2026 | V. 2 | N. 2

ISSN Online: 3086-173X

DOI: https://doi.org/10.5016/bjsphd.v2i2.20303

BRAZILIAN JOURNAL of SPORT PSYCHOLOGY & HUMAN DEVELOPMENT BJSPHD

MENTAL RESILIENCE IN BRAZILIAN JIU-JITSU:
A theoretical model of resilience in the tap cycle (TMR-TC)

A RESILIÊNCIA MENTAL NO JIU-JITSU BRASILEIRO:
um modelo teórico de resiliência no ciclo do tap (TMR-TC)

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ABSTRACT

This study proposes the Theoretical Model of Resilience in the Tap Cycle (TMR-TC), a conceptual framework designed to operationalize psychological resilience within the specific context of Brazilian Jiu-Jitsu (BJJ). Unlike conventional sports where adversity is often linked to macroscopic events such as chronic injuries or season-long defeats, BJJ offers a granular and frequent experience of acute stress through the submission mechanism. The TMR-TC is rooted in the Grounded Theory of Psychological Resilience and incorporates five fundamental protective pillars: positive personality, motivation, confidence, focus, and social support. The model approaches resilience not as a static trait but as a dynamic process structured into three interdependent stages: The Anticipation Phase, the Moment of Decision (The Tap), and the Reintegration Phase. During the Anticipation Phase, resilience is manifested through the maintenance of homeostasis and inhibitory control under pressure, preventing psychophysiological disintegration. In the Moment of Decision, the act of submission is analytically reconfigured via metacognition, transforming a "threat appraisal" to the ego into a "challenge appraisal" focused on the adaptive acceptance of biomechanical reality. Finally, the Reintegration Phase consolidates the cycle through a cognitive reset that dissociates the emotional weight of defeat from technical learning efficacy. It is concluded that the TMR-TC provides a cognitive architecture for systemic preservation, promoting athletic longevity and mental health by validating the axiom that learning is the direct byproduct of processed adversity. This framework offers essential tools for practitioners, particularly in Master categories, to transition from a survival mindset to a flourishing one, ensuring optimized psychophysiological functioning and sustained performance in high-pressure environments.

Keywords: Brazilian Jiu-Jitsu; Psychological Resilience; Metacognition; Combat Sports; Mental Health.

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RESUMO

O presente estudo propõe o Modelo Teórico de Resiliência no Ciclo do Tap (TMR-TC), uma estrutura conceitual desenhada para operacionalizar a resiliência psicológica no contexto específico do Jiu-Jitsu Brasileiro (BJJ). Diferente de modalidades esportivas convencionais, onde a adversidade é frequentemente associada a eventos macroscópicos, como lesões crônicas ou derrotas em ciclos plurianuais, o BJJ apresenta uma experiência de estresse granular e frequente através do mecanismo de finalização. O TMR-TC fundamenta-se na Teoria Fundamentada de Resiliência Psicológica e integra cinco pilares de proteção fundamentais: personalidade positiva, motivação, confiança, foco e suporte social. O modelo operacionaliza a resiliência não como um traço estático, mas como um processo dinâmico estruturado em três estágios interdependentes: Fase de Antecipação, Momento da Decisão (O Tap) e Fase de Reintegração. Na Fase de Antecipação, a resiliência manifesta-se pela manutenção da homeostase e pelo controle inibitório sob pressão, evitando a desintegração psicofisiológica. No Momento da Decisão, o gesto da submissão é reconfigurado analiticamente através da metacognição, transformando uma "avaliação de ameaça" ao ego em uma "avaliação de desafio" focada na aceitação adaptativa da realidade biomecânica. Por fim, a Fase de Reintegração consolida o ciclo através de um reset cognitivo que dissocia o peso emocional da derrota da eficácia do aprendizado técnico. Conclui-se que o TMR-TC oferece uma arquitetura cognitiva de preservação sistêmica, promovendo a longevidade esportiva e a saúde mental ao validar o axioma de que o aprendizado é o subproduto direto da adversidade processada. Este modelo fornece ferramentas essenciais para que praticantes, especialmente de categorias Master, transitem de uma mentalidade de sobrevivência para uma de florescimento, garantindo o funcionamento psicofisiológico otimizado e o rendimento sustentado em ambientes de alta pressão.

Palavras-chave: Jiu-Jitsu Brasileiro; Resiliência Psicológica; Metacognição; Esportes de Combate; Saúde Mental.

1 INTRODUCTION

Psychological resilience in the sporting domain transcends the mere absence of psychopathology or passive resistance to stress. It is configured as a dynamic and multidimensional process in which the individual utilizes personal and psychosocial resources to modulate the impact of stressors and promote better post-adversity adaptation (Fletcher; Sarkar, 2012; Richardson, 2002). This capacity is sustained by a systematic structure of psychological resources organized into five fundamental pillars: positive personality, motivation, confidence, focus, and social support (Sarkar; Fletcher, 2014).

While in conventional Olympic modalities adversity is often associated with macroscopic events, such as chronic injuries or defeats in multi-year cycles (Fletcher; Sarkar, 2012), in Brazilian Jiu-Jitsu (BJJ), the experience of adversity is granular and

frequent. It manifests acutely and repetitively through the mechanism of submission and the consequent acknowledgment of defeat (the tap), which acts as a controlled laboratory of psychobiological stress, providing a process-oriented view on the subject.

Galli and Vealey's (2008) Conceptual Model of Resilience in Sport proposes that resilience emerges from the tension between environmental demands (stressors) and the athlete's arsenal of individual resources. From this perspective, the defining factor lies in the capacity for post-adversity reintegration, where overcoming crises generates adaptive responses that strengthen the individual. The central merit of this approach was breaking with the view that resilience is merely an innate personality trait, positioning it as a dynamic phenomenon directly influenced by external context and internal adjustments.

However, despite the advancement in considering the environment, this model presented gaps regarding the mechanisms that effectively trigger resilient development. Observing these limitations, Fletcher and Sarkar (2012) structured the Grounded Theory of Psychological Resilience and Optimal Sport Performance. The authors argued that previous models exhibited an excessive bias toward defensive coping, treating adversities merely as problems and neglecting the role of metacognition and emotions in the recovery process. In this new proposal, resilience is understood through the mutual interaction between the athlete's psyche and the stressful context. The central pillar here is positive cognitive appraisal: instead of just "surviving" the stress, the athlete uses metacognition to view the challenge as an opportunity for evolution and technical mastery.

In the mat environment, this theoretical transition is clear: submission represents a dual stressor (an immediate physical threat and an attack on perceived self-efficacy and the ego). The response to this stressor is mediated by a protective triad: psychological characteristics, cognitive appraisal, and coping strategies (Wagstaff *et al.*, 2016). For the resilient athlete, the tap is reframed as a "challenge appraisal" rather than a "threat appraisal" (Fletcher; Sarkar, 2013), allowing for the maintenance of functional mood states characterized by high vigor, even in the face of technical defeat (Brandt *et al.*, 2021; Silva *et al.*, 2019).

However, literature points out that resilience in BJJ is a construct refined by daily practice. According to Hanley (2023), the psychological profile and emotional stability of BJJ athletes evolve significantly according to belt rank, suggesting that systematic combat practice functions as mental fortitude training for sustained success (Fletcher; Sarkar, 2016; Kegelaers *et al.*, 2021). Elite athletes tend to present higher levels of mental toughness and more effective coping strategies, which correlates positively with mental health and

performance in high-level championships (Hosseini; Besharat, 2010; Cowden *et al.*, 2016; Gameiro *et al.*, 2023).

Failure in this mediation process results in maladaptive responses. Low resilience or the use of ineffective coping strategies can raise pre-competitive anxiety and the risk of emotional burnout, which may lead to dropout from the modality (Gerber *et al.*, 2018; Faro *et al.,* 2019). Furthermore, performance pressure and a culture of "winning at all costs" can exacerbate vulnerabilities, manifesting in sleep disorders, indicators of eating disorders, and depressive symptoms, especially during periods of rapid weight loss (Bueno *et al.*, 2023; Da Silva Neto *et al.*, 2022; Vieira *et al.*, 2021). Thus, the mental health of the Jiu-Jitsu practitioner must be understood within a spectrum ranging from well-being derived from technical mastery to severe psychological stress (Rice *et al.*, 2016; 2019). Contemporary evidence underlines that the development of individual and team resilience is a crucial protective factor for maintaining psychological well-being in high-pressure environments (Sarkar; Page, 2022).

In this scenario, BJJ emerges not only as a combat sport but as a tool for promoting health and life skills. Practice is associated with reduced anxiety levels and strengthened resilience in adults and the elderly, offering critical social support that aids in the management of common mental disorders (Al-Qahtani *et al.*, 2018; Ciaccioni *et al.*, 2024; Valdés-Badilla *et al.*, 2021). There is an implicit transfer of skills, where emotional control developed under the imminent risk of submission is transposed to everyday life challenges.

2 DEVELOPMENT

The central objective of this work is to propose the Theoretical Model of Resilience in the Tap Cycle (TMR-TC). This model is founded on the protective pillars of Fletcher and Sarkar (2012) and Sarkar and Fletcher (2014) - optimism, confidence, focus, motivation, and social support - and integrates contemporary evidence on the psychometrics of resilience in sport (Bicalho *et al.*, 2021; 2022). This theoretical model operationalizes resilience not as a static trait, but as a dynamic process of emotional and cognitive regulation in the face of acute stress (submission).

In the Anticipation Phase, resilience manifests through inhibitory control and modulation of the alert system (homeostasis under pressure), allowing the practitioner to process the imminence of submission without psychophysiological disintegration into panic. This stage precedes the Moment of Decision (Tap), which must be analytically reconfigured:

instead of a moral capitulation or "failure," the gesture of submission is interpreted as an act of tactical intelligence and adaptive acceptance, where recognition of biomechanical reality prevails over the ego.

Finally, the Reintegration Phase consolidates the cycle through reflective resilience, enabling an immediate cognitive reset; in this stage, the practitioner transforms the event, dissociating the emotional weight of defeat from the efficacy of technical learning, maintaining that longevity and mental health in sport are cultivated subproducts for the practitioner's optimal functioning, ensuring the maintenance of performance in subsequent engagements (Sarkar; Page, 2022). This scientifically validates the axiom that, in Jiu-Jitsu, learning is the direct subproduct of processed adversity.

3 PROCEDURES AND METHODS

3.1. Nature of the study and theoretical approach

The present work is characterized as a theoretical proposition of a deductive-inductive nature, based on conceptual modeling and theoretical synthesis. The central objective is the construction of the Theoretical Model of Resilience in the Tap Cycle (TMR-TC). Unlike static models, the TMR-TC adopts the relational perspective of Fletcher and Sarkar (2012), which defines resilience as a dynamic process where psychological characteristics protect the individual from potential negative effects of stressors through cognitive appraisals and coping responses. This approach is complemented by the taxonomy of protective factors (personality, motivation, confidence, focus, and social support) established by Sarkar and Fletcher (2014), allowing the modeling to contemplate both the athlete's internal resources and the influences of the Dojo environment.

3.2. Search procedures and literature architecture

For the foundation of the framework, a non-systematic and discerning search strategy was conducted across databases (Google Scholar, PubMed, PsycINFO, Scielo), using Boolean descriptors: (Psychological Resilience OR Mental Toughness) AND (Brazilian Jiu-Jitsu) AND (Cognitive Appraisal OR Metacognition).

Inclusion and Eligibility Criteria: Seminal works on resilience were prioritized, emphasizing the study by Fletcher and Sarkar (2012), cross-referencing them with emerging BJJ literature (Cardoso *et al.*, 2023; Tarver *et al.*, 2023; Bueno *et al.*, 2023; Hanley, 2023) and mental health constructs in sport (Cevada *et al.*, 2012; Hill *et al.*, 2023). The inclusion of terms aimed at mental health and well-being is justified by the contemporary evolution of resilience theory, which began to consider full psychological functioning and athlete integrity as indicators of success, going beyond isolated competitive performance (Sarkar; Page, 2022).

3.3. Modeling logic and operationalization of the TMR-TC

The construction of the model followed the process mapping stages proposed by Contemporary Sport Psychology.

Stressor Taxonomy: The tap-out (submission or “tapping”) was operationalized as an acute situational performance stressor. Under the lens of Fletcher and Sarkar (2012), we differentiated between objective load (joint lock/strangulation) and subjective load (threat to athletic identity and hierarchical status).

Mapping of Mediators (The 5 Pillars): Integration of psychological characteristics (Optimism, Confidence, Focus, Motivation, and Social Support) identified in the review by Sarkar and Fletcher (2014) as protective resources that filter the practitioner's perception.

Cognitive Appraisal Mechanism: Inclusion of the critical distinction between Threat Appraisal (focus on loss and ego damage) and Challenge Appraisal (focus on growth and learning), the core of Fletcher and Sarkar's theory (2012, 2013).

3.4. Structure and axes of the model (the processual cycle)

The TMR-TC is operationalized in a cycle of three interdependent stages based on the dynamics of the Grounded Theory of Psychological Resilience (Fletcher; Sarkar, 2012), adapting the interaction between stressors and facilitative responses to the reality of combat:

Anticipation Phase (Filtering by Protective Factors): This phase focuses on psychological preparation before stress. In it, the five pillars (Sarkar; Fletcher, 2014) (optimism, confidence, focus, motivation, and social support) act as moderators that influence homeostasis under pressure. Resilience, at this stage, manifests itself in the athlete's ability to maintain inhibitory control and modulation of the alert system, preventing

the imminence of submission from being processed as an irrational catastrophic event (panic), keeping the integrity of the decision-making process.

Decision Moment - The Tap (Metacognition and Challenge Appraisal): This is the central point of the model, where the critical distinction between threat appraisal and challenge appraisal occurs (Fletcher; Sarkar, 2012). The TMR-TC proposes that the gesture of the tap (quitting by tapping) is a facilitative response derived from metacognition. Through the monitoring and control of their own thoughts, the resilient athlete replaces the "attack on the ego" (threat) with an "adaptive acceptance of biomechanical reality" (challenge). Here, resilience is the tactical intelligence to interrupt the combat to preserve physical integrity and enable the continuity of long-term performance (Fletcher; Sarkar, 2016).

Reintegration Phase (Facilitative Response and Growth): Based on the concept of rebound, this phase analyzes the post-stressor. The model postulates that resilience is validated by the efficacy of the facilitative reintegration, in which the athlete dissociates the negative outcome (loss of the fight) from their value as a competitor. Using reflective processes, the practitioner performs a "cognitive reset", transforming submission into technical learning. Success in this phase prevents maladaptive responses (such as anxiety, burnout, and injuries when resisting submissions) and consolidates resilience as a process of continuous growth, fundamental for mental health (Sarkar; Page, 2022).

3.5. Rigor and Construct Validation

Construct validity was established by adherence to the processes of metacognitive 'monitoring and control'. Methodological rigor was based on the verification that the TMR-TC explains not only survival of stress but the attainment of Optimal Sport Performance (as per the title of the original 2012 work), transforming the gesture of submission into a functional and adaptive response.

4 RESULTS AND DISCUSSION

The following Discussion section integrates Sarkar and Fletcher's (2014) five protective pillars with the phenomenology of Jiu-Jitsu, analyzing how each psychological resource modulates the athlete's response to the critical moment of submission (the tap).

3.1. The meta-architecture of resilience in the tap cycle

The construction of the Theoretical Model of Resilience in the Tap Cycle (TMR-TC) presupposes that resilience in BJJ is not a static characteristic or an unchangeable personality trait (Block; Kremen, 1996), but a processual, dynamic, and multi-determined phenomenon (Bicalho, Melo; Noce, 2020; García-Secades *et al.*, 2014). Under the lens of Fletcher and Sarkar (2012), the tap acts as a "controlled microtrauma" that demands risk exposure to be overcome. As postulated by Masten, Best, and Garmezy (1990), resilience manifests itself precisely in the presence of adversity; on the mat, the imminence of submission is the stressor that catalyzes the development of the capacity for "positive recovery" (bouncing back) described by Galli and Vealey (2008). The TMR-TC operationalizes this recovery by transforming acute stress into a continuous learning cycle.

3.2. Positive personality: adaptive optimism and causal reattribution

In the TMR-TC, positive personality, one of the central pillars identified by Sarkar and Fletcher (2014), is configured as a mechanism for affective stability. Evidence from Silva *et al.* (2019) suggests that the mood profile of athletes (iceberg profile) is sensitive to perceived health, underlining the importance of optimism in maintaining emotional homeostasis. At the moment of submission, adaptive optimism operates a causal reattribution: the resilient athlete interprets the tap as a specific, unstable, and controllable event. Unlike the "negative cascade" that would lead to dropout, this optimism is reinforced by self-reflection and insight, which Cowden and Meyer-Weitz (2016) point out as predictors of resilience. Athletes who use the tap as an source of technical feedback, and not as a defeat of identity, present greater vigor and lower risk of burnout (García, Vallarino; Montero, 2014). Thus, as Hanley (2023) points out, the mat becomes a safe environment for the renegotiation of vulnerability, transforming the stressor into a trigger for growth.

3.3. Motivation: mastery orientation and investment in longevity

Resilient motivation in BJJ is defined by the transition from ego-orientation to task-orientation (Sarkar; Fletcher, 2014). This pillar is supported by Self-Determination Theory, where intrinsic motivators of competence and interest/pleasure prevail over the search for status (Tarver; Levy, 2023; Cardoso *et al.*, 2023). According to Hanley (2023) the

psychological profile of the practitioner undergoes an intrinsic maturation as they advance in the hierarchy of belts, suggesting that resilience is developed over time and becomes both a prerequisite for "sustained success" and longevity in the sport (Fletcher; Sarkar, 2016).

Under Senanayake's (2023) perspective, this motivation is intrinsically linked to a perspective of non-violence and self-control, where the athlete prioritizes longevity. According to Cevada *et al.* (2012), quality of life is intrinsically linked to the athlete's ability to manage competitive stress. This mature choice positively correlates with mental health, mitigating the severe competitive anxiety observed in athletes with lower adaptation capacity (Hosseini; Besharat, 2010; Drew; Matthews, 2019).

Thus, tapping consciously to avoid an injury is not quitting, but an exercise in motivational resilience: the athlete prioritizes long-term technical evolution over maintaining an image of momentary invincibility. This logic, as Chinkov and Holt (2016) demonstrate, promotes an implicit transfer of life skills, where patience and persistence under pressure become existential tools for life outside the mat.

3.4. Confidence: self-efficacy and the consolidation of athletic identity

Confidence in the TMR-TC functions as a homeostatic regulator of anxiety. Studies by Togo *et al.* (2018), Andreato *et al.* (2014) and Bueno *et al.* (2023) indicate that self-confidence in BJJ is forged in the dialectical overcoming between mastery and submission. Studies by Cowden, Meyer-Weitz, and Asante (2016) indicate that mental toughness is intrinsically linked to resilience in competitive environments. In this context, resilience allows for what we term "Conscious Tap": the ability to recognize the momentary superiority of the opponent without weakening global self-efficacy.

The vulnerability of being submitted by someone of a lower belt rank, for example, is neutralized by a robust and dynamic athletic identity that prioritizes mental health and well-being over the isolated result (Bicalho *et al.*, 2020; Sarkar; Page, 2022). When confidence is resilient, it protects the athlete against burnout and the anxiety disorders cited by Kroenke *et al.* (2007), protecting the ego against perceived physical decline with advancing age (Gurgel *et al.*, 2013). The integrity of the individual then does not depend on invincibility, but on the competence in processing failure and maintaining optimal psychological functioning (Nezhad; Besharat, 2010; Fletcher; Sarkar, 2012).

3.5. Focus: selective attention and the flow state under adversity

The pillar of focus (Sarkar; Fletcher, 2014) is what distinguishes traumatic submission from technical submission. According to the analysis by Morris and Bone (2024), BJJ facilitates the flow state, that is, a total immersion and absolute focus on the activity even under extreme pressure. In the TMR-TC, resilient focus is the maintenance of cognitive functionality under acute stress (Hill *et al.*, 2023). At the limit of a hold, resilience manifests itself in directing attention to problem solving (breathing, reversals, and levers) instead of caving to panic. If the Jiu-Jitsu practitioner taps out of recognition of the other's effectiveness, the apex of cognitive control and emotional regulation is reached, factors essential for the prevention of maladaptive responses (Vieira *et al.*, 2021).

3.6. Social support: the protective ecosystem and injury prevention

Finally, social support is the substrate that makes all other pillars viable (Sarkar; Fletcher, 2014). Lu *et al.* (2016) demonstrate that social support, especially from coaches and peers, buffers the relationship between stress and exhaustion, while Hanley (2023) warns that the sporting environment can be a risk factor if there is a culture of stigma regarding submission. Williams and Smith (2023) warn that fear of failure and shame before peers are the main predictors of a "downward spiral" in BJJ. The TMR-TC postulates that academy culture is the main determinant of the bidirectional relationship between mental health and injuries. A culture that stigmatizes those who "tap" creates a high-risk environment and establishes the bidirectional relationship between mental health and injuries: such an environment generates psychological stress, which in turn increases the probability of serious physical injuries due to unnecessary resistance to submissions.

In addition to the psychological impact, there is a direct physical consequence: Codonhato *et al.* (2018) observed that athletes with low resilience and high stress show a higher incidence of injuries. In a culture of high social support, respect for the tap functions as a safety contract that guarantees physical integrity. As Sarkar and Page (2022) suggest, the development of collective resilience protects the physical and mental integrity of practitioners, allowing the mat to operate as a "safe haven" for human development (Morris; Bone, 2024; Faro *et al.*, 2019).

5 FINAL CONSIDERATIONS / CONCLUSION

The articulation of the evidence and constructs presented converges to the proposition that the Theoretical Model of Resilience in the Tap Cycle (TMR-TC) not only describes a motor response of interruption but maps a cognitive architecture of systemic preservation. By transposing Fletcher and Sarkar's (2012) Grounded Theory to the Brazilian Jiu-Jitsu ecosystem, this model demonstrates that resilience operates as a critical modulator between the acute stressor and the adaptive outcome.

The support for this architecture rests on the synergistic integration of the five proposed protective pillars: positive personality, motivation, confidence, focus, and social support (Sarkar; Fletcher, 2014). It is this base that allows the practitioner, especially in the Master category, to make the transition from a "survival mentality" to a "flourishing mentality". From this perspective, the TMR-TC reveals that sustained success and mental fortitude in sport (Fletcher; Sarkar, 2016) are not measured by resistance to submission, but by the metacognitive ability to manage risks and preserve physical integrity.

The intersection of these resources configures the TMR-TC as a complex and dynamic system, where resilience should not be measured by the ability to "not tap", but rather by the cognitive sophistication of recognizing the exact moment of the tap. This gesture, redefined as an act of tactical intelligence, allows the athlete to process the experience without damage to their athletic identity or their mental health, guaranteeing the optimized psychophysiological functioning required in high-pressure environments (Sarkar; Page, 2022).

In the final analysis, the TMR-TC scientifically validates that, on the mat, true resilience resides in the preservation of the "self" for tomorrow's fight. By prioritizing longevity and learning over momentary ego, the practitioner transforms submission into a sustainable resilience mechanism, consolidating Jiu-Jitsu as a practice of self-mastery, health, and human development.

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