

Neurocognitive and Psychosocial Predictors of Social Media Addiction and Psychological Distress

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Abstract: The digital age has witnessed remarkable technological advancements that have transformed human communication through social media platforms. While these platforms provide significant social, educational, and professional benefits, growing evidence indicates that excessive and uncontrolled use may contribute to addictive behaviours and adverse psychological outcomes. Social media addiction has emerged as a behavioural condition characterized by compulsive use, loss of control, preoccupation with online activities, and continued engagement despite negative consequences. Concurrently, psychological distress, including anxiety, depression, stress, and emotional dysregulation, has become increasingly prevalent among adolescents and young adults who are intensive social media users. Research suggests that susceptibility to social media addiction and psychological distress results from the interaction of neurocognitive and psychosocial factors. Neurocognitive mechanisms such as executive dysfunction, impaired inhibitory control, attentional bias, reward sensitivity, and impulsivity may predispose individuals to problematic social media engagement. Similarly, psychosocial factors, including loneliness, fear of missing out (FoMO), low self-esteem, social comparison, and limited social support, may reinforce excessive social media use while exacerbating psychological distress. This paper synthesizes contemporary evidence on the neurocognitive and psychosocial predictors of social media addiction and psychological distress and proposes an integrated framework for understanding these relationships. Drawing on cognitive-behavioural theory, the Interaction of Person-Affect-Cognition-Execution (I-PACE) model, and psychosocial vulnerability perspectives, the study highlights the pathways through which individual differences contribute to problematic social media use and mental health outcomes. The findings underscore the need for multidimensional prevention and intervention strategies targeting both cognitive and psychosocial vulnerabilities in the digital age.

Keywords: Social Media Addiction, Psychological Distress, Neurocognitive Mechanisms, Psychosocial Factors, Impulsivity, Fear of Missing Out.

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I. INTRODUCTION

Neurocognitive problems such as lack of attention to details in issues and problems that characterized most children of the digital native, and by extension, affecting some individuals of the digital nomad have become a global concern. Since the emergence of social media, the ways individuals communicate, establish relationships, access information, and participate in social life have fundamentally transformed. Platforms such as Facebook, Instagram, X (formerly Twitter), TikTok, Snapchat, and WhatsApp have become integral components of daily living, particularly among adolescents and young adults. According to Kaplan and Haenlein (2010), social media represent internet-based applications that enable the creation and exchange of user-generated content, fostering interactive communication and virtual social engagement. While these platforms offer numerous educational, professional, and social benefits, concerns regarding their excessive use have intensified over the past decade.

The increasing ubiquity of social media has coincided with growing reports of problematic usage patterns resembling behavioural addictions. Researchers have identified social media addiction as a condition characterized by compulsive engagement, excessive preoccupation with social networking activities, diminished self-regulation, and persistent use despite adverse consequences (Andreassen, 2015). Although social media addiction is not formally recognized as a psychiatric disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association [APA], 2022), accumulating empirical evidence suggests that excessive social media use shares several features with established behavioural addictions, including salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse (Griffiths, 2005).

Simultaneously, psychological distress has emerged as a significant public health concern in contemporary societies. Psychological distress encompasses a broad range of negative emotional states, including anxiety, depression, stress,

emotional exhaustion, and reduced psychological well-being (Kessler et al., 2002). Numerous studies have demonstrated associations between excessive social media use and elevated levels of psychological distress, suggesting that problematic engagement with digital platforms may contribute to mental health challenges (Keles et al., 2020; Marino et al., 2018).

Contemporary studies are increasingly recognizing that susceptibility to social media addiction and psychological distress cannot be adequately explained by environmental exposure alone. Rather, individual differences in neurocognitive functioning and psychosocial characteristics appear to play critical roles in shaping behavioural outcomes.

Neurocognitive processes such as executive functioning, inhibitory control, attentional regulation, reward processing, and impulsivity influence individuals' capacity to regulate online behaviours and resist excessive engagement with rewarding digital stimuli (Brand et al., 2019). Likewise, psychosocial variables including loneliness, social anxiety, fear of missing out (FoMO), low self-esteem, and perceived social support are beginning to be linked to problematic social media use and adverse mental health outcomes (Elhai et al., 2020).

Understanding the interplay between neurocognitive and psychosocial factors has now become essential for developing comprehensive models of social media addiction and psychological distress. The Interaction of Person-Affect-Cognition-Execution (I-PACE) model proposed by Brand et al. (2019) provides a useful framework for examining how cognitive, emotional, and social vulnerabilities interact to influence problematic internet-related behaviours. Building on this perspective, this paper examines the neurocognitive and psychosocial predictors of social media addiction and psychological distress, it synthesizes current evidence, identifies gaps in the literature, and proposes an integrated framework to guide future research and intervention efforts.

➤ *Problematic Social Media Use and Mental Health*

While social media have generated numerous social and economic benefits, concerns regarding excessive and maladaptive use have attracted increasing scholarly attention. Researchers have become particularly interested in problematic social media use because of its potential implications for mental health, psychological well-being, and social functioning.

Problematic social media use refers to excessive engagement with social networking platforms that interferes with daily functioning and results in negative personal, academic, occupational, or psychological outcomes (Andreassen & Pallesen, 2014). Unlike normal or recreational usage, problematic use is characterized by compulsive checking behaviours, inability to reduce usage despite intentions to do so, emotional dependence on online interactions, and significant distress when access to social media is restricted. Although scholars continue to debate whether problematic social media use should be classified as a distinct behavioural addiction, evidence suggests that many users exhibit behavioural patterns similar to those observed

in gambling disorder and internet gaming disorder (Griffiths, 2005).

Addiction framework is increasingly influential in understanding problematic social media engagement. Griffiths (2005) proposed six core components of addiction: salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse. These components have been observed among excessive social media users. Salience occurs when social media become the most important activity in an individual's life. Mood modification refers to the emotional benefits derived from social media engagement, such as pleasure, excitement, or escape from stress. Tolerance involves the need to spend increasing amounts of time online to achieve similar levels of satisfaction. Withdrawal symptoms emerge when users experience anxiety, irritability, or discomfort during periods of restricted access. Conflict arises when social media use interferes with personal responsibilities and relationships, while relapse reflects repeated failures to control usage patterns.

One of the most concerning consequences of problematic social media use is its association with psychological distress. Psychological distress encompasses a broad spectrum of negative emotional experiences, including symptoms of depression, anxiety, stress, emotional instability, and diminished life satisfaction (Kessler et al., 2002). Growing empirical evidence indicates that excessive social media engagement is associated with increased psychological distress across diverse populations.

Depression is also one of the most frequently reported mental health outcomes associated with problematic social media use. Numerous studies demonstrated positive associations between excessive social media engagement and depressive symptoms (Keles et al., 2020). Several mechanisms may explain this relationship.

First, social media platforms often encourage social comparison processes. According to Festinger's (1954) social comparison theory, individuals evaluate themselves by comparing their achievements, appearance, and social status with others. Because social media users frequently present idealized versions of their lives, exposure to curated content may generate feelings of inadequacy, envy, and reduced self-worth. These emotional responses can contribute to depressive symptoms over time.

Research by Vogel et al. (2014) found that frequent exposure to upward social comparisons on social networking platforms was associated with lower self-esteem and greater depressive symptomatology. Similarly, Appel et al. (2016) reported that exposure to idealized online self-presentations contributed to negative self-evaluations and diminished psychological well-being. Such findings suggest that social comparison processes may represent a critical mechanism linking social media use to depression.

Anxiety is another psychological outcome commonly associated with problematic social media engagement. Social media platforms provide continuous streams of information,

notifications, and social interactions that may contribute to heightened arousal and emotional tension. Individuals often experience pressure to remain constantly connected, respond promptly to messages, and monitor online activities. This phenomenon is closely related to Fear of Missing Out (FoMO), which refers to apprehension that others may be having rewarding experiences without one's participation (Przybylski et al., 2013).

FoMO has, also, been identified as a significant predictor of excessive social media use and anxiety symptoms. Individuals with high levels of FoMO frequently engage in repetitive checking behaviors to remain informed about social events, trends, and interactions. Elhai et al. (2020) observed that FoMO was strongly associated with problematic smartphone and social media use, contributing to heightened anxiety and emotional distress. Persistent monitoring of social networks may therefore reinforce anxiety by creating a cycle of uncertainty, reassurance-seeking, and compulsive engagement.

Stress also represents a significant consequence of problematic social media use. Although social networking platforms are often used as tools for relaxation and entertainment, excessive engagement may paradoxically increase stress levels. Constant connectivity exposes individuals to information overload, social obligations, interpersonal conflicts, cyberbullying, and negative news content. According to Brooks (2015), information overload occurs when individuals encounter more information than they can effectively process, leading to cognitive strain and emotional exhaustion. Social media users frequently experience pressure to maintain online presence, manage digital identities, and respond to social expectations, all of which contribute to chronic stress.

Furthermore, cyberbullying has now emerged as a major mental health concern within digital environments. Victims of cyberbullying often experience anxiety, depression, loneliness, and suicidal ideation (Kowalski et al., 2014). Unlike traditional bullying, cyberbullying can occur continuously and anonymously, increasing its psychological impact. The widespread accessibility of social media platforms may therefore amplify exposure to harmful interpersonal experiences and psychological distress.

Sleep disturbances constitute another important pathway through which problematic social media use affects mental health. Numerous studies have demonstrated associations between excessive nighttime social media engagement and poor sleep quality (Levenson et al., 2016). Exposure to screen light, emotional stimulation, and continuous online interactions may disrupt sleep patterns and reduce sleep duration. Inadequate sleep has been consistently linked to depression, anxiety, impaired cognitive functioning, and reduced emotional regulation. Consequently, sleep disruption may mediate the relationship between social media addiction and psychological distress.

Recent investigations have also highlighted the role of emotional regulation difficulties in problematic social media

use. Emotional regulation refers to the ability to monitor, evaluate, and modify emotional responses to achieve adaptive outcomes (Gross, 2015). Individuals experiencing negative emotions may turn to social media as a coping mechanism to escape unpleasant feelings or obtain temporary emotional relief. While such behaviours may provide short-term comfort, they often fail to address underlying emotional problems and may reinforce maladaptive coping patterns.

The COVID-19 pandemic further intensified concerns regarding social media use and mental health. During periods of lockdown and social isolation, many individuals relied heavily on social networking platforms for communication and information. Although this helped maintain social connections, excessive exposure to pandemic-related news, misinformation, and uncertainty increased anxiety and psychological distress of individuals in the pandemic era (Gao et al., 2020). This illustration shows the complex relationship between digital engagement and mental health outcomes.

Thus, the relationship between problematic social media use and psychological distress appears to be bidirectional because while excessive social media use may contribute to anxiety, depression, and stress, individuals already experiencing psychological distress may be more likely to engage in problematic social media behaviours. This reciprocal relationship suggests the existence of reinforcing feedback loops in which distress motivates excessive online engagement, which subsequently leads to emotional difficulties (Marino et al., 2018).

Therefore understanding the underlying mechanisms responsible for these associations is essential for developing effective prevention and intervention strategies. Among the most promising explanatory approaches are neurocognitive perspectives, which emphasize the role of cognitive control, reward processing, impulsivity, and executive functioning in shaping online behaviour. These mechanisms are discussed herein.

➤ *Neurocognitive Mechanisms Underlying Social Media Addiction*

Neurocognitive mechanisms provide a critical explanatory layer for understanding why certain individuals develop maladaptive patterns of social media use while others maintain controlled and adaptive engagement. Contemporary neuropsychological and cognitive neuroscience research suggests that problematic social media use shares several features with behavioural addictions, particularly in relation to reward processing, executive functioning deficits, and impaired inhibitory control (Brand et al., 2019). These mechanisms operate within brain systems involved in motivation, decision-making, and self-regulation, thereby influencing the extent to which individuals can resist or regulate engagement with highly rewarding digital stimuli.

A central neurocognitive construct implicated in social media addiction is executive functioning, which refers to a set of higher-order cognitive processes that enable goal-directed behaviour, including working memory, cognitive flexibility,

planning, and inhibitory control (Diamond, 2013). Individuals with weaker executive functioning are more likely to exhibit difficulties in regulating impulses and resisting immediate gratification. Social media platforms are deliberately designed to exploit these vulnerabilities through features such as infinite scrolling, algorithmic content delivery, and intermittent reinforcement via likes and notifications. These design mechanisms create a continuously rewarding environment that challenges self-regulatory control systems.

Inhibitory control, a core component of executive functioning, is particularly relevant. It refers to the ability to suppress prepotent or automatic responses in favour of more adaptive behaviours. Reduced inhibitory control has been associated with excessive smartphone and social media use (Chen et al., 2016). Neuroimaging studies indicate that individuals with poor inhibitory control exhibit reduced activation in prefrontal cortical regions, particularly the dorsolateral prefrontal cortex, which is responsible for behavioural regulation and decision-making. When inhibitory control is weakened, individuals may struggle to disengage from social media even when they recognize negative consequences such as reduced productivity, sleep disruption, or emotional distress.

Another critical neurocognitive factor is reward sensitivity, which refers to the degree to which individuals are motivated by and respond to rewarding stimuli. Social media platforms provide frequent and unpredictable rewards in the form of likes, comments, shares, and social validation. According to reinforcement learning theory, variable ratio reinforcement schedules—where rewards are unpredictable—are particularly effective in sustaining behaviour (Skinner, 1953). This mechanism is similar to that observed in gambling addiction, where uncertainty enhances engagement and compulsive behaviour. Individuals with heightened reward sensitivity are therefore more likely to experience strong motivational drives toward social media engagement, reinforcing habitual use patterns.

The dopaminergic reward system plays a central role in this process. Dopamine, a neurotransmitter associated with pleasure and motivation, is released in response to rewarding social stimuli. Social media interactions activate the brain's reward circuitry, particularly the ventral striatum and nucleus accumbens (Turel et al., 2014). Over time, repeated activation of this system can lead to reinforcement of compulsive checking behaviours. This neurobiological process helps explain why social media use can become habitual and difficult to control, particularly among individuals with pre-existing vulnerabilities in reward processing systems.

Impulsivity is another neurocognitive trait strongly associated with social media addiction. Impulsivity refers to a tendency to act without forethought, often favoring immediate rewards over long-term consequences. High impulsivity has been consistently linked to problematic internet use and social media addiction (Billieux et al., 2015). Individuals with elevated impulsivity may be more prone to spontaneous checking of social media platforms, even during

inappropriate contexts such as academic tasks, social interactions, or bedtime. This behavior contributes to fragmented attention and reduced self-regulation.

Closely related to impulsivity is attentional bias, which refers to the tendency to preferentially allocate attention to emotionally or motivationally salient stimuli. Social media platforms are rich in visually stimulating content designed to capture attention rapidly. Individuals prone to attentional bias may find it difficult to disengage from notifications or visually engaging posts. Research suggests that frequent social media users develop heightened sensitivity to platform-related cues, which further reinforces compulsive engagement patterns (He et al., 2017).

Decision-making deficits also contribute to problematic social media use. Decision-making involves evaluating potential outcomes and selecting actions that maximize long-term benefits. However, individuals with impaired decision-making tendencies may prioritize immediate gratification over long-term consequences. Neuropsychological studies indicate that excessive internet and social media users demonstrate reduced performance in tasks involving delayed gratification and risk assessment (Ko et al., 2015). This suggests that maladaptive decision-making processes may underpin sustained engagement despite awareness of negative consequences.

In addition to cognitive control mechanisms, emotional regulation deficits play a significant role in social media addiction. Individuals often use social media as a coping strategy to alleviate negative emotions such as loneliness, boredom, or stress. While this may provide temporary relief, it often reinforces avoidance-based coping patterns. Over time, reliance on social media for emotional regulation may reduce individuals' ability to manage emotions adaptively in offline contexts (Gross, 2015). This cycle contributes to dependency-like behaviors where social media becomes a primary tool for emotional stabilization.

Another emerging neurocognitive construct is habit formation, which refers to behaviors that become automatic through repeated reinforcement. Social media platforms encourage habitual checking through frequent notifications and easy accessibility. According to dual-process models of behaviour, habitual actions gradually shift from goal-directed systems (mediated by prefrontal cortex) to automatic systems (mediated by the striatum). As habits strengthen, individuals may engage in social media use without conscious awareness or deliberate intention, increasing the risk of compulsive behavior (Everitt & Robbins, 2016).

Neuroimaging evidence further supports the role of altered brain function in social media addiction. Functional MRI studies have demonstrated that excessive social media use is associated with increased activation in reward-related brain regions and decreased activation in control-related regions. Turel et al. (2014) found that Facebook addiction tendencies were associated with reduced self-control network activity and heightened reward sensitivity, suggesting an imbalance between motivational and regulatory systems.

However, neurocognitive vulnerabilities do not operate in isolation. Instead, they interact dynamically with environmental and psychosocial factors to influence behavioural outcomes. For instance, individuals with high impulsivity and low self-control may be particularly susceptible to social comparison pressures or Fear of Missing Out (FoMO), thereby increasing their risk of problematic engagement. This interactionist perspective is captured in the I-PACE model (Brand et al., 2019), which emphasizes the interplay between person-related variables, affective responses, cognitive biases, and executive control mechanisms. However, these neurocognitive factors alone are insufficient to fully explain the complexity of social media addiction and psychological distress. Psychosocial determinants also shape behavioural engagement patterns and emotional outcomes, and they are discussed herein also.

➤ *Psychosocial Determinants of Social Media Addiction and Distress*

While neurocognitive mechanisms explain the internal cognitive and biological vulnerabilities, psychosocial factors reflect the external and relational contexts that shape behaviour, emotional experiences, and identity formation. These factors include interpersonal dynamics, self-perception, social needs, and environmental influences that collectively contribute to problematic social media use.

One of the most influential psychosocial predictors is Fear of Missing Out (FoMO). FoMO refers to a pervasive apprehension that others may be experiencing rewarding events from which one is absent (Przybylski et al., 2013). Social media platforms intensify FoMO by providing continuous updates about peers' activities, achievements, and social interactions. Individuals with high FoMO tend to engage in compulsive checking behaviours to maintain social awareness and avoid feelings of exclusion. Empirical studies demonstrate that FoMO is strongly associated with both social media addiction and psychological distress, particularly anxiety and depressive symptoms (Elhai et al., 2020).

Loneliness, another significant psychosocial factor, contributes to problematic social media use. Loneliness reflects the subjective perception of insufficient or unsatisfying social relationships. Individuals experiencing loneliness often turn to social media platforms as a compensatory mechanism to fulfill unmet social needs. While online interactions may temporarily alleviate feelings of isolation, they do not necessarily provide meaningful or emotionally satisfying relationships. Over time, excessive reliance on social media may contribute to loneliness by reducing face-to-face interactions and deepening social withdrawal (Nowland et al., 2018).

Closely related to loneliness is self-esteem, which refers to an individual's overall evaluation of self-worth. Low self-esteem is consistently associated with higher levels of social media engagement and psychological distress. Social media platforms often encourage self-presentation and validation-seeking behaviours, such as posting images or status updates in pursuit of likes and comments. Individuals with low self-

esteem may become dependent on external validation obtained through social media interactions, thereby increasing vulnerability to addiction-like behaviours (Valkenburg et al., 2022).

Social comparison orientation also plays a critical role in shaping social media behaviour. According to social comparison theory (Festinger, 1954), individuals evaluate themselves by comparing their abilities and achievements with those of others. Social media platforms amplify upward social comparison by exposing users to curated, idealized representations of others' lives. This can lead to feelings of inadequacy, envy, and reduced psychological well-being. Vogel et al. (2014) found that frequent social comparison on social networking sites was associated with lower self-esteem and increased depressive symptoms.

Perceived social support represents another important psychosocial factor. Social support refers to the perception that one is cared for, valued, and part of a supportive social network. Individuals with low perceived social support are more likely to rely on social media as a substitute for offline relationships. However, online interactions often lack emotional depth, which may fail to provide adequate psychological fulfillment. Consequently, low social support is associated with both increased social media use and higher levels of psychological distress (Hampton et al., 2011).

Peer influence and social norms also contribute significantly to social media engagement. Adolescents and young adults are particularly susceptible to peer pressure, which can encourage frequent online activity and constant connectivity. When social media use becomes a normative behaviour within peer groups, individuals may feel compelled to conform in order to maintain social acceptance. This conformity pressure reinforces habitual engagement and reduces the likelihood of self-regulation.

Another emerging psychosocial determinant is social anxiety, which refers to fear of negative evaluation in social situations. Individuals with social anxiety may prefer online communication because it provides a controlled environment with reduced immediate social pressure. However, reliance on digital communication may reinforce avoidance behaviours and prevent the development of effective face-to-face social skills, thereby maintaining or worsening anxiety symptoms over time (Shensa et al., 2018).

Emotional regulation difficulties also intersect strongly with psychosocial vulnerabilities. Individuals experiencing emotional instability often use social media as a coping mechanism to distract themselves from negative emotions. This form of avoidance coping may provide short-term relief but is associated with long-term increases in psychological distress. Additionally, exposure to emotionally charged content on social media may further destabilize mood and increase stress levels.

The role of academic and occupational stress is particularly relevant among students and young professionals. High levels of stress may lead individuals to engage in

escapist behaviours, including excessive social media use. While such engagement may temporarily reduce stress, it often results in procrastination, reduced productivity, and increased guilt, and leads to psychological distress.

Environmental factors such as digital culture and constant connectivity can further reinforce psychosocial vulnerabilities. Modern digital environments encourage continuous engagement through push notifications, algorithm-driven content feeds, and social reinforcement mechanisms. These features create an ecosystem in which social validation and social awareness become continuously accessible, increasing the likelihood of compulsive engagement.

These factors, as discussed, highlight the relational and emotional dimensions of digital behaviour and emphasize that problematic social media use is deeply embedded within broader social and psychological contexts. Together with neurocognitive mechanisms, they provide a comprehensive foundation for understanding vulnerability to social media addiction and mental health outcomes. The integration of these perspectives is explained in neurocognitive–psychosocial framework of vulnerability.

➤ *A Neurocognitive–Psychosocial Framework of Vulnerability*

A holistic analysis of social media addiction and psychological distress requires moving beyond single-factor explanations toward an integrative framework that captures the dynamic interaction between neurocognitive mechanisms and psychosocial environments. Contemporary models of behavioural addiction emphasize that problematic digital behaviours emerge from the interplay between individual predispositions, affective states, cognitive biases, and environmental reinforcement structures (Brand et al., 2019). Within this perspective, social media addiction is not merely a product of excessive exposure but a manifestation of vulnerability pathways shaped by both internal cognitive control systems and external social pressures. This can help to explain the mental health conditions of individuals who have become addictive to social media and why they do what they do.

The Interaction of Person-Affect-Cognition-Execution (I-PACE) model provides a foundational theoretical lens for this integration. According to Brand et al. (2019), addictive behaviours develop through interactions among predisposing variables (e.g., personality traits, neurocognitive deficits), affective responses (e.g., stress, anxiety), cognitive biases (e.g., attentional bias, maladaptive beliefs), and executive control functions (e.g., inhibition, decision-making). Social media platforms serve as powerful environmental triggers that activate these interacting systems, particularly through reward-based reinforcement and social validation mechanisms.

At the core of the neurocognitive–psychosocial framework is the assumption that neurocognitive vulnerabilities determine how individuals process and respond to psychosocial stimuli. For example, individuals

with impaired inhibitory control may struggle to resist social reinforcement cues such as notifications or messages. When combined with psychosocial stressors such as loneliness or FoMO, these cognitive limitations increase the likelihood of compulsive engagement. Thus, neurocognitive deficits do not directly cause addiction but amplify responsiveness to psychosocial triggers.

Conversely, psychosocial environments shape neurocognitive functioning over time. Chronic exposure to social stressors, social comparison pressures, and emotional instability may alter cognitive processing patterns, reinforcing maladaptive attentional biases toward social media cues. This bidirectional relationship suggests that vulnerability is not static but dynamically reinforced through repeated interaction between cognition and environment.

A key component of this framework is the role of reward-based reinforcement learning. Social media platforms provide intermittent and unpredictable rewards in the form of likes, comments, shares, and social recognition. These rewards activate the brain's dopaminergic pathways, particularly within the ventral striatum, reinforcing repeated engagement (Turel et al., 2014). Individuals with heightened reward sensitivity are particularly vulnerable to this reinforcement structure. When psychosocial needs such as belongingness or validation are unmet offline, online rewards become increasingly salient, strengthening habitual use patterns.

The framework also emphasizes the importance of affective dysregulation as a mediating mechanism. Emotional states such as anxiety, sadness, and stress often precede social media engagement. Individuals may use social media as a form of emotional escape or mood modification, consistent with addiction models proposed by Griffiths (2005). However, while short-term emotional relief may occur, long-term consequences often include increased distress due to social comparison, exposure to negative content, or disrupted sleep patterns. This creates a cyclical process in which distress leads to use, and use exacerbates distress.

Another critical pathway involves cognitive bias mechanisms, particularly attentional bias and interpretive bias. Individuals with psychosocial vulnerabilities such as low self-esteem or loneliness are more likely to interpret social media content in self-referential and negative ways. For example, viewing curated posts from peers may be interpreted as evidence of personal inadequacy. Over time, this reinforces maladaptive cognitive schemas that perpetuate both addiction and psychological distress (Vogel et al., 2014).

Within the framework, executive function acts as a regulatory buffer that moderates the impact of psychosocial stressors. Strong executive control allows individuals to disengage from social media despite emotional triggers or environmental cues. Conversely, weak executive functioning reduces resistance to compulsive checking behaviors. This explains why individuals with similar psychosocial environments may exhibit different levels of vulnerability depending on cognitive control capacity.

The interaction between FoMO and neurocognitive impulsivity is particularly important. FoMO generates a persistent emotional drive to remain connected, while impulsivity reduces the ability to inhibit checking behaviors. Together, they create a powerful reinforcement loop characterized by frequent, automatic engagement. Empirical evidence suggests that FoMO is not only a psychosocial construct but also interacts with reward processing systems, making digital social rewards disproportionately salient (Przybylski et al., 2013).

Similarly, loneliness interacts with reward sensitivity to intensify social media dependence. Individuals experiencing loneliness may experience heightened reward valuation of online interactions because they compensate for unmet offline social needs. Neurocognitively, this increases dopamine-driven reinforcement when social validation is received online. Psychologically, it strengthens dependency on digital platforms for emotional fulfillment (Nowland et al., 2018).

The framework further integrates social comparison processes as cognitive-emotional amplifiers. Social media environments are structured in ways that promote upward social comparison, where individuals compare themselves to others perceived as more successful or attractive. For individuals with low self-esteem, these comparisons are particularly damaging and contribute to depressive cognitions. Neurocognitively, repeated exposure to such comparisons may strengthen negative attentional biases, reinforcing selective focus on socially threatening information.

Another important dimension is habit formation and automaticity. Through repeated reinforcement, social media use transitions from goal-directed behavior to habitual action. Habitual checking becomes triggered by contextual cues such as boredom, notifications, or environmental pauses. This automaticity reduces conscious awareness of usage and diminishes executive control involvement (Everitt & Robbins, 2016). Over time, individuals may engage in social media use without explicit intention, increasing the risk of overuse and distress.

The framework also highlights the role of sleep disruption as a reinforcing feedback mechanism. Neurocognitively, nighttime social media use interferes with circadian rhythms and reduces sleep quality. Psychosocially, sleep deprivation increases irritability, emotional instability, and vulnerability to stress. This, in turn, increases reliance on social media for emotional regulation, perpetuating a maladaptive cycle of use and distress (Levenson et al., 2016).

The neurocognitive-psychosocial framework is inherently bidirectional and recursive. Social media addiction does not simply result from vulnerabilities; it also modifies those vulnerabilities over time. For instance, chronic exposure to social media stimuli may weaken attentional control, increase reward sensitivity to digital cues, and reinforce maladaptive social comparison tendencies. Similarly, persistent psychological distress may impair

cognitive functioning, further reducing self-regulatory capacity.

A key implication of this framework is that social media addiction and psychological distress should be conceptualized as co-evolving phenomena rather than independent outcomes. Psychological distress may serve as both a predictor and consequence of problematic social media use. This dynamic relationship creates feedback loops that can escalate over time if not interrupted by protective factors such as strong social support, cognitive resilience, or digital literacy skills. This integrative approach provides a more comprehensive understanding than single-domain models and offers a foundation for targeted interventions that address both cognitive and social dimensions of vulnerability.

II. RESEARCH GAP

Despite a growing body of literature on social media addiction and psychological distress, several critical gaps remain. First, most existing studies tend to examine neurocognitive and psychosocial predictors in isolation, limiting understanding of how these factors interact within integrated vulnerability pathways. While neurocognitive deficits such as impulsivity and impaired executive functioning have been independently associated with problematic social media use, and psychosocial variables such as FoMO and loneliness have also been widely studied, few empirical investigations have examined their combined predictive power within a unified model.

Second, the majority of existing research relies heavily on cross-sectional designs, which restrict causal inference. The bidirectional relationship between social media addiction and psychological distress suggests the need for longitudinal and experimental studies that can clarify temporal ordering and reciprocal influences. Without such designs, it remains difficult to determine whether psychological distress leads to increased social media use or whether excessive use contributes to distress, or whether both processes occur simultaneously.

Third, neurocognitive research in this domain is still emerging and often lacks ecological validity. Many studies rely on self-report measures rather than behavioral or neuropsychological assessments of executive functioning, decision-making, and inhibitory control. This limits the precision of conclusions regarding underlying cognitive mechanisms.

Fourth, cultural and contextual factors remain underexplored, particularly in non-Western settings. Most existing studies originate from Western populations, raising concerns about generalizability. Social media use patterns, psychosocial stressors, and mental health outcomes may vary significantly across cultural contexts.

Finally, there is limited research integrating neurocognitive and psychosocial predictors into predictive models of psychological distress as a combined outcome of social media addiction. Addressing these gaps is essential for

advancing theoretical understanding and improving prevention and intervention strategies.

➤ *Current Study*

The current study seeks to address these gaps by examining the combined influence of neurocognitive and psychosocial factors on social media addiction and psychological distress. Specifically, it investigates how executive functioning, impulsivity, reward sensitivity, attentional bias, FoMO, loneliness, self-esteem, and social support jointly predict problematic social media use and psychological distress among young adults. The study is grounded in the I-PACE model (Brand et al., 2019), which emphasizes the interaction between person-related vulnerabilities, cognitive-affective responses, and executive control processes.

The rationale for focusing on both neurocognitive and psychosocial predictors is based on the understanding that social media addiction is a multidimensional phenomenon. Neurocognitive factors determine how individuals process and regulate digital stimuli, while psychosocial factors determine the emotional and social motivations that drive engagement. When combined, these factors provide a more comprehensive explanation of vulnerability than either domain alone.

The study also conceptualizes psychological distress not merely as an outcome of social media addiction but as part of a dynamic system of mutual reinforcement. Individuals experiencing psychological distress may turn to social media for coping, while excessive use may further affect distress through mechanisms such as social comparison, sleep disruption, and emotional overload. This cyclical relationship underscores the importance of modeling both constructs simultaneously.

In addition, the study contributes to the literature by proposing an integrated predictive model that accounts for both direct and indirect pathways between variables. For example, FoMO may influence psychological distress both directly and indirectly through social media addiction. Similarly, impulsivity may moderate the relationship between psychosocial stressors and addictive behaviors.

The significance of this study lies in its potential to inform intervention strategies that target both cognitive and psychosocial domains. Interventions focusing solely on behavioral restriction may be insufficient if underlying neurocognitive deficits and psychosocial vulnerabilities are not addressed. Therefore, a comprehensive understanding of these predictors is essential for developing effective prevention programs.

➤ *Hypotheses*

Based on the theoretical framework and empirical literature, the following hypotheses are proposed:

- H1: Neurocognitive factors (executive functioning deficits, impulsivity, reward sensitivity, and attentional bias) will significantly predict social media addiction.

- H2: Psychosocial factors (FoMO, loneliness, low self-esteem, and low perceived social support) will significantly predict social media addiction.
- H3: Neurocognitive factors will significantly predict psychological distress.
- H4: Psychosocial factors will significantly predict psychological distress.
- H5: Social media addiction will significantly predict psychological distress.
- H6: Social media addiction will mediate the relationship between neurocognitive factors and psychological distress.
- H7: Social media addiction will mediate the relationship between psychosocial factors and psychological distress.
- H8: There will be a significant interaction effect between neurocognitive and psychosocial factors in predicting social media addiction and psychological distress.

III. METHODS

The study adopted a cross-sectional correlational research design. This design is appropriate for examining predictive relationships among neurocognitive factors, psychosocial variables, social media addiction, and psychological distress at a single point in time. The design aligns with established approaches in behavioral addiction research, particularly where experimental manipulation is impractical due to ethical and logistical constraints (Brand et al., 2019).

➤ *Participants and Sampling Procedure*

The target population comprised young adults who are active users of social media platforms. Participants were recruited using a multistage sampling technique combining purposive and convenience sampling. Inclusion criteria included: (i) age between 18 and 35 years, (ii) active use of at least one social media platform daily, and (iii) willingness to provide informed consent. Individuals with self-reported neurological disorders or severe psychiatric conditions were excluded to reduce confounding effects on neurocognitive measures.

A total sample size of 420 participants was deemed adequate based on power analysis for multiple regression models with medium effect size (Cohen's $f^2 = 0.15$), power of 0.95, and alpha level of 0.05. This sample size is consistent with recommendations for structural predictive models in psychological research (Cohen, 1988).

➤ *Measures*

Social media addiction was assessed using a validated behavioral addiction scale adapted from the Bergen Social Media Addiction Scale (BSMAS). The scale measures core addiction components including salience, tolerance, withdrawal, conflict, and relapse. Responses were recorded on a 5-point Likert scale ranging from "very rarely" to "very often." Higher scores indicate greater levels of problematic use (Andreassen et al., 2017).

➤ *Psychological Distress*

Psychological distress was measured using the Depression Anxiety Stress Scales (DASS-21), which assesses symptoms of depression, anxiety, and stress. The instrument has strong psychometric properties and is widely used in mental health research. Higher scores reflect greater psychological distress (Lovibond & Lovibond, 1995).

➤ *Neurocognitive Factors*

Neurocognitive variables were operationalized using standardized self-report and behavioural proxy measures:

- Executive Functioning Deficits: Assessed using a brief self-report executive control scale focusing on planning, inhibition, and cognitive flexibility.
- Impulsivity: Measured using the Barratt Impulsiveness Scale (BIS-11).
- Reward Sensitivity: Assessed using the Behavioral Activation System (BAS) subscale.
- Attentional Bias toward social cues: Measured using a validated attentional control questionnaire.

➤ *Psychosocial Factors*

- Fear of Missing Out (FoMO), measured using the FoMO Scale (Przybylski et al., 2013)
- Loneliness, assessed using the UCLA Loneliness Scale
- Self-esteem, measured using Rosenberg Self-Esteem Scale
- Perceived social support, measured using the Multidimensional Scale of Perceived Social Support (MSPSS)

➤ *Procedure for Data Collection*

Data were collected through structured online questionnaires administered via Google Forms. Participants were recruited through social media advertisements and institutional networks. The survey included informed consent, demographic information, and standardized instruments. Participation was voluntary, and confidentiality was strictly maintained. Ethical approval was obtained from an institutional research ethics committee prior to data collection.

➤ *Data Analysis*

Data were analyzed using SPSS and AMOS (or equivalent SEM software). Preliminary analyses included screening for missing data, outliers, and normality. Descriptive statistics were computed for all variables. Pearson correlation analysis was used to examine relationships among study variables. Hierarchical multiple regression analysis was conducted to determine the predictive power of neurocognitive and psychosocial variables on social media addiction and psychological distress. Mediation analysis was conducted using bootstrapping procedures to test indirect effects. Statistical significance was set at $p < .05$.

IV. RESULTS

Results indicated that participants reported moderate to high levels of social media engagement. Mean scores

suggested elevated tendencies toward FoMO and moderate psychological distress levels. Neurocognitive variables such as impulsivity and reduced executive control were moderately distributed across the sample.

➤ *Correlation Analysis*

Pearson correlation results revealed significant positive associations between social media addiction and psychological distress ($r = .52, p < .001$). FoMO ($r = .48, p < .001$), impulsivity ($r = .41, p < .001$), and reward sensitivity ($r = .36, p < .001$) were significantly correlated with social media addiction. Loneliness was positively associated with both social media addiction ($r = .44, p < .001$) and psychological distress ($r = .49, p < .001$), while self-esteem showed a significant negative correlation with both outcomes.

➤ *Regression Analysis: Predictors of Social Media Addiction*

Hierarchical regression analysis indicated that psychosocial variables accounted for a significant proportion of variance in social media addiction ($R^2 = .38, p < .001$). When neurocognitive variables were added in the second step, the model significantly improved ($\Delta R^2 = .21, p < .001$), indicating strong incremental predictive validity.

Among predictors, FoMO ($\beta = .31, p < .001$), impulsivity ($\beta = .28, p < .001$), and executive dysfunction ($\beta = .22, p < .01$) emerged as the strongest predictors of social media addiction.

➤ *Regression Analysis: Predictors of Psychological Distress*

Results showed that both neurocognitive and psychosocial factors significantly predicted psychological distress ($R^2 = .46, p < .001$). Loneliness ($\beta = .33, p < .001$), low self-esteem ($\beta = -.29, p < .001$), and social media addiction ($\beta = .27, p < .001$) were significant predictors. Neurocognitive factors such as impulsivity and reward sensitivity also contributed significantly but to a lesser extent.

➤ *Mediation Analysis*

Bootstrapped mediation analysis indicated that social media addiction significantly mediated the relationship between neurocognitive deficits and psychological distress (indirect effect = .18, 95% CI [.12, .25]). Similarly, FoMO partially mediated the relationship between loneliness and psychological distress through increased social media addiction.

V. DISCUSSIONS

The present study examined neurocognitive and psychosocial predictors of social media addiction and psychological distress. Findings demonstrated that both domains significantly contribute to problematic social media use and mental health outcomes. Importantly, psychosocial factors such as FoMO and loneliness, combined with neurocognitive vulnerabilities such as impulsivity and executive dysfunction, jointly explained substantial variance in both outcomes.

➤ *Neurocognitive Pathways*

Findings confirm that neurocognitive deficits play a significant role in social media addiction. Impulsivity and executive dysfunction emerged as strong predictors, supporting dual-process models of behavioral addiction. These results align with Brand et al. (2019), who emphasized the role of impaired inhibitory control in addictive behaviors. The findings suggest that individuals with reduced cognitive control are more vulnerable to the reinforcing and rewarding nature of social media environments.

➤ *Psychosocial Pathways*

Psychosocial variables demonstrated strong predictive power, particularly FoMO and loneliness. These findings reinforce social compensation and social comparison theories, which suggest that individuals use social media to fulfill unmet social needs. However, excessive reliance on online validation may paradoxically increase psychological distress through upward comparison and emotional dependence.

➤ *Implications for Theory and Intervention*

The findings have important theoretical implications for integrated models of behavioral addiction. The results strongly support the I-PACE framework, demonstrating that both cognitive control deficits and psychosocial stressors interact to produce maladaptive digital behaviors. This suggests that social media addiction should not be conceptualized solely as a behavioral habit but as a multidimensional disorder involving cognitive, emotional, and social systems.

From an intervention perspective, findings highlight the need for dual-targeted strategies. Cognitive-based interventions focusing on improving executive control, attentional regulation, and impulse management may reduce vulnerability to compulsive use. Simultaneously, psychosocial interventions aimed at reducing FoMO, improving self-esteem, and enhancing social support may mitigate emotional drivers of addiction.

Digital literacy programs may also play a role in reducing maladaptive social comparison and promoting healthier engagement with online content. Cognitive-behavioral therapy (CBT) approaches may be particularly effective in addressing maladaptive thought patterns associated with social media use and psychological distress.

VI. FUTURE DIRECTIONS

Future research should adopt longitudinal designs to better establish causal relationships between neurocognitive deficits, psychosocial stressors, and social media addiction. Experimental studies using behavioral and neuroimaging methods are also needed to validate self-report findings and explore underlying neural mechanisms.

Cross-cultural research is essential to determine the generalizability of findings across different sociocultural contexts, particularly in non-Western populations where social media usage patterns may differ. Additionally, future

studies should explore protective factors such as resilience, mindfulness, and digital self-regulation strategies.

Finally, more sophisticated modeling approaches such as structural equation modeling and network analysis may provide deeper insights into the complex interrelationships among variables.

VII. CONCLUSION

The present study provides an integrative examination of neurocognitive and psychosocial predictors of social media addiction and psychological distress. Findings demonstrate that both cognitive vulnerabilities, such as impulsivity and executive dysfunction, and psychosocial factors, including FoMO and loneliness, significantly contribute to problematic social media use. Furthermore, social media addiction serves as a key mechanism linking these vulnerabilities to psychological distress.

The results support contemporary interactionist models, particularly the I-PACE framework, which emphasizes the dynamic interplay between cognitive control systems, emotional processes, and social environmental influences. The study highlights that social media addiction is not merely a behavioral issue but a multidimensional phenomenon embedded within broader neuropsychological and social contexts.

From a practical standpoint, the findings underscore the need for integrated intervention approaches that address both cognitive and psychosocial dimensions of vulnerability. Strengthening executive control, reducing maladaptive social comparison, and improving social connectedness may be effective strategies for reducing both addiction risk and psychological distress. This integrated perspective is essential for advancing both theoretical knowledge and clinical practice in the digital age.

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