making and operational stress

In environments characterized by uncertainty, emergency and psychological pressure, decision-making becomes extremely important for maintaining team performance. These types of environments require rapid decisions, often based on incomplete or contradictory information. Thus, decision-making is deeply influenced by operational stress, available cognitive resources and thought patterns, trained in professional experience.

A relevant contribution to understanding how people make decisions under uncertainty comes from the Naturalistic Decision Making (NDM) model [9]. This theory contradicts the idea of ideal decision making, that implies a completely rational analysis of all alternatives. In turn, it underlines the importance of practical experience and rapid pattern recognition. Thus, the NDM model [9], suggests that effective decisions in high-risk situations come from the decision-maker's ability to identify familiar scenarios and act intuitively, based on accumulated experience. The process is fast, automated and adaptive, making it highly efficient in demanding conditions but at the same time vulnerable to errors of judgment in an ambiguous or unknown context.

Stress, as a major contextual factor, significantly influences the quality of the decision-making process. According to Lazarus and Folkman's theory, stress should be viewed rather as a transactional process, in which a person makes a cognitive evaluation of each stressful

action, regarding its intensity, harmfulness, threat or challenge, in order to overcome it (fig. 2) [2,3].

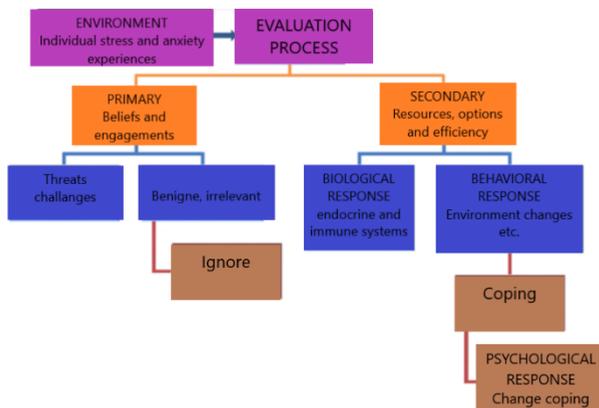


Fig. 2. Stress as a transactional process [2,3]

In intense operational situations, the primary and secondary evaluations follow each other quickly. A negative perception of one's own effectiveness or of available support can lead to maladaptive reactions, such as: decision-making blockage, impulsivity or hesitation. Cognitive evaluation of an emergency situation may trigger cognitive biases, which become accentuated in conditions of stress and ambiguity. Most common cognitive biases in such contexts are [2,3]:

- Overconfidence bias, representing the tendency to overestimate the accuracy of judgments or decisions, leading to excessive risk-taking and ignoring corrective information.
- Anchoring bias, represents focusing on the first available information and insufficiently adjusting the decision based on new data.
- Confirmation bias is the selection of information that supports pre-existing beliefs and ignoring those that contradicts them.

2.4 Organizational culture and leadership in interventions

Organizational culture and leadership are elements of great importance in order to achieve performance in intervention and rescue operations. A culture characterized by transparency, continuous learning and responsibility, along with authentic and adaptive leadership, are prerequisites for efficient and sustainable reactions in difficult situations. These have a direct impact on psychological resilience, the ability to adapt, learn and function in conditions of increased risk.

A central concept for organizations operating in hazardous environments is that of safety culture. According to the model proposed by Reason [12], safety culture implies the existence of institutionalized mechanisms for learning from mistakes, transparent reporting of incidents and cultivation of a vigilant attitude in relation to everyday risks. Safety is not treated as an external task, but as a shared collective responsibility. It manifests as a constant attention to operational details and in a heightened resistance to oversimplifications that can mask structural vulnerabilities [12].

Karl Weick and Kathleen Sutcliffe provide a complementary perspective through the concept of High Reliability Organizations [12]. They describe structures in which the capacity to react and adapt is supported by consistent organizational practices, not just isolated efforts. Such organizations develop a “collective memory” oriented towards

prevention and flexibility, in which each member, regardless of position, contributes to maintaining the functionality of the system under operational stress.

Leadership is a factor of cohesion and orientation, able of mobilizing the team's psychological resources. Closely related to organizational culture is the leadership style practiced within the team or organization, two fundamental types of leadership being frequently discussed by literature [13]: transactional leadership and transformational leadership. Transactional leadership is based on regulated exchanges and respect for hierarchy and can support the stability of processes, but can often prove insufficient in crisis contexts. Contrary, transformational leadership brings added value through the ability to inspire, stimulate critical thinking and build a shared vision, adaptable to the dynamics of work, being essential for maintaining collective resilience and the team's ability to function coherently, despite external pressures [13].

Organizational psychology applied to risk contexts emphasizes that operational performance is closely linked to the team's psychosocial climate. Effective leaders interpret reality for their colleagues, provide meaning to ambiguous events and regulate stress levels through contextualized communication and decisions. Culture and leadership are mutually supportive: a mature organizational culture facilitates the development of flexible and accountable leadership and leaders who encourage learning, transparency and reflection actively contribute to strengthening this culture.

In the literature, these concepts have often been analysed separately from individual resilience or team dynamics. The current paper proposes an integrative framework that places organizational culture and leadership in direct relation with the other factors, an aspect that constitutes an original and necessary contribution to deepening the mechanisms by which performance is maintained under high-risk conditions.

3 Proposed integrated theoretical framework

The model we propose integrates four interdependent levels, namely individual, team, organizational and contextual, that define optimal psychological functioning in the situation of an intervention in hazardous environments (fig. 3). This multi-layered approach is inspired by systemic theories and the ecological approach to human development, according to which behaviour is influenced by interactions between multiple levels of the environment. Each level influences and is influenced by the others, shaping a continuous feedback network.

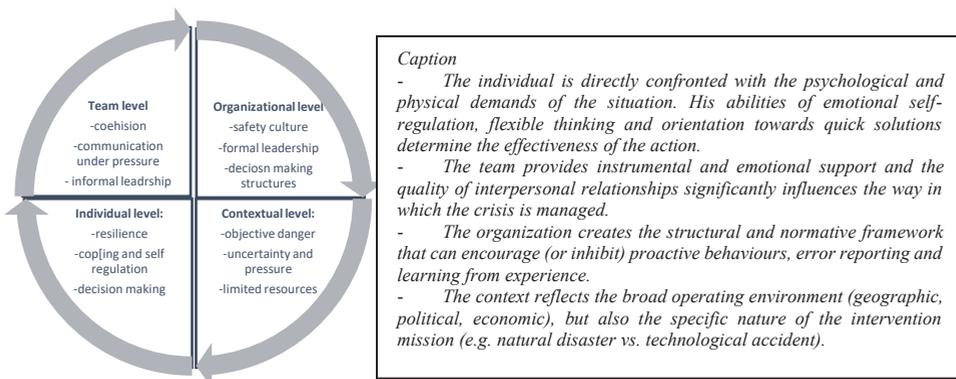


Fig. 3. Integrated theoretical framework (original contribution)

The novelty of the model lies in the articulation of the four levels – individual, team, organizational and contextual – into a unified conceptual framework, which, in the specialized literature, have so far been investigated predominantly in isolation. This

integration offers a significant theoretical contribution and constitutes a reference point for the development of occupational safety policies and programs based on a solid scientific foundation.

3.1 Individual level

The individual is the basic unit of performance. Individual psychological factors determine adaptability and stress response:

- Self-efficacy. Literature [1, 14] shows that individuals with a high degree of self-efficacy are more resistant to stress and maintain their decision-making capacity even under extreme conditions. In turn, people who strongly believe that they cannot handle a certain situation experience high levels of anxiety.
- Cognitive flexibility and tolerance for ambiguity. These factors allow the adaptation of mental strategies to new, unforeseen situations. Thus, those individuals who show high levels of tolerance for ambiguity have the ability to exhibit behaviours characterized by high flexibility, being largely adaptive. In turn, those who show low levels of tolerance have a marked tendency to react quickly, not taking into account the most important information for assessing the situation and implementing appropriate coping strategies [5].
- Emotional self-regulation. The ability to manage affective responses in the face of danger or the suffering of others is a key predictor of performance [2, 3].
- Intrinsic motivation and meaning of work. Personnel frequently report strong internal motivation, associated with prosocial values and a perception of the mission as the greater purpose [2,3].

People with high self-efficacy, emotional control and mental anticipation capacity are more likely to react adaptively under risk conditions. Personal resources can be enhanced through interventions such as mindfulness, progressive exposure and simulation training.

Table 1. Specific resilience factors depending on the systemic level (own elaboration, based on literature [1,2,9,10])

Level	Key factors	Support mechanisms	Examples of interventions
Individual	Individual Self-efficacy, internal control	Self-regulation, biofeedback	VR training, psychological counselling
Team	Cohesion, communication	Team training, leadership informal	Debriefing, group simulations
Organizational	Safety culture, leadership	Politics, psychological climate	Systemic training, continuous evaluation
Contextual	Social support, safe infrastructure	Predictability, legislation	Modern infrastructure, interventions plans

3.2 Team level

The team is the basic functional unit in emergency response. In these contexts, mission success depends not only on individual skills, but also on the coordination and functional cohesion of the team. The model we proposed includes the following critical factors [9,10,11,12]:

- Mutual trust. Members must trust that others will perform their tasks responsibly. In teams with high staff turnover or a lack of shared experience, trust can be fragile.

- Distributed leadership. In crisis situations, formal leaders may be unavailable. The ability of members to temporarily take over informal leadership is an indicator of the team's functional maturity.
- Clear and standardized communication. The use of a common language, reducing ambiguity and clarity of commands or requests are vital. Communication errors are a major source of accidents.
- Collective reflection practices. These tools (e.g. debriefing) allow learning from experience and correcting errors without blaming, promoting a culture of continuous learning.

3.3 Organizational level

At this level, organizational culture, leadership style and support policies become important. Organizations that value learning from mistakes, create spaces for feedback and provide formal psychological support (counselling, debriefing) contributing to long-term protection of teams. Organizations are responsible for developing a structural and cultural environment that supports psychological and operational safety having the following essential components [9, 13]:

- Organizational safety culture, involving: open communication about mistakes, promoting the reporting of near-misses, non-punitive support for those who indicate risks.
- Psychological support systems. Post-traumatic counselling, debriefing interventions, access to specialized organizational psychologists are vital to reducing the impact of cumulative trauma [2,3].
- Transformational leadership. This type of leadership increases employee engagement, team coherence and mission trust.
- Continuous training programs and crisis simulations. An emerging practice is the use of real-time stress inoculation training, where teams are exposed to controlled high-stress situations to practice self-regulation and decision-making under pressure (e.g., through VR training programs).

3.4 Contextual level

Often, lack of control over the environment leads to a feeling of helplessness. This level refers to external conditions that cannot be controlled by the individual or organization, but have a major impact on performance, including:

- Physical characteristics of the environment: extreme temperatures, toxic air, danger of collapse, lack of visibility.
- Unpredictability of tasks: dynamic nature of interventions in hazardous environments makes planning often useless.
- Resource constraints: insufficient equipment, lack of personnel, unstable communications.

3.5 Theoretical implications and research directions

The model we propose has theoretical implications, relevant to the field of organizational psychology applied in risk and intervention contexts. First, it suggests that resilience is not an exclusively individual attribute, but an emergent characteristic at multiple levels of analysis. This systemic perspective is opposite to theories that place the responsibility for adaptation solely on the individual. Theoretically, the model we proposed can be used for:

- Developing multidimensional scales to measure resilience at individual, team and organizational levels;
- Longitudinal studies to track the evolution of psychological adaptation over time, depending on risk exposure;
- Empirical testing of inter-level relationships, such as the influence of organizational culture on field performance or the effect of informal support on perceived stress.
- From an application point of view, the model offers valuable directions for:
- Selecting personnel for risk missions, based on scientifically validated psychological profiles;
- Designing training and simulation programs, in which all four levels are addressed in an integrated manner;
- Implementing post-intervention psychological support protocols, adapted to the specifics of the teams and institutional culture;

It is also necessary for future research to analyse cultural and socio-institutional variables, given that resilience patterns may vary between countries, organizations and intervention cultures.

Thus, the original contribution of the study is not limited to a simple synthesis of existing literature, but is embodied in the proposal of an innovative framework, with analytical and applicative value, relevant both for future research and for the development of institutional practices in the field of occupational safety and health.

Conclusions

The paper brings two main contributions. First, it outlines a framework for understanding resilience and performance by considering four interconnected levels: individual, team, organization and the broader context. This integrated view goes beyond earlier approaches that tended to look at these dimensions in isolation and can serve as a useful reference for developing tools of assessment and intervention within organizational psychology. Second, the model speaks directly to the field of occupational health and safety. It can be applied in the design of selection and training programs, as well as psychological support measures, all aimed at improving operational safety, reducing the likelihood of errors and lowering occupational risks. At the same time, it offers direction for organizational policies that foster a culture of safety and create a supportive psychological climate. The study's distinctive contribution lies in connecting theoretical perspectives with practical measures for strengthening workplace safety. By integrating psychological, organizational and contextual factors into a single coherent model, it provides a foundation for practices in training, leadership and communication in high-risk environments. It also points toward practical avenues for enhancing both safety and sustainability at work. Thus, the paper contributes with both theoretical insights and applied relevance to the field of organizational psychology in contexts where occupational risks are particularly high.

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