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Ph.D. THESIS SUMMARY

THE ROLE OF BOREDOM IN MENTAL HEALTH AND PSYCHOPATHOLOGY

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Summary

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CHAPTER I. THEORETICAL BACKGROUND

1.1. Boredom, a universal experience

Boredom is a pervasive (Chin et al., 2017) and deeply human experience, reported across cultures, life stages, and historical periods. While it may not always live up to its reputation as "the most unexpectedly common of all emotions" (Toohey, 2011), boredom is indeed ubiquitous-present in homes, workplaces, hospitals, and classrooms alike (Daschmann et al., 2011). Philosophers and writers across centuries have grappled with its meaning and consequences. From the reflections of Seneca and Pascal to the existential meditations of Nietzsche and Sartre, boredom has occupied a prominent place in intellectual thought as a marker of both the human condition and the search for meaning (Svendsen, 2005).

Once described as a "neglected concept" (Fisher, 1993) or even a "socially disvalued emotion" (Darden, 1999), boredom has increasingly attracted empirical attention. Once relegated to the margins of psychological inquiry, it is now being actively studied in neuroscience, philosophy, economics, education, and clinical psychology (Westgate & Steidle, 2020). This multidisciplinary surge reflects a growing recognition that boredom is not a trivial or passive state, but rather a psychologically significant experience with profound consequences.

The discomfort boredom brings is so aversive that individuals sometimes go to remarkable lengths to avoid it. In a striking study, participants chose to administer mild electric shocks to themselves rather than sit alone with their thoughts, suggesting that even self-inflicted pain may be preferable to the discomfort of mental under-stimulation (Havermans et al., 2015). Such findings emphasize that boredom is far from benign-it is a potent emotional state capable of motivating action, for better or worse.

Despite its prevalence, boredom has not been fully integrated into dominant models of emotion or psychopathology. This omission is problematic, especially given its consistent associations with psychological difficulties such as depression, anxiety, impulsivity, aggression, and addictive behaviors (Elhai et al., 2018; Mugon et al., 2020). It is no coincidence that boredom has been linked to low well-being, poor self-regulation, and a diminished sense of life meaning, variables that feature prominently in many theories of mental health and resilience (Westgate, 2020). Moreover, the scientific fascination with boredom lies not in its simplicity, but in its complexity.

Although it may feel mundane, boredom reflects a sophisticated interplay of attention, emotion, motivation, and meaning. It often arises when individuals are unable to find satisfaction in their current activity, despite a desire to be engaged. In this sense, boredom is not the absence of desire, but a thwarted attempt at purposeful engagement-a mismatch between internal states and the external environment (Eastwood et al., 2012). Thus, boredom is increasingly seen not just as a passive lapse in attention or arousal, but as a signal of unmet psychological needs. The current surge in boredom research reflects this paradigm shift: from ignoring or dismissing boredom to taking it seriously as a psychological construct worthy of empirical attention and theoretical integration.

This expansion marks a shift from earlier neglect to growing recognition of boredom's psychological significance. Even though people stay away from experiencing boredom, almost at all cost, even self-inflicting pain (Havermans et al., 2015), scientists consider it anything but boring (Westgate, 2020) and continue to approach it. Despite its prevalence across all age groups and cultures, boredom remains underrepresented in psychological models of emotion and mental health (Bench & Lench, 2013). This is particularly problematic given that boredom is

consistently linked to outcomes such as depression, anxiety, impulsivity, aggression, and addictive behaviors (Elhai et al., 2018; Mugon et al., 2020).

1.2. Theoretical Perspectives on Boredom

Several frameworks have been proposed to explain boredom, as it has long resisted a unified definition, emerging instead as a multifaceted construct encompassing attentional, emotional, motivational, cognitive, and existential components. As empirical attention has grown, so has the need to integrate the scattered theoretical landscape. This section reviews the major frameworks that have shaped our understanding of boredom and contextualizes them within contemporary psychological science.

1.2.1. Attentional Models: The Failure to Engage

One of the most widely cited conceptualizations of boredom comes from attentional theory. Eastwood et al. (2012) define boredom as "the aversive state that occurs when we (a) are not able to successfully engage attention with internal (e.g., thoughts or feelings) or external (e.g., environmental stimuli) information required for participating in satisfying activity, (b) are focused on the fact that we are not able to engage attention and participate in satisfying activity, and (c) attribute the cause of our aversive state to the environment". This definition highlights both the subjective awareness of attentional failure and the external attribution that often accompanies it, which can lead to dissatisfaction, disengagement, and behavioral escape.

In this view, boredom reflects a disconnect between intention and attention-individuals want to engage but cannot. This can arise from overstimulating environments (where attention is scattered) or from monotonous ones (where attention cannot be sustained). Research has consistently shown that poor attentional control predicts boredom proneness (Hunter & Eastwood, 2018), and that momentary lapses in sustained attention are common precursors to boredom in daily life (Isacescu et al., 2017). These attentional lapses can have cascading consequences for emotional regulation and task performance, particularly in academic, occupational, or clinical contexts.

1.2.2. Existential and Meaning-Based Perspectives

Beyond the cognitive mechanics of attention, boredom has also been historically (see the philosophical approaches) interpreted through an existential lens. In this tradition, boredom emerges as a response to perceived meaninglessness, reflecting an unmet psychological need for purpose, significance, or coherence (Van Tilburg & Igou, 2012). From this perspective, boredom is not merely a failure to be stimulated, but a call to reorient one's life in search of deeper meaning. It can function as an affective signal that one's current activities or circumstances are misaligned with personal values or goals.

This theoretical stream has gained traction in recent years, particularly in work emphasizing the role of self-concept, identity, and personal agency in boredom experiences (Barbalet, 1999; Danckert & Eastwood, 2020). Studies have shown that boredom proneness is associated with lower perceived meaning in life (Tam et al., 2024) and that boredom can motivate behaviors aimed at restoring meaning, such as volunteering, creative pursuits, or even risk-taking (Van Tilburg & Igou, 2017). The idea that boredom can serve both as a threat and a motivator has reframed it as an emotionally aversive but potentially adaptive experience.

1.2.3 Motivational Models: Seeking Change and Stimulation

Closely linked with existential views are motivational models of boredom, which frame it as a drive state, a signal that current goals are unsatisfying or unreachable, and that change is needed (Bench & Lench, 2013). In this framework, boredom prompts individuals to seek novelty, engagement, or meaningful activity, similar to how hunger prompts food-seeking or fatigue promotes rest. However, unlike physiological drives, the objects of boredom are not always obvious or attainable, which can lead to restlessness, impulsivity, and maladaptive behaviors (Mugon et al., 2020).

Motivational accounts are particularly relevant in understanding why boredom is associated with both exploratory and self-destructive behaviors. When effective outlets are unavailable or coping skills are poor, boredom may manifest as irritability, frustration, or avoidance (Struk et al., 2016). This aligns with findings from Study 3 in this thesis, where boredom coping played a critical role in mediating emotional outcomes. Moreover, motivational perspectives help explain individual differences in response to boredom: those with strong executive functioning or adaptive strategies may channel boredom into creative or goal-directed pursuits, while others may default to passive or compulsive behaviors (Danckert & Merrifield, 2018).

1.2.4. Affective Perspectives: Low Arousal, High Cost

From an affective standpoint, boredom is typically described as a low-arousal negative emotion-marked by discontent, disengagement, and restlessness (Merrifield & Danckert, 2014). Although it lacks the intense physiological arousal of fear or anger, boredom exerts substantial psychological pressure, often driving individuals toward stimulus-seeking or emotional regulation behaviors. As such, it has been conceptualized as a threat to self-regulation, particularly in settings with little novelty, autonomy, or task variability (Tam et al., 2024).

1.3. Trait vs. State Boredom: Disentangling the Constructs

Modern conceptualizations of boredom distinguish between state boredom-a momentary and context-dependent experience-and trait boredom, also known as boredom proneness, which reflects a stable disposition to experience boredom frequently and across a wide variety of situations (Farmer & Sundberg, 1986; Vodanovich, 2003). This dual-process framework is increasingly central to understanding boredom's emotional, cognitive, and behavioral consequences.

State boredom refers to an acute, temporally bound experience characterized by dissatisfaction, attentional disengagement, and the perceived inability to derive meaning or stimulation from one's current environment. It can last for seconds, minutes, or hours and tends to emerge when individuals are placed in monotonous, unstimulating, or overly familiar settings (Eastwood et al., 2012; Elpidorou, 2017). As Elpidorou notes, the episodic and concrete nature of state boredom makes it accessible to introspection, measurable in time, and often visible through behavioral expressions.

State boredom involves several key psychological features (Elpidorou, 2017): dissatisfaction with the current state, disengagement from the environment, difficulty sustaining attention, altered time perception, suboptimal stimulation, motivational restlessness, varied arousal levels, observable motor expressions, and perceived lack of control.

Trait boredom, or boredom proneness, is conceptualized as a relatively stable personality characteristic. It denotes a general tendency to experience boredom more frequently, across a broader range of situations, and with greater intensity (Vodanovich, 2003; Fahlman et al., 2013). Individuals high in trait boredom are more sensitive to under-stimulating environments and tend to report more frequent disengagement, difficulty sustaining attention, and reduced self-regulatory capacities (Hunter & Eastwood, 2018).

Empirical studies have consistently linked trait boredom with a host of maladaptive outcomes, including emotional difficulties (Elhai et al., 2018; Mugon et al., 2020; Vodanovich, 2003), risky and dysfunctional behaviors (Havermans et al., 2015; LePera, 2011), cognitive impairments (Tze et al., 2016; Mercer-Lynn et al., 2014), and occupational or academic disengagement (Watt & Hargis, 2010). Alarmingly, trait boredom has even been associated with increased all-cause mortality (Britton & Shipley, 2010).

Although trait and state boredom are conceptually distinct, they are closely related. Trait boredom increases the likelihood of experiencing state boredom and may amplify its emotional effects (Tam et al., 2024). Still, the constructs differ along several dimensions:

Table 1 - Key differences between state and trait boredom (Elpidorou, 2017)

Dimension	State Boredom	Trait Boredom
Duration	Transient (seconds to hours)	Stable (months to years)
Continuity	Continuous within episodes	Discontinuous, often latent
Measurement	Concrete, introspectively accessible	Abstract, inferred through patterns
Susceptibility	Strongly influenced by context	Less situationally dependent
Emotional impact	Immediate emotional dulling or restlessness	Long-term risk for dysfunction and distress
Regulatory function	Potentially adaptive	Often associated with poor coping

Understanding the nuanced relationship between state and trait boredom has several implications. Firstly, it highlights the need for context-sensitive interventions. Reducing situational boredom may suffice for low-trait individuals, while high-trait individuals may require more targeted support, including emotional regulation training or boredom coping strategies (Tam et al., 2021). Secondly, it suggests that boredom proneness is not simply a predictor of more frequent state boredom, but a moderator of its emotional and cognitive impact.

1.4. Boredom and Mental Health: A Risk or a Signal?

Boredom is increasingly recognized not just as an unpleasant experience, but as a significant psychological state with implications for emotional, behavioral, and cognitive health. Over the past two decades, a growing body of research has linked both state boredom and trait boredom proneness to a wide array of maladaptive outcomes. Emotionally, boredom is consistently associated with elevated levels of sadness, frustration, anxiety, and irritability (Struk et al., 2017; van Hooft & van Hooff, 2018). Several studies suggest that individuals experiencing frequent boredom are more likely to report symptoms of depression, anhedonia, and emotional dysregulation (Elhai et al., 2018; Mugon et al., 2020).

Behaviorally, boredom has been shown to predict a variety of problematic behaviors. Trait boredom has been linked to increased substance use, particularly in adolescents and young adults (Weybright et al., 2015; LePera, 2011), as well as to compulsive smartphone or internet use (Elhai et al., 2017; Isacescu et al., 2017), procrastination (Blunt & Pychyl, 2000), and aggression (Dahlen et al., 2004). Some researchers have described boredom as a "behavioral risk factor," particularly when it co-occurs with poor impulse control or high sensation-seeking tendencies (Mercer & Eastwood, 2010; Biolcati et al., 2018). In extreme cases, chronic boredom has been associated with risky behaviors such as reckless driving, gambling, and even self-harm (Havermans et al., 2015).

From a cognitive standpoint, boredom has been tied to deficits in attentional control, executive function, and working memory. Individuals high in boredom proneness are more susceptible to mind-wandering, reduced cognitive flexibility, and impaired task persistence (Isacescu et al., 2017; Martarelli et al., 2021; Malkovsky et al., 2012). These cognitive consequences are particularly problematic in academic or occupational settings, where sustained attention and goal-directed behavior are essential.

Despite these associations, boredom is not necessarily pathological. Several theoretical perspectives propose that boredom may serve an adaptive function as a psychological signal that something in the current context is not aligned with one's goals, values, or interests (Elpidorou, 2014; Van Tilburg & Igou, 2017). In this sense, boredom can act as a motivational cue, encouraging the individual to seek more meaningful, stimulating, or rewarding activities. Elpidorou (2014) argues that boredom promotes the restoration of goal-directedness by making individuals aware of the inadequacy of their present situation. This functionalist view positions boredom not as a mental health liability in itself, but as a form of affective feedback that becomes maladaptive only when ignored, suppressed, or poorly regulated. Just as pain is unpleasant, but essential for our well-being or physical health, boredom may act like a powerful signal, asking for our attention to make situations either more meaningful or at least engaging.

Indeed, the line between adaptive and maladaptive boredom may depend on coping mechanisms and trait dispositions. Individuals who possess effective boredom coping strategies-such as reappraisal, goal adjustment, or task restructuring-may be better equipped to respond constructively to boring situations (Tam et al., 2024; Mugon et al., 2020). Conversely, those high in boredom proneness may lack the cognitive and emotional resources to manage their boredom effectively. For these individuals, boredom can become a chronic and destabilizing force that contributes to emotional dysregulation, low self-efficacy, and heightened vulnerability to psychological distress (Goldberg et al., 2011; Vodanovich, 2003).

Importantly, recent studies suggest that the relationship between boredom and psychopathology is likely to be bidirectional. While boredom may contribute to the onset or exacerbation of depressive and anxious symptoms, these same symptoms can also increase susceptibility to boredom by impairing attentional control, reducing intrinsic motivation, and blunting affective engagement (Tam et al., 2024; Van Hooff & Van Hooft, 2017). This dynamic interplay underscores the importance of viewing boredom within a broader self-regulatory and motivational framework, rather than as a mere epiphenomenon of under-stimulation.

Moreover, the COVID-19 pandemic offered a poignant context in which the role of boredom in mental health was starkly illustrated. Lockdowns, social isolation, and disruption of daily routines led to unprecedented levels of boredom, particularly among adolescents and young adults. Studies conducted during this period found strong associations between pandemic-related boredom and increased depression, anxiety, substance use, and problematic media consumption (Boylan et al., 2021; Martarelli et al., 2021). These findings not only highlight boredom's relevance in times of global crisis, but also emphasize the urgency of developing evidence-based interventions aimed at improving boredom regulation and emotional resilience.

In sum, boredom may function as both a risk and a signal. While it has the potential to promote self-awareness, creativity, and behavioral change, it can also trigger emotional distress and maladaptive coping when chronic, poorly regulated, or misunderstood. Understanding the mechanisms by which boredom influences mental health-and the conditions under which it becomes either a burden or a guide-remains a central challenge for contemporary psychology.

1.5. Research Gaps

Despite growing interest in boredom as a psychologically significant experience, several notable gaps and limitations persist in the empirical literature, making it difficult for the field to advance.

1.5.1. Unclear direction and strength of associations

While boredom has consistently been linked to a wide range of negative psychological, behavioral, and cognitive outcomes-including depression, anxiety, impulsivity, and addictive behaviors (Elhai et al., 2018; Mugon et al., 2020; Struk et al., 2016)-the strength, consistency, and contextual moderators of these associations remain unclear. Existing studies vary widely in effect size, population, and outcome focus, making it difficult to ascertain whether these relationships are robust or domain-specific. Furthermore, questions remain as to whether demographic factors such as gender or age moderate these effects

A key unresolved issue concerns the moderating role of factors, such as age, gender, or cultural background. Although boredom is a transdiagnostic experience, its consequences may not be uniform across populations. For instance, some evidence suggests that boredom-related impulsivity may differ between adolescents and adults (Weybright et al., 2015), and that men and women may report distinct boredom coping patterns (Tam et al., 2021). However, a comprehensive synthesis of those associations and their potential moderators is lacking.

Gender differences also remain underexplored. Preliminary evidence indicates that men and women may differ in how they experience, report, and cope with boredom, with men tending to externalize through sensation-seeking or risk-taking behaviors, while women may be more likely to experience internalizing symptoms such as anxiety or sadness (Tam et al., 2024). However, few studies have directly compared these patterns, and even fewer have examined interaction effects between boredom and demographic moderators.

Ultimately, without a systematic synthesis of findings across diverse populations and outcome domains, the field lacks a clear understanding of how boredom impacts mental health across the lifespan. Clarifying these moderator effects would be a significant step toward identifying at-risk subgroups and tailoring boredom-reduction strategies accordingly.

1.5.2. Lack of a cognitive map of boredom

Despite the growing interest in boredom as a psychologically significant state, the underlying cognitive processes that contribute to its emergence and persistence remain poorly understood. Much of the existing research has focused on the outcomes of boredom-such as impulsivity, disengagement, or mind-wandering (Danckert, 2018)-without thoroughly examining the mental content and thinking patterns that precede or accompany the state itself. This represents a major theoretical and empirical gap, particularly given that boredom is often characterized by a lack of engagement with one's internal or external environment (Eastwood et al., 2012). Attentional models have highlighted the role of failures in sustained attention or task engagement, but less is known about the cognitive appraisals, beliefs, and meta-cognitive experiences that may shape boredom. For instance, individuals who experience boredom may engage in negative self-talk, ruminate about the meaninglessness of their current activity, or adopt rigid thought patterns that inhibit reappraisal or problem-solving. Yet, these subjective cognitive reactions have rarely been captured in boredom research, leaving the psychological mechanisms vague.

Furthermore, while some studies have linked boredom with cognitive inflexibility and reduced executive functioning (Hunter & Eastwood, 2018; Malkovsky et al., 2012), there is limited research exploring how these deficits interact with real-time cognitive experiences. The extent to which boredom reflects distorted perceptions of time, unrealistic expectations for stimulation, or dysfunctional coping-related cognitions remains speculative. Even fewer studies have attempted to map cognitions during boredom episodes-such as catastrophizing, personalization, or low frustration tolerance-which are common in affective disorders and central to evidence-based theoretical approaches of emotions, such as CBT or REBT (David et al., 2009). Without deeper insight into these cognitive underpinnings, it is difficult to develop targeted cognitive-behavioral interventions to manage boredom effectively. Understanding what people think in order to reach boredom-not just what they do or feel during or after those experiences-could offer crucial clues for differentiating between adaptive boredom and patterns that spiral into emotional distress or maladaptive behaviors.

1.5.3. Neglect of potential mediator or moderator factors

Although boredom is widely recognized as a context-sensitive experience, surprisingly little empirical attention has been given to the situational or psychological factors that may moderate or mediate its effects on emotional, behavioral, and cognitive outcomes. Existing literature often documents correlations between boredom and maladaptive outcomes-such as depression, impulsivity, or substance use-without sufficiently investigating the mechanisms or contextual variables that account for these associations (Mugon et al., 2020; Elhai et al., 2018).

Boredom's emotional signature is especially complex, varying not only in intensity but also in arousal and affective tone. While some individuals report low-arousal experiences of fatigue, disengagement, or sadness, others experience boredom as a restless, irritable, or frustrated state-often with high arousal (van Hooft & van Hooff, 2018). This variability suggests that contextual moderators-such as task difficulty, autonomy, perceived meaningfulness, and environmental stimulation-play a crucial role in shaping how boredom is experienced and expressed. For instance, the same task may be experienced as boring and emotionally draining when autonomy is low, but less distressing when individuals perceive control or purpose.

Despite these patterns, few studies have systematically examined moderator effects, leaving major questions unanswered. Equally understudied are the mediators-particularly cognitive and emotional processes-that might explain how and why boredom leads to distress or dysfunction. Cognitive distortions (e.g., catastrophizing, personalization), poor emotion regulation skills, and low frustration tolerance may all contribute to boredom's downstream consequences, but have received limited attention in empirical models. Moreover, the role of reappraisal, self-reflection, or disengagement strategies in regulating boredom remains largely unexplored, with few notable exceptions (Nett et al., 2010; Nakamura, 2021).

Understanding boredom's correlates more in depth requires moving beyond simple associations and toward integrated models that examine when, how, and for whom boredom becomes maladaptive. This includes investigating emotion regulation strategies as mediating variables that explain individual differences in boredom outcomes and identifying situational moderators that alter the emotional impact of boredom-inducing environments. Without these analyses, our understanding of boredom remains incomplete, and interventions risk being too generalized or ineffective across different contexts.

Advancing boredom research will therefore require multi-level approaches that consider both person-level traits (e.g., boredom proneness, cognitive flexibility) and context-level features (e.g., task novelty, social constraints) in shaping how boredom unfolds and impacts mental health. Moderator and mediator analyses are not only methodologically important-they are theoretically indispensable for decoding the complexity of boredom's emotional landscape.

1.5.4. Lack of longitudinal and experimental data

Despite the growing interest in boredom as a psychologically significant state, much of the existing literature remains limited by its reliance on cross-sectional and correlational research designs. This methodological pattern restricts the field's ability to establish causal inferences, assess directionality, or examine changes in boredom and its effects over time (Tam et al., 2021b; Westgate, 2020). While numerous studies document associations between boredom and emotional distress, impulsivity, addiction, and poor well-being (Elhai et al., 2018; Mugon et al., 2020), these findings are often snapshots in time and cannot tell us whether boredom leads to these outcomes, results from them, or both.

Not enough studies have employed longitudinal designs capable of tracing how boredom fluctuates and accumulates within individuals over days, weeks, or months, or whether early boredom experiences predict later psychological difficulties. Without this temporal data, researchers cannot disentangle state-based variations in boredom from stable, trait-like tendencies, nor can they test dynamic models of interaction between boredom, affect regulation, and behavioral outcomes.

While boredom has been shown to impair attention, reduce cognitive flexibility, and increase risk-taking in laboratory settings (Bench & Lench, 2013; Moynihan et al., 2021), its emotional consequences remain surprisingly understudied in experimental paradigms. Most existing research relies on retrospective self-reports or global trait measures, which fail to capture the immediate affective dynamics triggered by situational boredom. As a result, there is limited empirical clarity on whether state boredom reliably increases negative affect (e.g., frustration, anxiety) or suppresses positive affect (e.g., enjoyment, interest), particularly in controlled settings.

Moreover, experimental studies seldom examine how individual differences in boredom proneness interact with induced boredom to shape emotional or behavioral outcomes. This interaction is theoretically meaningful, as trait boredom may amplify or attenuate the impact of situational boredom (Fahlman et al., 2013; Tam et al., 2021b), yet it remains poorly understood. Investigating how dispositional and contextual factors jointly influence affective

responses would offer deeper insights into boredom's psychological mechanisms and inform the development of targeted interventions for those most vulnerable to its effects.

Overall, the lack of longitudinal and experimental research leaves open key questions: Does boredom predict emotional dysregulation or does emotional dysregulation increase boredom? Are the same individuals consistently more vulnerable to boredom's negative consequences? And how do these patterns shift across different developmental stages or life contexts? Addressing these gaps is critical for both theoretical refinement and effective intervention design.

1.5.5. Lack of Intra-Individual Perspective

While boredom has traditionally been approached as a relatively stable individual difference-most often operationalized through trait measures such as the Boredom Proneness Scale (Farmer & Sundberg, 1986; Vodanovich, 2003)-growing empirical evidence suggests that boredom may also fluctuate dynamically within individuals across time and situations (Hunter et al., 2015). Despite this recognition, most boredom research remains limited to between-person analyses, averaging across participants and neglecting intra-individual variation. This approach may obscure critical patterns of momentary vulnerability and resilience that unfold within individuals' everyday experiences.

Capturing these dynamic shifts is essential for understanding how boredom operates as both a transient state and a chronic disposition. For example, some individuals may experience boredom only in specific contexts (e.g., low-autonomy tasks), while others might exhibit broader susceptibility across settings. However, without methods capable of modeling such fluctuations, these important distinctions remain speculative.

A promising but underutilized strategy for addressing this gap is multilevel structural equation modeling (MSEM). Unlike traditional cross-sectional designs or global trait measures, MSEM allows researchers to disaggregate within-person and between-person variance, offering a more precise view of how boredom unfolds over time, how it interacts with contextual features, and how it relates to concurrent emotional and behavioral outcomes. By combining the strengths of longitudinal and hierarchical modeling, MSEM can provide richer insights into how state boredom predicts subsequent mood, behavior, or cognitive states within individuals, while simultaneously accounting for stable individual differences such as boredom proneness or coping ability.

To date, however, few studies have applied such advanced analytic approaches in boredom research, leaving a notable gap in understanding the temporal dynamics and intra-individual complexity of boredom. Bridging this gap could improve predictive models of psychological functioning and inform tailored interventions for boredom-related difficulties.

1.5.6. Summary

This chapter provides a comprehensive theoretical foundation for the psychological study of boredom, outlining its ubiquity, complexity, and significance for mental health. Once considered a trivial or socially disvalued emotion, boredom has emerged as a topic of multidisciplinary inquiry, now recognized as a meaningful psychological experience with cognitive, emotional, motivational, and existential dimensions.

The chapter reviews key theoretical perspectives, beginning with attentional models that frame boredom as a failure to sustain engagement, then exploring existential accounts that see boredom as a signal of unmet needs for meaning. Motivational models depict boredom as a drive toward novelty and change, while affective theories emphasize its low-arousal, aversive nature and threat to emotional well-being.

A critical distinction is made between state boredom, a transient, situationally induced experience, and trait boredom, a dispositional tendency toward frequent and intense boredom. These constructs differ in duration, measurement, and emotional consequences, but they interact in meaningful ways-particularly in shaping self-regulatory capacity and vulnerability to distress.

Finally, the chapter outlines several pressing gaps in the literature, including unclear effect sizes and moderators, limited understanding of cognitive underpinnings, neglect of contextual mediators, lack of experimental and longitudinal studies, and underexploration of intra-individual dynamics. These gaps point to an urgent need for methodologically robust, theoretically integrative research to clarify boredom's psychological mechanisms and its role in well-being and dysfunction.

CHAPTER II. RESEARCH OBJECTIVES AND OVERALL METHODOLOGY

This thesis aims to advance the understanding of boredom as a psychological construct by integrating multiple methodological approaches to explore its emotional, cognitive, and dispositional dimensions pertaining to both psychological health and psychopathology. Across five research studies, we pursued a series of interrelated

objectives to clarify the strength of boredom's associations with maladaptive outcomes, investigate its underlying cognitive mechanisms, and evaluate the roles of state and trait boredom and coping strategies in predicting emotional responses. These objectives were driven by significant gaps identified in the literature, including the heterogeneity of associations with boredom, the limited examination of mediators and moderators, the scarcity of longitudinal data, the underrepresentation of within-person variations, and the lack of causal data.

Our first objective (study 1) was to systematically synthesize and quantify the associations between boredom and a wide spectrum of psychological correlates. Specifically, the meta-analysis focused on (a) negative emotions (e.g., sadness, anger, frustration), (b) maladaptive behaviors (e.g., substance use, procrastination, risky behaviors), and (c) clinical symptoms (e.g., anxiety, depression, ADHD). A meta-analytical framework was used to compute the overall strength of these associations and to test for the presence of both categorical (e.g., sample type, publication type) and continuous moderators (e.g., age, gender, cultural setting).

In conducting the meta-analysis, rigorous inclusion criteria were established to ensure that only peer-reviewed, empirical studies with sufficient statistical data were included. Advanced meta-analytic techniques were employed, including random-effects modeling, moderator analyses, and publication bias diagnostics. This allowed for not only quantification of the average strength of associations between boredom and various psychological outcomes, but also for testing the robustness of these findings across different subpopulations and methodological features.

Study 1 responds to a notable gap in the literature: while boredom has been repeatedly associated with negative psychological outcomes, these findings have largely been presented in isolated studies, limiting their generalizability. By providing a quantitative synthesis and identifying both the magnitude and moderators of boredom's psychological effects, this study offers a foundational reference point for future research and contributes to theory-building in the psychology of boredom.

The second study focused on the cognitive underpinnings of trait boredom using theoretical models derived from Rational Emotive Behavior Therapy (REBT). Therefore, our second objective was to test both the psychopathology and psychological health versions of the REBT model by examining the relationship between trait boredom and a wide array of cognitive beliefs (e.g., demandingness, frustration intolerance, catastrophizing, and preferences). These cognitive patterns were treated as independent variables (beliefs, or B), while trait boredom was treated as the outcome (consequence, or C).

This study also explored the associations between trait boredom and internalizing symptoms such as anxiety and depression. Importantly, it was conducted in an Eastern European context, which remains underrepresented in psychological research on boredom. Most existing studies have been conducted in Western or Asian settings, and this study provides valuable insight into how these cognitive-affective relationships manifest in a Romanian sample. Using cross-sectional self-report data and advanced modeling techniques, the study tested the fit of both the REBT psychopathology model (based on irrational thinking patterns) and the psychological health model (based in rational thinking patterns), thus attempting to fill the gap related to the cognitive map of boredom.

A longitudinal multilevel structural equation modeling (MSEM) framework was employed in the third study, in order to approach our third main objective of examining the dynamic interplay between state boredom, emotional responses, and boredom coping over time. The study was conducted across three measurement points and addressed both between-subject and within-subject variations. Specifically, the objectives were threefold: (a) to determine whether individuals with generally higher levels of state boredom report higher levels of negative emotions across time (between-subject effects), (b) to assess whether intra-individual fluctuations in boredom are associated with concurrent shifts in emotional states (within-subject effects), and (c) to evaluate whether boredom coping mediates the relationship between boredom and negative emotions at all time points.

Participants completed measures of state boredom, emotional experience, and boredom coping strategies at three distinct time points. The MSEM approach enabled a decomposition of the total effects into within- and between-person components, offering fine-grained insight into how boredom and emotion interact in real time. By incorporating coping as a mediator, the model addressed not just whether boredom relates to emotion, but how that process unfolds psychologically.

Findings revealed that both trait-like and momentary experiences of boredom are linked to elevated negative affect. Furthermore, boredom coping played a significant mediating role, with adaptive coping strategies buffering against negative outcomes. This study is among the few to capture these dynamics longitudinally, making it a key direction in our endeavor of filling this gap in the growing field of boredom research.

The fourth main objective was to investigate whether boredom predicted loneliness across time at both the within-subject and between-subject levels and to evaluate the mediating role of boredom coping in these relationships. It was hypothesized that individuals who experienced greater levels of boredom would also report greater loneliness, and that changes in boredom within individuals over time would be mirrored by concurrent

changes in loneliness. Boredom coping was hypothesized to serve as a mediator, such that individuals employing more adaptive coping strategies would report reduced loneliness in response to boredom.

The longitudinal design of this study allowed for differentiation between stable traits and momentary experiences, providing insight into the temporal dynamics of boredom and loneliness. Using MSEM techniques, the study estimated distinct paths from boredom to loneliness and identified both direct and indirect effects via coping. This approach addressed the need for more nuanced models of how boredom translates into social and emotional difficulties.

Findings supported the hypothesized relationships, with boredom predicting loneliness across levels and boredom coping playing a partial mediating role. These results highlight the interpersonal costs of boredom, particularly when individuals lack effective strategies to manage it. Importantly, the study adds to the limited research examining the broader social implications of boredom, which is often narrowly construed as an individual, internal state.

By showing that boredom has consequences beyond immediate emotional discomfort-extending into feelings of social disconnection-this study underscores the potential utility of boredom-focused interventions for improving emotional and interpersonal well-being.

The final study in this thesis (Study 5) adopted an experimental approach to investigate the immediate emotional effects of state boredom and the moderating roles of trait boredom and coping strategies. Participants were randomly assigned to either a boredom-inducing condition (watching a monotonous, meaningless video) or a control condition (viewing a nature documentary), and their emotional states were assessed post-induction.

The study aimed to determine whether state boredom leads to reductions in positive affect and increases in negative affect, particularly dysfunctional emotions. Furthermore, it explored whether trait boredom proneness moderates these effects, with the expectation that individuals high in boredom proneness would exhibit stronger emotional reactions to the induction. Boredom coping was also assessed to examine its potential as a moderating or mediating variable. It provides one of the few attempts to isolate the emotional consequences of state boredom in the lab while accounting for individual differences in trait boredom. This study reinforces the need for further experimental research to clarify boredom's immediate effects and to understand how stable traits and situational factors interact to shape emotional experiences. It also points to the importance of including both functional and dysfunctional emotions in assessments, in order to better capture the diversity of responses elicited by boredom-inducing contexts.

In summary, the overall aim of this dissertation is to advance the understanding of boredom as a psychologically significant experience in psychological health and psychopathology with emotional, cognitive, and behavioral implications. The following specific objectives were formulated: (a) To assess the magnitude and consistency of the association between boredom and three domains of psychological maladjustment, such as negative emotions (e.g., anxiety, sadness, irritability), maladaptive behaviors (e.g., procrastination, substance use), and clinical symptoms (e.g., depression, psychological distress); (b) to explore the cognitive underpinnings of trait boredom using REBT theory, by testing both models of psychopathology and psychological health; (c) to examine boredom coping as a mediator between state boredom and emotions, using a multilevel longitudinal design, in order to understand how momentary fluctuations in state boredom influence positive and negative emotional states, both between- and within-person; (d) to experimentally test the causal effect of state boredom on emotional experience, particularly distinguishing between positive affect, functional negative emotions, and dysfunctional negative emotions. This also includes testing whether boredom proneness and coping moderate these effects.

CHAPTER III. ORIGINAL RESEARCH

Study 1. A Meta-analystical Assesment of the Strength of Association Between Boredom and Negative Psychological Outcomes

1.1. Introduction

Boredom is an aversive emotional experience that arises when individuals are unable to direct their attention toward either internal stimuli (e.g., thoughts, emotions) or external stimuli (e.g., tasks, environment) in a meaningful and engaging way. More than a simple lack of stimulation, boredom involves a subjective dissatisfaction with one's current state, a sense of disengagement, and a tendency to attribute that dissatisfaction to the external environment (Eastwood et al., 2012). Whether described as a state or a trait, boredom reflects a mismatch between cognitive, emotional, or motivational needs and the environment's ability to fulfill them (Bench & Lench, 2019). As such, it is increasingly recognized as a psychologically meaningful experience (Chan et al., 2018) - not just a fleeting nuisance, but a signal of unmet psychological needs (Van Tilburg & Igou, 2012).

Despite being one of the most commonly experienced emotions in everyday life (Daschmann et al., 2011; Chin et al., 2017), boredom has long been overlooked in psychological research. However, interest in the topic has

surged in recent years (Martz et al., 2016), especially with the growing awareness that boredom may act as a vulnerability factor in both emotional regulation and mental health (Macklem, 2015). Previous theoretical perspectives have framed boredom as a negatively valenced state associated with low arousal, impaired attentional control, and reduced perceived meaning (Raffaelli et al., 2018), while others have likened it to pain - unpleasant but potentially adaptive, signaling the need for change, reorientation, or reengagement (Elpidorou, 2014; Bench & Lench, 2013).

Empirical studies have begun to link boredom to a wide array of psychological consequences, including elevated negative emotions (e.g., anxiety, sadness, irritability; Goldberg et al., 2011), maladaptive behaviors (e.g., procrastination, substance use, excessive smartphone or internet engagement; Todman et al., 2008), and clinical symptoms (e.g., depression, anhedonia, stress, and addictive patterns). Still, the findings remain scattered across different populations, measures, and theoretical frameworks. Existing meta-analytic work has been narrow in focus - for example, limited to the academic context (Tze et al., 2015) - and there remains a critical gap in understanding the broader psychological significance of boredom beyond educational performance.

Compounding this issue, the construct of boredom itself is inconsistently measured. While some instruments capture momentary, state-level boredom (e.g., Multidimensional State Boredom Scale), others reflect boredom proneness as a stable individual trait (e.g., Boredom Proneness Scale). The majority of empirical research uses the BPS, though recent reviews suggest the field is rapidly diversifying in its measurement approaches (Vodanovich, 2003; 2012). Meanwhile, different contexts - such as academic, occupational, or interpersonal boredom - may invoke different psychological processes and consequences.

Moreover, several demographic and contextual variables may moderate boredom's psychological impact (Tam et al., 2022). Age has shown mixed effects, with some studies finding that adolescents and young adults are particularly vulnerable to boredom-related impulsivity and affective instability, while others suggest that older adults experience more existential forms of boredom (Plummer, 2019). Similarly, gender may play a role (Studak & Workman, 2004; Vodanovich et al., 2011), with emerging evidence that women may report greater emotional or internalizing consequences of boredom than men (Sundberg et al., 1991).

Given these uncertainties, there is a clear need for a systematic synthesis of the literature on boredom's psychological correlates. The current meta-analysis addresses this gap by examining the strength and consistency of boredom's associations with three categories of negative outcomes. This meta-analysis aims to quantify the associations between boredom and (a) negative emotions, (b) maladaptive behaviors, and (c) clinical symptoms, and to identify both categorical and continuous moderators of these relationships.

1.2. Method

1.2.1. Inclusion Criteria

Studies were included if they met several criteria. First, the study had to explicitly assess boredom using a validated psychological scale or subscale; single-item or ad hoc measures were excluded. Second, the sample had to consist of adult human participants (aged 18 and over). Third, the study must report a statistical association (typically a correlation coefficient) between boredom and at least one of three psychological outcome categories: negative emotional states (such as sadness, anxiety, or anger), maladaptive behaviors (such as substance use, procrastination, or digital overuse), or symptoms indicative of psychological disorders (such as depression, stress, or addictive behaviors). All included articles were published in English in peer-reviewed journals. Only cross-sectional designs were considered eligible for inclusion.

1.2.2. Exclusion Criteria

Studies were excluded if boredom was not a focal variable or if it was assessed through unvalidated measures such as single-item or ad hoc scales. Additional exclusion criteria included insufficient statistical data to calculate an effect size, focus on non-psychological outcomes (e.g., academic performance, GPA), samples limited to individuals under 18 (or without any data to clarify that participants were over 18 years old), and non-English or non-peer-reviewed publications.

1.2.3. Searching strategy

A comprehensive literature search was conducted across four major databases: PsycINFO, PubMed, SCOPUS, and ISI Web of Science. The search took place between December 2020 and January 2021 and was limited to peer-reviewed articles published in English. Search terms combined boredom-related keywords (e.g., "bored," "tedious," "ennui") with a wide range of psychological, behavioral, and clinical terms (e.g., "emotion," "addiction," "depression," "dysfunction," "maladaptive behavior"). The full search string included both emotional

and behavioral indicators as well as clinical symptomatology, aiming to capture the breadth of boredom's psychological correlates. We searched those terms in both title and abstract, without applying any filter.

1.2.4. Study Selection

Based on the inclusion and exclusion criteria, two independent evaluators screened the articles' titles and abstracts, employing EndNote. The same evaluators independently evaluated the articles selected for full-text review, and any discrepancies were managed through mutual discussion.

1.2.5. Data extraction

Two independent coders reviewed and extracted data from the studies considered eligible. Extracted variables included the reported effect size (e.g., Pearson's r), sample size, mean participant age, proportion of female participants, outcome, type of boredom scale used, and characteristics of the sample (student vs. non-student; clinical vs. non-clinical; country). Where disagreements occurred, they were resolved through discussion, without the intervention of a third evaluator being deemed necessary.

1.2.6. Moderator analysis and coding

We categorized outcomes into three domains: negative emotions, maladaptive behaviors, and clinical symptoms. Effect sizes were included if they reflected a reported association between boredom, measured using a validated instrument, and any of the targeted psychological outcomes. In cases where studies reported multiple relevant outcomes or independent subgroups, these were coded as distinct samples. Therefore, in order to account for potential heterogeneity, we coded a range of moderator variables. Categorical moderators included sample type (clinical vs. non-clinical), educational status (student vs. non-student), and the specific boredom scale used. Measures of boredom were classified as the Boredom Proneness Scale (BPS), Boredom Susceptibility Scale (BSS), the Multidimensional State Boredom Scale (MSBS), or other validated tools. This categorization was based on the recognition that different instruments may capture varying aspects of boredom, such as trait-like tendencies versus state-specific experiences, as different boredom instruments tend to capture either state-specific or trait-like aspects of boredom. The Multidimensional State Boredom Scale (MSBS), for instance, measures momentary disengagement and inattention, while the Boredom Proneness Scale (BPS) assesses an individual's general tendency to feel bored across time and contexts (Fahlman et al., 2013; Kass et al., 2001).

We also included continuous moderators where such data were available, and the necessary coding information was sufficient. These consisted of mean participant age, the percentage of female participants in the sample, and overall sample size. When possible, these variables were incorporated into meta-regression models to directly assess their impact on effect size variability in an objective manner.

All moderator data were coded independently by two raters, using a structured protocol that had previously been agreed on. Discrepancies were discussed and resolved by consensus. This approach allowed for a systematic and comprehensive examination of the methodological and demographic factors that might influence the observed associations between boredom and negative psychological outcomes.

1.2.7. Meta-analytical procedure

Given the diversity of samples across the included studies-with participants drawn from different countries, populations, and sociodemographic contexts-a random-effects model was used to estimate pooled effect sizes. This model was deemed most appropriate, as it accounts for between-study variability and assumes that individual studies estimate different yet related true effects (Borenstein et al., 2011). Separate meta-analyses were conducted for each of the three outcome domains: negative emotions, maladaptive behaviors, and clinical symptoms.

As already mentioned, moderator analyses were used to investigate potential sources of heterogeneity, including both categorical variables (e.g., sample type, boredom scale used) and continuous variables (e.g., mean age, percentage of female participants). Categorical moderators were examined through subgroup analysis, while continuous moderators were analyzed using meta-regression models. Following Fu et al. (2011), subgroup comparisons were performed only when a minimum of four studies was available for each subgroup.

Moderator analyses were conducted using subgroup analysis (for discrete variables) and meta-regression (in the case of continuous variables) within CMA. Categorical moderators included sample type (clinical vs. non-clinical), student status (student vs. non-student), and boredom scale type (Boredom Proneness Scale vs. Boredom Susceptibility Scale). Continuous moderators included mean age and percentage of female participants within the sample. All analyses were performed using Comprehensive Meta-Analysis software (version 2.2).

1.2.8. Effect Size Calculation

Effect sizes were extracted or computed as correlation coefficients (r), reflecting the strength of the association between boredom and the outcome variables. When necessary, other reported effect sizes (e.g., standardized mean differences, odds ratios) were converted to r using established conversion formulas (Borenstein et al., 2009). Correlation coefficients were first transformed to Fisher's z to normalize the distribution and stabilize variance. After meta-analytic computations, results were back-transformed to r for interpretation.

According to Cohen's (1988) guidelines, values of r around .10 indicate small effects, around .30 medium effects, and .50 or higher large effects. Studies reporting multiple associations between boredom and outcomes were handled with care to avoid double-counting; when appropriate, multiple effect sizes were averaged within studies to produce a single estimate per sample. If separate subgroup data were reported (e.g., by diagnosis or population), these were treated as independent samples, provided there was no overlap in participants.

Studies were assessed for statistical outliers, defined as those whose 95% confidence interval did not overlap with the pooled effect size confidence interval. When the same outcome was measured using more than one instrument in a single study, effect sizes were averaged across instruments. When multiple boredom–outcome associations were reported for different subgroups within the same sample, they were treated separately only if independence could be confirmed.

Heterogeneity was evaluated using both Cochran's Q statistic and the I^2 statistic, which quantifies the proportion of variance attributable to between-study differences. I^2 values of 25%, 50%, and 75% were interpreted as indicating low, moderate, and high heterogeneity, respectively (Crombie & Davies, 2009). Confidence intervals around I^2 estimates were calculated using the non-central chi-square approach where appropriate (Orsini et al., 2006). Moderator effects were tested using the Q-between statistic for categorical variables.

1.2.9. Publication Bias

Given that each of the three primary outcome categories included more than 10 effect sizes, we assessed the presence of small study effects and publication bias through multiple approaches. Funnel plots were visually inspected for asymmetry, and the trim-and-fill method (Duval & Tweedie, 2009) was used to estimate potential missing studies. In addition, we calculated Rosenthal's fail-safe N (Rosenthal, 1979) to determine how many null-result studies would be needed to reduce the observed effect to nonsignificance (Sterne et al., 2011).

1.3. Results

1.3.1. Systematic Review

1.3.1.1. Included studies

A total of 13,712 records were initially identified through systematic searches across four electronic databases: PsycINFO, PubMed, SCOPUS, and Web of Science. After removing 2,657 duplicates, 11,055 unique records remained for screening. Titles and abstracts were assessed for relevance, leading to the exclusion of 10,766 records that did not meet the basic inclusion criteria. Subsequently, 289 full-text articles were retrieved and examined in detail. Of these, 250 studies were excluded based on criteria such as inadequate measurement of boredom, absence of relevant outcomes, insufficient statistical data, or non-adult samples. Ultimately, 39 studies met all eligibility criteria and were included in the final meta-analysis. The study selection process is detailed in Figure 1 (PRISMA Flow Diagram).

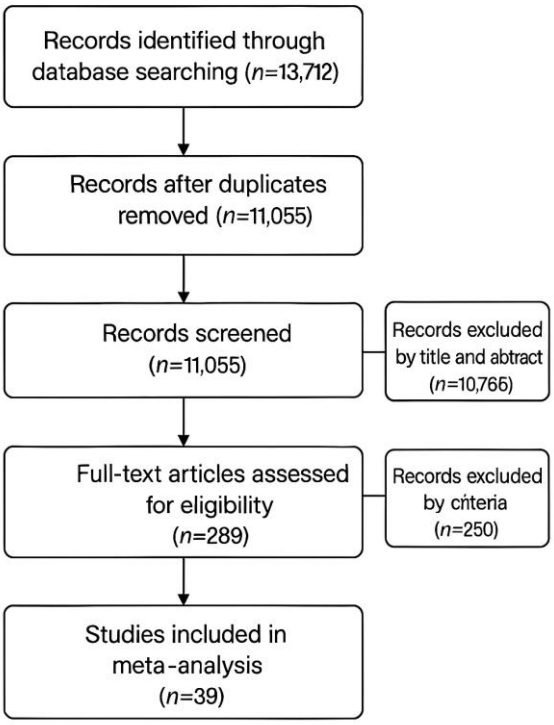

Fig. 1.1. PRISMA Flow Diagram

1.3.1.2. Study Characteristics

The final dataset included 39 studies yielding a total of 56 effect sizes, based on data from 23,020 participants. The majority of studies used cross-sectional designs and were conducted in diverse cultural and geographical contexts including North America, Europe, Asia, and Australia. The sample types varied across studies, with 27 involving student populations and 12 involving non-student or clinical populations. Among all samples, the percentage of female participants ranged widely, from 0% to 100%, with a median of approximately 60%. Reported mean ages of participants ranged from 18 to 49.3 years, reflecting a focus on adult populations, in line with the inclusion criteria.

Boredom was primarily assessed through three validated self-report instruments: the Boredom Proneness Scale (BPS), the Boredom Susceptibility Scale (BSS), and the Multidimensional State Boredom Scale (MSBS). In some studies, adaptations or shorter versions of the BPS were used (e.g., sBPS), and a few employed context-specific instruments like the Job Boredom Scale. These instruments were applied consistently across both student and clinical populations.

As for outcome variables, studies covered a broad spectrum of negative psychological constructs. Emotional outcomes included anxiety, depression, anger, stress, and general affect (e.g., as measured by PANAS or DASS-21). Maladaptive behaviors assessed in the studies included impulsivity, aggression, problematic smartphone or internet use, risky driving, compulsive buying, gambling, substance use, and cyberloafing. A smaller subset of studies included clinical symptomatology measures, such as diagnostic scales for depression or anxiety, or general psychological distress (e.g., HADS, BDI, GHQ-28). Most outcomes were measured using standardized instruments with well-established psychometric properties, reported by participants themselves.

Some studies provided multiple outcomes, either reporting correlations between boredom and several different constructs or presenting data for multiple subgroups (e.g., males vs. females, students vs. non-students). These were treated as separate effect sizes for the purpose of the meta-analysis.

1.3.1.3. Sample Description

The total combined sample across the 39 included studies comprised 23,020 adult participants, with individual study sample sizes ranging from 52 to 3,435. Most samples were drawn from community or university populations, with the majority of studies (n = 27) focusing on student samples, often recruited via online platforms, classroom settings, or campus-wide announcements. The remaining studies included non-student community samples or clinical populations, recruited from mental health centers or broader community settings.

Participants' ages ranged from 18 to 49.3 years, with a mean age of approximately 25.6 across studies that reported this data. Where gender distribution was available, the percentage of female participants varied considerably, from entirely male to entirely female samples, with most studies reporting a majority female sample (median ~60%).

In terms of geographic distribution, the studies were conducted across multiple continents, reflecting an international interest in the psychological correlates of boredom. The most represented countries included the United States, Canada, Australia, the United Kingdom, and several European nations. A few studies also included samples from Asia and South America, enhancing the generalizability of findings across cultural contexts.

We categorized outcomes into three domains: negative emotions, maladaptive behaviors, and clinical symptoms. Moderators included sample type (clinical vs. non-clinical), student status, the specific boredom scale used (e.g., BPS, BSS), mean participant age, and gender composition. All effect sizes were transformed to Fisher's z for computation and then converted back to Pearson's r for interpretation. Analyses were performed using Comprehensive Meta-Analysis (version 2.2), employing a random-effects model to account for between-study variability. Heterogeneity was assessed with Cochran's Q and I^2 statistics. Publication bias was evaluated through funnel plots, Duval and Tweedie's trim-and-fill method, and Rosenthal's fail-safe N. Moderator effects were analyzed through subgroup comparisons and meta-regression.

1.3.2. Main effects of boredom and negative outcomes

This meta-analysis synthesized data from 56 effect sizes across 39 studies, assessing data from 23,020 adult participants, to examine the association between boredom and three categories of negative psychological outcomes: negative emotions, maladaptive behaviors, and clinical symptoms. Random-effects models were employed throughout. Across all domains, boredom demonstrated a significant and positive association with negative outcomes (r = .338, 95% CI [.301; .373]). The strongest effect emerged in relation to clinical symptoms (r = .471, 95% CI [.414, .524]), followed by negative emotional experiences (r = .337, 95% CI [.292, .381]) and maladaptive behaviors (r = .293, 95% CI [.244, .340]). All effects were statistically significant ($p < .001$). Heterogeneity was substantial across domains, with I^2 values ranging from 83% to 88%, indicating considerable between-study variability and justifying the inclusion of moderator analyses.

Publication bias was assessed using Duval and Tweedie's trim-and-fill method and fail-safe N estimates. The number of potentially missing studies was small for all domains (2 for emotions, 3 for symptoms, 7 for behaviors), and adjusted effect sizes remained similar or even slightly stronger. The adjusted estimate for maladaptive behaviors rose to r = .351 after imputation, while fail-safe N calculations revealed that 7,907 studies would be needed to nullify the effect.

The adjusted estimate for negative emotions rose to r = .335 after imputation, while fail-safe N calculations revealed that 7,431 studies would be needed to nullify the effect. The adjusted estimate for symptoms rose to r = .51 after imputation, while fail-safe N calculations revealed that 937 studies would be needed to nullify the observed effect.

1.3.2.1. Subgroup analyses

Consistent with our objectives, subgroup analyses were conducted, especially in the context of high heterogeneity. They constantly showed significant effects of moderator variables, both in the case of continuous and categorical ones. Moderator analyses revealed several consistent patterns. For sample type, clinical populations generally showed stronger associations in the emotion and behavior domains. However, this pattern reversed in the symptoms domain, where non-clinical samples exhibited a slightly higher average effect (r = .507) than clinical samples (r = .458). Student status also significantly moderated effects across all three domains. Studies involving student samples reported stronger associations between boredom and negative outcomes than those involving non-students. In the clinical symptoms domain, for instance, the mean effect size in student samples was r = .535, compared to r = .337 among non-students.

Discussion

The results of this meta-analysis confirm a consistent and significant association between boredom and negative psychological outcomes in adults. Across 39 studies and 56 effect sizes, boredom was positively correlated with negative emotions (r = .337), maladaptive behaviors (r = .293), and clinical symptoms (r = .471), with all

associations reaching statistical significance. The association was strongest for clinical symptoms, suggesting that boredom may play a particularly meaningful role in the development or maintenance of psychological distress. Substantial heterogeneity across studies justified the moderator analyses, which helped to identify several meaningful explanatory variables.

The robustness of the results was also supported by high fail-safe N values and minimal publication bias. In fact, trim-and-fill procedures suggested that the true effects may have been slightly underestimated, particularly in the domains of maladaptive behavior and negative emotions. Heterogeneity was high across all outcome categories, reflecting methodological, demographic, and cultural diversity in the included studies. However, this variability also underscores the generalizability and real-world relevance of boredom as a psychological construct.

Moderator analyses provided further nuance. The measurement instrument emerged as a significant moderator, particularly in the domain of negative emotions. Studies using the Boredom Proneness Scale (BPS) yielded consistently stronger associations than those using the Boredom Susceptibility Scale (BSS). These findings align with concerns in the literature regarding the validity of the Boredom Proneness Scale (BPS) as a pure measure of trait boredom. Specifically, there is accumulating evidence that BPS may overestimate emotional vulnerability due to conceptual overlap with other constructs such as impulsivity, anhedonia, and experiential avoidance (Mercer-Lynn et al., 2013; Zhang et al., 2015; Cai et al., 2022). For instance, longitudinal research has shown that only 28% of the variance in BPS scores reflects trait boredom, with the remainder influenced by transient state factors or measurement error (Gana et al., 2019). This suggests that high BPS scores may, in part, reflect broader affective or self-regulatory vulnerabilities rather than boredom itself, in accordance with theories viewing boredom as a regulatory mechanism (Danckert et al., 2018).

Sample type also influenced the magnitude of associations. While clinical and student samples generally showed stronger boredom–outcome relationships than non-clinical or non-student groups, the moderating effect reached significance only in the case of negative emotions. This may reflect differences in emotion regulation capacity or motivational control, as students and clinical populations may experience greater environmental constraints (Tze, Daniels, Klassen, 2015; Pedrini & Meloni, 2024) or emotional instability (Lai et al., 2022), heightening the impact of boredom.

Interestingly, age and gender emerged as consistent continuous moderators across outcome domains. Younger participants showed stronger associations between boredom and negative outcomes-particularly maladaptive behaviors and symptoms-possibly due to underdeveloped coping strategies or greater reactivity to environmental constraints, promoting impulsivity (Moynihan et al., 2017). In contrast, samples with higher percentages of female participants exhibited stronger boredom–symptom links, a pattern consistent with gender differences in internalizing symptoms and affect regulation. However, in the domain of emotions, the pattern was reversed, suggesting that gender moderates the boredom–emotion link in complex, context-dependent ways. These results may also reflect known gender differences in boredom proneness, with men often scoring higher on trait boredom, and women potentially being more vulnerable to its emotional consequences (Studak & Workman, 2004; Vodanovich et al., 2011).

From a theoretical standpoint, these results reinforce the view of boredom as a psychologically meaningful and multifaceted emotion, rather than a trivial or passive experience. Boredom may serve as an early warning signal of disengagement (Elpidorou, 2015), motivational depletion (Wolff & Martarelli, 2020), or unmet psychological needs (Van Tilburg & Igou, 2012). The significant associations across all outcome categories suggest that boredom should be considered more centrally in models of emotion regulation, behavioral dysregulation, and psychopathology. Additionally, we should take into account that both boredom and symptoms of psychological disorders share associations with lack of meaning, one of the possible mechanisms of explaining our results.

Practically, the findings suggest that boredom assessment could be a useful component in mental health screening, particularly among youth, students, or individuals presenting with impulsivity or mood disorders. Interventions that enhance boredom coping strategies-such as promoting mindfulness, adaptive emotion regulation, or behavioral activation-could buffer individuals from boredom's adverse effects. Moreover, in clinical settings, boredom may deserve attention not only as a symptom but as a potential contributor to comorbidity and relapse, particularly in disorders characterized by apathy, impulsiveness, or anhedonia.

Lastly, a period where people are predisposed to boredom, such as a pandemic, is especially to be taken into account. The global crisis of COVID-19 pandemic created unprecedented conditions that may have amplified individuals' susceptibility to boredom through factors such as prolonged isolation, monotony, disrupted routines, and reduced access to stimulating activities. These environmental stressors may have heightened both the prevalence and psychological impact of boredom, potentially intensifying its association with emotional distress, maladaptive behaviors, and clinical symptoms.

1.3.3. Limitations

While rich in implications, several limitations of this meta-analysis should be acknowledged. Firstly, the correlational nature of the data limits causal inference. While boredom is strongly associated with negative outcomes, we cannot determine whether it acts as a cause, consequence, or correlate of psychological dysfunction. Secondly, the meta-analysis relied primarily on self-report measures, which are susceptible to bias and may conflate trait-like tendencies with state-based reactions. Thirdly, heterogeneity remained moderate to high even after moderator analysis, indicating that unmeasured variables-such as cultural context, personality traits, or specific stressors-may further explain variation in effect sizes. Fourthly, certain moderator analyses (e.g., scale type) were limited by the small number of studies using alternative instruments (e.g., MSBS, job boredom scales), preventing a more comprehensive evaluation, especially in the case of psychopathological symptoms, where correlations were shown to be even higher. Finally, demographic data (such as age and gender breakdowns) were not consistently reported, which reduced statistical power in moderator analyses and forced additional error into our findings.

1.3.4. Future directions

Future research should aim to clarify the causal mechanisms linking boredom to negative outcomes. One particularly interesting avenue would be to uncover the underlying processes (such as thinking patterns) behind the emotion of boredom. Longitudinal designs as well as experimental studies that manipulate boredom levels or coping responses (e.g., boredom induction, cognitive reappraisal) or moderation/mediation analyses could help determine directionality and test for variables influencing or causing the associations between boredom and negative outcomes. The use of ecological momentary assessment (EMA) would also be valuable, capturing real-time fluctuations in boredom and their immediate psychological consequences. Moreover, further refinement of boredom measurement tools-particularly for state boredom and context-specific expressions (e.g., digital environments)-would enhance construct validity and comparability across studies.

1.4. Conclusion

In conclusion, this meta-analysis demonstrates that boredom is a consistent and meaningful correlate of emotional distress, maladaptive behaviors, and clinical symptoms. Its effects are especially pronounced in younger individuals, women, and students, underscoring its relevance to public mental health and clinical practice. Rather than being dismissed as a benign or trivial experience, boredom warrants serious attention as a potential leverage point for promoting psychological resilience, adaptive coping, and mental health more broadly. These findings suggest that boredom could play a valuable role in shaping public mental health strategies, particularly those focused on youth well-being, digital engagement, and community-building in increasingly fragmented or overstimulated environments. However, they have to be taken with a grain of salt, as a series of limitations of the current research suggest. Future directions should further uncover the mechanisms behind boredom, should further analyze the associations of boredom and negative outcomes and test them in experimental designs.

Study 2. The map of cognitive processes in boredom: multiple mediation models

2.1. Introduction

Boredom is one of the most prevalent affective states one could experience, according to experience sampling studies (Chin et al., 2017; Goetz et al., 2014; Nett et al., 2011). Almost two-thirds of the general population (63%) frequently report feeling bored and more than 90% (especially among youth) have experienced boredom at some point (Chin et al., 2017; Yazzie-Mintz, 2007).

Despite its high frequency, the concept of boredom is rather neglected in scientific research. Less than one paper per year was published on boredom between 1926 and 1981 (Smith, 1981), but it has recently gained more popularity, as 326 papers were published in 2015 alone, a growth of more than 3200% (Martz et al., 2016). It was argued that boredom research was still in incipient stages, as it was more preoccupied with defining the concept and analyses of individual differences than with ardent topics, such as the role of boredom in burnout, psychotherapeutic interventions or creativity (Piotrowski, 2013).

This might be of concern, as trait boredom is positively associated with a number of negative emotions and behaviours. The former category includes anxiety (Fahlman et al., 2009), apathy, guilt, anger and depression (Vodanovich, 2003), and the latter involves compulsive eating (Havermans et al., 2015), reckless driving (Steinberger et al., 2016), adult attention deficit hyperactivity disorder (ADHD) symptoms, learning problems, low school performance (Tze et al., 2016), internet and gaming addiction (Chou et al., 2018), under-age alcohol consumption (Windle and Windle, 2018), low job performance (Watt and Hargis, 2010), problematic smartphone use (Elhai et al., 2017), phubbing (Al-Saggaf et al., 2019), gambling, alcohol and drug abuse, and addiction (LePera, 2011). Moreover, some people even prefer the experience of self-inflicted pain

(electric shocks) rather than allow themselves to stay bored (Nederkoorn et al., 2016). It is well understood that the associations do not imply causality, but the mere fact that a plethora of them are found in two reviews (Vodanovich, 2003; Vodanovich and Watt, 2016) should seriously be taken into account. Therefore, we argue that it is best to further investigate boredom, its connections and possible predictors and consequences. While the thinkers at various historical time points (Heraclitus, B. Pascal, A. Schopenhauer, L. Svendsen; see Svendsen, 2005) have approached boredom in a theological, philosophical or practical manner, contemporary scientists adopt definitions and scientific methods to study this complex topic. As Piotrowski (2013) indicated, boredom research is still developing, and the concept lacks an unanimously accepted definition.

In their comprehensive review, Vogel-Walcutt et al. (2012) go through a large number of definitions, attempting to categorize them. A first group of definitions considers boredom as the opposite of flow, a state of optimal motivation (Nakamura and Csikszentmihalyi, 2014), emphasizing low arousal and sub-optimal stimulation or (acute) under-stimulation (Mastro et al., 2002) components. Another category of definitions indicate boredom as a negative emotion: 'aversive and counter-productive' (Green-Demers, 1997); 'unpleasant and transient affective state' (Fisher, 1993). Mostly based on self-report assessment methods, those definitions anticipate some associations between boredom and negative emotions, such as discomfort or anxiety, a research direction that has yielded significant results (Vodanovich and Watt, 2016).

Some experts offer a two-dimensional definition of boredom, in terms of both its quality and level of activation. In this context, definitions such as 'low arousal and dissatisfaction' (Azizi, 2009) or 'under-stimulation, under-arousal, and dissatisfaction' (Mikulas and Vodanovich, 1993) stand out as examples of conceptual integration. Building on the idea that boredom was made up of more than negative state and arousal (Elpidorou, 2017a,b), some researchers proposed a definition of boredom in terms of attention: the unpleasant state that occurs when attention cannot be successfully engaged to participate in satisfactory activity, is focused on this inability, and the environment is considered the cause of this state (Eastwood et al., 2012).

Other researchers emphasize the adaptive nature of emotions, and the work of Elpidorou (2014, 2015, 2017a, 2018) is especially effective in presenting boredom as a process that leads to well-being, by promoting personal development and a meaningful life. In an ingenious parallel with pain, the author wonders how a lack of boredom might shape the world (Elpidorou, 2015), showing it acts like an alarm signal. Boredom warns individuals that their current (lack of) activity does not offer the necessary or expected stimulation or meaning. As absence of pain does not mean lack of harm, the absence of boredom cannot keep people away from boring situations, and some might find themselves in monotonous situations, without opportunities for growth or a sense of interest. Boredom itself might be the one providing both a warning and the motivation to avoid such situations, moving towards more productive, stimulating and rewarding activities. However, boredom is still far from being a universal solution, as Elpidorou (2018) mentions instances when it is maladaptive, rather than beneficial. The situations include monotony as part of the task, such as waiting in line or being stuck in traffic, or examples of harmful over-stimulation, such as substance abuse or risky driving (Dahlen et al., 2005).

Elpidorou (2018) admits that boredom represents a strong emotion, capable of disengaging people from the current situation, conveying the idea that there might be alternatives, and offering the motivation to explore them. Therefore, not boredom itself, but someone's knowledge about boredom and its benefits might be helpful. Like any instrument, it is not useful by itself, but it might become purposeful when it is properly handled and directed towards self-motivation and experiences that are congruent with someone's goals. In this context, the research pertaining to meaninglessness as a component of boredom is worth mentioning. Lack of meaning and challenge is considered a key component of both state (Chan et al., 2018; van Tilburg and Igou, 2012, 2016) and trait boredom (Todman, 2003). When boredom (and therefore meaninglessness) is high, impulsiveness might be elevated, as an attempt to restore meaning (Moynihan et al., 2017).

Similarly, other studies conceptualize boredom as an emotion (Darden, 1999; Pekrun et al., 2010), and present it as a different notion to related experiences, such as apathy, anhedonia or depression (Goldberg et al., 2011), as well as sadness, anger, frustration, fear, disgust, shame, guilt, regret and disappointment (van Tilburg and Igou, 2017). Additionally, a physiological signature of boredom (Jang et al., 2015; Merrifield and Danckert, 2014; Seo et al., 2019) is proposed.

Boredom proneness – or trait boredom – is the susceptibility to feel boredom frequently and in a variety of situations, and is typically measured by self-report scales (Vodanovich, 2004). There are clear distinctions between state and trait boredom in terms of duration, continuity, situation susceptibility and concreteness (Elpidorou, 2017). Whereas state boredom is argued to have an adaptive nature, trait boredom is quite the opposite. The alarming number of studies connecting it to a series of major negative consequences is the main reason why this research is focused on trait boredom.

Several boredom alleviation techniques have been attempted (Weinerman and Kenner, 2016), but only few of them have proven to be effective. These include living nostalgia (van Tilburg et al., 2013), cognitive reinterpretations (Nett et al., 2011), adding meaning (van Tilburg and Igou, 2012) and using humour (Loukidou et al., 2009). The common ground of those strategies is the cognitive mechanism of change. In their approach to emotions, the theories in the cognitive behavioural theory (CBT) family have the importance they grant to cognition in common. Starting from the insights of Albert Ellis (Ellis, 1962; Ellis, 1995), who observed that not the external events, but their interpretation caused emotions, rational emotive behaviour therapy (REBT) was developed. This CBT theory states that emotional, behavioural or physiological consequences (C) do not directly appear at the interaction with an event in the internal/external environment (A – activating event), but are the results of one's evaluative beliefs (B) regarding that event. The ABC model (Ellis, 1962; Beck, 1976; David and Szentagotai, 2006) is used as a frame for the entire theory. It states that evaluation, the cognitive processing of internal or external activating events, is the only causal element leading to C (Ellis, 1962; Ellis and Dryden, 1997).

According to the same theory (Ellis, 1995), the evaluations may be rational (e.g. flexible, accepting) or irrational (e.g. rigid, extreme). The latter lack logical, empirical and pragmatic support and predict dysfunctional emotional consequences and maladaptive behaviours, while the former have logical, empirical and pragmatic support, and promote a healthy life, adaptive consequences and functional emotions.

The adaptive nature of emotions is also highlighted in an REBT theory framework (David, 2003; Spörrle et al., 2006), linking them to specific goals or a general sense of purpose. Functional emotions, as opposed to dysfunctional ones, are a more suitable response to life events, enabling adaptive behavioural responses, while containing maladaptive approaches towards a goal. Functional negative emotions after a loss (e.g. sadness, offering the opportunity to process the loss and receive emotional support) or before an important event (e.g. worry, providing the motivation to double check important aspects) prepare the individual and enable the appropriate responses rather than their alternatives. Dysfunctional emotions in the same contexts (e.g. depression or anxiety) could offer the same benefits, but with higher costs in terms of physiological arousal, cognitive load and intensity of negative feelings.

As several studies indicate (Bench and Lench, 2013; Elpidorou, 2018), boredom might be seen as a functional emotion in relation to goals. It signals that the current activity (or lack of activity) is neither useful in the long run, nor satisfying enough. However, when boredom interferes with current activity and is detrimental to long-term goal attainment (e.g. academic boredom interfering with academic results), arises too frequently or in a wide array of contexts, it could be considered a dysfunctional emotion as well.

Contemporary REBT theory (David et al., 2009) specifies four types of irrational evaluative beliefs, and four rational alternatives. Therefore, demandingness (DEM) is the irrational primary evaluative cognition and represents the formulation of goals in an inflexible manner, as they 'must' take place (e.g. 'I must succeed'). When an event does not match the absolute requirements, a second wave of information processes appears – secondary evaluative beliefs. They are catastrophizing (CAT – e.g. 'This is the worst thing that could have happened'), low frustration tolerance (LFT – e.g. 'I cannot stand this situation') and global evaluation (GE – e.g. in case of self-evaluations: 'I am bad and worthless'). The psychopathological model of REBT predicts that, in a certain situation (A), the irrational primary evaluative cognition will set in motion the secondary irrational ones, triggering dysfunctional emotional or behavioural responses (C).

In opposition, the rational primary evaluative cognition, preference (PRE), allows for more flexibility and is open to other outcomes, despite the best efforts (e.g. 'I would like to succeed, but I do not have to succeed'). Furthermore, the realistic evaluation of badness (REB – e.g. 'This is bad, but certainly not the worst'), high frustration tolerance (HFT – e.g. 'This situation is very difficult and hard to stand, but I can stand it'), and unconditional acceptance (UA – e.g. 'Her behaviour is bad, but she is not less worthy than another person').

When, in the same situation, DEM is turned into PRE, the modification changes secondary cognitions, and then the behavioural/emotional consequences change into adaptive and functional ones (David et al., 2009), as the psychological health model of REBT would predict. It is noteworthy that the mere absence of irrationality does not necessarily equal the presence of rationality. While the link between primary, secondary cognitive evaluations (Bs) and emotional consequences (Cs) is a rather theoretical one, there are studies attempting to test the models in various contexts, for different outcomes, such as post-traumatic stress disorder (PTSD; Hyland et al., 2014), anxiety and depression (Oltean et al., 2017), and even happiness and optimism (Oltean et al., 2019). As expected, the model underlines distinct configurations for the outcomes investigated, suggesting specific intervention patterns. In PTSD, for instance, the REBT theory was confirmed, as DEM was found to affect the PTSD symptom groups (intrusions, avoidance, dysphoria, hyper-arousal), both directly and

indirectly, through the secondary belief processes (Hyland et al., 2014). All the outcomes investigated were considered consequences (C) with regard to the ABC model.

As the diverse and rather frequent associations between boredom and several behaviours and emotions have been explored, we feel it is high time research in this area moved forward. The role of boredom in the emergence and manifestation of those psychological outcomes has not been explained beyond its correlational nature, in spite of the ever-growing need. Taking into account those aspects, as well as the necessity to further test the REBT framework, we consider it relevant to further examine the cognitive configuration of both the psychopathology and psychological health models of trait boredom, as a first step towards the development of intervention strategies.

2.1.1. Overview of the present study

This paper aims to investigate the cognitive architecture of trait boredom, testing both the psychopathology and psychological health REBT models. In those models, the investigated cognitions play the role of beliefs (B), while boredom is regarded as a consequence (C). Furthermore, this study investigates the association between trait boredom and internalizing problems (anxiety, depression) in a Romanian sample. This latter aspect is valuable, especially because studies regarding the associations of boredom have largely been conducted in the western world or Asia. This study is among the first to investigate an East-European sample.

Based on the REBT psychopathology model, we expect DEM to directly and positively predict secondary evaluative cognitions (CAT; LFT; GE) and expect LFT to be the main significant predictor of trait boredom in the psychopathology model. The connection between boredom and frustration has already been investigated in educational contexts (D'Mello et al., 2007; D'Mello and Graesser, 2010), and frustration has been found as both a consequence and a predictor of boredom.

Based on the REBT psychological model, we expect PRE to directly and positively predict secondary evaluative cognitions (REB; HFT; UA), and expect HFT to be the main significant predictor of trait boredom in the psychological health model. Even though low irrationality does not equal high rationality (David et al., 2009), the importance of frustration tolerance in previous studies (D'Mello et al., 2007; D'Mello and Graesser, 2010) is expected to be confirmed. Based on previous research data, which showed a connection between trait boredom and depressive and anxiety symptoms (Goldberg et al., 2011; Isacescu et al., 2017; LePera, 2011; Vodanovich, 2003; Vodanovich and Watt, 2016), we expect trait boredom to be positively and significantly associated with depressive and anxiety symptoms.

2.2. Method

2.2.1 Instruments

Rational and irrational beliefs levels were measured using the Abbreviated Version of Attitudes and Beliefs Scale (ABS-2-AV; Hyland et al., 2013). This self-report Likert scale has 24 items, measuring each of the eight rational and irrational evaluative beliefs, in accordance with REBT theory. The total score is a composite of each item, while the rationality and irrationality levels, as well as a score for each subscale, are computed. Cronbach's alpha for this research was $\alpha = .89$ for the total score, $\alpha = .85$ for PRE, $\alpha = .63$ for REB, $\alpha = .63$ for FT, $\alpha = .68$ for UA, $\alpha = .76$ for DEM, $\alpha = .76$ for LFT, $\alpha = .78$ for CAT, $\alpha = .82$ for GE, $\alpha = .84$ for the rationality subscale, and $\alpha = .77$ for the irrationality subscale.

Depressive symptoms were analysed using the Beck Depression Inventory II (BDI-II; Beck et al., 1996). This scale has 21 self-report items, measuring the severity of depressive symptoms. Each item represents a symptom, and is evaluated from 0 (absent) to 3 (very severe). The score can vary between 0 and 63, with a cut-off score of around 20 indicating moderate depression, and a score above 29 being considered high. Cronbach's alpha for this research was $\alpha = .92$.

State and trait anxiety levels were measured using State-Trait Anxiety Inventory (STAI; Spielberger et al., 1970). This self-report Likert scale has 40 items, half measuring state anxiety (X1), and the other half evaluating trait anxiety (X2). Each item is given a score from 1 (not at all) to 4 (very much), including reverse scoring. The score is reported on each subscale, making it vary between 20 and 80. A score of around 40 might be an indicator of clinically relevant symptoms. Cronbach's alpha for this research was $\alpha = .94$ for X1 and $\alpha = .92$. for X2.

We used the Boredom Proneness Scale (BPS; Farmer and Sundberg, 1986) to measure trait boredom levels. This self-report scale has 28 items, measuring trait boredom (boredom proneness). Although the original scale required dichotomous answers (yes/no), it is now employed as a Likert scale from 1 (strongly oppose) to 7 (strongly agree). The scores vary between 28 and 196, with a higher score suggesting a higher boredom proneness. Cronbach's alpha for this research was $\alpha = .88$.

2.2.2 Participants and procedure

An a priori analysis run through G*Power software (Faul et al., 2007) indicated that a sample size of at least 191 participants is necessary to underline a small effect size ($f^2 = .1$, $\alpha = .05$, $1–\beta = 0.95$). Therefore, the sample consisted of 232 participants (84.05% female), with a mean age of 24.03 years (SD = 6.97; range 18–66), who registered online. They followed a link on the study poster that was advertised on a social platform, signed the informed consent, and filled in the questionnaires. After submitting their answers, the participants were reminded about the confidentiality policy and the email address they could use to redeem the incentives and ask further questions. Potential participants were offered an interpretation of their results, while psychology students could opt to receive five student practice hours.

In order to test the first two a priori hypotheses, a multiple mediation model (Hayes, 2009) was employed. The PROCESS extension (Hayes, 2012) was added to the SPSS 20 program specifically for this purpose. This type of analysis permitted the use of several mediators, and the results indicated the impact of each mediator on the criterion variable, while controlling for all the others. Such a model included covariates, and the effect was considered to be a significant one, provided that the 95% confidence interval did not include 0. Therefore, the mediation model was able to compute the association between variables, controlling for indirect effects.

We used model 4, which allows the mediation effect between two variables X and Y to be realized by up to 10 mediator variables. Thus, the three secondary evaluative cognitions were considered to be mediators, while the primary evaluative cognition was the predictor, and the trait boredom level was the criterion. This method was selected, as this analysis highlighted both the direct effect of the primary evaluative cognition on the trait boredom level, and the indirect one, through the three secondary evaluative cognitions (mediators). Two separate analyses were conducted, taking into account the REBT psychopathological model and the psychological health model. The other two a priori hypotheses were approached using three separate Pearson correlations, between trait boredom levels and depressive symptoms, and state/trait anxiety levels, respectively.

2.3. Results

According to the descriptive data, the mean levels reported for trait boredom and rational and irrational cognitions are moderate, the levels for state and trait anxiety are rather high (both averages above the cut-off point), while the level of depressive symptoms is low to moderate. No significant gender differences were found regarding the levels of cognitions, boredom or anxiety.

In order to test the REBT psychopathology model, the components were added in a mediation model, with DEM subscale score as predictor, the BPS score as Y, and CAT, LFT and GE subscales scores as the three multiple mediators. The coefficients were significant for the connection between DEM and CAT ($b = .47$; $p < .01$ [.32 to .62]), DEM and LFT ($b = .67$; $p < .01$ [.53 to .80]), as well as DEM and GE ($b = .17$; $p < 0.01$ [.04 to .29]). For the further prediction of boredom score, the coefficients were not statistically significant for DEM ($b = –1.13$; $p < .78$ [–2.38 to .13]) or CAT ($b = 1.00$; $p < .68$ [–.78 to 2.09]). However, they are significant for LFT ($b = 2.34$; $p < 0.01$ [.99 to 3.27]) and GE ($b = 2.08$; $p < .01$ [.84 to 3.31]) as predictors of BPS score. Thus, the direct effect of primary evaluative cognitions X on Y (trait boredom) is not significant, while the indirect one reaches significance with an effect of .25 [.15 to .35].

The components of the psychological health model were input in the mediation analysis. X was the PRE (primary rational evaluative cognition) subscale score of ABS-2-AV, Y was the BPS score, while the three mediators were REB, HFT and UA subscale scores. The coefficients are significant for the connections between PRE and REB ($b = .42$; $p < .01$ [.33 to .51]), HFT ($b = .40$; $p < .01$, interval [.30 to .50]) and UA ($b = .33$; $p < .01$, interval [.16 to .35]). Furthermore, the boredom score was negatively predicted by HFT, with a coefficient of $b = –1.66$ ($p < .02$ [–3.07 to –.23]).

The other coefficients were not significant for PRE ($b = –.41$; $p < 0.49$ [–1.59 to .76]), REB ($b = –1.58$; $p < .51$ [–.316 to .01]), or UA ($b = –.96$; $p < .17$ [–2.33 to .42]). Thus, the direct effect of PRE is not significant, while the indirect one reaches significance with an effect of –.66 [–1.39 to –.04]. It is worth mentioning that the significant effects are in accordance with the REBT model, both in the case of rational, and irrational primary and secondary evaluative cognitions, respectively.

The other two a priori hypotheses were confirmed, as trait boredom had a correlation of $r = .62$ ($p < .01$) with depressive symptoms, an $r = .58$ ($p < .01$) with state anxiety, and an $r = .67$ ($p < .01$) with trait anxiety, respectively. Therefore, trait boredom is strongly, significantly and positively associated with depressive symptoms, state and trait anxiety.

2.4. Discussion

This study was meant to enrich a continuously developing subject of psychological investigation: boredom. As this concept was analysed in relation to internalization and externalization problems and defined as emotion, an important step was to connect it to the REBT theory and open new ways to approach boredom, its alleviation or prevention. The significant connections between boredom, anxiety and depression that were identified once more in this study might be interpreted as warning signs, highlighting the responsibility and care this domain would require, as it could prove to be especially relevant in the near future.

Although the a priori hypotheses were only partially confirmed, the theoretical and practical implications of this research might prove valuable. To the best of our knowledge, this is the first paper to investigate the map of REBT cognitive processes specifically for boredom. Whereas the connection between boredom and frustration (as observed cognitive-affective state) had already been addressed in a different psychological paradigm (D'Mello et al., 2007; D'Mello and Graesser, 2010), this study attempted to approach boredom as emotion, and to analyse its underlying cognitions. While confirming the important role of LFT in the psychopathological model of trait boredom, the role of HFT in the psychological health model was underlined. HFT might represent a resilience factor in the face of the possible, negative dysfunctional consequences of boredom, and LFT could stand out as a vulnerability.

Several definitions of boredom (Eastwood et al., 2012; Vogel-Walcutt et al., 2012) point out that the bored individual blames the environment for lack of relevant stimulation. Therefore, the role of frustration tolerance in boredom makes sense, but the emergence of GE is more difficult to integrate with previous conceptualizations. If GE as a mediating evaluative cognition between DEM and boredom could mean one holds themselves responsible, or blames the others or life itself, is rather unclear at the moment. Future studies should investigate this aspect.

The strong associations between trait boredom and depressive symptoms, and anxiety, respectively, provide evidence that the connection between boredom and internalizing problems is more than a western world issue (Martz et al., 2016). As a consequence, the silent alarm of boredom is to be taken seriously, with additional resources dedicated to research in this field.

The identification of LFT and GE as evaluative cognitions positively associated with trait boredom, as well as the identification of HFT as negatively associated with boredom, might indicate the path towards the development of interventions for boredom reduction, prevention or efficient coping. We feel that the approach of boredom through the lens of CBT/REBT could lead to results consistent with the traditions of this family of interventions, especially as no context or activity is intrinsically boring.

The evaluation of boredom in future studies, both before and after interventions, as well as the development and testing of prevention programmes for people working in monotonous environments, or even in schools or other companies are bold, but important future steps. Such interventions could not only prevent boredom, but as studies (Caserta et al., 2010; Popa and Predatu, 2019) pinpoint, a rational thinking style could offer even further protection against negative and stressful life events (medical procedures, workplace change, personal loss). As the present study suggests, such endeavours should be particularly attentive to the role of HFT and GE, the significant negative predictors of boredom.

2.4.1. Limitations

This research is based on internet surveys conducted online, using self-report instruments. The influences of unsystematic errors, such as subjectivity, social desirability or momentary affective dispositions cannot be completely ruled out. While offering some valuable advantages, the online nature of this study made it impossible for people not using social platforms to be included, and the lack of exclusion criteria other than the minimum age of 18 could have under- or over- estimated the population levels of trait boredom. The research team did not control for levels of anger, impulsivity and sensation seeking, which are known to have a connection with boredom (Dahlen et al., 2004). The high percentage of female participants in our sample might provide an explanation of the lack of gender differences, as opposed to other studies (Dahlen, 2005; Isacescu et al., 2017; Sundberg et al., 1991).

As David et al. (2019) indicate, several instruments that are frequently used in CBT are affected by contamination with distress items. This might be detrimental to a measurement where the cognition level is the main interest. Even the ABS-2-AV scale we have employed seems to be affected by contextual factors (Hyland et al., 2014). Certain problems associated with the measurement of beliefs in REBT exist, regardless of the scale (Hyland et al., 2017). We sought to use an instrument that would allow a low level of distress and context contamination, while keeping a reasonable number of items – too lengthy a scale could have impaired our chances of gathering the required sample. Moreover, as the ABS-2-AV has constantly been used in similar

studies regarding PTSD (Hyland et al., 2014), anxiety and depression (Oltean et al., 2017) or loneliness (Hyland et al., 2019), we opted to employ it, in spite of its documented flaws (DiGiuseppe et al., 2020; Hyland et al., 2017). Nevertheless, future studies should adopt different measures of (ir)rationality, in order to contain possible errors associated with this particular instrument.

Furthermore, the ABC model (Ellis, 1962; Ellis and Dryden, 1997) requires the presence of an activating event, in order to emphasize the underlying cognitions of certain behavioural or emotional outcomes. The nature of this study did not allow the control of activating events, and they were not even recorded. It is possible that certain beliefs might not have been active in the case of some participants. This important limitation could be addressed by conducting a study in which the testing conditions and levels of state boredom are held constant.

Boredom stands out as a concept related to dysfunctional emotions and maladaptive behaviours, but as a useful emotion, as well. Although the causal connections have not been underlined, the relevance of boredom in the context of mental health is almost unquestionable. Both state and trait boredom are subjects for further scientific investigations that could further clarify their influence, the underlying processes and consequences.

Study 3A. Boredom Coping as a Mediator between State Boredom and Emotions: a Longitudinal Multilevel Structural Equation Modeling Approach

3.1. Introduction

Boredom is a common human experience, and scientific interest in the topic has surged, especially after the COVID-19 pandemic (Gu et al., 2023). However, psychology lacks a unified definition or understanding of boredom. Some researchers define boredom as a trait (Farmer & Sundberg, 1986), while others view it as an affective state or emotion (Darden, 1999; van Tilburg & Igou, 2016). Meanwhile, some emphasize different key aspects of boredom. Mind-wandering, attentional failures (Danckert & Merrifield, 2018; Hunter & Eastwood, 2018), meaning (van Tilburg & Igou, 2012), or even physiological signatures (Jang et al., 2015; Seo et al., 2019) are brought into attention by various definitions of the concept, showcasing its versatility and ubiquity.

Reflecting the diverse perspectives on boredom, the number of self-report measures assessing it is also growing (Vodanovich, 2003; Vodanovich & Watt, 2016), with different facets of the experience being highlighted (Goetz et al., 2014; Raffaelli et al., 2018). These facets include valence (e.g., positive or negative), arousal (e.g., high, low), type (e.g., reactant boredom, searching boredom, calibrating boredom, apathetic boredom), and context (e.g., academic boredom, job boredom, relational boredom, leisure boredom).

Boredom has been widely associated with negative emotions, such as depression (German & Latkin, 2012; Lee & Zelman, 2019, anger (Cao & An, 2020), anxiety (Chao, 2020; Milea et al., 2021), and stress (Lee & Zelman, 2019). It has also been linked to various negative behaviors, including risky driving and mobile phone use in the car (Oxtoby et al., 2019), alcohol consumption (Krotava & Todman, 2014) or binge drinking (Biolcati et al., 2016), risky gambling (Kılıç et al., 2020), problematic digital media use (Camerini et al., 2023), aggressivity (Cao & An, 2020), increased smartphone use (Wolniewicz et al., 2020), HIV risk behaviors (German & Latkin, 2012), overeating (Moynihan et al., 2015), and even suicide (Yeung et al., 2024). Additionally, boredom is associated with a lack of self-control (Boylan et al., 2021), impulsivity (Cao & An, 2020), reduced academic motivation (Tze et al., 2016), and rumination (Waterschoot et al., 2021).

While, as shown above, the association between boredom and negative outcomes is well-documented and s across multiple studies, it is noteworthy that state boredom does not always occur in monotonous situations, nor does it affect everyone exposed to monotony (Shakelton, 1981; Wilson et al., 2014; Geana et al., 2016). For instance, highly monotonous jobs, such as quality control roles, or tasks requiring constant vigilance, do not necessarily lead to boredom (Loukidou et al., 2009). As demonstrated in a previous study (Milea et al. 2021), no context is inherently boring; rather, it is the individual's cognitive processing that determines whether an experience is perceived as boring.

Consequently, boredom is not the root of all evil (Bieleke et al., 2024). However, individuals may cope with it in maladaptive or adaptive ways, depending on their coping strategies. This is particularly important because boredom coping strategies can be learned, allowing individuals to gain greater control over their emotional responses. Furthermore, boredom is not entirely detrimental, as it may serve as a signal (Westgate, 2020), indicating whether engagement with the current task and its level of significance align with expected performance levels.

Other scholars (Elpidorou, 2015) even draw a parallel between pain and boredom, both negative and undesirable experiences, yet highly adaptive. As pain indicates possible health problems, boredom might signal a

deficiency of adequate stimulation or a lack of significance in the present environment. In such cases, state boredom acts as a motivational power, offering the energy to pursue new objectives (Bench & Lench, 2013): either more meaningful or more appropriately stimulating. Following contemporary scientists (Wolf et al., 2024; Agrawal et al., 2022; Danckert, 2019; Gomez-Ramirez & Costa, 2017), boredom is thought to serve an evolutionary function by driving exploration of the environment. This phenomenon may lead a bored individual to engage in both adaptive and maladaptive responses in their search for adequate stimulation or significance, a process referred to as undirected exploration (Wolf et al., 2024). It is undirected, as the person disengages from the boring environment and begins seeking alternatives that could be either more meaningful, or more engaging.

Exploring the knowns and unknowns of boredom (Raffaelli et al., 2018), the level of stimulation, time perception and agency have been shown to be consistent boredom correlates. What is more, a negative affect was consistently associated with boredom and, and while various definitions consider boredom a negative experience (Vodanovich et al., 2003), few studies have investigated whether boredom is linked to positive emotions or experiences. To our knowledge, none have explored the multilevel structure of this relationship. This is important because fluctuations in boredom may predict changes in other emotions and even behavioral tendencies. Additionally, such an approach could shed light on the influence of boredom, both on a visible level (between individuals) and on an individual one (within oneself).

While it is common knowledge that mere monotony is not the equivalent of boredom, the associations between boredom and negative outcomes are consistent and robust. Mismatch theory (Raffaelli et al., 2018) predicts that boredom arises when there is a discrepancy between expected or desired challenge levels and reality, with both under- and over-stimulation contributing to its occurrence. The present research was carried out during the COVID-19 pandemic, when quarantine and isolation likely resulted in reduced external stimulation and increased constraints (Daschmann et al., 2011), thus creating conditions for heightened boredom and negative emotions.

This longitudinal study aimed to investigate the relationship between state boredom and negative emotions at both the between-subject and within-subject levels at three different time points. Specifically, we examined whether individuals with higher overall levels of state boredom reported higher levels of negative emotions (between-subject effect) and whether changes in state boredom within individuals over time were associated with concurrent changes in negative emotions (within-subject effect). Additionally, we tested the mediating role of boredom coping in these relationships. We hypothesized that boredom coping would mediate the relationship between boredom and negative emotions at all time points, and that both between-subject and within-subject effects of boredom would be reflected in levels of negative emotions.

3.2. Method

3.2.1. Participants

The total sample size consisted of N=393 (91,1 % females) participants with a mean age of 25.48 (SD=8.58), ranging from 18 to 60 years old in the first data collection wave, of which 299 remained in the second wave, and 264 in the third one. Regarding education, 15 participants (3.81%) had completed primary education, 228 participants (57.98%) had completed secondary education, 7 participants (1.78%) had post-secondary education, 75 participants (19.05%) held a bachelor's degree, 62 participants (15.77%) had a master's degree, and 6 participants (1.52%) had earned a doctoral degree.

They registered via an online link, posted on social media platforms, where the informed consent and initial scales were filled in. Participants who had expressed their desire via e-mail received a short interpretation of their results, and psychology students were also offered practice hours.

3.2.2. Instruments

State boredom was measured using Multidimensional State Boredom Scale Short Form (MSBS-SF; Hunter et al., 2015). This is an 8-item self-report, Likert-type scale, derived from the Multidimensional State Boredom Scale (MSBS; Fahlman et al., 2013), a larger, 29-item scale, a validated instrument for enquiring state boredom. It ranges from 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating higher levels of state boredom. Cronbach's alpha for this research was $\alpha = .90$ for time 1, $\alpha = .89$ for time 2, and $\alpha = .91$ for time 3.

Positive and negative emotions were assessed with Profile of Affective Distress (PDA; Opriș & Macavei, 2007), a 39-item self-report scale. The 39 items represent emotion-describing adjectives, either positive (13 adjectives), or negative (12 of the "fear-anxiety" and 14 of the "sadness-depression" domains). PDA measures the frequency of positive and negative emotions for the past 2 weeks on a Likert type scale, ranging from 1 (not at all) to 5 (very much). For this study, the scale was adapted to ask participants whether they felt those emotions in the past week. Cronbach's alpha for this research was $\alpha = .94$ for time 1, $\alpha = .95$ for time 2, and $\alpha = .96$ for time 3 in the case of positive emotions and $\alpha = .97$ for all time points in the case of negative emotions.

Finally, we have employed Boredom Coping Scale (BCS; Hamilton et al., 1984). This 10-item scale uses forced choice to assess the ability to generally cope with boredom. Participants are asked to choose between two affirmations, which measure the coping ability at work/school or at home. A higher score indicates a higher predisposition to successfully restructure one's perceptions when feeling bored. Cronbach's alpha for this research was $\alpha = .67$ for time 1, $\alpha = .70$ for time 2, and $\alpha = .76$ for time 3.

3.2.3. Procedure

Ethical approval was obtained from the ethical review board at the institution to which the authors belong. This research was conducted online during the first lockdown period of the COVID-19 pandemic, March to June 2020. Participants who had enrolled through a link shared on various social media platforms and student groups were sent subsequent scales via email as an online link. It also contained informed consent and the conditions (e.g. requirements and rewards) of research about emotions. Those who did not respond within 24 hours received a reminder via text message. Upon completing the set of scales, participants were shown a thank-you message and informed of the date for their next email, typically one week later. Data from each participant were collected in three sets, each one week apart.

3.2.4 Data analysis

All analyses were performed using R software via the RStudio interface (Posit team, 2023). First, we explored the data to ensure the scores fell within the acceptable range and checked for any scoring errors. Next, we assessed the univariate and multivariate normality assumptions. Univariate normality was tested using skewness and kurtosis, while multivariate normality was assessed using the Henze-Zirkler test (Henze & Zirkler, 1990). Values for skewness and kurtosis between -2 and +2 (Hahs-Vaughn, 2016), accompanied by a non-significant result for the Henze-Zirkler test, would support normality assumptions. Finally, we explored the percentage of missing data across the three time-points and computed the intracluster correlation coefficient (ICC).

To test our hypotheses, we specified and tested a mediation model at two levels using Multilevel Structural Equation Modeling. Specifically, we have specified a 2-2-2 model in which relationships at both levels one and two were simultaneously estimated (MacKinnon & Valente, 2014). Level 1 (within-subjects) assesses whether the variables change together. A significant relationship at the within-subjects level would indicate that two variables increase or decrease together. At Level 2 (between-subjects), a significant relationship would suggest that individuals who generally have higher levels of boredom also have higher levels of negative emotions. Thus, Level 1 describes moment-to-moment variations in the variables, while Level 2 indicates a more stable relationship between variables across individuals. The models were estimated using the R-package 'lavaan' (Rosseel, 2024). We used Maximum Likelihood Robust (MLR) as the estimator, and missing data were handled via Full Information Maximum Likelihood (Schminkey et al., 2016).

3.3. Results

3.3.1. Preliminary analyses

All the values were within the acceptable range. The missing percentage was 0% at T1, 24% at T2, and 33% at T3. The univariate normality assumption was supported, as skewness and kurtosis for all variables were within the acceptable range. Specifically, skewness varied between -0.44 (Boredom coping at T3) and 1.02 (Negative Emotions at T2). Kurtosis ranged from -0.99 to 0.42 (Negative Emotions at T2). The Henze-Zirkler test was significant (H-Z = 1.00, $p < .001$), indicating that multivariate normality was not supported. Regarding ICC, it varied from $\rho = .43$ to $\rho = .52$ (state boredom). This implies that 43% to 52% of the variance in the data is accounted for by differences between people, while 57% to 58% is accounted for by variances within the same individual across measurements. Thus, we have a substantial level of variance both between and within individuals, which supports the use of multilevel structural equation modeling.

3.3.2 Model 1: From state boredom to negative emotions via boredom coping

Regarding level I (within subjects), we found a significant negative path from state boredom to boredom coping ($\beta = -.44$, $p < .001$) and from state boredom to negative emotions ($\beta = .46$, $p < .001$). Furthermore, we found a significant path from Boredom coping to negative emotions ($\beta = -.12$, $p < .001$). Boredom coping mediated the relationship between state boredom and negative emotions ($\beta = .05$, $p < .05$). Finally, state boredom explained 20% of the variance in Boredom coping ($R^2 = .20$), while state boredom and boredom coping jointly explained 27% of the variance in negative emotions ($R^2 = .27$).

Regarding level II (between subjects), we found a significant negative path from state boredom to boredom coping ($\beta = -.47$, $p < .001$) and from state boredom to negative emotions ($\beta = .41$, $p < .001$). Additionally, we found

a non-significant path from boredom coping to negative emotions ($\beta = -.04$, $p < .644$). Finally, State boredom explained 22% of the variance in boredom coping ($R^2 = .22$), while state boredom and boredom coping jointly explained 19% of the variance in negative emotions ($R^2 = .19$)

3.3.3 Model 2: From state boredom to positive emotions via boredom coping

Regarding level I (within subjects), we found a significant negative path from state boredom to boredom coping ($\beta = -.41$, $p < .001$) and from state boredom to positive emotions ($\beta = -.29$, $p < .001$). Furthermore, we found a significant path from boredom coping to positive emotions ($\beta = .27$, $p < .001$). Boredom coping mediated the relationship between state boredom and positive emotions ($\beta = -.11$, $p < .001$). Finally, state boredom explained 17% of the variance in boredom coping ($R^2 = .17$), while state boredom and boredom coping jointly explained 22% of the variance in positive emotions ($R^2 = .22$).

Regarding level II (between subjects), we found a significant negative path from state boredom to boredom coping ($\beta = -.50$, $p < .001$) and from state boredom to positive emotions ($\beta = -.37$, $p < .001$). Additionally, we found a significant path from boredom coping to positive emotions ($\beta = .25$, $p < .001$). Boredom coping mediated the relationship between state boredom and positive emotions ($\beta = -.13$, $p < .001$). Finally, state boredom explained 25% of the variance in boredom coping ($R^2 = .25$), while state boredom and boredom coping jointly explained 29% of the variance in positive emotions ($R^2 = .29$).

3.4. Discussion

This study aimed to examine the mediating role of boredom coping in the longitudinal relationships between state boredom and negative and positive emotions. We hypothesized that state boredom would be positively associated with negative emotions and negatively associated with positive emotions, with boredom coping acting as a mediator. Additionally, we expected these relationships to be consistent at both the within-subject and between-subject levels.

The use of multilevel mediation analysis in this study provided a nuanced, adaptable, and statistically robust framework for investigating the indirect relationships embedded within the hierarchical structure of the data. Unlike traditional mediation analysis, which assumes independence among observations and typically focuses on relationships at a single level, multilevel mediation enabled us to simultaneously examine dynamic, momentary processes at the within-subject level and stable, individual patterns at the between-subject level. At the within-subject level, the analyses captured how momentary fluctuations in boredom influenced immediate emotional responses via coping strategies. This reflects the dynamic, context-dependent nature of psychological processes that evolve over time and in response to situational demands.

At the within-subject level, the results were significant. As hypothesized, boredom coping mediated the relationship between state boredom and positive and negative emotions. This is noteworthy, as it indicates the interplay of those variables not only cross-sectionally, but also in a longitudinal data set for the within subject-level. This suggests that the observed relationships reflect stable patterns of boredom and other emotions over time. Such findings emphasize the importance of boredom and boredom coping skills, as the former might influence positive and negative emotions, while the latter would mediate the relationship. This suggests that an individual's level of state boredom would influence their ability to cope with boredom, which in turn would affect their emotional responses. This finding is consistent with the idea that state boredom, when left unregulated, can contribute to negative emotional outcomes (van Tilburg & Igou, 2017). The more bored a person feels, the less capable they are of regulating it, making them more likely to experience negative emotions and less likely to experience positive ones. The mediating role of boredom coping highlights the importance of coping strategies in modulating emotional responses to boredom. In moments of heightened boredom, individuals who have fewer or less effective coping strategies may be more prone to experience negative emotions, confirming previous research suggesting that the inability to cope with boredom is linked to emotional distress (Vodanovich et al., 2016).

Conversely, at the between-subject level, the findings highlighted how individuals' overall tendencies-such as consistently higher levels of state boredom-affected their long-term emotional patterns through coping mechanisms. This layer of analysis provides valuable insight into the stable characteristics of boredom that may differentiate individuals and their unique situations. At the between-subject level, the results were also significant in accordance with our hypotheses, with the sole exception of boredom coping predicting negative emotions.

Firstly, consistent with our expectations, state boredom levels predict both boredom coping and negative emotions across the individuals in the study. It means that, on average, people with higher levels of boredom tended to experience more negative emotions and had less effective coping strategies. Secondly, however, overall differences in boredom coping were not significantly associated with variations in negative emotions. This suggests

that the effect of boredom coping on negative emotions may vary from one person to another and isn't consistent enough across the sample to be detected at the group level. While a non-significant result might indicate differences in the effectiveness of coping strategies, it may also reflect a lack of statistical power. Even though the direction of the relation was according to the initial hypothesis, the methodology we used might have overestimated the between-subjects variability in comparison to the within-subjects one. A higher between-person variability can dilute the effect of boredom coping on negative emotions, making it harder to detect significant effects.

In our view, the most important finding of this paper is the mediator role that boredom coping plays longitudinally, at both within- and between-subject levels in the case of state boredom and positive emotions and at within-subject level in the relation between state boredom and negative emotions. Such results make it clear that boredom coping, not the mere development of boredom, is the element making a difference considering the valence of emotions, the direction of the emotional experience. This is of crucial importance, as the coping strategies when dealing with boredom are virtually teachable, leading to more control in dealing with such experiences. It also opens the discussion about boredom coping as a causal factor in the well-documented associations between boredom and negative outcomes.

A further talking point is the longitudinal design of our study. By collecting data over multiple time points, we were able to capture the dynamics of state boredom, boredom coping, and emotional responses over time, offering a deeper understanding of how these factors interact and evolve. This design allows for a clearer examination of potential causal relationships and their temporal patterns, as opposed to cross-sectional studies that can only provide snapshots. The longitudinal approach enhances the value of our findings, offering insights into how boredom and boredom coping influence emotional outcomes in the longer term.

Another strength of this research is the use of multilevel mediation analysis. By integrating both levels of analysis, this innovative approach has shed light on the interplay between short-term variability and long-term stability in boredom and boredom coping strategies and their different impact on positive and negative emotions. These insights would have been missed with traditional mediation models, emphasizing the importance of employing multilevel techniques when examining phenomena that are both temporally dynamic and inherently hierarchical. Such findings are particularly relevant for psychological research on boredom, where behaviors and emotions fluctuate not only within individuals over time but also across individuals in meaningful ways.

3.4.1. Limits

As valuable as this investigation is, it encountered several limitations. First, the study was conducted during the pandemic, a period marked by higher levels of stress and boredom, which may have influenced participants' experiences and emotional responses. While participating in our research may have provided a valuable opportunity for reflection or encouraged meaningful time investment, external factors-such as heightened uncertainty during the period-could have influenced our findings. Additionally, the study did not account for the causes of boredom, which could have provided further insight into the factors contributing to boredom and emotional outcomes. Furthermore, the sample was a convenience sample, entirely recruited online, which limits generalizability.

3.4.2. Future Directions

Future research could explore boredom coping as a critical mechanism for effectively managing boredom. Investigating how individuals apply different coping strategies could provide valuable insights into mitigating the negative dysfunctional emotional outcomes of boredom and enhance the positive or functional ones. Additionally, experimental manipulations of boredom, along with cognitive coping interventions, could be useful in examining how these strategies influence emotional responses in real-time. Such studies could shed light on the potential for targeted interventions to enhance coping skills, offering practical solutions for individuals struggling with boredom and its associated negative effects. This approach could have significant implications for mental well-being and emotional regulation.

3.5. Conclusion

Overall, this study highlights the critical role of boredom coping in influencing positive and negative emotions. Depending on the levels of state boredom, boredom coping influences the level of within-subject positive and negative emotions, as well as the level of between-subject positive emotions at multiple time points over three weeks. The findings emphasize that how individuals cope with boredom, rather than simply experiencing it, influences their emotional responses. By using a longitudinal design and multilevel mediation analysis, we were able to capture both momentary fluctuations and long-term patterns at within-subject and between-subject levels, providing a deeper understanding of how boredom and coping strategies influence emotions over time. Despite

certain limitations, such as the context of the pandemic and the use of a convenience sample, these results open important avenues for future research on boredom coping interventions and their impact on mental well-being.

Study 3B. Boredom Coping as a Mediator between State Boredom and Loneliness: a Longitudinal Multilevel Structural Equation Modeling Approach

4.1. Introduction

Boredom and loneliness are two affective states that, while conceptually distinct, frequently co-occur and influence one another (Conroy et al., 2010, Sharp et al., 2020). Boredom is an aversive psychological state that emerges when individuals experience a lack of stimulation, engagement, or meaning in their activities (Eastwood et al., 2012). It serves as a regulatory signal, prompting individuals to seek novelty or meaningful engagement (Danckert et al., 2018). In contrast, loneliness arises from a perceived discrepancy between desired and actual social connections, often leading to distress and social dissatisfaction (Cacioppo & Cacioppo, 2018). Despite their differences, these states share common psychological mechanisms and are frequently observed in tandem, particularly in environments where individuals face constraints on their ability to regulate social and cognitive experiences (Weiss et al., 2022).

While terms such as alone, loneliness, solitude, social isolation, and ostracization are sometimes used interchangeably, they each have distinct meanings. Ostracization refers to the intentional exclusion or ignoring of an individual (Carpenter, 2020), social isolation is characterized by the objective absence of social relationships and interactions (Luhmann et al., 2023). The momentary state of being alone, on the other hand, simply refers to a transient lack of social interaction at a given time (Luhmann et al., 2023) and does not inherently carry emotional connotations. In contrast, solitude is considered a positive, voluntary state of aloneness, while loneliness is defined as the dissatisfaction with the quality of one's social interactions (Hipson et al., 2021). As a result, a person might feel lonely even in society (de Jong Gierveld et al., 2006), when perceived social support (not necessarily actual social support) is low (Nowakowska, 2020) or when boredom levels are high (Weiss et al., 2022).

A common human experience across a variety of ages, loneliness is a potent predictor for a variety of physical and mental health consequences (Hawkley & Cacioppo, 2010). Perceived social isolation was found to increase the risk of major depression, dysthymia, generalized anxiety, social anxiety (Chou et al., 2011), sleep problems (Cacioppo et al., 2002), alcohol abuse (Akerlind & Hornquist, 1992) and obesity (Lauder el al., 2006) and to reduce physical activity, positive emotions (Hawkley et al., 2009), and even immunity levels (Pressman et al., 2005). While social isolation often precedes loneliness (Nowakowska, 2020), individuals who are socially isolated may not always experience loneliness.

Similarly, boredom does not always arise from monotonous situations, nor does monotony lead to boredom for everyone (Shakelton, 1981; Geana et al., 2016). Having been linked to poor self-regulation (Mugon et al., 2020), problematic internet use (Skues et al., 2015), binge eating (Schulte, 2016), and even bedtime procrastination leading to reduced sleep quality (Teoh et al., 2021), boredom is often intertwined with loneliness (Conroy et al., 2010, Sharp et al., 2020). Some of the several associations they share are related to psychological distress, such as depression (Hager et al., 2022), while others are behavioral, such as binge-eating (Schulte, 2016), problematic internet use (Skues el al., 2015) or gaming addiction (Zhou, Leung, 2019).

Although boredom can be fleeting, its accumulation over time has the potential to create a cycle that deepens the experience of loneliness. Boredom can amplify feelings of disconnection from others and contribute to social withdrawal potentially acting as a precursor to feelings of loneliness (Weiss et al., 2022). In extreme cases, the interplay of boredom and loneliness is particularly evident among marginalized populations. A particular situation where loneliness and boredom coexist under the umbrella of lack of meaning is homelessness (Marshall, 2024). In such cases, social exclusion and poverty deprive individuals of both social interactions and a sense of purpose, leading to cycles of boredom, loneliness, and sometimes substance use (Biolcati et al., 2018), which, in turn, reinforce exclusion and poverty (Dej, 2020).

While loneliness and boredom might be considered relatively minor issues for homeless individuals, the use of Capabilities Approach allows the author (Nussbaum, 2011) to argue that they represent significant challenges. For example, homeless people often have limited mobility, few opportunities for social connections, and a lack of leisure activities (Harmon, 2019), all of which hinder their access to meaningful activities, elevate feelings of boredom and loneliness, and diminish life meaning and well-being. In cases of incarceration, loneliness and boredom are frequently experienced together, amplifying their psychological deterioration (Knight, 2015). For inmates, television time keeps ”poisonous” boredom and loneliness away, providing external stimuli that distract them from their own thoughts. Even though this coping mechanism makes sense from a pragmatic standpoint,

Cognitive Behavioral Therapy (CBT) and Rational Emotive Behavior Therapy (REBT) scholars (David & Szentagotai, 2006) would argue that inmates' cognitive appraisals (e.g., evaluations) should be addressed more directly in order to achieve long-term psychological benefits.

According to these theories (David et al., 2009), neither social isolation nor monotony fully explains feelings of loneliness (Cacioppo & Patrick, 2008, for the former) or boredom (Loukidou et al., 2009, for the latter). Instead, rational and irrational thinking patterns play a crucial role. The way individuals cognitively appraise their situations is a primary factor in shaping emotional, behavioral, and psychophysiological responses. This distinction leads to theoretical models of psychological health (focused on rational beliefs) and psychopathology (focused on irrational beliefs). Recent research has further mapped out rational and irrational beliefs related to both loneliness (Hyland et al., 2019) and boredom (Milea et al., 2021). For instance, while loneliness results from catastrophizing and self-downing beliefs, boredom is driven by low frustration tolerance beliefs.

The COVID-19 pandemic presented an unprecedented opportunity to investigate the interplay between boredom and loneliness. Lockdown measures imposed to curb viral transmission significantly disrupted social interactions and access to engaging activities, limiting face-to-face interaction (Dumitrache et al., 2021), resulting in heightened reports of boredom, loneliness, and associated mental health concerns (Wolff et al., 2020). Boredom most probably increased as individuals struggled to find meaningful engagement (Van Tilburg & Igou, 2017), while loneliness surged due to forced separation from social support networks (Luhmann et al., 2023). This co-occurrence raised concerns about their psychological consequences, particularly among vulnerable populations. Research suggests a bidirectional relationship between boredom and loneliness, where boredom may lead to social disengagement, and the unavailability of social interactions may exacerbate feelings of boredom, reinforcing cycles of isolation and psychological distress (Tam et al., 2021; Martarelli et al., 2021).

During the COVID-19 lockdown, the general population faced limited opportunities for face-to-face social interaction (Dumitrache et al., 2021) and had to endure. It was expected that factors such as widespread isolation and social restrictions in the context of disruptions to daily routines and the psychological stress of a global disease would contribute to significant psychological distress and boredom. However, as highlighted in the previous section, the way individuals cope with feelings such as boredom could have played a critical role in shaping subsequent emotional outcomes. While isolation and monotony heightened vulnerability to negative emotions, we hypothesized that boredom coping would be a key factor, mediating the relationship between boredom and loneliness. Despite the growing body of research on boredom and loneliness, most studies have relied on cross-sectional data, limiting their ability to establish causal relationships and within-person variations over time. To address this gap, the present study employs a Longitudinal Multilevel Structural Equation Modeling approach to examine the dynamic interplay between state boredom and loneliness across multiple time points. Unlike cross-sectional studies, this methodology differentiates within subjects and between subjects effects, offering a more nuanced understanding of how boredom coping mediates the boredom-loneliness link (Luhmann et al., 2023).

We opted for a longitudinal study in order to understand the interplay between boredom and loneliness, as cross-sectional investigations constantly underscore a co-variation (Conroy et al., 2010, Weiss et al., 2022) of the two. Additionally, multilevel data collection is constantly called for, especially for loneliness (Luhmann et al., 2023). Therefore, it was our hypothesis that boredom would predict loneliness at all time points, and that both within-subject and between-subject effects of boredom would be visible in the levels of loneliness. Additionally, we hypothesized that boredom coping would mediate the relationship between boredom and loneliness.

4.2. Method

4.2.1. Participants

The study initially included 393 participants (91.1% female), with ages ranging from 18 to 60 years (M = 25.48, SD = 8.58). Over the course of data collection, 299 participants remained for the second wave, and 264 continued through the third.

In terms of education levels, 15 participants (3.81%) had completed only primary education, while 228 (57.98%) had secondary education. A small proportion (7 participants, 1.78%) had pursued post-secondary studies without earning a degree. Among those with higher education, 75 (19.05%) held a bachelor’s degree, 62 (15.77%) had obtained a master’s degree, and 6 (1.52%) had earned a doctoral degree.

Recruitment was conducted via an online registration link shared on social media. Participants provided informed consent and completed initial assessments upon signing up. Those who requested it via email received a brief interpretation of their results, while psychology students were additionally given the opportunity to count their participation as practical training hours.

4.2.2. Instruments

Boredom was evaluated using the Multidimensional State Boredom Scale Short Form (MSBS-SF; Hunter et al., 2016), an 8-item self-report Likert-type measure derived from the more extensive 29-item Multidimensional State Boredom Scale (MSBS; Fahlman et al., 2013), a validated instrument for assessing state boredom. Participants responded on a scale from 1 (strongly disagree) to 7 (strongly agree), with higher scores signifying elevated levels of state boredom. The internal consistency of the scale, as measured by Cronbach's alpha for this sample was $\alpha = .90$ for time 1, $\alpha = .89$ for time 2, and $\alpha = .91$ for time 3.

For assessing boredom coping, we utilized the Boredom Coping Scale (BCS; Hamilton et al., 1984), a 10-item forced-choice measure designed to evaluate individuals' general ability to cope with boredom. Participants select between two statements that reflect their coping abilities in work/school or home environments. Higher scores indicate a greater tendency to effectively reframe one's perceptions when experiencing boredom. The internal consistency of the scale, as measured by Cronbach's alpha for this sample was $\alpha = .67$ at Time 1, $\alpha = .70$ at Time 2, and $\alpha = .76$ at Time 3. These values indicate a moderate but improving reliability over time, suggesting increased consistency in responses across measurement points.

The 3-item UCLA Loneliness Scale (UCLA-LS-3; Hughes et al., 2004) is a condensed version of the 20-item UCLA-LS, designed to assess loneliness using three key statements: "I feel left out," "I feel isolated," and "I lack companionship." Each item is rated on a 3-point scale, ranging from "not at all" (1) to "often" (3) (). The total score varies between 3 and 9, with higher scores indicating greater loneliness. The internal consistency of the scale, as measured by Cronbach's alpha for this sample was $\alpha = .73$ for time 1, $\alpha = .67$ for time 2, and $\alpha = .75$ for time 3.

4.2.3. Procedure

This study received ethical approval from the institutional review board affiliated with the authors. Conducted online during the initial COVID-19 lockdown (March–June 2020), participants were recruited with the help of a link circulated on social media and student groups. No advertisements were paid, but the research team heavily promoted the announcement on several groups around the country. Those who signed up received an email containing informed consent details, participation requirements, and information about potential rewards. The email also included a link to the first set of questionnaires. Participants who did not respond within 24 hours received a follow-up reminder via text message. Upon completing each set of assessments, they were shown a thank-you message and informed of the scheduled date for their next set, typically one week later. Data collection occurred in three waves, with each session spaced one week apart.

4.2.4. Data Analysis

All statistical analyses were conducted using R software through the RStudio interface (Posit team, 2023). Initial data exploration ensured that all scores fell within acceptable limits and were free from scoring errors. Normality assumptions were then assessed at both univariate and multivariate levels. Univariate normality was evaluated using skewness and kurtosis, with values between -2 and +2 considered acceptable (Hahs-Vaughn, 2016). Multivariate normality was tested using the Henze-Zirkler test (Henze & Zirkler, 1990), where a non-significant result would support normality. Additionally, the percentage of missing data across the three time points was examined, and the intracluster correlation coefficient (ICC) was calculated.

To evaluate our hypotheses, a multilevel mediation model was analyzed using Multilevel Structural Equation Modeling (MSEM). Specifically, a 2-2-2 model was applied, estimating relationships at both the within subject (Level 1) and between subject (Level 2) levels simultaneously (MacKinnon & Valente, 2014). Level 1 examined whether changes in one variable corresponded with changes in another over time, indicating moment-to-moment variations. Level 2 explored more stable relationships, determining whether individuals with higher overall levels of boredom also reported greater negative emotions. The model was implemented using the 'lavaan' package in R (Rosseel, 2024), with Maximum Likelihood Robust (MLR) estimation. Missing data were managed using Full Information Maximum Likelihood (Schminkey et al., 2016).

4.3. Results

4.3.1. Preliminary analyses

All values fell within acceptable limits. The proportion of missing data was 0% at Time 1 (T1), 24% at Time 2 (T2), and 33% at Time 3 (T3). The assumption of univariate normality was met, with all variables remaining within the established thresholds for skewness and kurtosis values. Intraclass correlation coefficients (ICCs) for state boredom ranged from $\rho = .43$ to $\rho = .52$, indicating that 43% to 52% of the variance was attributable to between-person differences, while the remaining 48% to 57% reflected within-person fluctuations over time. These findings

point to substantial variability at both levels, thereby justifying the application of multilevel structural equation modeling (ML-SEM) in the analysis.

4.3.2. Structural equation modeling: From state boredom to loneliness via boredom coping

At Level I (within subjects), a significant negative path was observed from state boredom to boredom coping ($\beta = -.41$, $p < .001$) and from state boredom to loneliness ($\beta = .49$, $p < .001$). A Additionally, a significant path was identified from boredom coping to loneliness ($\beta = -.11$, $p < .05$). Boredom coping was found to mediate the relationship between state boredom and loneliness ($\beta = .05$, $p < .05$). State boredom accounted for 25% of the variance in boredom coping ($R^2 = .25$), while both state boredom and boredom coping together explained 46% of the variance in loneliness ($R^2 = .46$).

At Level II (between subjects), a significant negative path was found from state boredom to boredom coping ($\beta = -.50$, $p < .001$) and from state boredom to loneliness ($\beta = .62$, $p < .001$). The path from boredom coping to loneliness was not statistically significant ($\beta = -.11$, $p = .141$). Boredom coping did not mediate the relationship between state boredom and loneliness in this level significantly ($\beta = .06$, $p = .147$). State boredom explained 46% of the variance in boredom coping ($R^2 = .46$), and the combination of state boredom and boredom coping accounted for 25% of the variance in loneliness ($R^2 = .25$).

4.4. Discussion

The present study investigated the longitudinal relationship between state boredom, boredom coping, and loneliness, with a specific focus on how boredom coping mediates this relationship. Using a multilevel structural equation modeling approach, we were able to distinguish within subjects from between subjects patterns across three time points during the early COVID-19 lockdown. We hypothesized that boredom would predict loneliness consistently across all measurement points. Additionally, we expected boredom coping to mediate the association between boredom and loneliness and these relations to be visible at both within- and between subjects levels.

At the within subjects level, our findings support the hypothesized mediation model: state boredom negatively predicted boredom coping, and both constructs were significantly associated with loneliness. Moreover, boredom coping partially mediated the relationship between boredom and loneliness. These findings suggest that fluctuations in boredom are not only linked to increases in loneliness over time but that the way individuals themselves cope with boredom can buffer or exacerbate this association.

At the between subjects level, the results revealed that individuals who experienced higher overall levels of state boredom also reported greater loneliness and lower boredom coping, aligning with our initial hypotheses. However, the mediating role of boredom coping was not statistically significant at this level. This suggests that, while boredom coping is relevant on a moment-to-moment basis, it may not fully explain individual differences in the broader boredom–loneliness relationship across the sample. This may also indicate that the effectiveness of boredom coping in alleviating loneliness varies considerably across individuals, making it difficult to detect a uniform effect across the sample.

While the direction of the relationship was consistent with our theoretical expectations, the multilevel modeling approach may have emphasized between subjects variability to a degree that reduced the sensitivity to detect such effects. In this context, individual differences in how people cope with boredom may be too nuanced or context-dependent to manifest as significant at the group level. While the non-significant result may point to variability in the effectiveness of boredom coping across individuals, it could also be attributed to limited statistical power. Although the direction of the relationship aligned with our initial hypothesis, the analytic approach may have overemphasized between-subject variability relative to within-subject dynamics. Elevated between subjects variability can obscure the overall impact of boredom coping on loneliness, potentially making it more difficult to detect statistically significant effects at the group level.

Our findings are consistent with previous research identifying boredom as a regulatory signal prompting the pursuit of stimulation or meaning (Eastwood et al., 2012; Danckert et al., 2018). The observed relationship between boredom and loneliness supports the theoretical perspective that boredom may act as a psychological precursor to social disengagement (Weiss et al., 2022), particularly in situations where opportunities for meaningful social engagement are restricted. The COVID-19 context, marked by widespread social isolation and limited activity, likely amplified the need for effective coping mechanisms, and those who had been able to show better adapted boredom coping strategies were more likely to succeeded in reducing their loneliness.

Arguably, the most significant contribution of this study lies in demonstrating the mediating role of boredom coping in the relationship between state boredom and loneliness over time. Our findings revealed that boredom coping functioned as a mediator at the within-subject level for the association between state boredom and loneliness.

These results highlight that it is not the mere presence of boredom that predicts loneliness, but rather how individuals respond to boredom that shapes their experience of loneliness.

While boredom coping demonstrated a protective role at the within subjects level, its limited effect between subjects may reflect variability in how coping strategies are deployed across situations. This highlights the potential importance of flexible, context-sensitive coping rather than trait-level coping dispositions alone. The findings also align with cognitive models suggesting that rational and irrational appraisals shape emotional experiences (David & Szentagotai, 2006), including boredom (Milea et al., 2021) positioning boredom coping enhancement strategies as a potential intervention point.

Another plus of our study is its longitudinal design, which allowed us to observe how state boredom, boredom coping, and loneliness fluctuate and interact over time. By capturing these processes across multiple time points, we were able to move beyond the limitations of cross-sectional research and examine temporal patterns and directional relationships with greater clarity. This dynamic perspective not only deepens our understanding of how boredom contributes to loneliness but also underscores the potential for boredom coping to act as a causal mechanism in the often-reported link between boredom and adverse psychological outcomes. Together, these insights advance both theoretical and practical conversations around loneliness, emotional self-regulation in the form of boredom coping strategies, and the role of boredom in daily life.

The application of multilevel mediation analysis in this study offered a nuanced, flexible, and statistically sound approach to exploring the indirect relationships inherent in hierarchically structured data and constitutes another notable strength of this paper. Unlike traditional mediation methods, which typically assume independence among observations and focus on single-level associations, this approach allowed us to investigate both transient, moment-to-moment processes and more stable, person-level patterns simultaneously. At the within subjects level, the analysis revealed how fluctuations in boredom influenced immediate emotional outcomes through boredom coping, highlighting the fluid and context-sensitive nature of psychological experiences as they unfold over time and across varying situations.

4.4.1. Limitations

Firstly, the reliance on self-report measures could have introduced potential bias, particularly for variables such as boredom, boredom coping, and loneliness, which may be influenced by social desirability or introspective accuracy, especially during the lockdown phase. Although the COVID-19 context could be regarded as an opportunity to study boredom and loneliness together, the fact that data collection occurred during a pandemic, a time characterized by elevated stress (Mareci, 2021) disrupted routines, and potentially increased baseline levels of boredom (Nowakowska, 2020) and loneliness (Luhmann et al., 2023) should also be taken into account as a limitation. These contextual factors may have shaped participants' emotional experiences additionally to the effects of the studied variables. Their engagement in the study may have also offered participants a structured and reflective activity with the potential of increasing meaning, a variable known to influence boredom (Van Tilburg & Igou, 2012; O'Dea et al., 2024) or reducing loneliness, via social engagement.

Moreover, the study did not explore the antecedents of boredom, leaving the situational or dispositional factors that may have triggered the boredom episodes under investigation unexamined. This omission limits the ability to contextualize how boredom emerges and influences loneliness, depending on boredom coping abilities. Finally, the reliance on a convenience sample recruited exclusively online poses constraints on the generalizability of the findings, as the sample may not adequately reflect broader population characteristics. This is a concern, especially seeing that the sample was heavily skewed toward female participants. It should also be clarified that, although our modeling approach supports the directionality of associations, causal conclusions cannot be drawn, as the study design does not involve experimental manipulation.

4.4.2. Future Directions

Future research could further examine boredom coping as a key mechanism in managing the emotional consequences of boredom, particularly its association with loneliness. Exploring how individuals deploy various coping strategies in response to boredom may offer valuable insights into mitigating loneliness and promoting psychological resilience. Experimental studies incorporating both boredom induction and cognitive coping interventions could help clarify how specific strategies influence emotional outcomes in real-time, while better disentangling causality and temporal precedence. Such work would contribute to the development of targeted interventions aimed at enhancing adaptive coping skills, with the potential to reduce loneliness and improve overall emotional well-being. Future studies should also aim for more diverse samples in terms of gender, age, and sociocultural background, in order to allow for better generalizability.

4.5. Conclusions

This study offers important insights into the emotional impact of boredom, particularly in relation to loneliness, and highlights the central role of boredom coping in this dynamic. By employing a longitudinal design and a multilevel structural equation modeling approach, we found that boredom coping significantly mediates the relationship between state boredom and loneliness at the within-subject level. Our results emphasize that it is not the experience of boredom itself, but the way individuals manage and respond to it, that most strongly influences their subsequent feelings of loneliness. These findings contribute to a more nuanced understanding of how boredom contributes to emotional well-being and position boredom coping as a key mechanism in mitigating its negative consequences.

Given the growing recognition of loneliness as a public health concern, particularly during times of social isolation or crisis, these findings carry clear practical implications. Interventions designed to promote adaptive boredom coping strategies, such as cognitive reappraisal, mindfulness, and engagement in meaningful activities, could play a protective role in maintaining emotional health and preventing loneliness. Mental health programs, especially those implemented in isolated settings, should incorporate components that educate individuals on how to effectively manage boredom. Future research should continue to explore how boredom and boredom coping can be cultivated and sustained across different populations and life contexts, with the aim of reducing vulnerability to loneliness and enhancing overall psychological resilience. What is more, future studies should expand the longitudinal findings of our study in experimental designs.

Study 4. A Causal Investigation on the Effects of Boredom on Emotions

5.1. Introduction

Boredom is a previously understudied (Martz et al., 2016), yet "ubiquitous human experience that can best be described as an inability to engage with one's environment despite the motivation to do so" (Danckert & Merrifield, 2018). Traditionally viewed as a transient state (Mills & Christoff, 2018) of disinterest or restlessness (Danckert et al., 2018), boredom has been reconceptualized in recent literature as a complex psychological phenomenon with affective, attentional, and existential dimensions (Tam et al., 2024). Affectively, boredom is experienced as an aversive emotional state characterized by dissatisfaction and disinterest in the present activity (Eastwood et al., 2012). Attentional theories conceptualize it as a failure to sustain attention toward a valued task, often resulting in a restless search for stimulation or meaning (Raffaelli et al., 2018; Eastwood & Gorelik, 2019). From an existential standpoint, boredom arises when individuals perceive a lack of meaning in their current activity or broader life context, often prompting a reevaluation of personal goals or values (Van Tilburg & Igou, 2012).

Boredom has consistently been associated with a range of negative emotional, behavioral, and cognitive outcomes across various empirical studies. Emotionally, it frequently co-occurs with negative affect (Barnett & Klitzing, 2006), anxiety (Lee & Zelman, 2019; Struk et al., 2017), anger (Van Tilburg et al., 2019), dissatisfaction (Struk et al., 2017), loneliness (Conroy et al., 2010), irritation and depression (van Hooft & van Hooff, 2018), often being characterized by low arousal (van Tilburg & Igou, 2016). It has also been conceptualized as a threat to personal agency (Danckert & Eastwood, 2020)., emerging when individuals feel unable to influence their situation or goals.

In terms of behavior, the links with risky and maladaptive behaviors, such as rule-breaking (Brosowsky et al., 2021), sensation-seeking, and noncompliance (Kılıç et al., 2020; Mercer & Eastwood, 2010; Dahlen et al., 2005; Moynihan et al., 2015, 2021a; Yang et al., 2020; Biolcati et al., 2018; Mann & Robinson, 2009; Bruursema et al., 2011)), drug use (Lee et al., 2007; Biolcati et al., 2016, 2018) or internet and smartphone addiction (Mercer & Eastwood, 2010; Elhai et al., 2018; Lin & Chiang, 2017) are noteworthy. One of the most concerning behavioral associations of boredom is its link to aggression, with studies showing connections between boredom and both reactive and proactive forms of aggressive behavior (Pfattheicher et al., 2020, 2021; Wood, 2016; Gofin & Avitzour, 2012; Kokkinos et al., 2014). Boredom has been shown to correlate with poor physical health outcomes, including reduced sleep quality, sedentary behavior, and unhealthy eating patterns (Sommers & Vodanovich, 2000; Britton & Shipley, 2010; Wolff et al., 2021; Van Tilburg et al., 2022), all under the umbrella of poor self-control (Isacescu et al., 2017; Struk et al., 2016; Boylan et al., 2021).

Cognitively, boredom has been tied to increased mind-wandering (Isacescu et al., 2017; Martarelli et al., 2021a; Carriere et al., 2013; Seli et al., 2016), which may reflect an attempt to cognitively disengage from unfulfilling tasks. Additionally, boredom has been linked with both attention problems (Hunter & Eastwood, 2018; Malkovsky et al., 2012) and cognitive inflexibility (Diehl & Wyrick, 2015), further impairing individuals' ability to engage effectively with their environment. Interestingly, despite these deficits, boredom is also associated with exploratory thought, which may indicate a latent motivational drive to escape under-stimulation through mental or

behavioral novelty (Christoff et al., 2016; Mooneyham & Schooler, 2013; Fox & Christoff, 2014). However, this exploratory impulse may not always translate into adaptive outcomes, as boredom is reliably associated with low well-being (Bai et al., 2021; Tam et al., 2021b; Mugon et al., 2020; Moynihan et al., 2021b; Lee & Zelman, 2019; Struk et al., 2017), negative personality traits (Hunter et al., 2016; Tam et al., 2021b), and poor self-regulation (Struk et al., 2016; Mugon et al., 2020; Wolff et al., 2020; Dahlen et al., 2004). Taken together, this extensive body of research illustrates that boredom is far from a trivial or neutral experience-it is a psychologically significant state with wide-ranging implications for emotional well-being, cognitive functioning, and behavioral health.

In the psychological literature, a distinction is commonly made between state boredom, which refers to momentary, situational experiences of boredom (Vodanovich & Watt, 2016) and trait boredom or boredom proneness, which denotes a chronic disposition to experience boredom across situations (Farmer & Sundberg, 1986; Eastwood et al., 2012). Trait boredom has been associated with heightened attentional lapses (Malkovsky et al., 2012), reduced self-regulation (Mugon et al., 2018), and greater susceptibility to affective disturbances (Bieleke et al., 2021).

Crucially, boredom should not be confounded with related psychological constructs such as apathy, anhedonia, or depression. While these experiences may share certain surface features-such as reduced interest or low arousal-they are fundamentally distinct in terms of motivational direction and underlying cognitive processes. For instance, unlike apathy, which involves diminished motivation across contexts, boredom often triggers a desire to seek out novel or meaningful engagement (Meagher & Mason, 2012; Bench & Lench, 2013). Empirical analyses confirm that boredom forms a unique latent construct distinguishable from apathy and depression, even though it may co-occur with them (Goldberg et al., 2011; van Tilburg & Igou, 2017). Furthermore, studies have identified physiological signatures of boredom-including specific patterns of skin conductance, heart rate variability, and neural activation-suggesting that boredom constitutes a distinct affective and psychophysiological state (Merrifield & Danckert, 2014; Jang et al., 2015; Seo et al., 2019).

Despite its predominantly negative portrayal, boredom can also have adaptive functions. Several studies suggest that under specific conditions, boredom may serve as a catalyst for creativity, self-reflection, and prosocial behavior. For instance, boredom has been shown to enhance divergent thinking (Mann & Cadman, 2014), increase the desire to donate to charity as a way to regain meaning (Van Tilburg & Igou, 2017), and promote introspection and goal reevaluation (Barbalet, 1999; Park et al., 2019). These findings support the view that boredom may act as a functional signal, motivating individuals to seek novel, meaningful, or socially constructive engagement when appropriately regulated. Taken together with the information from previous paragraphs, this extensive body of research illustrates that boredom is far from a trivial or neutral experience-it is a psychologically significant state with wide-ranging implications for emotional well-being, cognitive functioning, and behavioral health.

However, as several authors (Bieleke et al., 2024; van Hooff & van Hooff, 2024) highlight, the field remains in need of robust experimental investigations that examine how (state) boredom impacts emotional outcomes, especially when measured alongside trait predispositions like boredom proneness. Most existing studies rely on correlational or self-report data, limiting causal inference. There is a recurring call for experimental studies that not only manipulate boredom in a controlled setting but also measure its emotional consequences across different affective dimensions, including functional and dysfunctional forms of emotion (Milea et al., 2021) as outlined in theories like Rational Emotive Behavior Therapy (REBT; David et al., 2009).

From the perspective of REBT, emotions are not simply automatic reactions to external stimuli, but are shaped by the way individuals interpret and evaluate their circumstances (Ellis, 1994; David et al., 2009). Together with positive emotions, REBT distinguishes between functional negative emotions (e.g., sadness, concern), which promote adaptive behaviours and serve goal-directed functions, and dysfunctional negative emotions (e.g., depression, anxiety, frustration), which impair well-being and interfere with effective coping (David & Szentagotai, 2006). This distinction is key in understanding how boredom, both as a state and a trait, can produce a range of emotional outcomes that either promote adaptive behavior or hinder emotional regulation. Understanding how these two forms of boredom interact is critical for identifying both situational and dispositional risk factors for maladaptive emotional outcomes.

Boredom has increasingly been recognized as a potent disruptor of emotional regulation and a contributor to psychological distress. In REBT terms, boredom is challenged by individuals' frustration tolerance and may be activated by irrational beliefs in the form of global evaluations (Milea et al., 2021). The same study showed an association between boredom and dysfunctional emotions such as anxiety or depression. Additionally, boredom has been linked to poor self-regulation, impulsiveness, and emotional disengagement, all of which can exacerbate the emotional impact of monotonous or unengaging environments (Struk et al., 2016).

The present study addresses this gap by investigating whether an experimental induction of state boredom produces changes in emotional experience, particularly in terms of positive versus negative affect, as well as

functional versus dysfunctional emotional responses. We hypothesize that individuals exposed to a boredom-inducing condition (a monotonous, non-significant video) will report lower levels of positive affect and higher levels of negative emotions, particularly dysfunctional ones, compared to those in a control condition (a nature video documentary). Additionally, we expect that boredom proneness will moderate these effects, such that individuals high in boredom proneness will exhibit stronger emotional reactivity to the boredom induction. This study contributes to a growing literature on the emotional dynamics of boredom, offering insights with both theoretical and applied relevance for understanding emotion regulation, motivational processes, and the psychological impact of under-stimulation.

5.2. Method

5.2.1. Participants

Although the initial sample consisted of 60 participants, scheduling difficulties led to a final sample of N=44 participants (70,44% females) split into the boredom induction group (24 participants) and the control group (20 participants), recruited from a university student population through online and course-based announcements. Their mean age was 21.59 (SD=4.48), ranging from 19 to 30 years old. Eligibility criteria required participants to be at least 18 years old, to be fluent in Romanian language, and be able to attend one in person meeting. All participants were provided informed forms consent prior to participation and received either course credit or equivalent compensation in practice hourse (in the case of students) or the opportunity to take part in a prize draw in the form of a library voucher that was organized in order to incentivize participation.

While being transparent about our research involving a short movie screening and the completion of psychological scales, the study was advertised as an opportunity to see the psychology lab in one of the countries' most prestigious universities rather that an experiment on boredom. We opted for such a strategy as a means of keeping suggestibility at a low, as well as preserving internal validity of the research. However, participants were briefed immediately after the experiment about the true nature of our study. They were also required not to share any details of their experience, to ensure future participants would not have more information about the nature of the lab meeting.

5.2.2. Instruments

Multidimensional State Boredom Scale – Short Form (MSBS-SF; Hunter et al., 2015). State boredom was assessed using the MSBS-SF, a validated 8-item instrument designed to measure transient experiences of boredom across several dimensions, including disengagement, low arousal, and difficulty concentrating. Items are rated on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating greater levels of state boredom. Internal consistency for the current sample was strong, with Cronbach's $\alpha = .81$ at pre-test and $\alpha = .90$ at post-test.

Profile of Affective Distress (PDA; Opriș & Macavei, 2007). The PDA was used to evaluate emotional responses across four domains: positive emotions, total negative emotions, functional negative emotions, and dysfunctional negative emotions. It includes separate subscales for each domain, enabling a nuanced understanding of emotional functioning consistent with Rational Emotive Behavior Therapy (REBT) principles. Responses are recorded on a 5-point Likert scale, ranging from 1 (not at all) to 5 (very much). Internal consistencies were excellent, both pre-test: $\alpha = .95$ (positive), $\alpha = .97$ (total negative), $\alpha = .94$ (dysfunctional), and $\alpha = .93$ (functional), and post-test: $\alpha = .96$ (positive), $\alpha = .94$ (total negative), $\alpha = .94$ (dysfunctional), and $\alpha = .86$ (functional).

Boredom Proneness Scale (BPS; Farmer & Sundberg, 1986). Trait boredom/boredom proneness was measured using the 28-item BPS (Farmer & Sundberg, 1986), which assesses an individual's general tendency to experience boredom across contexts. Responses are given on a 7-point Likert scale, with higher scores reflecting greater proneness to boredom. Internal consistency in this sample was high, with Cronbach's $\alpha = .82$.

Boredom Coping Scale (BCS; Hamilton et al., 1984). The BCS was employed to evaluate participants' perceived ability to cope with boredom through behavioral and cognitive strategies. Although less frequently used in research, the scale includes items designed to capture proactive coping mechanisms for boredom regulation. Responses are typically rated on a Likert-type scale, and in the present study, the BCS demonstrated modest internal consistency ($\alpha = .61$), suggesting interpretive caution.

5.2.3. Procedure

Participant recruitment was carried out both online-through social media platforms and university student groups-and offline, via announcements during academic courses and student association meetings. Interested individuals accessed a registration link where they were first presented with an informed consent form. After providing consent, participants completed a short demographic questionnaire and two baseline assessments: the

Boredom Proneness Scale (BPS) and the Boredom Coping Scale (BCS). Following the initial registration, participants were scheduled for a laboratory session and notified by email. Those who did not confirm their attendance were contacted via phone calls or text message reminders to ensure commitment. Only participants who reconfirmed were invited to attend a session.

The experimental sessions were conducted in groups of approximately 8 to 10 participants. Each group was assigned to one of two video conditions-boredom induction or control-based on a pre-established randomization list generated by an external collaborator uninvolved in the research. To ensure partial blinding and reduce expectancy bias, the experimenter only discovered the assigned condition at the start of each session. In cases where a participant could not attend their scheduled session, they were rescheduled to a different group session, which may have altered their condition assignment depending on that group's randomization.

Upon arrival, participants were instructed to remain silent throughout the session, to maintain a distance of at least three seats from one another, and to refrain from using or looking at their phones or smartwatches, which were kept inside pockets or bags. The experimenter was careful not to make distracting noises or engage with participants once the procedure had begun.

Each session began with the administration of two questionnaires: the Multidimensional State Boredom Scale–Short Form (MSBS-SF) followed by the Profile of Affective Distress (PDA), capturing participants' pre-induction levels of boredom and emotional state. Participants then viewed one of two videos, each lasting exactly 20 minutes. The boredom-inducing video was a slow-paced instructional tutorial on Microsoft Word basics, while the control video featured a dynamic ranking of 30 lesser-known but visually engaging locations in Romania, including natural monuments, historical landmarks, and recreational sites. Both videos were pre-screened and deemed appropriate by two independent colleagues, and were previously piloted with 10 students to verify their suitability.

Immediately following the video, participants completed the MSBS-SF and PDA again, in the same order as before, to measure post-induction changes in state boredom and emotional distress. The entire procedure lasted approximately 40 minutes, including time allocated for instructions, data collection, and a brief debriefing. Participants were informed that a more comprehensive debriefing session would be offered at the conclusion of the broader study, particularly for those interested in understanding the research in greater detail. As compensation, they either received course credit or practice hours or were entered into a prize draw.

5.2.4. Data Analysis

All statistical analyses were conducted using IBM SPSS Statistics version 20. To examine differences between groups and changes over time, we employed repeated measures ANOVAs and MANOVAs, where appropriate. In addition, moderation analyses were performed using the PROCESS macro for SPSS (version 3.4; Hayes, 2018), employing Model 1 to test whether trait boredom (as measured by the Boredom Proneness Scale) and boredom coping strategies moderated the effect of the experimental condition on post-induction emotional outcomes. Heteroscedasticity-consistent standard errors (HC3) were applied in all moderation models to ensure robustness of estimates. Statistical significance was set at $\alpha = .05$ for all analyses.

5.3. Results

5.3.1. Preliminary analyses

Prior to hypothesis testing, several checks were conducted to ensure the reliability and validity of the measures and the appropriateness of the analytic strategy. Internal consistency was acceptable to excellent for most scales: the MSBS-SF (state boredom) showed Cronbach's $\alpha = .81$ at pre-test and $\alpha = .90$ at post-test. The Profile of Affective Distress (PDA) showed high reliability across all subscales, including positive emotions ($\alpha = .95$ pre, $\alpha = .96$ post), total negative emotions ($\alpha = .97$ pre, $\alpha = .94$ post), dysfunctional emotions ($\alpha = .94$ pre, $\alpha = .94$ post), and functional emotions ($\alpha = .93$ pre, $\alpha = .86$ post). The Boredom Proneness Scale (BPS) had acceptable reliability ($\alpha = .82$), while the Boredom Coping Scale (BCS) showed lower internal consistency ($\alpha = .61$), suggesting caution in interpretation.

5.3.2. Main analyses

To assess the effects of boredom manipulation, a repeated measures ANOVA examined changes in state boredom across time. The main effect of time was significant, $F(1, 42) = 4.35$, $p < .01$, $\eta^2_p = .094$, indicating that boredom increased from pre- to post-task across the sample. However, the interaction between time and group was not significant, $F(1, 42) = 1.87$, $p = .179$, suggesting that the increase in boredom did not differ significantly between the experimental and control groups.

To examine emotional outcomes, a MANOVA tested whether group assignment predicted post-task emotional responses. The multivariate test was not significant, Wilks' $\Lambda = .882$, $F(3, 40) = 1.78$, $p = .166$, indicating

no overall group effect. However, follow-up univariate tests revealed that participants in the boredom induction group reported significantly lower levels of positive affect compared to the control group, $F(1, 42) = 4.29$, $p = .044$, $\eta^2_p = .093$. No significant group differences were found for total negative emotions, functional negative emotions, or dysfunctional negative emotions (all ps > .79).

Moderation analyses were conducted using PROCESS Model 1 (Hayes, 2018), applying heteroscedasticity-consistent standard errors (HC3) to test whether boredom proneness and boredom coping moderated the effect of group assignment on emotional outcomes. Boredom proneness (BPS) emerged as a marginally significant moderator of the effect of group on post-task positive emotions, $b = 0.26$, $p = .088$, 95% CI [–0.04, 0.57]. Johnson-Neyman analysis indicated that the effect of group was significant at lower levels of boredom proneness, suggesting that individuals who were less prone to boredom experienced a sharper decrease in positive affect following the boredom induction. A similar pattern was observed for boredom coping, which showed a trending moderation effect, $b = –2.20$, $p = .124$, 95% CI [–5.02, 0.63], with lower coping abilities associated with greater declines in positive affect in the boredom group.

In contrast, no significant main effects or interactions were found for total negative emotions, functional negative emotions, or dysfunctional negative emotions (all ps > .33). Neither boredom proneness, nor boredom coping significantly moderated the effect of the boredom manipulation on these emotional dimensions.

5.4. Discussion

The present study aimed to examine the emotional effects of boredom induction, focusing on both positive and negative affective outcomes and the moderating roles of trait boredom and boredom coping. Although previous research has often emphasized the maladaptive consequences of boredom, our findings offer a more nuanced view. The boredom manipulation was successful in increasing self-reported state boredom, yet its emotional impact appeared selective, primarily affecting the positive domain of emotional experience.

Participants exposed to the boredom-inducing task reported significantly lower levels of positive affect compared to those in the control group. This result aligns with prior research suggesting that boredom suppresses engagement and enjoyment, and may interfere with individuals' capacity to experience positive emotions (van Tilburg & Igou, 2017). Interestingly, no significant group differences were found in total negative affect, functional negative emotions, or dysfunctional negative emotions. These findings suggest that, in the short term, boredom may act more as a dampener of positive affect than as a direct trigger of negative emotional states-at least in relatively low-stakes experimental conditions. Rather than triggering overt anxiety, sadness, or frustration, boredom may instead produce a state of disengagement or muted emotional tone, consistent with the conceptualization of boredom as a low-arousal, dissatisfying state (Eastwood et al., 2012).

More importantly, trait factors moderated this effect on positive emotions. The interaction between group assignment and boredom proneness approached significance, indicating that individuals lower in boredom proneness were more affected by the induction, experiencing greater declines in positive affect. This supports the conceptualization of boredom proneness as a trait that not only influences how frequently boredom is experienced but also how affectively disruptive boredom can be when encountered. A similar, albeit non-significant, trend emerged for boredom coping. Participants with lower coping skills reported reduced positive emotions in the boredom condition, suggesting that the way individuals manage boredom may have downstream effects on emotional resilience. These trends resonate with theoretical frameworks (e.g., REBT, Ellis, 1962) highlighting the fact that emotional responses are shaped not only by the events themselves but by the individual's capacity to appraise and manage them.

Contrary to expectations, neither boredom proneness, nor boredom coping significantly moderated the effects of boredom induction on negative emotional outcomes. One possible explanation is that the experimental task, while effective in inducing boredom, did not elicit sufficient frustration, stress, or cognitive strain to provoke strong negative affect. Additionally, the stability of negative emotional states may be less sensitive to momentary manipulations and more entrenched in dispositional or situational variables beyond the scope of the current study. Given that previous findings have linked boredom with negative affect, impulsivity, and even aggressive behavior (Struk et al., 2016; Pfattheicher et al., 2020), it is plausible that stronger effects would emerge under more immersive or prolonged boredom conditions.

One of the primary strengths of the present study lies in its experimental design, which allowed us to directly manipulate boredom in a controlled environment. Unlike correlational studies that can only infer associations between boredom and emotional outcomes, our approach permitted causal inferences about the immediate emotional effects of situational boredom. By randomly assigning participants to either a boredom-inducing condition or a control condition, we were able to isolate the specific impact of boredom on emotional states, thus enhancing the internal validity of the findings. While the difference between groups in terms of boredom

levels was not significant, both sets of participants significantly enhanced their boredom levels, allowing us to experimentally investigate the causal relationship between state boredom and emotions.

Another important strength is the mixed design, which combined both state and trait variables to explore how individual differences interact with situational factors. This allowed us to examine not only the general emotional effects of a boredom-inducing experience but also how dispositional traits like boredom proneness and boredom coping modulate these effects. Such an approach acknowledges the complexity of emotional experiences, which rarely result from environmental triggers alone but are shaped by stable personality features and coping capacities.

A third notable strength is the integration of the Rational Emotive Behavior Therapy (REBT) framework, which offered a more nuanced conceptualization of emotional outcomes. Rather than collapsing all negative emotions into a single category, the study distinguished between functional and dysfunctional forms of negative affect-an important theoretical distinction often overlooked in boredom research. This approach allowed for a more refined understanding of how boredom might contribute not just to the presence of negative emotions, but to their adaptive or maladaptive nature.

Finally, the study demonstrated meaningful trends in the data, even where results did not reach conventional levels of statistical significance. The observed patterns-particularly the reduction in positive affect following boredom induction, and the moderating role of boredom proneness and coping-are theoretically consistent and suggestive of underlying mechanisms worthy of further exploration. These emerging trends point to the potential value of replicating and extending the study with larger, more diverse samples to fully capture the scope of boredom's emotional impact.

5.4.1. Limitations

Several limitations should be acknowledged. The sample size was relatively small, which may have limited statistical power, particularly for detecting interaction effects. Additionally, the boredom induction task-while previously validated-may not have been sufficiently immersive or frustrating to elicit strong emotional responses, especially in the negative domain, enough to make a difference between the groups. Is should, however, be noted that both groups significantly changed their state boredom levels. All data were self-reported, raising concerns about demand characteristics and subjective bias. Finally, the use of a university sample may limit the generalizability of findings to broader or more diverse populations. Therefore, data interpretation should be made cautiously.

5.4.2. Future directions

Future research would benefit from employing a larger and more statistically robust sample, as well as utilizing more immersive or extended boredom induction techniques. The relatively modest effects observed in this study may have been constrained by the short duration and limited emotional intensity of the task. More engaging and ecologically valid boredom manipulations-such as repetitive cognitive tasks or prolonged exposure to monotonous stimuli-could yield stronger emotional reactions and more clearly differentiate between groups. Secondly, future studies should aim for greater ecological validity by replicating experimental design in naturalistic settings such as classrooms, offices, or clinical environments. Boredom in real-life contexts is often tied to performance expectations, social dynamics, or long-term consequences (van Hooft & van Hooff, 2018; Vafeas, 2023). Capturing the emotional and behavioral responses to boredom in such settings would provide more generalizable and practically relevant insights.

Furthermore, incorporating interventions for reducing or managing boredom could further advance this line of research. For example, training participants in cognitive restructuring techniques derived from Rational Emotive Behavior Therapy (REBT), or in specific boredom coping strategies, may help reduce the emotional costs of boredom. Comparing such interventions against passive or control conditions could offer useful evidence for prevention or therapeutic programs targeting emotion regulation. Finally, future research should examine the cumulative effects of repeated or chronic boredom on emotional well-being. While our study focused on a single episode of state boredom, many individuals experience boredom recurrently or over extended periods. Longitudinal studies that assess how boredom unfolds over time-and how it interacts with vulnerability factors like boredom proneness-would be especially valuable in understanding its long-term emotional and psychological consequences.

5.5. Conclusion

Boredom is far more than a fleeting inconvenience - it is an emotionally and psychologically significant state with the potential to disrupt well-being, engagement, and emotional balance. Through an experimental design grounded in REBT theory, the present study sheds light on how state boredom selectively undermines positive emotional experience, even in the absence of heightened negative affect. Crucially, individual differences such as

boredom proneness and coping abilities appear to modulate this effect, pointing to the importance of dispositional and regulatory factors in emotional resilience to under-stimulation.

Although the effects were modest and some fell short of statistical significance, the trends observed here are theoretically meaningful and suggest that boredom's emotional toll may be more insidious than overt - quietly eroding the capacity for positive engagement rather than triggering overt distress. As such, boredom may operate as a "silent" disruptor of psychological well-being, particularly in emotionally vulnerable individuals or those lacking effective coping strategies.

Taken together with the growing literature on boredom's psychological correlations, these findings underscore the need for both further research and practical intervention. Targeted strategies aimed at enhancing boredom tolerance and restructuring cognitive appraisals may help mitigate boredom's emotional impact - especially in environments where under-stimulation is inevitable. By deepening our understanding of how and for whom boredom becomes emotionally consequential, this study contributes to a more nuanced, clinically relevant, and psychologically grounded portrait of boredom in the modern world.

CHAPTER IV. GENERAL CONCLUSIONS AND IMPLICATIONS

This chapter outlines the main contributions of the present thesis, which examined boredom through a multi-method approach across five empirical studies. By combining meta-analytic synthesis, experimental and longitudinal designs, and advanced statistical modeling, this thesis provides novel insights into boredom's emotional, cognitive, and behavioral dimensions. The findings challenge oversimplified views of boredom as a trivial or passive state and reposition it as a psychologically significant construct with implications for well-being, mental health, and emotional self-regulation. The conclusions are grouped thematically across theoretical, methodological, empirical, and applied contributions, followed by an analysis of limitations and suggestions for future research.

1.1. Theoretical Contributions

The current research contributes to the growing recognition of boredom as a complex psychological construct. Across studies, boredom was shown to span multiple dimensions-affective, cognitive, motivational, and dispositional-underscoring its theoretical richness and importance. From a theoretical perspective, the findings of this research program reinforce the conceptualization of boredom as a psychologically significant and multidimensional construct, rather than a trivial or passive affective state. Rather than reflecting mere disengagement or under-stimulation, boredom appears to signal deeper psychological processes, such as motivational depletion (Wolff & Martarelli, 2020), unmet psychological needs (Van Tilburg & Igou, 2012), or a disruption in goal-directed behavior and self-regulation. In line with Elpidorou's (2015) framework, boredom can be understood as an affective cue that signals the need for cognitive or behavioral redirection, serving as an early indicator of psychological misalignment or dissatisfaction.

The robust associations identified between boredom and a range of maladaptive outcomes across emotional, behavioral, and clinical domains in Study 1 support the notion that boredom warrants greater integration into dominant models of emotional regulation, psychopathology, and motivational functioning. Furthermore, given that both boredom and many psychological disorders (e.g., depression, anxiety) are strongly linked to deficits in perceived meaning or purpose, meaninglessness may represent a shared underlying mechanism-providing a valuable theoretical bridge for future research. As such, boredom may not simply co-occur with negative affective states but may serve as a precursor or amplifier of psychological vulnerability, meriting its inclusion in transdiagnostic models of mental health.

An additional theoretical advancement is offered through the integration of Rational Emotive Behavior Therapy (REBT) frameworks in Study 2. This novel application explores how irrational beliefs, such as low frustration tolerance and catastrophizing, lead to trait boredom, positioning boredom within well-established models of emotion and psychological dysfunction. The REBT lens also introduces clinically meaningful distinctions between psychological health and psychopathology models, areas rarely explored in boredom literature. In addition to being relevant for the main subject of the thesis, this particular part of our research is also important for CBT, especially REBT, and contributes to the waves of research testing the main models. Similar studies have emerged with regard to anxiety and depression (Oltean et al., 2017), PTSD (Hyland et al., 2014), or loneliness (Hyland et al., 2019).

One of the most theoretically significant findings of this research program lies in the mediating role of boredom coping, particularly as demonstrated through longitudinal data (Study 3A). Specifically, boredom coping emerged as a robust mediator in the relationship between state boredom and emotional outcomes-at both within- and between-subject levels in the case of positive affect, and at the within-subject level in relation to negative emotions. These results indicate that it is not the mere experience of boredom itself, but rather how individuals manage and respond to it, that determines the emotional trajectory that follows. In other words, boredom coping appears to function as a critical mechanism through which the valence and direction of emotional responses to boredom are shaped.

This insight carries important theoretical implications. It shifts the focus from conceptualizing boredom as an inherently maladaptive state to viewing it as a psychologically neutral or even adaptive cue whose consequences depend largely on intervening regulatory processes, implicitly adding another layer to the foundation the first studies created. Framing boredom coping as a modifiable mediator not only deepens our understanding of individual variability in boredom responses, but also highlights its potential role as a causal factor in the well-established associations between boredom and a host of negative psychological outcomes. These findings suggest that maladaptive outcomes often attributed to boredom may, in fact, stem from ineffective or dysfunctional coping strategies, thereby positioning boredom coping as a central construct in future models of emotional regulation, well-being, and psychopathology.

Another key theoretical contribution of this research program lies in the demonstration of boredom coping as a mediating mechanism in the relationship between state boredom and loneliness over time (Study 3B). Study findings revealed that this mediation occurred at the within-subject level, underscoring the idea that it is not the mere presence of boredom that determines experiences of loneliness, but rather how individuals respond to it. This supports the growing recognition that boredom coping, rather than boredom per se, functions as a determinant of downstream psychological outcomes.

While boredom coping demonstrated a protective function at the intra-individual level, its limited impact at the between-subject level suggests variability in the deployment of coping strategies across contexts. This observation contributes to a more refined theoretical understanding by suggesting that effective regulation of boredom is not merely a function of stable coping traits, but depends on adaptive, context-sensitive strategies. These findings align with cognitive frameworks such as those derived from Rational Emotive Behavior Therapy (REBT), which emphasize the role of situational appraisals and beliefs in shaping emotional experience (David & Szentagotai, 2006). In this framework, boredom coping may represent a modifiable, proximal factor in the link between boredom and maladaptive outcomes such as loneliness.

Moreover, the longitudinal nature of the studies 3A and 3B provides an important theoretical advancement by capturing how boredom, coping, emotions, and loneliness, respectivelly evolve over time. This temporal design addresses the limitations of cross-sectional research and enables stronger inferences about the directionality and dynamism of these psychological processes. It reinforces the view that emotional and cognitive responses to boredom fluctuate meaningfully and that boredom coping may serve not only as a buffer but also as a potentially causal mechanism linking boredom to longer-term emotional challenges.

Finally, the application of multilevel mediation modeling constitutes an important methodological contribution with theoretical implications. This analytic strategy allowed for simultaneous investigation of momentary (within-person) and more stable (between-person) processes, offering a layered understanding of how coping mechanisms function in real-time emotional experiences. The use of this flexible framework further supports conceptualizations of boredom as an emotion deeply embedded in both trait-level vulnerabilities and situational responses, reinforcing its relevance for models of self-regulation, interpersonal well-being, and emotional development. Our model showed how the levels of boredom at individual (not only group) level further modified boredom coping, emotions and loneliness, respectively.

A key theoretical contribution of this thesis lies in its experimental investigation of boredom's immediate emotional consequences (Study 4), which offers conceptual clarity on the affective nature of situational boredom. While much of the prior literature has relied on self-report or correlational designs, this study employed a boredom induction paradigm to test theoretical assumptions regarding boredom's impact on emotional experience. The findings nuance existing theories by showing that state boredom may not strongly elicit high-arousal negative emotions, such as anger or anxiety, as commonly assumed. Instead, it appears to suppress positive affect, aligning with models that characterize boredom as a low-arousal, aversive state. This challenges simplified categorizations of boredom within general emotion taxonomies and supports more refined conceptualizations that emphasize affective flattening rather than reactivity.

Furthermore, the integration of both trait and state variables within the same paradigm enhances theoretical models of emotional functioning by illustrating the interaction between dispositional vulnerability (e.g., boredom proneness) and situational triggers – addressing one of the main limitations of Study 2. This trait–state framework is particularly relevant in advancing emotion theories that account for individual variability in affective reactivity and supports calls for dynamic models of emotion that go beyond trait-centric or purely environmental explanations.

A particularly novel theoretical dimension stems from the application of Rational Emotive Behavior Therapy (REBT) to differentiate between functional and dysfunctional forms of negative emotion following boredom induction. This perspective brings a new layer of meaning to boredom's emotional sequelae, suggesting that boredom may not only trigger unpleasant affect but may also influence its quality-adaptive or maladaptive-depending on how individuals interpret and respond to the experience. By incorporating emotion differentiation into the boredom literature, this study contributes to the emerging understanding of boredom not just as a precursor to distress, but as a psychologically meaningful state that can contribute to the shaping of the nature and function of subsequent emotional responses. This integration lays important groundwork for future theoretical models that seek to integrate cognitive appraisal theories with contemporary boredom research. Additionally, it opens the door towards interventions based on REBT to challenge boredom coping skills or appraisals.

The thesis also advances the field by distinguishing clearly between state and trait boredom, offering empirical support for their divergent emotional signatures and psychological consequences. Studies 3A and 4 demonstrate that state boredom tends to suppress positive affect rather than induce overtly negative emotions,

suggesting a potentially adaptive regulatory function. In contrast, trait boredom appears consistently associated with maladaptive outcomes, supporting its conceptualization as a transdiagnostic vulnerability factor.

This thesis supports an integrated conceptualization of boredom as involving dissatisfaction, attentional failure, low perceived control, and motivational disengagement (Eastwood et al., 2012; Tam et al., 2024). Notably, it positions boredom as a meaningful, context-sensitive emotion that interacts with individual traits and situational demands. From an affective standpoint, boredom is typically described as a low-arousal negative emotion-marked by discontent, disengagement, and restlessness (Merrifield & Danckert, 2014). Although it lacks the intense physiological arousal of fear or anger, boredom exerts substantial psychological pressure, often driving individuals toward stimulus-seeking or emotional regulation behaviors. As such, it has been conceptualized as a threat to self-regulation, particularly in settings with little novelty, autonomy, or task variability (Tam et al., 2021).

This framework helps contextualize the findings from the experimental study (Study 4), which demonstrated that even brief exposure to boredom-inducing stimuli could reduce positive affect-especially among individuals low in trait boredom proneness. While negative emotions (e.g., anxiety, frustration) were not significantly elevated, the consistent drop in positive affect underscores boredom's capacity to dull emotional richness and reduce motivation in the short term.

One of the most significant theoretical contributions of this thesis lies in the differential emotional impact of state versus trait boredom, as revealed through experimental evidence. As already mentioned, Study 4 demonstrated that state boredom primarily functions supresses positive affect rather than directly eliciting negative emotions-a nuance that has been largely overlooked in prior conceptualizations of boredom. This distinction reinforces the view of state boredom as a context-sensitive, potentially adaptive emotional signal, rather than inherently pathological. In contrast, trait boredom-particularly as measured by the Boredom Proneness Scale (BPS) and the Boredom Susceptibility Scale (BSS)-was consistently linked to dysfunctional emotional outcomes (as seen in Study 1) and aligns more closely with the pathological framework proposed in Study 2. These findings suggest that the chronic, dispositional tendency to experience boredom may reflect broader deficits in attentional control or motivational engagement, mechanisms commonly associated with psychopathology and situated on a higher explanation-level. While state boredom is an unpleasant experience (hence the drop in positive affect), it is trait boredom who shares associations with negative outcomes.

Moreover, the results imply that the emotional consequences typically attributed to boredom may not stem from transient experiences of state boredom alone, but rather from the way individuals respond to and interpret these experiences-especially in the presence of trait-level vulnerabilities (as seen in Study 3A and 3B). This theoretical clarification advances the field by challenging the assumption that all forms of boredom are inherently maladaptive and by providing empirical support for models that distinguish between adaptive and maladaptive emotional responses based on individual differences and coping mechanisms. As such, this work calls for a more refined integration of boredom into emotion regulation and psychopathology models, differentiating between its dispositional and situational forms and their respective psychological functions.

Finally, this research critically engages with construct validity concerns surrounding popular boredom measures, such as the Boredom Proneness Scale (BPS). Results suggest that trait boredom may conceptually overlap with other constructs, including impulsivity and anhedonia, warranting refinement in operational definitions and measurement practices.

1.2. Methodological Contributions

A central strength of this thesis lies in its methodological diversity and rigor, which allowed it to address multiple literature gaps. The five studies employed a variety of methods-including meta-analysis, cross-sectional and longitudinal designs, multilevel structural equation modeling (MSEM), and experimental manipulations-each chosen to suit the specific research question at hand.

Study 1 offered one of the most comprehensive meta-analyses on boredom to date, quantifying its associations with negative emotions, maladaptive behaviors, and clinical symptoms across 39 studies and over 23,000 participants. Unlike earlier syntheses focused on academic boredom, this meta-analysis expanded the field by targeting emotional and clinical correlates, providing effect size estimates and uncovering demographic moderators.

Study 2 was, to our knowledge, the first to apply parallel and serial mediation models to boredom research using cognitive variables derived from REBT. This allowed for testing theoretical predictions regarding the role of dysfunctional beliefs in the development of trait boredom, a methodological innovation that helps bridge cognitive theory and boredom literature, deepening the understanding of boredom as an emotion.

Studies 3A and 3B implemented multilevel structural equation modeling, capturing both within-person and between-person variability in boredom and emotion across three time points. These designs offer more ecologically valid insights into how boredom evolves and affects emotional functioning in daily life, representing a significant

advancement over static, cross-sectional models. While the longitudinal designs captured the variables in different time-points over three weeks and underlined the dynamical relationship between boredom, emotions and loneliness, respectively, via boredom coping, the MSEM underscored the way in which those concepts interact both between- and within-person.

Study 4 introduced experimental rigor into the field, testing causal relationships between boredom induction and emotional responses. It examined not just affective changes post-induction but also the moderating influence of trait boredom. This methodological innovation provides a model for future causal research in boredom science.

1.3. Empirical Contributions

The empirical findings of this thesis offer multiple robust insights into boredom's psychological significance. The meta-analysis (Study 1) yielded substantial effect sizes for the associations between boredom and its outcomes: negative emotions ($r = .337$), maladaptive behaviors ($r = .293$), and clinical symptoms ($r = .471$). Moderator analyses revealed that age, gender composition, sample type, and boredom measurement instruments significantly influence these associations.

Study 2 demonstrated that specific irrational beliefs-especially low frustration tolerance and global evaluation-predict trait boredom, providing empirical support for the REBT framework. Moreover, this study identified significant associations between trait boredom and internalizing symptoms (depression and anxiety), further substantiating the maladaptive character of boredom proneness.

Studies 3A and 3B confirmed the mediating role of boredom coping in the relationship between state boredom and negative emotions. Importantly, these studies showed that both between-subject and within-subject variations in state boredom predict emotional outcomes, suggesting that boredom coping strategies play a key regulatory role.

Study 4 offered one of the few experimental demonstrations of boredom's emotional impact, revealing that induced state boredom suppresses positive affect more reliably than it elevates negative affect. These findings reinforce the idea that state boredom may serve an adaptive function, signaling a need for change without necessarily triggering emotional dysregulation.

Together, these studies provide compelling evidence that boredom is not merely a correlate of distress, but a meaningful psychological phenomenon with distinct mechanisms and outcomes. They also support the emerging perspective that trait and state boredom should be considered separately in both research and clinical contexts.

1.4 Practical and Applied Implications

Beyond its theoretical and methodological advancements, this thesis offers valuable insights for applied settings. In clinical practice, our findings suggest that trait boredom and ineffective boredom coping strategies may serve as early indicators of emotional vulnerability. Cognitive restructuring approaches, such as REBT, could be particularly effective in addressing the maladaptive belief systems underlying boredom proneness.

Moreover, boredom coping emerges as a promising intervention target. Given its mediating role in multiple studies, enhancing individuals' ability to tolerate and manage boredom could reduce the risk of negative emotional outcomes. Programs that train emotion regulation skills, cognitive flexibility, and boredom resilience (e.g., mindfulness training, adaptive self-talk) could prove to be promising when implemented in schools, universities, and mental health settings.

In educational contexts, these findings challenge traditional views of boredom as merely a student engagement issue. Educators are encouraged to consider boredom as an emotional signal reflecting unmet cognitive or motivational needs. Addressing factors such as task autonomy, meaningfulness, and stimulation level may prevent disengagement and support student well-being.

In occupational and organizational psychology, similar applications apply. Boredom-prone employees may benefit from interventions designed to enhance job meaningfulness, task variety, and self-regulation skills. Screening for boredom proneness in high-risk professions (e.g., repetitive or low-stimulation jobs) could inform tailored support strategies.

Overall, the findings presented in this thesis urge mental health professionals, educators, and organizational leaders to recognize boredom as more than a nuisance-rather, as a potential signal for deeper psychological needs and a target for evidence-based intervention.

1.5. Limitations

While this thesis makes meaningful theoretical, methodological, and empirical contributions to the study of boredom, several limitations should be acknowledged. Firstly, the generalizability of the findings is constrained by

the sample characteristics. With the exception of the meta-analysis in Study 1, all empirical studies were conducted exclusively with Romanian, non-clinical participants. While this addresses a longstanding Western-centric bias in boredom research, the overrepresentation of young, highly educated individuals-particularly university students-limits the extent to which findings can be extrapolated to more diverse populations. Furthermore, most samples had a disproportionately high percentage of female participants, which may have influenced the observed effects and contributed to the lack of significant gender differences found in some studies. These demographic imbalances suggest caution in generalizing results across age groups, socioeconomic backgrounds, or gender-diverse populations.

Secondly, the meta-analysis conducted in Study 1, though comprehensive, encompassed studies with substantial variability in sample types, study designs, and measurement instruments. The heterogeneity of effect sizes across studies reflects this variation, as the included works assessed boredom and its correlates using different operational definitions and psychometric tools. Although the analysis employed rigorous moderator testing and statistical controls for heterogeneity, the range in methodological quality and inconsistencies in outcome classification may still have biased the pooled results. Additionally, certain subgroups (e.g., clinical populations, adolescents, or males) were underrepresented in the meta-analyzed studies, further limiting the precision of the findings.

Thirdly, while Study 2 provided novel theoretical insight by applying Rational Emotive Behavior Therapy (REBT) to boredom, the study's cross-sectional nature prevents conclusions about the causal direction of relationships. According to the ABC model (Ellis, 1962; Ellis & Dryden, 1997), emotional or behavioral consequences (C) are shaped by beliefs (B) activated by specific events (A). However, in this study, activating events were neither controlled nor assessed, making it difficult to determine whether the reported beliefs were actively influencing participants' experiences of boredom or were merely dispositional tendencies. The absence of event-related data restricts interpretation and highlights the importance of future studies incorporating contextual triggers into REBT-based models.

Moreover, three of the studies were conducted entirely online using self-report measures, which, while efficient, introduces several biases. Respondents may have been influenced by social desirability, momentary emotional states, or interpretation biases, especially in the absence of interviewer clarification. Internet-based recruitment may have also excluded individuals less engaged with digital platforms. Additionally, the sample lacked exclusion criteria beyond the minimum age of 18, potentially under- or overestimating levels of trait boredom. Important psychological variables such as impulsivity, anger, and sensation seeking-known to correlate with boredom (Dahlen et al., 2004)-were not measured or controlled for, which may have introduced confounding variables to the findings. The predominance of female participants may also account for the absence of gender differences, contrasting with previous findings (Dahlen, 2005; Isacescu et al., 2017; Sundberg et al., 1991).

Fourthly, although Studies 3A and 3B implemented sophisticated longitudinal multilevel modeling techniques to capture both within- and between-subject effects, the relatively short time span (three weekly measurements) may not fully reflect the evolving nature of boredom and emotional coping over longer durations. Additionally, the reliance on self-report instruments remains a limiting factor in assessing real-time affective experiences. Compounding these limitations, the studies were conducted during the COVID-19 pandemic, a period marked by elevated emotional strain, social isolation, and increased boredom. These unique contextual factors may have amplified the relationships between variables, potentially inflating effect sizes and limiting the ecological validity of the findings in post-pandemic contexts.

Lastly, while Study 4 added valuable experimental rigor to boredom research, the induced boredom was brief, highly controlled, and potentially insufficient to produce strong or lasting emotional effects. Although both groups significantly increased their state boredom levels post-task, the manipulation may not have elicited sufficiently aversive or frustrating emotional responses to produce marked differences between the experimental and control conditions. The sample size was also relatively modest, which likely limited statistical power-particularly for detecting interaction effects involving trait boredom and boredom coping. Moreover, all data were collected via self-report, introducing the risk of demand characteristics and subjective bias. These issues highlight the need for future experiments with more immersive boredom induction paradigms (e.g., virtual reality), larger samples, multimethod assessments that incorporate objective and behavioral measures of emotional reactivity, and more externally valid processes (e.g., boredom at work, boredom in school settings).

1.6. Future Directions

Taken together, while these limitations do not undermine the contributions of the thesis, they do call for cautious interpretation and underscore several important avenues for future research. Building on the limitations discussed above, several promising solutions emerge for future research, many of which stem directly from the

individual studies presented in this thesis. To begin with, future studies should aim to replicate and extend the present findings using more culturally diverse and clinically relevant populations. The current research, with the exception of the meta-analysis, was based exclusively on Romanian, non-clinical participants. Although this provides an important corrective to the Western-centric bias in boredom research, future work should investigate whether the same patterns hold across cultural and clinical boundaries. The development of cross-cultural models of boredom and its correlates would enhance our understanding of how sociocultural factors shape the experience and consequences of boredom. Likewise, more attention should be paid to population characteristics such as gender balance, educational level, and mental health status to improve generalizability.

Furthermore, longitudinal and experimental designs should be prioritized to better elucidate the directionality and causal mechanisms underlying the observed associations. While this thesis introduced multiple methodological innovations-such as mediation modeling, serial mediation, and multilevel structural equation modeling (MSEM)-replications using longer time frames and more time points would help to test the stability and variability of boredom-related processes over time. For example, the findings from Studies 3A and 3B offer a strong foundation for future work exploring the temporal dynamics of boredom, but future studies should assess these processes over months or even years, potentially in developmental or clinical trajectories.

Moreover, there is a growing need for studies that implement ecological momentary assessment (EMA) to track boredom and emotional fluctuations in real-world contexts. As boredom is a dynamic and context-sensitive experience, EMA would allow for higher temporal resolution and reduce retrospective bias in self-reporting. Integrating EMA with physiological or behavioral data (e.g., heart rate variability, pupillometry, actigraphy, or task performance) could offer objective markers of attentional disengagement and emotional reactivity. This direction aligns with the observed need in Studies 3A and 3B to more deeply explore within-subject processes and real-time adaptation to boredom, but could also represent a follow-up on the Study 4, by potentially capturing causal influences.

Additionally, the concept of boredom coping-central across Studies 3A, 3B, and 4-deserves systematic psychometric development and theoretical elaboration. While the findings clearly demonstrate the mediating role of boredom coping in both emotional and social outcomes, current measures do not fully account for the context-sensitivity and flexibility that are essential for effective coping. A revised model of boredom coping should distinguish between cognitive, behavioral, and emotional strategies, as well as between functional and dysfunctional outcomes. It may also benefit from integration with frameworks of emotion regulation and stress reactivity. Validating such a model would not only improve measurement precision but also support the design of targeted interventions.

What is more, Study 2 demonstrated that cognitive beliefs derived from Rational Emotive Behavior Therapy (REBT) models are associated with trait boredom. However, it remains unknown whether these cognitive schemas causally influence boredom or whether boredom reinforces dysfunctional beliefs. Future studies could explore this relationship through experimental priming of beliefs or through longitudinal assessment of belief activation in response to boredom-inducing events. Furthermore, identifying the role of activating events-as emphasized in the ABC model (Ellis, 1962)-would clarify under which circumstances cognitive distortions are most likely to affect boredom outcomes.

Building on the experimental paradigm of Study 4, future research should also investigate more immersive and ecologically valid methods of boredom induction. Virtual reality (VR), adaptive computerized tasks, and interactive simulations offer new possibilities for manipulating boredom in ways that more closely mimic everyday experiences. Future experiments should also include larger samples and attempt to increase emotional salience through personalized or socially embedded boredom scenarios. Examining how individuals with different trait dispositions (e.g., boredom proneness, impulsivity, cognitive flexibility) respond to these inductions would shed light on moderating mechanisms.

Although comprehensive, and focused on emotional, cognitive, behavioral variables, this thesis did not include physiological data. Interdisciplinary research that includes cognitive neuroscience and behavioral genetics could help clarify the neurocognitive underpinnings of boredom. Functional neuroimaging (e.g., fMRI, EEG) could be used to examine attentional networks, reward sensitivity, and motivational systems implicated in boredom. Investigating the overlap between neural markers of boredom and those of psychiatric vulnerability (e.g., ADHD, depression) could yield valuable insights into boredom as a transdiagnostic risk factor.

Finally, future work should explore the implications of boredom for mental health promotion and intervention design. While this thesis did not directly test interventions, several findings-especially those on boredom coping-point to the potential utility of targeted programs for emotional regulation and boredom tolerance. Educational, occupational, and clinical settings may benefit from structured efforts to teach individuals how to reinterpret and manage boredom constructively.

In summary, advancing boredom research will require interdisciplinary, multimethod approaches that integrate cognitive, emotional, behavioral, and contextual data. Such approaches will deepen our understanding of boredom's function in daily life and its role in emotional well-being and psychological resilience, paving the way for more precise, effective, and inclusive theories and applications.

1.5. General conclusion

This thesis set out to explore boredom as a psychologically meaningful, multidimensional construct with affective, cognitive, and behavioral implications. Beginning with a comprehensive theoretical framework, the introductory chapters emphasized the complexity of boredom, distinguishing between state and trait dimensions, outlining its associations with maladaptive outcomes, and identifying critical gaps in the empirical literature. These gaps-including the need for causal clarity, better specification of mediators and moderators, and a deeper understanding of within-person variability-provided the foundation for the five studies that comprise this research program.

To address these issues, the thesis adopted a multi-method approach encompassing meta-analysis, mediation modeling, multilevel structural equation modeling, and experimental design. Each study pursued a targeted objective: (1) quantifying the strength and variability of associations between boredom and negative outcomes; (2) mapping the cognitive underpinnings of trait boredom through REBT frameworks; (3) and (4) assessing the longitudinal interplay between state boredom, emotion, loneliness, and coping; and (5) experimentally examining the emotional consequences of boredom and the moderating roles of trait variables. Together, these studies not only offered new empirical data but also extended theoretical perspectives on boredom, particularly by highlighting the role of boredom coping and the distinct emotional signatures of trait and state boredom.

The present thesis contributes to the field in several key ways: It affirms boredom's role in psychological functioning, demonstrates the mediating power of boredom coping, and reveals the nuanced ways in which boredom shapes affective experiences. Methodologically, it exemplifies how diverse analytic strategies-meta-analytic synthesis, longitudinal modeling, and experimental manipulation-can converge to produce a richer, more nuanced understanding of emotion. Theoretically, it refines our understanding of boredom's adaptive versus maladaptive dimensions and integrates cognitive models such as REBT into the study of emotional regulation. Practically, the findings point toward boredom coping as a promising target for interventions aimed at enhancing resilience and well-being across clinical, educational, and organizational contexts. Altogether, this thesis positions boredom not as a trivial inconvenience but as a central, instructive, and modifiable aspect of the human emotional landscape.

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