Swipe Your Stress Away:

Does Social Media Use Buffer Young Adults from Acute Stress?

By

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Abstract

Emerging adulthood is a critical developmental stage often characterized by heightened exposure to acute and chronic stressors, which are associated with increased mental health challenges and emotional vulnerability (Clayborne et al., 2019; Floriou-Servou et al., 2021; MacLeod & Brownlie, 2014). Social media is frequently used by young adults as a stress coping strategy (Bae, 2023; O'Reilly, 2020), and theories suggests it may offer both social buffering and distraction during stress recovery (Gunnar, 2017; Mansell et al., 2020). The present study examined whether brief social media use facilitates recovery from an acute stressor in young adults and whether this effect is moderated by ADHD symptomology. Individuals with ADHD symptomology may perceive stress as more intense and difficult to manage (Barra et al., 2021; Combs et al., 2015). Additionally, exploratory multiple regressions within the social media use condition evaluated whether content-theme predictors, controlling for age, anticipate subjective (VAS) and physiological (PPG) recovery, based on evidence linking high-arousal content to stress and emerging research on social media's mental health effects (Bucci et al., 2019; Competiello et al., 2023; Naslund et al., 2020; Zhao & Zhou, 2020). Given social media's prevalence in the daily lives of young people, it was hypothesized that it may serve as an accessible coping strategy. Participants from the University of Manitoba were sampled and completed an online version of the Trier Social Stress Test (TSST), followed by random assignment to either a 5-minute social media use condition (n = 49) or a control condition (n = 53). Stress recovery was assessed using both subjective (visual analog scale) and physiological (heart rate) measures at multiple time points. The findings demonstrated that social media use did not significantly improve stress recovery relative to the control and ADHD symptomology did not moderate this effect. However, gender identity was a significant factor; women reported

higher emotional reactivity across stress and anxiety measures. Although most participants enjoyed using social media, this did not translate to improved recovery outcomes. The results of this study highlight the need to more thoroughly examine content type, quality of engagement, and individual differences when assessing the effectiveness of digital interventions for stress.

Keywords: Mental health, social media, young adults, wellbeing, stress

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Positive mental health is an essential component of healthy development. Specifically, proper supports, stress management and positive environments are important as this can impact a young adults' mental health. Potentially detrimental consequences during healthy development may occur should vulnerability and susceptibility be present due to developmental change; making emerging adulthood a prime target for mental health challenges (Clayborne et al., 2019; Hawke et al., 2021; Thapar et al., 2022). Despite the increases in mental health challenges, young adults have reported ways of coping, with one mechanism being social media usage (Bae, 2023; O'Reilly, 2020).

The emergence of adulthood involves transitioning into a complex and multifaceted stage of exploring social statuses and personal qualities, exposed to many risk and protective factors that can influence mental health outcomes (Hartmann & Swartz, 2006; MacLeod & Brownlie, 2014). Social media is one way of exploring the social world and has introduced a novel way of connecting and communicating with others. Online communication and social connection are an important part of a young person's social world (O'Reilly et al., 2018). Over the years, social media has increased in popularity since the early 2000s, with the majority of young people (over 80%) engaging with social networking sites (OECD Society at a Glance, 2019). In 2021, 18- to 24-year-olds use Instagram (71%), Snapchat (75%), or TikTok (55%) on average, with more than half using social media sites several times a day (Pew Research Poll, 2021). In 2023, many young Americans (ages 18-29) popularly use YouTube (93%), Instagram (78%), and Facebook (67%; Pew Research Poll, 2024). Interestingly, usage varies by gender identity across all ages (18-65+), with men commonly using YouTube (82%), Facebook (59%), and Instagram (39%),

while women commonly used YouTube (83%), Facebook (76%), and Instagram (54%; Pew Research Poll, 2024). For young people, social media is a main component of their daily lives, taking up a large portion of their waking time. Social media serves as an important connection in youth's lives, allowing young people to remain connected to friends and family, work, and school, which are beneficial to mental health and well-being (Cingel et al., 2022; Orsolini et al., 2022; O'Reilly et al., 2018; Lin et al., 2021). However, social media has various short-term and long-term risks associated with the significant and daily screen time, including low self-esteem, dysfunctional sleep patterns, bullying/harassment, negative social comparison, declines in subjective well-being, increases in stress, and potential suicidal behaviours (O'Reilly, 2020; Rus & Tiemensma, 2017; Thomée et al., 2011). Social media is not inherently positive nor negative, rather benefits and risks are nuanced and contextual, which gives social media a unique ability to be tailored to individuals' preferences, thus impacting their outcomes from engagement.

Social media is creating increased awareness and accessibility for mental health information and services. Popular social media platforms (e.g., YouTube, Instagram) have expanded into the mental health field, increasing the accessibility of mental health resources, destigmatizing mental health, and supporting public health outcomes (Lupton, 2021; McCashin & Murphy, 2022; Montag et al., 2021). Young people have reported using social media to support social skills, enhance peer relationships, and as stress management, with social media being labeled as an active coping mechanism (Bae, 2023; Cingel et al., 2022; Orsolini et al., 2022). It could be argued that the components behind social media as an active coping strategy could be from social buffering theory and distraction theory. Active coping is described as adaptive ways of dealing with stress, including seeking social support (social buffering theory) to changing the environment or planning activities to shift attention away from the stress

(distraction theory; Gunnar, 2017; Mansell et al., 2020). Since social media is an activity that young people actively engage with daily that provides social engagement, there may be a way to use social media as a tool for stress management. However, there is little evidence that suggests social media having long-term benefits on stress management, whereas research has found short- and long-term consequences of social media on well-being and mental health (Rus & Tiemensma, 2017;Välimäki et al., 2017). Currently, evidence has found short-term cardiac relief from acute stressors and improved coping strategies for young people (George et al., 2013; Johnshoy et al., 2020). The evidence suggests there may be short-term beneficial components of social media that appear to manage acute stressors.

The emergence of adulthood is a period of mental health vulnerability due to various changes in cognition, relationships, emotional and behavioural dysregulation (Broderick & Blewitt, 2020; MacLeod & Brownlie, 2014; Valkenberg et al., 2022). Transition periods are fraught with high demands of stress, often acute stressors (Broderick & Blewitt, 2020; Hartmann & Swartz, 2006). Stress exists on a spectrum that can be defined on one end as distress, the negative response to stress, and the other end as eustress, the healthy response to stress (Bienertova-Vasku et al., 2020). Stress varies from toxic to healthy/tolerable levels of stress based on the perceived threat of the stressful event (Bienertova-Vasku et al., 2020; Bovier et al., 2002). Acute stressors, which are daily realities, are believed to be building blocks that have the potential to develop into chronic stress without proper coping mechanisms (Floriou-Servou et al., 2021). Stress management is key for reducing levels of stress to avoid chronic, toxic stress. Social media has been found to be an additional benefit in the role of stress management for university students, including an effective dissemination of stress management strategies

(George et al., 2013; Johnshoy et al., 2020). The management of stress is critical in reducing the likelihood of developing mental health challenges.

Stressors can be linked to higher rates of mental health challenges during young adult development (American Psychological Association, 2020; Harvard Graduate School of Education, 2023; National Institute of Mental Health, n.d.). Particularly, young adults who experience mental health challenges may have more difficulties managing stressors. Young adults who experience ADHD symptoms are at a higher risk of significant psychosocial impairment, suicidality, complications with work, school, finances, interpersonal relationships, and behaviours (Abdelnour et al., 2022; American Psychiatric Association, 2022; Jans & Jacob, 2012; Di Lorenzo et al., 2021; Merrill et al., 2019). Experiencing stressors during this critical period, such as diagnosed and undiagnosed ADHD symptoms, young adults have demonstrated significantly lower academic, attention, and interpersonal performance compared to young adults without ADHD (Combs et al., 2015). Additionally, individuals experiencing ADHD have demonstrated elevated levels of physiological stress responses and higher reports of subjective stress, and in turn having a greater difficulty in recovering from elevated levels of stress (Hirvikoski et al., 2009; Lackschewitz et al., 2008). Given the challenges associated with ADHD individuals with ADHD often have difficulty alleviating stress (Combs et al., 2015). Emerging into adulthood requires a multitude of supports to reduce the stress created by the complex and multifaceted stage and minimize the risk and maximize the protective factors that can influence mental health outcomes. Thus, stress management is one crucial step to maintaining well-being and improving mental health outcomes.

Given the adverse consequences that unmanaged stress has on young people's well-being, it is critical to address these mental health concerns. Social media plays a pivotal role in

young people's lives, implying that there are unexplored opportunities for mental health support access for young people. Empowering young people is a key feature of mental health services, and social media may be the connection to reduce the impact of stress for young people (George et al., 2013; O'Reilly, 2020). The purpose of this study is to explore young adult's use of social media can facilitate the recovery from an experimental induction of acute stress, and to assess whether the effect of social media use on acute stress recovery was moderated by ADHD symptomology.

Social Media as a Tool for Stress Management

Since social media has gradually become central to young adults' lives, there may be influence about social media's effect on mental well-being and stress management. Social media is an internet-based medium of communication that allows for the interaction, synchronously or asynchronously, with other people to consume, engage with, or create content (Carr & Hayes, 2015). Social media's neutrality allows for people to explore preferences and new interests, making social media very popular, with many young adults reporting social media as a positive outlet for many challenges and stressors (Bae, 2023). Conversely, young adults can also experience low self-esteem, disturbed sleep patterns, bullying/harassment, negative social comparison, declines in subjective well-being, and potential suicidal behaviours that are linked to social media use (O'Reilly, 2020; Rus & Tiemensma, 2017). However, social media's design is to facilitate social interaction, which for some individuals or others experiencing impaired social functioning as part of a disorder (e.g., schizophrenia) may be better able to facilitate communication and social interaction (Naslund et al., 2020). One study found that individuals with schizophrenia reported that social media supported easier interactions and socialization with others (Miller et al., 2015). Further, research demonstrated among young adults with mental

health conditions benefit from social media by reducing isolation, increasing community participation, increased social connection/online relationships, and general daily functioning (i.e., work, visiting family and friends; Badcock et al., 2015; Brusilovskiy et al., 2016; Giacco et al., 2016; Gowen wt al., 2012; Spinzy et al., 2012). Additionally, research among young adults with mood disorders has found that there is a subjective preference for online social interactions, with some individuals seeking online mental health support over in-person encounters (Batterham & Calear, 2017). While social media is not inherently a negative form of entertainment, studies have found adverse consequences linked to psychological and physiological health due to problematic usage (Hezel & Håkansson, 2021; Lin et al., 2020; Shannon et al., 2021). Furthermore, the type of content and the affect of the individual can influence social media's impact on their mental health. A study examining disaster stressors and social media found that young people were more likely to have higher depression levels when exposed to disaster news on social media, which was associated with worse mental health outcomes (Zhao & Zhou, 2020). To further add to the complexity, content focused on perpetuating negative mental health stigma is associated with a reduction in seeking mental health treatment in among women low in feminine-typed gender role espousal (Competiello et al., 2023). This suggests that certain levels of social media content and engagement have a level of sociocultural power to change attitudinal processes. This is exemplified through research that demonstrated that social media is associated with shaping individuals' attitudes towards health behaviors, health related information, or health related conspiracy beliefs (Allington et al., 2020; Moran et al., 2022; Wang et al., 2021; Wilson & Wiysonge, 2020). Overall, social media content, whether positive or negative, has a potential to negatively impact psychological and attitudinal processes through exposure and engagement (Competiello et al., 2023). Additionally, with social media having various implications on mental

health outcomes, an individual's functioning life can be impacted significantly by the state of their health. Social media appears to be nuanced and highly dependent on the individual as to whether there are more benefits or consequences due to the engagement. Expanding on social media as an active coping mechanism, social media has been found to significantly decrease cardiac arousal following 5-minutes after experiencing an acute stressor for undergraduates (i.e., TSST; Johnshoy et al., 2020). This highlights the important and influential role that social media plays in young people's lives, demonstrating the potential impact on individuals and the influence this would have on stressors.

Theoretical Framework

Social Buffering Theory

Sources of stress can be managed by various forms of coping strategies, with a prominent strategy called social buffering (Gunnar, 2017). The social buffering framework can be described as an active coping strategy that involves the connection of social partners (physical or symbolic) during stressful situations to reduce stress-mediating physiological systems, including the presence of social networks. Thus, social buffering increases the stress recovery process, making the return to baseline stress levels quicker than if there was no stress management. The role of social buffering's importance on stress recovery has been found in adults (e.g., Harvie et al., 2021), adolescents (e.g., Gunnar et al., 2021), and children (e.g., Seltzer et al., 2010).

Social support has been found to reduce physiological responses (e.g., cortisol and cardiovascular) and psychological responses (e.g., perceived stress) for adults, with social media being associated with a reduction in acute stress (Ditzen et al., 2008; George et al., 2013; Heinrichs et al., 2003; Lepore et al., 1993; Rus & Tiemensma, 2018). Additionally, heightened stress has been linked increased social support seeking on social media (Frison & Eggermont,

2015). However, social buffering can change depending on the stage of life the individual is in, for example, parental social buffering is significant throughout childhood and becomes more complex in adulthood (Gunnar & Hostinar, 2015). Furthermore, early attachment development in infancy and childhood is an indicator for relationship quality and can shape an individuals' ability to benefit from social buffering in adulthood (Gunnar, 2017). The social buffering theory highlights the importance social support and how social support can be used as a tool in stress management.

Emerging research is recognizing the potential role that social media may play in enabling peer support for individuals with mental health challenges (Bucci et al., 2019; Naslund et al., 2014). Similar to the social buffering theory, literature has described this system as mutual giving and receiving of hope, friendship, and support through lived experiences with mental health to others facing similar challenges (Davidson et al., 2006; Mead et al., 2001; Naslund et al., 2020). Related to social interactions, literature notes that online social networking may provide critical purposes of new friendships, romantic relationships, maintaining existing relationships, reconnection, and online peer support (Highton-Williamson et al., 2015). Literature has revealed important and common support themes across online peer support groups, such as informational support (e.g., medication), esteem support (e.g., encouragement), network support (e.g., sharing similar experiences), and emotional support, demonstrating the potential benefit of social media as an access for peer support (Chang, 2009).

To relate social buffering theory to the hypotheses, if social buffering mechanisms underlie social media use, then gender differences in how social support is experienced may lead to differential recovery effects. Women may report greater perceived benefit from social media as a form of symbolic social connection, even if this does not translate clearly into physiological

changes (Cohen et al., 2021; Graves et al., 2021; Kneavel, 2021; Tamres et al., 2002). Further, ADHD symptomology may blunt the effectiveness of social buffering due to impaired social cognition, leading to weaker perceived support from digital content (Grossman & Avital, 2023; Ji et al., 2011; Kamradt et al., 2017; King et al., 1998; Misra & Gandhi, 2023; Raz & Leykin, 2015). Despite social media's design to be connective, individuals with ADHD may not process it as a buffer.

Distraction Theory

Another active coping mechanism commonly used is distraction theory in stress management (Mansell et al., 2020). Distraction theory can be described as using everyday activities to reduce the stressor by shifting attention away for a period of time, as a way to maintain control over stressful situations (Mansell et al., 2020). Distraction theory has been found to improve mood for a short period of time and reduced stress through social activities (Tabibnia, 2020; Webb et al., 2012). Additionally, college students have been found to use distraction theory to reduce negative emotions by enhancing positive emotions (Chen et al., 2020). However, distraction theory's effectiveness depends on the situations that it is used in (e.g., distracting oneself with taking on extra work; Mansell et al., 2020). Based on the theoretical frameworks, it could be inferred that engagement with social media is an everyday activity that most young people are occupied with and provides a social engagement or network component that could be theorized to provide stress management via social buffering in tandem with distraction theory.

To relate distraction theory to the hypotheses, if distraction is the key mechanism, gender may moderate the effectiveness of social media. This could include men benefitting more from distraction-based scrolling, whereas women might need deeper emotional engagement or may

not disengage as easily from the stressor (Cohen et al., 2021; Graves et al., 2021; Kneavel, 2021; Tamres et al., 2002). Additionally, individuals with ADHD may experience difficulty with using social media effectively as a stress-relief tool. Their impulsive use patterns and attentional instability may interfere with the calming effect of distraction (Grossman & Avital, 2023; Ji et al., 2011; Kamradt et al., 2017; Misra & Gandhi, 2023).

Gender Differences

This study is interested in using gender as a moderator/covariate as research has demonstrated that there are gender differences that impact factors such as social support and managing stress (Graves et al., 2021; Glynn et al., 1999; Heinrichs et al., 2003; Kirschbaum et al., 1995; Kneavel, 2021; Tamres et al., 2002; Tomova et al., 2014). Importantly, gender plays a role in adopting coping strategies, with a meta-analysis finding consistently that women are more likely to use emotion-focused and relational coping strategies (i.e., social support, venting) than compared to men that often use rational or problem-solving strategies (Tamres et al., 2002). This was also found during a recent study of Undergraduate women, that consistently reported higher subjective levels of stress compared to men and were more likely to use emotion-based coping strategies in response to stress (Graves et al., 2021). Additionally, women on average were more likely to engage with most coping strategies than compared to men (Tamres et al., 2002). Theoretically, these findings are similar to the social buffering theory, with women being more inclined to seek social bonding under stress according to previous literature. Furthermore, stress research has found that emotional contagion and empathy may vary by gender, with women being more likely to be empathetic under acute stress whereas men tend to become more self-focused (Tomova et al., 2014). In stress-buffering research, women who provided social support reduced cardiovascular changes in both women and men participants, whereas support provided

by men did not find the same effect (Glynn et al., 1999). These findings suggest potential gender differences in how social support is received and processed physiologically.

Previous experimental research exploring the moderation of social support effects on physiological stress found interesting gender differences in terms of buffering. Research from Kirschbaum and colleagues (1995) and Heinrichs and colleagues (2003) found that close social support from a stressor reduced cardiovascular and neuroendocrine stress responses in both women and men. However, the quality and relational closeness appeared to matter, in addition to these effects differing by gender (Heinrichs et al., 2003; Kirschbaum et al., 1995). Lastly, a large-scale study explored the nonlinear gender effects in social support stress relationships. Kneavel (2021) found that the relationship between perceived stress and perceived social support varied by gender. The findings demonstrated that women reported higher stress and greater perceived support quality, in addition to the stress-support curve varying nonlinearly by gender identity (Kneavel, 2021). This highlights the way stress levels respond to support depending on the level of perceived support and the gender identity of the person experiencing the stress. These summative findings align with the tend-and-befriend theory, which posits that women are more likely to seek affiliative support from others and benefit from relational coping as a stress response (Cohen et al., 2021). Overall, including gender as a moderator is theoretically supported because, according to research, women and men differ in stress reactivity and coping engagement, and thus may respond different to the same digital stress-buffering intervention.

Use and Gratification Theory

The foundational background of the content themes was based on Katz and colleagues (1973) Uses and Gratification theory that described different themes such as entertainment and humour, social connection, information seeking, escapism/distraction, and emotional regulation

are used by individuals to actively meet emotional or cognitive needs. Content themes related to entertainment and humour (i.e., humour and memes) align with findings from Shifman (2013), suggesting that social media users may engage with culturally evocative media for shared social experiences and emotional uplift (Vorderer et al., 2004). Further, consistent with findings from Naslund and colleagues (2016), theme categories such as mental health, animals, or inspiration may reflect emerging trends in users seeking emotional support and validation through social media (Myrick, 2015).

A team consultation was conducted to provide clarity, relevance, and consistency along with feedback on the accuracy and the level of alignment with their perspectives who regularly use social media (i.e., Instagram), with 13 members recruited from the University of Manitoba, Hearts and Minds Laboratory. This is supported by literature demonstrating that the type of content engaged with can influence emotional and physiological responses (Meier & Reinecke, 2020). These analyses were framed as hypothesis-generating rather than confirmatory, and results should be interpreted with caution. However, they serve to highlight potential mechanisms and moderators that warrant further study and may guide future research or interventions.

Stress

Stress is comprised of external stressors, the perceived or psychological stress, and the physiological response to the stressor (Rice, 1999). Stress is a nuanced concept that describes the continuum ranging of healthy or tolerable stress to toxic stress (Bienertova-Vasku et al., 2020). Healthy or tolerable stress is a stressor that is manageable based on the adaptive response of the psychological and physiological response of the individual and environmental interaction, whereas toxic stress is repetitive and prolonged distress based on a maladaptive response

(Bienertova-Vasku et al., 2020; Franke, 2014). Recently with the rise in social media, stress created by social media has complicated the relationship between social media and psychological outcomes (Steele et al., 2020). Digital stress can be associated with seeking approval, fear of missing out, communication overload, and availability of stress due to the perpetual connection to online and diverse social content (Steele et al., 2020). Familiar to students, and often a predominant form of stress, is academic stress from school. Academic stress can be defined as the pressure of workload, study time, and worry about grades that contributes to high self-expectation stress and dependency (Kuyumcu, 2020). Young adults experiencing academic stress are more likely to have negative emotional well-being and mental health challenges, if not engaged in any coping strategy or social support (Barker et al., 2018; Zhang & Zheng, 2017) Academic pressure, life demands (e.g., first job), increased responsibility, and constant social connection are a common, on-going experience in a student's daily life. Stressors by themselves are usually acute stressors, often described as healthy or tolerable levels of stress, such as studying for a test.

Acute stress can become problematic when maladaptive coping and continuous, repeated stressors lead to the development of toxic, chronic stress (Floriou-Servou et al., 2021; Franke, 2014; Kemeny, 2003). This overload of acute stress can impact important brain functions in the hippocampus, prefrontal cortex, and amygdala, with childhood stress, particularly pernicious when experienced early in development, impacting cognitive functions, mental health, and increasing neurobiological vulnerability (McEwan et al., 2012, Mygind et al., 2018). By studying how people cope with tolerable stressors, this can inform how one may cope in similar situations Thus, stress is important to manage and to develop adaptive coping strategies to avoid negative cognitive and health impairments.

ADHD Symptomology

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder that is characterized by a persistent pattern of inattention and/or hyperactivity-impulsivity (e.g., Often has difficulty waiting their turn; American Psychiatric Association, 2022). Young adults who experience ADHD symptoms are at a higher risk of significant psychosocial impairment, complications with work, financial troubles, interpersonal conflicts, negligent behaviour, and family dysfunction (Jans & Jacob, 2012). Experiencing ADHD symptomology is a risk factor for increased suicidal ideation, reduced school performance, and academic attainment (Abdelnour et al., 2022; American Psychiatric Association, 2022; Di Lorenzo et al., 2021; Merrill et al., 2019). Additionally, individuals with ADHD symptomology are associated with poorer occupational and school performance, higher probability of unemployment, lower self-esteem relative to peers, increased negative interactions and peer rejection, and physical injuries (American Psychiatric Association, 2022; Di Lorenzo et al., 2021; Merrill et al., 2019). ADHD symptomology can co-occur with autism spectrum disorder (ASD), other neurodevelopmental disorders, conduct and oppositional defiant disorders, substance use disorders, incarceration, posttraumatic stress syndrome, personality disorders, and less commonly co-occurring with depression, anxiety, and sleep disorders (American Psychiatric Association, 2022; Di Lorenzo et al., 2021; Merrill et al., 2019). Psychological services, lifestyle changes to compensate for symptoms, and medications have been demonstrated to lead to significant improvements in functioning (Asherson et al., 2012; Boland et al., 2020; Young et al., 2017). Without interventions and supports for those experiencing ADHD symptoms combined with the pervasive impairment across several life domains, stress often becomes difficult to manage. Experiencing stressors during this critical period, such as ADHD symptoms, undergraduates

have demonstrated significantly lower performance, impaired attention, interpersonal skills, initiative, task persistence, and hinder occupational functioning compared to undergraduates without ADHD (Combs et al., 2015). This cyclical relationship of stress impacting life outcomes which only creates more stress creates a logical theory that individual with ADHD are likely to live with elevated subjective stress. Research has demonstrated that young adults with ADHD experience elevated levels of physiological stress responses and higher reports of subjective stress, while having a greater difficulty in recovering from elevated levels of stress (Hirvikoski et al., 2009; Lackschewitz et al., 2008). Additionally, given the challenges associated with lower self-esteem, interpersonal problems, poor planning, organization, and self-control, which are critical for successful stress management skills, individuals with ADHD often have difficulty alleviating stress (Barra et al., 2021; Combs et al., 2015).

There is a focus on the differential reasons for why ADHD symptoms versus diagnosis or medication status, might influence differential responses to stress and the buffering protocols. In terms of physiological stress, cortisol reactivity and Hypothalamic-Pituitary-Adrenal (HPA) axis dysfunction may have a role in stress reactivity for individuals with ADHD. A meta-analytic review examining the association between cortisol reactivity and ADHD from a stressor found no consistent effects (Kamradt et al., 2017). However, Kamradt and colleagues (2017) noted high heterogeneity in the analyses, indicating other factors (e.g., symptom profiles or emotional dysregulation severity) may moderate the association. Additionally, research highlighted that adults with ADHD demonstrated a heightened cortisol response in response to an arithmetic ability test, specifically regarding the participants anticipation of the stressor and the post stressor period (Raz & Leykin, 2015). This suggests that individuals with ADHD symptoms may have stronger HPA activation that is potentially tied to ADHD symptom severity. Furthermore,

research found that individuals diagnosed with ADHD were more likely to have a blunted stress response to a stressor than compared to individuals whose ADHD diagnoses were no longer retained after one year (King et al., 1998). Together, these findings support the idea that ADHD symptom dimensions (e.g., inattention, hyperactivity, emotional regulation) are more likely to predict physiological stress reactivity than compared to diagnostic categories or medication.

Other factors of ADHD that potentially influence a differential stress response are emotional dysregulation and executive functioning skills. Literature has demonstrated that ADHD symptoms have a greater impact on emotional dysregulation, influencing response inhibition, emotional lability, and recovery from stress (Grossman & Avital, 2023; Ji et al., 2011; Kamradt et al., 2017; Misra & Gandhi, 2023). This impact on emotional dysregulation and factors play a key role in shaping an individual's buffering potential. Theoretical models have linked individuals with ADHD to be more likely to have deficits in executive functioning and inhibition, suggesting that areas and responses of the prefrontal cortex, including stress perception, emotional regulation, and reactivity is likely to be impaired (Martella et al., 2020; Posner et al., 2019). Together, this supports the importance of differentiating ADHD symptoms (e.g. impulsivity, emotional instability) from categorical diagnoses when theorizing about stress responses and coping strategies.

Lastly, stress coping strategies and attachment patterns may impact stress responses and reactivity for individuals with ADHD symptoms. Research has found a positive association between ADHD symptom severity and maladaptive coping strategies, in addition to individuals with more severe ADHD symptoms finding less benefit from adapting stress coping strategies (Barra et al., 2021). These findings suggest that diagnostic status does not provide a comprehensive evaluation of how individuals with varying degrees of ADHD will benefit from

coping strategies. Additionally, while literature about individuals with ADHD attachment patterns is rare, research has demonstrated that individuals with ADHD have higher vulnerability to insecure attachments and are significantly more likely to have maladaptive attachments and mediated poorer coping outcomes (Al-Yagon et al., 2020). This suggests that ADHD symptom profiles have the potential to influence stress buffering through relational and emotional dimensions.

The current study

There is an agreement about the negative impact that social media has on well-being and little evidence about its role in long-term stress management. However, research exploring positive short and long-term associations between social media, stress management and well-being are relatively rare in the literature, highlighting the knowledge gap of this relationship (Schønning et al., 2020; Steele et al., 2020). Additionally, there have been inconsistent findings about social media as an effective tool for coping from stress (Wolfers & Utz, 2022). The current study aimed to explore whether young adults' use of social media (i.e., Instagram) can provide social buffering and distraction to increase the recovery from the acute stress (i.e., cardiac arousal and self-report) in response to an online version of the Trier Social Stress Test (TSST), demonstrated as a viable way for inducing acute stress (Gunnar et al., 2021). It is hypothesized that young adults stress was lessened by social media and produce reduction in time for the stress recovery.

A secondary aim is to assess whether young adults' ADHD symptomology moderates the effect of social media use on acute stress recovery. Research supports adults experiencing ADHD have weakened stress recovery and elevated levels of subjective stress compared to individuals without ADHD, along with poor stress management skills (Combs et al., 2015;

Hirvikoski et al., 2009; Lackschewitz et al., 2008). Thus, it would be expected that emerging adults experiencing ADHD symptoms would have reductions in the effects of social buffering and distraction, increasing stress recovery time. Additionally, it would be likely to posit that individuals with ADHD may demonstrate less variability when comparing their baseline heart rates to their stressed heart rates, as individuals with ADHD symptomology likely experience higher subjective levels of stress. While prior research has demonstrated that individuals with ADHD symptoms tend to exhibit greater physiological and perceived stress reactivity (Combs et al., 2015; Hirvikoski et al., 2009), the core aim was to examine whether social media engagement would be more or less effective for those with elevated ADHD symptoms during stress recovery. The focus of RQ2 was not just whether people with ADHD symptoms experience more stress (a well-established main effect), but whether their response to the social media buffer differs from those without such high symptoms. This aligns with literature suggesting that ADHD is associated with impairments in attention regulation, impulsivity, and difficulty engaging in goal-directed coping strategies; these are factors that may reduce the efficacy of distraction-based or symbolic social support coping mechanisms (Barra et al., 2021; Lackschewitz et al., 2008). Therefore, the moderation hypothesis was grounded in the idea that coping tool effectiveness varies by individual difference, and individuals with ADHD symptoms might experience blunted or inconsistent recovery depending on how well the coping strategy aligns with their neurocognitive profile.

Exploratory analyses were included to investigate potential nuanced influences on stress recovery. This approach aligns with recommendations in psychological and health research to complement confirmatory testing with data-driven exploration, particularly when investigating complex and dynamic phenomena such as digital media use and psychophysiological stress

regulation (de Groot, 2014; Yarkoni & Westfall, 2017). Specifically, social media use is individualized and context-dependent, thus this study conducted exploratory regression analyses to examine how common content themes (e.g., influencers, science/tech, family/friends) may differentially predict recovery. Twenty-five content themes were decided by examining previous literature (e.g., Garrett, 2009; Greenhow et al., 2009; Harrf & Schmuck, 2025; Holeman et al., 2014; Lui et al., 2017; Nabi et al., 2013; Rieger & Klimmt, 2019; Segev, 2020; Valkenburg & Peter, 2009) and team consultation of individuals similar in age to the sample population.

Methods

Participants

The study targeted a sample of 120 University of Manitoba Psychology students between the ages of 18 to 25 years, who represented an ethically/racially diverse group living in Winnipeg and surrounding areas and were compensated with partial research participation credit. To be included in the study, participants must be (a) proficient in the English language, (b) enrolled in Introduction to Psychology (PSYC 1200) at the University of Manitoba, (c) with no recent mental health diagnosis (i.e., within the past month), (d) must have a smartphone, and (e) must have a social media account on Instagram. A priori power analysis was conducted using G*Power (Version 3.1.9.7), demonstrating that a minimum sample size of 93 is necessary to achieve 80% power for detecting a moderate effect at a significance criterion of $\alpha = 0.05$.

One hundred and forty-seven participants met eligibility criteria were included in the coding and analysis. Forty-five (30.6%) participants were excluded from final analyses due to no shows (i.e., did not show up to experiment within 15 minutes), incomplete surveys and heart rate data, a mental health diagnosis within the past month, or withdrawing participation from the study during the experiment. The final sample of 102 participants consisted of 68 participant

who identified as women and 34 participants who identified as men (See Table 1). Additionally, biological sex was recorded, with 68 participants identifying as female and 34 as male. Participants averaged 19.45 years of age (*SD* = 1.85; range, 18-24 years). In terms of race and ethnicity, the sample was majority White/European (33.3%), South Asian (20.6%; East Indian, Pakistani), African American/Black (20.6%; African), Filipino (12.7%), Indigenous (11.8%; First Nations, Innuit, Metis), Latin American (3.9%), Arab (3.9%), South East Asian (2.9%; Vietnamese, Cambodian), and West Asian (1.0%). In terms of medication, the sample included hormonal birth control (i.e., pill, impact, IUD; 18.6%), anti-depressants/anti-anxiety medication (i.e., SSRIs, SNRIs, TCAs; 7.8%), ADHD medication (i.e., Adderall, Concerta, Vyvanse; 5.9%), estrogen (2.0%), testosterone (1.0%), corticosteroids for asthma (1.0%), insulin (1.0%), levothyroxine (1.0%), metformin (1.0%), and methimazole (1.0%). In the final analyses, there were 49 participants in the social media use condition and 53 participants in the control condition.

Measures

Adult ADHD Self-Report Scale (ASRS-v 1.1) Symptom Checklist

ADHD symptomology was measured using the Adult ADHD Self-Report Scale (ASRS-v. 1.1; Kessler et al., 2005). The ASRS is an 18-item (Part A = 6; Part B = 12) self-report measure to rate participants characteristic attitudes and symptoms of ADHD. Items are scored on a 5-point Likert scale (i.e., 1 = Never, 3 = Sometimes, 5 = Very Often) to assess attitudes such as restlessness, organization, and concentration (e.g., “How often are you distracted by activity of noise around you?”). The ASRS has good internal consistency, ranging from .72 to .92 (Kessler et al., 2007). Interpretation guidelines for cutoff values only examine Part A and are evaluated based on the endorsement of a positive response (i.e., A response of “Sometimes,” “Often,” or

"Very Often" on Part A items is considered a positive response; Kessler et al., 2005). Zero to three positive responses are considered low risk, and 4 or more positive responses (total of 24 or higher for Part A) indicates a high risk and requires further evaluation (Kessler et al., 2005). The final sample for the ASRS Part A yielded an average score of 25.63 (SD: 3.31; range: 18) with the minimum value of 15 and the maximum value of 33. The most frequent total scores fell within 25-28 range, with 29.4% of the final sample was within the low-risk range, with 70.6% of the final sample within the high-risk range (> 24 total score for Part A).

Photoplethysmography (PPG) index of heart rate

Heart rate was collected via photoplethysmography (PPG) using the Heart Rate Plus application for smartphones based on Harvie and colleagues PPG heart rate results (PVD Apps, 2015; Harvie et al., 2021). This allows participants to remotely self-administer their heart rate by measuring and estimating their vital signals using a smart phone. Participants were provided with verbal and visual instruction for obtaining the measurements (i.e., participants finger over the appropriate area, sitting still, and refraining from talking). The application uses photoplethysmography which implements smartphone's light emission from the flash and detection of light intensity in the subcutaneous tissue (i.e., fingertip) from the camera. On average, measurements from Heart Rate Plus take approximately 10-20 seconds to yield a single PPG estimate of the average heart rate during the measurement window. During the assessment, heart rate was measured seven times.

Visual Analogue Scale (VAS) of perceived stress and anxiety

After completing the heart rate measurement, participants completed two self-report measurements via a Visual Analogue Scale (VAS), assessing the participant's current feelings with respect to stress and anxiety in that moment (i.e., "How ___ are you currently feeling?";

Lesage et al., 2012). The VAS assesses the participants current state of anxiety and stress with a sliding scale from 0 to 100 (i.e., 0 = *not feeling anxious; not feeling stressed* and 100 = *feeling very anxious; feeling very stressed*). Definitions were provided to distinguish between stress and anxiety.

Procedure

This research was approved by the Research Ethics Board at the University of Manitoba (HE2024-0053). The study was administered via an online survey through REDCap and Zoom. Participants signed up for the online study through Manitoba Sona Systems (Sona Systems, n.d.), which provided information about the study, and registered for an available timeslot which was randomly assigned a REDCap and study number for data collection. Written consent form and verbal consent was obtained on REDCap and over Zoom with a trained research assistant leading the assessment.

Participants were randomly assigned to one of two conditions: 1) using a social media platform (i.e., Instagram) after completing the TSST, or 2) reading neutral articles after completing the TSST. Participants selected their assessment according to available time slots between 9:00 am to 6:00 pm, Monday through Friday, to best accommodate participants (Domes et al., 2019; Het et al., 2009; Kirshbaum et al., 1993). Participants received an email 24 hours in advance containing details with the Zoom assessment link. Once in the Zoom assessment, a research assistant greeted the participant to administer written and informed consent, and ensured participants remain minimally uninterrupted throughout the assessment, in a private space, refrained from eating or drinking anything except water for the duration of the session, and ensured that the participant had writing materials.

The session began with participants guided to download the Heart Rate Plus app to collect their first heart rate and VAS measurement. Immediately following, participants watched a 5-minute YouTube video featuring underwater wildlife accompanied by tranquil instrumental music. Participants were reminded to be mindful of relaxing their body and to have their hands on their desk or lap throughout the duration of the video. Following the video, participants were instructed to record their second heart rate and VAS measurement. Next, all participants were tasked with reading neutral articles from magazines or research articles for a 5-minute period. Six PDF articles featuring interesting but minimally affective content were sent to participants over the Zoom chat function, with participants being informed they are allowed to read as many of the articles that they want within the time period. During this time, participants were asked to share their screen to ensure task compliance while the lead assessor turns of their video and microphone feed. Afterwards, participants were instructed to record their third heart rate and VAS measurement.

Participants then began the internet-Trier Social Stress Test (TSST) adapted from Het and colleagues (2009) to control for general reactivity to performing speech and arithmetic. The TSST is considered the gold standard for inducing acute psychological stress (Kirschbaum et al., 1993). Participants were instructed with preparing a 5-minute speech for their ideal 5-minute job interview using writing materials. The speech included highlighting the participant's strengths as an employee, how they overcome their weaknesses, and why they are the ideal employee. Participants were encouraged to use the whole 5-minutes allocated to preparation. The lead assessor turned off their video and microphone feed to avoid interfering with the preparation for the 5-minute period. After speech preparation, the lead assessor turned on their video and microphone back on and informed participants that their colleagues were joining to run the next

couple tasks. Two panelists were admitted into the Zoom assessment from the waiting room, where they had been waiting in preparation. The panelist entered the assessment wearing formal business clothing (e.g., collared shirts), prompting the lead assessor to turn off their video and microphone again, while the panelists outlined the expectations of the speech task to the participant. The expectations included destroying the notes made during preparation, to set the Zoom screen to "Gallery view", and that the participant must talk for the full duration of the 5-minute period. During the speech, panelists remained neutral in their facial expressions and refrained from positive feedback. If the participant paused for 3 seconds, panelists interjected with phrases such as, "You still have time remaining," and, "Continue your speech".

Following the speech task, a panelist instructed participants to record their fourth heart rate and VAS measurement. Participants then began the arithmetic task of the TSST. Participants were instructed to perform serial subtraction of 2043 in increments in 17 as quickly and accurately as possible for a 5-minute period. If the participant made a mistake, panelists interjected and asked the participant to start from the beginning, starting at 2043. If the participant paused, panelists interjected with statements such as, "You need to go as fast as you can," and, "Try not to pause between numbers during this task.". After the arithmetic task, one panelist instructed participants to record their fifth heart rate and VAS measurement. Following the measurement, the lead assessor turned on their video and microphone feed, while the panelists left the Zoom session.

Immediately following the TSST, participants in the social media use condition were instructed to either open on their computer browser a social media site (i.e., Instagram) and screen share to confirm they are on the site, or participants used their phone to browse the social media site. Once participants confirmed they were on task to the lead assessor, they were

instructed to stop screen sharing or showing their phone and began the 5-minute period to scroll through and interact with the assigned social media platform. The lead assessor turned off their video and microphone to avoid interference. Participants in the control condition were instructed to sit quietly and read the articles that were sent before, in their room for a 5-minute period and the lead assessor turned off their video and microphone feed. After completing the 5-minute period, the lead assessor turned on their video and microphone feed, instructing the participant to close their social media site or article, and guided the participant in recording their sixth heart rate and VAS measurement.

For the final component of the experiment, participants are instructed to watch another 5-minute YouTube video of underwater wildlife with tranquil music, following the same procedure as before. After the video, participants were instructed to record their final heart rate and VAS measurement, then to provide some final demographic information, including a series of qualitative questions about the content they were consuming while scrolling through social media or reading the articles. Questions included asking participants if they enjoy social media or what the general theme of the content they were looking at. Once completed, the assessment concluded, and the assessor debriefed the participant about the study before ending the Zoom call.

Data Analysis

To address the first research question, a 2 (condition) x 7 (time) repeated measures analysis of variance controlling for participant gender (ANCOVA), was performed separately on self-reported affect and measures of heart rate obtained from PPG. There is an expectation to see a main effect of time and a condition x time interaction, reflecting differences in self-report and PPG across the measurement timepoints that are exaggerated after the post-stress social media

use. A priori planned comparisons of measurement timepoints was performed for each condition, expecting differences in self-report and PPG after the period of social media usage (timepoint #6). It was predicted that self-reported stress and PPG values would be lower in the group assigned to use social media after the stressor relative to the control group.

The second research question was addressed using a regression analysis on the treatment group, to see if ADHD symptom severity in a non-clinical population was associated with any buffering effects of social media usage on self-report and PPG. The outcome variable of the regression was buffering scores calculated for self-report and PPG as values obtained after social media usage (timepoint #6) subtracted by values obtained during the stressor (timepoint #4). Participant age was entered in the first step of the model, and ADHD scores was entered in the second step of the model. It was predicted that higher ADHD scores would be associated with larger recovery effects related to social media usage.

Lastly, an exploratory data analysis was used to investigate whether social media content themes can predict self-report and PPG recovery using multiple regression analysis conducted on the social media use condition. As mentioned, previous research identified common themes and categories that aligned with the interests of this study for social media (e.g., Garrett, 2009; Greenhow et al., 2009; Harrf & Schmuck, 2025; Holeman et al., 2014; Lui et al., 2017; Nabi et al., 2013; Rieger & Klimmt, 2019; Segev, 2020; Valkenburg & Peter, 2009). The 18 identified themes relevant to social media use were coded here as present or not present during the social media use condition, as well as evaluating general daily usage for participants. Two multiple regressions were conducted (i.e., VAS and PPG) and each of the 25 themed variables (coded 0 = not viewed, 1 = viewed) were entered as a predictor, with age included as a covariate. Based on previous literature, content with high emotional arousal is likely to influence subjective stress

levels (i.e., Zhao & Zhou, 2020) and there is limited but emerging literature investigating the role of social media content as a factor for mental health and peer support (i.e., Bucci et al., 2019; Competiello et al., 2023; Naslund et al., 2020).

Results

Research Question 1

To examine changes in self-reported affect and heart rate over time and between conditions, a series of 2 (Condition: Social Media Use vs. Control) × 7 (Time: T1–T7) repeated measures analyses of covariance (ANCOVAs) were conducted. Gender identity was included as a covariate due to observed differences in affective responses (See Figures 1-5). Mauchly's test indicated that the assumption of sphericity was violated for the effects of time and the time × VAS interaction, therefore Greenhouse-Geisser corrections were applied.

For physiological arousal, a significant main effect of Time was observed, $F(6, 582) = 3.94$, $p < .001$, $\eta^2_p = .039$, indicating that heart rate varied significantly across the 7 timepoints, which reflects the expected stress-reactivity curve. However, the Time × Condition interaction was not significant, $F(6, 582) = 1.03$, $p = .406$, suggesting that physiological reactivity and recovery patterns did not differ between the social media use and control conditions. Descriptive statistics showed elevated heart rate during the stressor (Timepoint 4), followed by a gradual recovery in both groups. However, the recovery trajectory was statistically comparable across conditions. A Time × Gender Identity interaction, $F(6, 582) = 3.13$, $p = .005$, $\eta^2_p = .031$, was also observed, suggesting that heart rate recovery patterns varied by gender. The post hoc comparisons indicated that participants of different gender identities (i.e., Woman and Man) did not follow the same stress recovery pattern over time, with women demonstrating more sustained physiological stress over multiple time points (T4-T6).

A significant main effect of Time was observed on VAS, $F(2.76, 582) = 3.94$, $p = .011$, $\eta^2_p = .039$, indicating that stress levels varied across the 7 time points. However, the Time × Condition interaction was not significant, $F(2.76, 582) = 1.03$, $p = .376$, $\eta^2_p = .010$, suggesting that the pattern of change over time did not differ significantly between the social media use and control conditions. Planned comparisons at the post-recovery timepoint (T6) also failed to reveal significant differences between conditions. Importantly, there was a significant Time × Gender Identity interaction, $F(6, 582) = 3.13$, $p = .030$, $\eta^2_p = .031$. This suggests that patterns of stress and anxiety recovery differed between gender groups, with post hoc comparisons indicating that participants identifying as women reported higher stress at certain time points (T4) relative to other gender groups. There was also a significant VAS × Gender Identity interaction, $F(1, 97) = 4.83$, $p = .030$, $\eta^2_p = .047$, indicating overall gender differences in subjective stress levels and overall reported anxiety levels. Although participants of different genders demonstrated peak stress during the TSST (T4), post hoc comparisons indicated significantly higher perceived stress and anxiety scores over multiple timepoints for women, particularly during and following the TSST (T3-T5).

Research Question 2

A hierarchical linear regression was conducted to examine whether ADHD symptom severity in a non-clinical population predicted affective recovery following social media use in the experimental group (See Figure 6). Age was entered at Step 1 and accounted for a non-significant portion of the variance in self-report scores, $R^2 = .060$, $F(1, 47) = 3.02$, $p = .089$. ADHD symptom severity was added in Step 2, but did not explain additional variance, $\Delta R^2 = .000$, F change $(1, 46) = 0.002$, $p = .968$. The overall model was not significant, and ADHD

symptom severity was not a significant predictor of buffering (β = .006, p = .968), failing to support the hypothesis.

A second hierarchical linear regression was conducted to assess whether ADHD symptom severity predicted physiological stress recovery following social media use, measured via changes in PPG. Age was entered in the first step and did not significantly predict recovery, R^2 = .004, $F(1, 43) = 0.16$, p = .693. In the second step, ADHD symptom severity was added but explained no additional variance, ΔR^2 = .000, F change (1, 42) = 0.004, p = .950. ADHD symptom severity was not a significant predictor of PPG buffering (β = –.010, p = .950), providing no support for the hypothesis.

Additional hierarchical linear regressions were performed with the ASRS cut-off value (≥ 24 total score on Part A) to provide a further evaluation for individuals with elevated levels of ADHD symptoms. The first hierarchical linear regression was conducted to examine whether age and elevated ADHD symptom scores predicted PPG. In Model 1, age was entered as the sole predictor and did not significantly predict PPG, $F(1, 72) = 0.18$, p = .674, R^2 = .002. In Model 2, elevated ADHD symptom scores were added, but the model remained non-significant, $F(2, 71)$ = 0.73, p = .396, R^2 = .013. Neither age (β = .012, p = .923) nor ASRS Part A (β = .107, p = .396) were significant predictors. A second regression analysis was conducted using self-reported VAS scores as the outcome variable. Model 1 included age as the predictor and was not significant, $F(1, 77) = 0.91$, p = .342, R^2 = .012. Model 2 added elevated ADHD symptom scores, but the model remained non-significant, $F(2, 76) = 0.81$, p = .450, R^2 = .021. Neither age (β = .136, p = .253) nor ASRS Part A (β = –.099, p = .404) significantly predicted self-reported VAS scores. These findings further provided a lack of support for the second hypothesis.

Exploratory Data Analysis

A correlation matrix was conducted to examine potential multicollinearity among the primary physiological and self-report stress indices (See Table 2). The first five variables included in the analysis were HR reactivity (change in heart rate from baseline to peak during the TSST), HR buffer (physiological heart rate recovery score derived from photoplethysmography data), VAS reactivity (change in subjective stress ratings from baseline to peak), VAS buffer (self-reported stress recovery score), and age. Consistent with Cohen's (1988) guidelines, a threshold of $r > .50$ was used to identify potentially problematic correlations. The results indicated a moderate negative correlation between HR reactivity and HR buffer ($r = –.40$) and a moderate positive correlation between HR reactivity and VAS reactivity ($r = .25$). No other correlations among these variables exceeded the collinearity threshold, suggesting they could be retained for subsequent modeling. Two multiple regressions were conducted to explore whether social media content themes viewed during the social media use condition predicted affective (VAS) and physiological (PPG) stress recovery, controlling for age (See Figure 7). In the VAS model, the overall model was significant, $F(19, 82) = 1.89$, $p = .026$, $R^2 = .31$, with 30.5% of the variance explained. Viewing memes ($p = .027$), technology/science ($p = .031$), and family/friend content ($p = .028$) were significant predictors of self-reported affect after social media use, with the former associated with less recovery from the TSST and the latter two with greater recovery. Several additional content types demonstrated non-significant but notable trends. Disaster-related content was linked to substantially poorer stress recovery ($B = −104.21$, $p = .051$), as was political content ($B = −46.49$, $p = .054$). Content involving animals showed a marginally negative effect on VAS recovery ($B = −20.27$, $p = .052$), whereas gaming-related content trended positively ($B = 30.43$, $p = .069$).

In the PPG model, the regression model was also significant, $F(19, 76) = 2.97$, $p < .001$, $R^2 = .43$, explaining 42.6% of the variance. Technology/science content again predicted greater recovery ($p < .001$), while disaster content predicted reduced recovery ($p = .002$). Although not statistically significant, other themes showed potential effects. Viewing health and fitness content was associated with a modest negative trend ($B = -97.11$, $p = .203$), while entertainment content had a small positive association ($B = 78.24$, $p = .160$). Memes, consistent with the VAS findings, showed a negative direction of effect but were not statistically significant ($B = -31.26$, $p = .514$). These results suggest that not all social media content is equal in its effects on stress recovery, meaning that some themes may buffer arousal, while others may exacerbate it.

Additional analyses examined whether participants enjoyed using social media and most enjoyed using social media (86.3%), followed by Unsure (6.9%), Other (2.9%), and No (3.9%). For everyday use of social media (See Table 3), the descriptive frequencies noting common themes across this sample were Entertainment (84.3%), Distraction (74.5%), Social Connection (73.5%), Friends and Family (60.8%), Memes (59.8%), Comedy (55.9%), Influencers (43.1%), Sports (42.2%), News and Information (41.2%), Travel (34.3%), Health and Fitness (33.3%), World News (28.4%), Hobby (26.5%), Inspiration (26.5%), Mental Health (25.5%), Education (25.5%), Animals (22.5%), Tutorials and DIY (20.6%), Gaming (19.6%), Conflict/Controversy (18.6%), Crime (18.6%), Technology/Science (18.6%), Politics (18.4%), Disasters (9.8%), and Other (9.8%).

Discussion

The current study aimed to examine whether social media use facilitates recovery from an acute stressor (i.e., TSST) in young adults, whether this effect is moderated by ADHD symptomology, and to use exploratory analyses to investigate whether content themes would

impact subjective (VAS) and physiological (PPG) recovery. These findings provide insight into how theoretically social media may be a potential form of coping strategy (i.e., social buffering and distraction), yet the complex and nuanced nature that not all social media use is equally beneficial, with its effectiveness likely depending on how individuals engage with it, the emotional tone of the content, and individual traits such as gender or ADHD symptomology. These nuances are explored further below and require further evaluation.

For the present study, there were no main effects to support social media as a social buffer and distraction to increase young adults' recovery from an acute stressor (RQ1). Related to the initial hypothesis, there is no evidence to suggest that the intervention of social media had an effect on self-reported affect of recovery across timepoints. The interaction between the conditions and time following the post-social media activity demonstrated similar recovery, therefore indicating that social media did not significantly accelerate recovery that differed from the control condition. However, there were significant differences in self-reported scores (i.e., VAS) between gender identities, suggesting that gender may impact subjective affect levels. There were substantial differences in the average scores between the two gender identities explored, with women on average reporting consistently higher VAS scores (i.e., more stress or emotional arousal) and these differences are apparent across timepoints and VAS types (i.e., stress and anxiety). Further, gender differences varied across timepoints and VAS types, particularly for women, who reported much higher scores at stress peak (time 4-5), especially those in the social media use condition. Women may be more emotionally reactive to the stressor and may be more engaged with the VAS content than compared to men. This may be explained by research that shows that women are generally more emotionally expressive and attuned to internal states, which may make them more reactive to social-evaluative stressors (Kelly et al.,

2008). Additionally, women are more likely to engage more deeply with social and emotional content (Nolen-Hoeksema, 2012), which may amplify their affective response when viewing emotionally salient content on social media. This heightened engagement may make social media both more emotionally activating and more impactful in shaping perceived stress levels during recovery. These findings highlight the importance of considering gender identity when interpreting stress reactivity and recovery. Additionally, these findings align with a substantial body of research suggesting that women tend to report higher levels of perceived stress and demonstrate greater emotional reactivity to stressors than compared to men (Dedovic et al., 2009; Matud, 2004; Kelly et al., 2008). This gender gap in perceived stress has been attributed to both biological and psychosocial factors. For example, women may experience heightened activity in stress-related neuroendocrine systems, such as the HPA axis, in response to interpersonal stress (Kudielka et al., 2004; Stephens et al., 2015; Stroud et al., 2002), which may be particularly salient in the context of a psychosocial stressor like the one used in this study. Further, gender socialization patterns may encourage more emotional expressivity and self-monitoring in women, contributing to higher self-reported affective responses (Dedovic et al., 2009; Nolen-Hoeksema, 2012). These effects may be especially pronounced in young adults (e.g., ages 18-25), who psychosocially are navigating emerging autonomy, evolving peer and romantic relationships, and heightened social comparison through digital platforms (Clayborne et al., 2019; Hawke et al., 2021; Thapar et al., 2022). These factors can intensify emotional sensitivity to social stressors. From a neuropsychological perspective, young adult females have exhibited greater activation in the limbic regions (e.g. amygdala, hippocampus, ventromedial prefrontal cortex) and stronger connectivity with stress regulating networks in response to psychosocial stress tasks (Cohen et al., 2023). This suggests that women are more likely to rely

on neural circuits that are tied to emotional processing when regulating stress. As such, the intersection of gender, developmental stage, and sex-specific neuropsychological patterns may help explain the elevated VAS scores observed among women in this age group during peak stress.

Within the framework of social buffering theory (e.g., Gunnar et al., 2017), it is possible that women may be more attuned to the social dimensions of both stress and coping, potentially heightening their emotional engagement with the stressor and the VAS self-report scales. Yet, despite this engagement, the absence of a greater recovery benefit from social media use suggests that the buffering effects may not be sufficient to nullify the observed heightened emotional reactivity. This may indicate that the form or content of the social media engagement was not optimally tailored to function as a meaningful source of support for participants, or that passive engagement with social media is less effective as a stress buffer compared to more interactive or emotionally validating forms of social connection.

Distraction theory also offers a complementary lens. While distraction can be an effective short-term coping mechanism, it may be less beneficial for individuals experiencing high emotional arousal if the distraction lacks sufficient absorption or personal relevance (Webb et al., 2012). The higher emotional reactivity observed among women may have limited the efficacy of the distraction component of the intervention, especially if the content consumed during the social media use condition was not sufficiently engaging or emotionally neutral. Taken together, these findings highlight the importance of accounting for gender identity when evaluating stress responses and coping mechanisms. The differences in VAS responses across gender suggest that perceived stress is not only a subjective experience but also one deeply intertwined with individual and social factors. Future research should explore the role of content type, emotional

engagement, and interactivity in shaping the effectiveness of social media as a coping tool, especially across diverse gender identities.

Additionally, the stress induction (TSST) was effective, and recovery occurred over time and had significant impact throughout the experiment, demonstrating significant change over the seven timepoints and is consistent with a stress-recovery curve. The significant differences occurred from timepoints 1-5 to timepoints 4-5 (stress peak) with sharp declines from timepoints five to six (recovery begins) and minimal to non-significant changes where recovery flattened from timepoints 6 to 7. This confirms the continued support for using the online TSST for eliciting acute stress among an adult population (e.g., Gunnar et al., 2021; Meier et al., 2022).

Contrary to the second hypothesis, ADHD symptom severity did not predict affective or physiological recovery (RQ2), despite research supporting that adults experiencing ADHD symptoms have weakened stress recovery and elevated levels of subjective stress compared to individuals without ADHD symptoms (Combs et al., 2015; Hirvikoski et al., 2009; Lackschewitz et al., 2008). Thus, these findings did not support young adults experiencing both low and elevatedADHD symptoms to have reductions in the effects of social buffering and distraction, increasing stress recovery time. This continues to add to the inconsistent research about social media as a potential tool for coping from stress (Wolfers & Utz, 2022). In both regression models (VAS and PPG), ADHD symptom severity and elevated ADHD symptoms explained no additional variance in self-reported or PPG scores, and regression coefficients were nonsignificant. These results suggest that ADHD symptomology may not be a relevant individual difference factor in the effectiveness of passive social media use as a buffer. Additionally, these findings are inconsistent with previous literature about the differential

psychological and physiological responses to stressors (Grossman & Avital, 2023; Ji et al., 2011; Kamradt et al., 2017; Misra & Gandhi, 2023; Barra et al., 2021).

Theoretically, however, there are compelling reasons to expect that ADHD symptoms—particularly inattention, impulsivity, and emotional dysregulation—may interfere with effective engagement in social buffering or distraction-based interventions. For instance, emerging research has shown that symptom severity, rather than formal diagnosis or medication status, is more strongly associated with neurobiological stress reactivity, such as dysregulated cortisol patterns and heightened HPA axis activation in response to social stressors (Kamradt et al., 2017; Raz & Leykin, 2015). Emotional dysregulation, a common but often under-recognized component of ADHD, has been linked to greater physiological arousal, reduced stress recovery, and difficulty with adaptive coping (Grossman & Avital, 2023; Ji et al., 2011; Kamradt et al., 2017; Misra & Gandhi, 2023; Barra et al., 2021). These challenges may inhibit the capacity of individuals with high ADHD symptoms to benefit from passive coping mechanisms, such as scrolling through social media, particularly if the content lacks sufficient emotional relevance or regulation cues (Webb et al., 2012; Meier & Reinecke, 2020).

Additionally, individuals with ADHD symptoms are more likely to rely on less effective coping strategies (e.g., avoidance, withdrawal) and may demonstrate impaired executive functioning, which limits the ability to redirect attention or evaluate stress-reducing stimuli during digital tasks (Al-Yagon et al., 2020; Barra et al., 2021; Combs et al., 2015). These cognitive inhibitions may undermine the distraction and social buffering functions of digital content, especially in passive or unstructured formats. This may help explain the null findings in the current study and suggests that more tailored, engaging, or interactive forms of digital

intervention may be necessary to support stress recovery in individuals with elevated ADHD symptoms.

Finally, it is important to differentiate between ADHD symptoms, formal diagnosis, and medication status, as each may interact differently with stress physiology and coping. For example, stimulant medications can temporarily normalize cortisol response patterns (King et al., 1998), while undiagnosed individuals may lack both insight into their symptoms and access to structured coping supports. Given the rising rates of adult ADHD recognition (Abdelnour et al., 2022) and the role of social media in shaping self-awareness and help-seeking (Yeung et al., 2022), future research should consider how symptom profiles, rather than diagnostic labels, influence engagement with digital coping tools like social media. Overall, ADHD symptom severity shows theoretically a higher degree of relevance than purely examining diagnosis or medication status when considering stress reactivity and buffering. These symptoms impact psychological and physiological stress reactivity, along with stress coping style and ability to benefit from social buffering. It can be inferred that participants with higher ADHD symptom severity, particularly those with emotional dysregulation or poor inhibitory control, are likely to respond differently to passive social media buffering, regardless of whether those individuals have a formal diagnosis or receive treatment through medication.

Exploratory data analyses were aimed at determining whether content type of social media would impact stress recovery in the social media use condition based on previous literature that found the type of content and the subjective affect of the individual can influence social media's impact on their mental health (Zhao & Zhou, 2020). The findings of this study indicated that there were significant differences in stress recovery dependent on the type of content viewed. Technology and science-based content predicted better VAS and PPG recovery.

Family and friends-based content was linked to better VAS recovery. Further, memes and political based content were linked to poorer VAS recovery. Lastly, disaster-related content predicted worse PPG recovery. These results indicate that not all social media content is comparable, meaning the theme of what participants engaged with post stressor significantly shaped recovery outcomes. These results further strengthen the findings by Zhao and Zhou (2020) and supports that certain content themes (i.e., disaster news) can impact mental health outcomes when exposed to an acute stressor. Despite these significant differences in themes, these helpful themes were not popular for every day social media use. Technology and science, which predicted the strongest recovery (VAS and PPG), was one of the least reported everyday uses (18.6%). Disaster content, which predicted worse recovery, was also among the least used (9.8%), yet still showed a negative impact. These findings highlight that the impact of a theme is not proportional to how often people consume it and themes that are less frequently used can still significantly influence stress outcomes, positively or negatively.

This study was also interested in user experience along with social media themes. Most participants enjoyed using social media; 86.3% reported enjoying social media use during the social media use condition, which suggests that a lack of enjoyment is unlikely to explain the lack of a buffering effect. This is an important finding, as enjoyment or engagement quality is often cited as a moderate in digital intervention studies, however enjoyment does not guarantee effectiveness (e.g., Donkin et al., 2011; Kelders et al., 2012; Perski et al., 2017; Yardley et al., 2016). Further, everyday social media use reflects escapism and connection as the main contents. The top self-reported uses were entertainment (84.3%), distraction (74.5%), social connection (73.5%), and family and friends (60.8%). These patterns are theoretically consistent with literature describing social media as a tool for coping, distraction/avoidance, or mood regulation

(e.g., Gunnar, 2017; Mansell et al., 2020; Tabibnia, 2020). Additionally, these findings align with the two key theoretical frameworks guiding this current study: social buffering theory and distraction theory, which together provide a robust lens through which to interpret the effects of social media engagement on stress recovery. Social buffering theory posits that the presence, either physical, virtual, or symbolic, of social partners can attenuate physiological responses to stress, thereby accelerating the return to baseline functioning (Gunnar, 2017) and has particular relevance when considering social media as a modern, pervasive form of social connection. In line with this framework, this study's use of physiological indicators (i.e., heart rate recovery) as a measure of stress recovery allows for direct assessment of whether engagement with social media might serve as a form of social buffering in real time. Although participants in the social media condition did not demonstrate significantly improved recovery, nearly three-quarters reported using social media for connection or family and friend's content. This indicates that participants may perceive social media as fulfilling a social need, even if the buffering effects were not physiologically measurable in this setting. It can be speculated that the buffering effects predicted by the theory require deeper or more interactive forms of online engagement (e.g., messaging or live video), which were not captured in this study. Alternatively, the passive nature of most scrolling behaviors, or emotionally mismatched content, may have limited the effectiveness of any perceived social support.

In addition, distraction theory offers a complementary explanation, by shifting attention from the stressor and toward a familiar, low-effort activity like social media browsing, participants may have experienced short-term mood improvements and decreased perceived stress comparable to that of other low-effort activities like reading (Mansell et al., 2020; Tabibnia, 2020). From this lens, social media, especially when used for entertainment or

escapism, should hypothetically provide a short-term reduction in perceived stress. Indeed, 74.5% of participants identified distraction as a key reason for social media use. However, the data showed no clear pattern of improved recovery in this condition, suggesting that not all distractions are equally effective. In particular, some content (e.g., memes) may not have been emotionally congruent with participants' post-stress states, potentially limiting their regulatory value. Additionally, the fragmented or overstimulating nature of social media content could have created cognitive noise, rather than the mental detachment typically needed for effective distraction.

Together, these findings highlight that while this study's theoretical models provide a strong foundation, real-world applications are highly sensitive to contextual factors—such as content type, user mood, platform behavior (passive vs. active use), and individual differences in stress response. Rather than serving as strong evidence for or against the theories, the current results point to their conditional relevance and requires the contextual factors to be studied extensively as this study neglected to examine them. Social media may hold potential as a coping mechanism, but its efficacy likely depends on how, why, and in what emotional context it is used. These nuances align with recent calls in the literature to move beyond simplistic "good or bad" framings of social media and instead focus on who uses it, how, and for what purposes (Wolfers & Utz, 2022). In this way, the current study contributes to a more theoretically informed and empirically cautious understanding of social media's role in stress regulation rather than real world application.

Importantly, these findings contribute to a nuanced understanding of stress coping mechanisms in young adults. The young adult developmental stage is characterized by increasing reliance on peer relationships and digital platforms for social engagement, suggesting that both

the social and distractive elements of social media may be especially salient in this population (Broderick & Blewitt, 2020; MacLeod & Brownlie, 2014; Valkenberg et al., 2022). By analyzing heart rate differences between time points (e.g., Time points 6 – 4) and modeling the influence of ADHD symptom severity, the data further suggest that individual differences may moderate the effectiveness of social media as a coping mechanism, a point that aligns with literature showing variability in social buffering benefits based on early attachment and developmental history (Gunnar & Hostinar, 2015). Together, these frameworks provide a strong theoretical basis for interpreting the observed effects of social media on stress recovery, highlighting the dual role of social platforms as both a source of perceived social support and an effective form of everyday distraction.

However, the studied themes did not all equally translate to a stronger recovery and only specific themes (i.e., technology/science, family/friends) had beneficial effects. Although distraction and connection are common motivators for use, not all distractions are equally effective in a post-stress context. Additionally, popular themes often did not predict positive recovery. Participants reported frequent use of memes and comedy. However, memes predicted worse affective recovery, and comedy was not a significant predictor of either. This suggests that common or popular themes may not be effective coping tools under stress, which may be due to emotional mismatch or surface-level engagement. These findings support the idea that curated, meaningful content (e.g., science, family) may foster recovery, while emotionally charged or trivial content (e.g., disaster, memes) may deter it. Future studies should consider content type, engagement quality, and individual differences more thoroughly when evaluating digital stress interventions.

Lastly, there is a discrepancy between everyday use and stress recovery value. Themes like news, politics, memes, or influencers while are commonly used, were either neutral or slowed stress recovery. Whereas recovery promoting themes, like family/friends and technology/science may offer more emotionally grounded or cognitively engaging content, which may help support emotional regulation. Future studies and interventions using social media for stress recovery should consider curating or recommending content types, rather than assuming general social media use will be beneficial. These findings highlight a disconnect between the types of social media content users frequently engage with and the types of content that may support stress recovery. Enjoyment and frequency of social media use alone are not reliable indicators of buffering effectiveness. Future digital stress interventions may benefit from encouraging participants to engage with more purposeful or grounding content, such as technological/scientific advancements or personal connections, rather than entertainment or passive scrolling.

Strengths

The current study has several strengths, mainly that this research continues to expand upon the online TSST research and the use of multi-method assessment of stress (i.e., PPG and VAS). The results from this study support the use of an online TSST format that continues to uphold the TSST gold standard and used by previous researchers (i.e., Harvie et al., 2021; Gunnar et al., 2021). Further, this study applied the use of both self-report (VAS) and physiological (HR/PPG) data, which enhances the validity by capturing both subjective and objective stress responses. By examining these two stress responses, the current study continues to support the knowledge gap as few studies (i.e., Cho et al., 2019; Pfeifer et al., 2021; Gunnar et

al., 2021, Meier et al., 2022; Rus & Tiemensma, 2018) integrate these two measures during digital interventions, making the design of this study more comprehensive.

Another advantage of this research is the data analysis design of the experimental manipulation with repeated measures and the inclusion of individual differences and contextual variables. The within-subjects time design (seven time points) with an experimental manipulation (social media v. control) provides a strong temporal resolution for understanding stress and recovery. This design enables the detection of stress induction and recovery patterns, adding rigor to inferences obtained from the data. Furthermore, the inclusion of individual differences and contextual variables (i.e., ADHD symptom severity, gender, age) added an important nuance to the analysis and recognized the variability in stress experiences. As such, gender effects turned out to be a significant interaction, highlighting the value of including these moderator variables in stress recovery research. Additionally, this reinforces longstanding theoretical frameworks that suggest stress is not experienced or managed uniformly across individuals. For instance, social buffering theory and tend-and-befriend theory emphasize that affiliative coping and perceived social support may be especially salient for women (Cohen et al., 2021), who are more likely to engage in relational and emotion-focused strategies (Tamres et al., 2002). This may explain why gender differences in stress perception were most pronounced at peak stress and during recovery. Similarly, individuals with elevated ADHD symptoms may struggle to engage with or benefit from coping strategies, especially those requiring sustained attention or emotional interpretation, due to core deficits in executive functioning, social cognition, and emotional regulation (Combs et al., 2015; Barra et al., 2021). These theoretical lenses suggest that digital interventions, while broadly accessible, may not function equivalently across users. Future research should consider how moderators like gender and ADHD interact

with the mechanisms of intervention, such as distraction quality, content relevance, and symbolic social connection, when evaluating outcomes. Understanding these individual differences is critical for tailoring digital mental health tools to maximize benefit for diverse users.

Another strength is that this study utilized an innovative exploratory content analysis of social media themes. Exploring what type of content people engage with and how those themes may influence recovery is a novel and underexplored direct in digital stress literature. The study's analysis by content theme reveals meaningful and practical insights into how content themes may be beneficial as a potential stress recovery strategy and how context dependent stress recovery can be. Lastly, this research supports ecological validity by using realistic, everyday context to examine digital stress recovery. By using Instagram and participants' typical media exposure, this aimed at mimicking real-life coping strategies, which boosts the ecological validity of this research. Additionally, the experience that most participants enjoyed using social media, supports ruling out the lack of engagement as a potential confounding variable.

Limitations and Future Studies

There are several caveats of the current research that are worth noting. The main limitation of this research is that there was a dearth of evidence of a general buffering effect. Although using prevailing social media allows for a greater extent of a high ecological validity, the results are not generalizable, and no conclusions can be drawn about the effectiveness of passive (i.e., viewing, not posting) social media use as a stress recovery tool. This study did not manipulate, measure, or track the quality of the engagement or attention (e.g., commenting, interacting). The findings could have presented a stronger result had the social media used in the social media use condition be manipulated, as only the use of passive social media was examined. Thus, this study is limited on what can be said about an active versus passive role of

social media in stress recovery. Future studies should consider exploring how different manipulation of engagement type and whether social media has variability in stress recovery based on participation.

There are also limitations related to the analytic approaches of this study. The decision not to use linear modeling (e.g., multilevel models or growth curve analysis) reflects both the study's aims and common practices in the stress literature. The Trier Social Stress Test (TSST) paradigm, and related protocols, frequently rely on discrete comparisons between specific timepoints rather than modeling continuous slopes of change (e.g., Allen et al., 2017). This is partly because stress responses in such paradigms are often non-linear and may not conform well to assumptions of simple growth models. In the present study, hypotheses were centered on differences between recovery and peak stress points, operationalized as the change between T6 and T4, rather than on predicting the shape or rate of change across all timepoints. As such, the use of t-tests to examine these specific intervals is consistent with both prior research and the discrete nature of the predictions. However, it is acknowledged that this approach may not capture more nuanced recovery patterns, such as delayed or partial return to baseline. Methods such as linear mixed models or growth curve analyses could offer additional insights into individual variability in trajectories, and area under the curve (AUC) metrics are widely used to summarize the total magnitude and duration of physiological responses (Pruessner et al., 2003). While these approaches were not employed here due to the study's focus and analytic plan, future research may benefit from combining discrete comparisons with trajectory-based or cumulative measures to provide a more comprehensive picture of stress recovery.

Additionally, this study was only able to examine short-term effects. While stress recovery was measured continuously for period of time (i.e., approximately an hour), the

recovery was only measured for a brief time span post-stressor (i.e., after 5 minutes of a post-stressor, PPG and VAS were measured). Based on this procedure, this study cannot determine whether social media has longer-term effects on stress regulation and recovery. In addition to the short-term nature of the procedure, the panelists were not blinded to the condition of the participant. Since panelists were not blinded to participant condition, the potential for experimenter bias and expectancy effects cannot be ruled out. Although procedures were standardized, future research should consider employing blinded protocols to reduce possible observer bias. Further, this continues to contribute to the minimal evidence about social media's role in long-term stress management (e.g., Rus & Tiemensma, 2017;Välimäki et al., 2017).

Another caveat is that the time-of-day effects were not controlled, as sessions occurred at varied times of the day. Physiological and subjective affective stress responses are influenced by circadian rhythms. Physiological data (i.e., heart rate, cortisol, mood) fluctuates across the day, often peaking in the morning and declining towards the evening (Mohd Azmi et al., 2021). Without controlling for these effects, the study may have introduced noise into the physiological data (e.g., variation in baseline HR), that were unrelated to the stressor or recovery intervention. Additionally, the time of the sessions were not included in the models as a covariate. This may have obscured subtle differences of the recovery manipulation or ADHD symptoms due to uncontrolled time-based variance in physiological reactivity. Additionally, multicollinearity was not addressed for the exploratory analyses as these analyses were purely hypothesis generating, potentially leading to unstable and unreliable regression results. Without addressing the multicollinearity, the study may have introduced unable coefficient estimates, inflated standard errors, insignificant coefficients, and difficulties in interpretation. This may lead to incorrect

conclusions of potential important predictors, lower t-statistics, and difficulty interpreting the individual contribution of each variable to the dependent variable.

Lastly, this study lacked inclusion and representation of transgender and gender diverse individuals. While gender identity was statistically modeled, this current sample reflects a binary conceptualization of gender (e.g., man/woman), consistent with common research norms. Transgender and gender-diverse individuals remain underrepresented in stress research, including in the present study. This exclusion both limits generalizability and continues systemic erasure of gender-diverse experiences, which is particularly important given that trans and queer individuals often experience heightened baseline stress and discrimination (White Hughto et al., 2015). Future studies should consider studying these potential unique stress experiences in marginalized populations and addressing these gaps in future work is critical for producing inclusive and physiologically informed stress research.

Conclusion

Stress recovery and effective coping strategies with digital intervention should continue to be explored. While passive social media use did not provide a general buffering effect, the results determined that specific types of content may influence recovery in meaningful ways. Further, gender differences emerged in subjective stress responses, and the content theme mattered more than the platform itself. This research demonstrates that certain, meaningful content (e.g., science, family) may foster better stress recovery, meanwhile emotionally charged or trivial content (e.g., disaster, memes) may inhibit stress recovery, which offers support to previous findings (e.g., Zhao & Zhou, 2020). Together, these findings reinforce the idea that social media's effects are highly context- and content-dependent. While theoretically (e.g., social buffering theory and distraction theory), it may serve as both a social buffer and distraction (e.g.,

George et al., 2013; Mansell et al., 2020; Tabibnia, 2020; Rus & Tiemensma, 2018; Wolfers & Utz, 2022), in practice, the quality of content and the emotional state of the user critically shape outcomes. Importantly, popular content—like memes—was not effective in reducing stress, and sometimes worsened recovery. This may be due to surface-level engagement or emotional mismatch during times of distress. In summary, while social media shows potential as a coping tool through mechanisms of social buffering and distraction, its effectiveness is not guaranteed. The impact of social media on stress recovery depends on content type, emotional engagement, gender, and individual differences.

The lack of effective manipulation, potential underpowering for interaction effects, the passive use of social media, no measurement of engagement, only examining short-term effects, potential time-of-day effects, lack of inclusivity, and insufficient generalizability, are worth noting that limits the significance of the results and should be addressed in future research. The findings of the present study have several practical implications for future research that should consider content type, engagement quality, and individual differences more deeply when evaluating digital stress interventions.

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Table 1

Demographics

	N	Percentage of Sample
Age		
18	49	48.0%
19	17	16.7%
20	10	9.8%
21	9	8.8%
22	5	4.9%
23	8	7.8%
24	4	3.9%
Sex		
Female	68	66.7%
Male	34	33.3%
Intersex	0	0%
Other	0	0%
Gender Identity		
Gender-fluid	0	0%
Woman	68	66.7%
Nonbinary	0	0%
Trans man	0	0%
Trans woman	0	0%
Trans nonbinary	0	0%
Two-Spirit	0	0%
Man	34	33.3%
I don’t identify with any option provided	0	0%
Prefer not to answer	0	0%
Ethnic Group		
Arab	4	3.9%
Black	21	20.6%
Chinese	0	0%
Filipino	13	12.7%
Indigenous (First Nations, Metis, or Inuit)	12	11.8%
Japanese	0	0%
Korean	0	0%
Latin-America	4	3.9%
South Asian (e.g., East Indian, Pakistani)	21	20.6%
Southeast Asian (e.g., Vietnamese, Cambodian)	3	2.9%
West Asian	1	1.0%
White	34	33.3%
Population not listed above	0	0%
Prefer not to answer	0	0%

Note: The above table describes fuller demographics for the sample.

Table 2

Correlations Between Physiological Measures and Demographic Variables

Variable	1	2	3	4	5
1. HR Reactivity					
2. HR Buffer	-.42**				
3. VAS Reactivity	-.12	-.03			
4. VAS Recovery	.14	.05	-.53**		
5. Age	.15	.88	-.12	.10	

Note: VAS = Visual Analogue Scale (self-reported affective recovery; higher values indicate __*); HR buffer = Heart rate-based recovery score; HR reactivity = peak HR minus baseline; HR recovery = post-buffer heart rate minus peak heart rate;* Pearson's *r* reported; pairwise deletion used. * indicates $p < .05$. ** indicates $p < .01$

Table 3

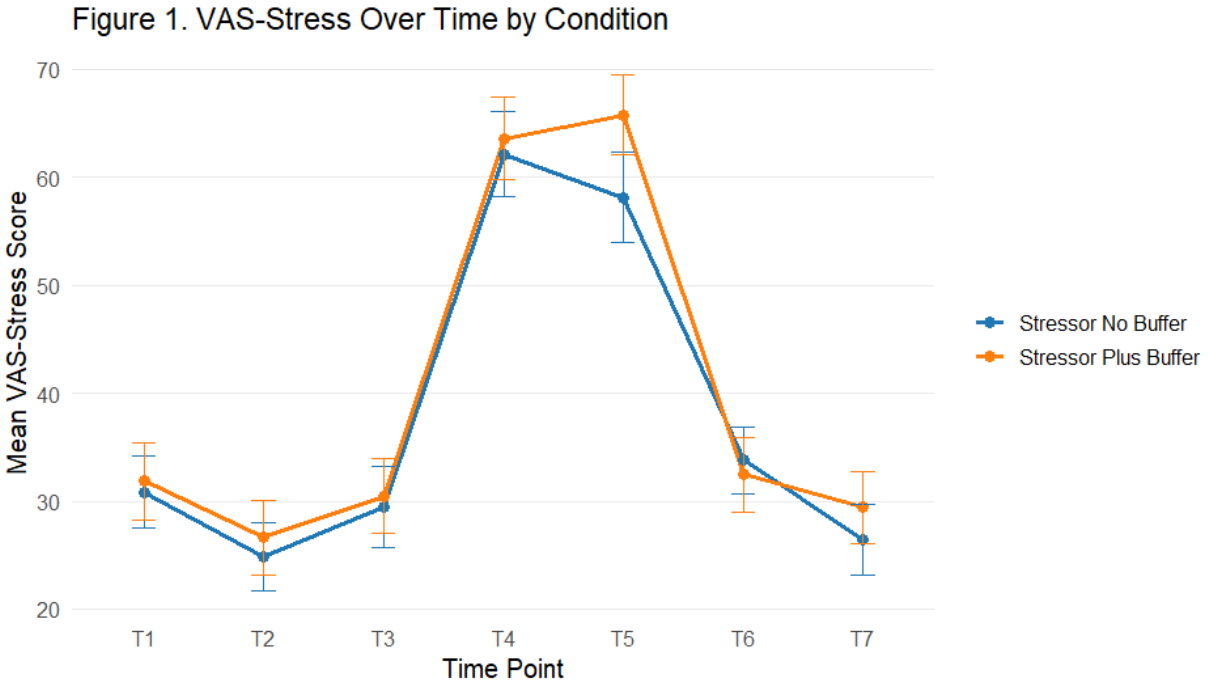
Social Media Content Themes

	N	Percentage of Sample
Everyday Content Themes		
Distraction	76	74.5%
Social Connection	75	73.5%
Hobby	27	26.3%
Comedy	57	55.9%
Entertainment	86	84.3%
Influencers	44	43.1%
News	42	41.2%
Health and Fitness	34	33.3%
Memes	61	59.8%
Politics	19	18.6%
Gaming	20	19.6%
Tutorials and DIY	21	20.6%
Animals	23	22.5%
Friends and Family	62	60.8%
Education	26	25.5%
Sports	43	42.2%
Inspiration	27	26.5%
World News	29	28.4%
Mental Health	26	25.5%
Conflict	19	18.6%
Disaster	10	9.8%
Crime	19	18.6%
Technology and Science	19	18.6%
Travel	35	34.3%
Other	10	9.8%

Note: The above table described fuller demographics for the everyday social media content.

Figure 1

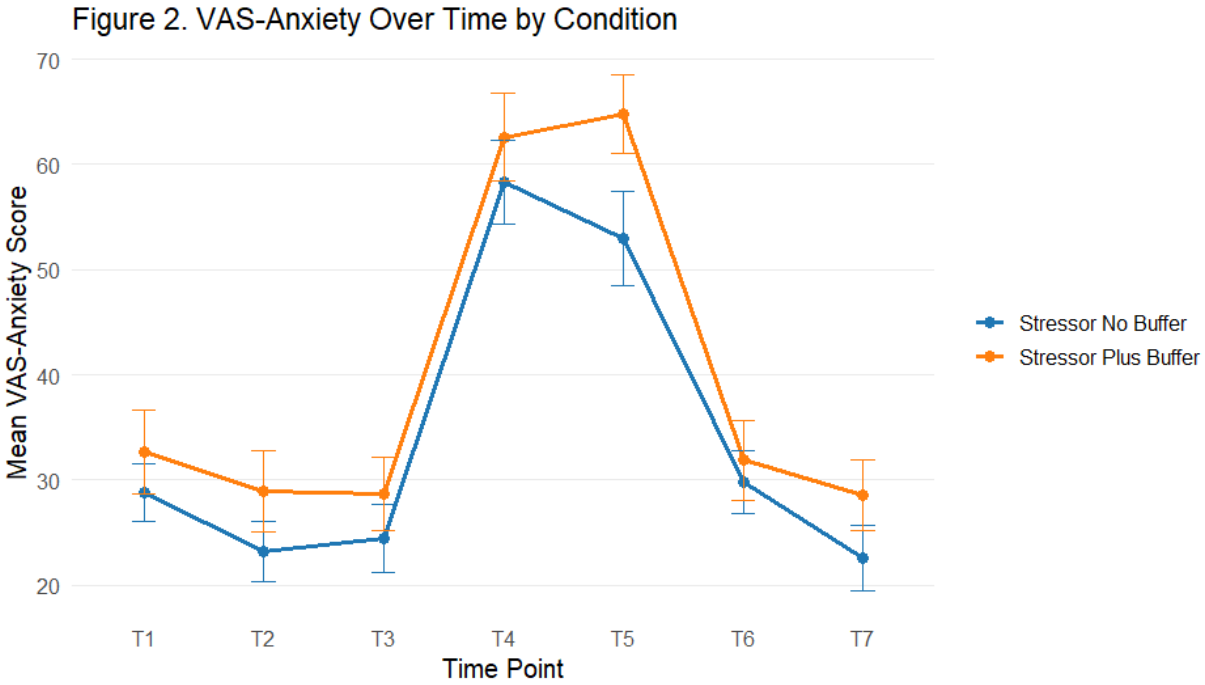
Self-Reported Stress Over Time by Condition



Note: Error bars shown are ± 1 standard error. Additionally, the TSST was administered during T3-T5, with experimental manipulation occurring after T5.

Figure 2

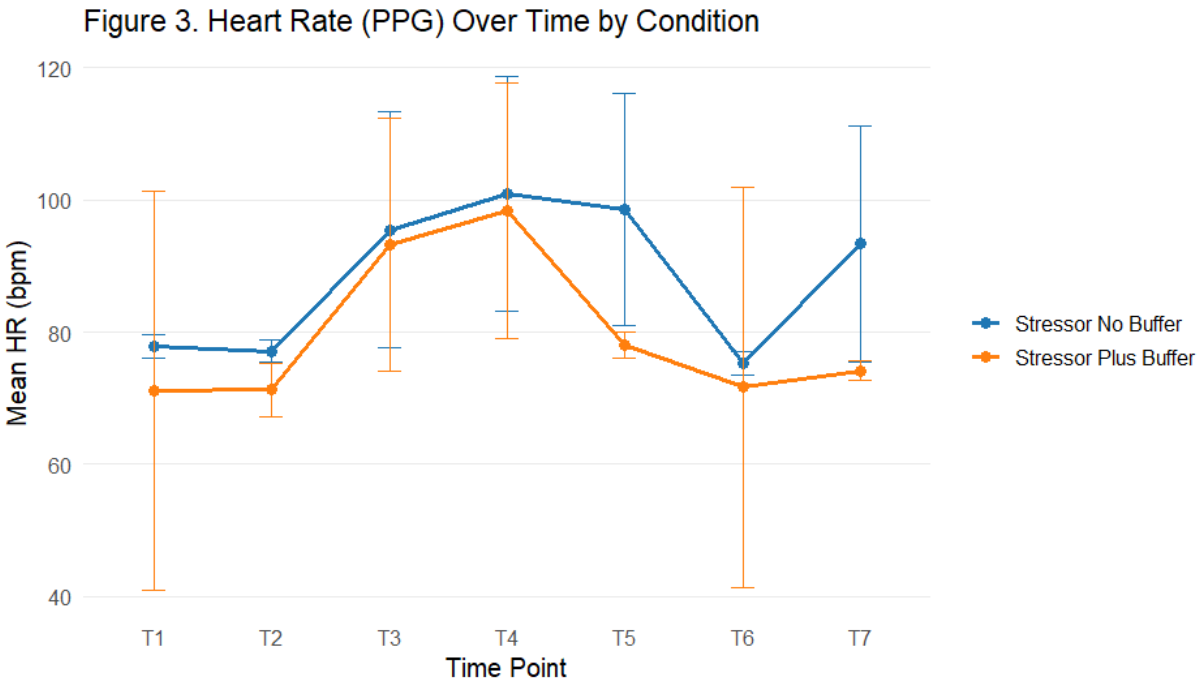
Self-Report Anxiety Over Time by Condition



Note: Error bars shown are ± 1 standard error. Additionally, the TSST was administered during T3-T5, with experimental manipulation occurring after T5.

Figure 3

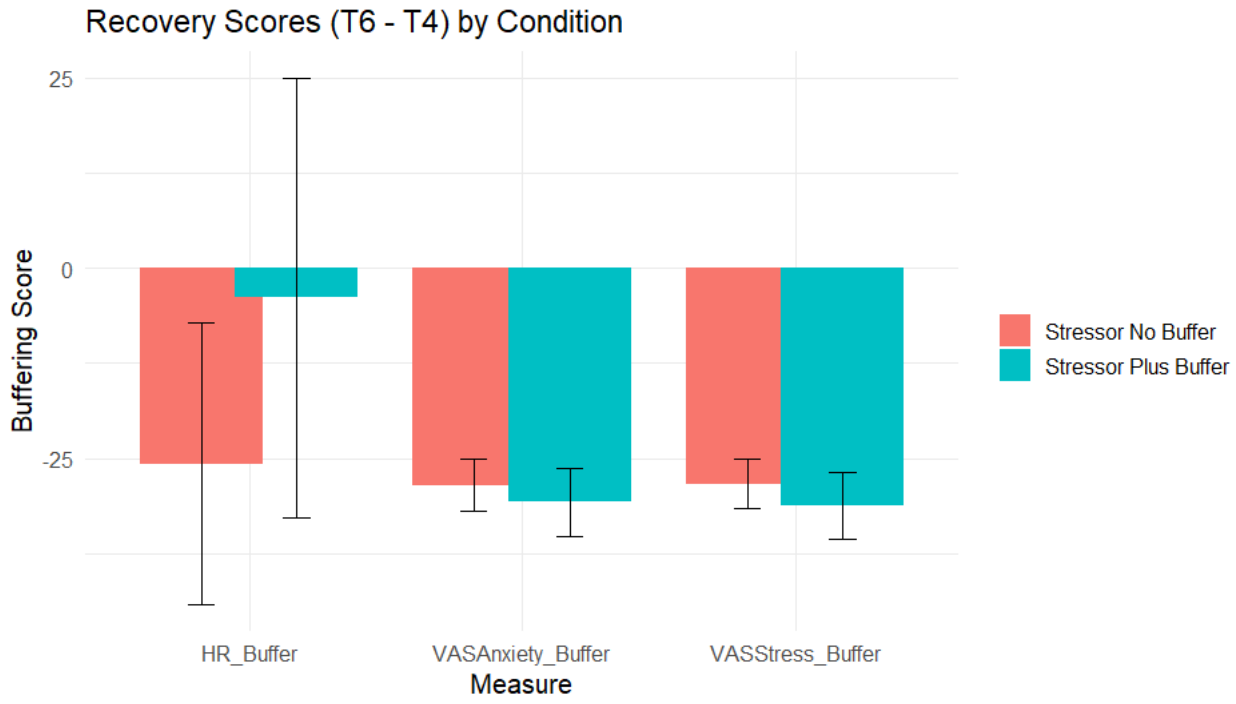
Mean Heart Rate (PPG) Over Time by Condition



Note: Error bars shown are ± 1 standard error. Additionally, the TSST was administered during T3-T5, with experimental manipulation occurring after T5.

Figure 4

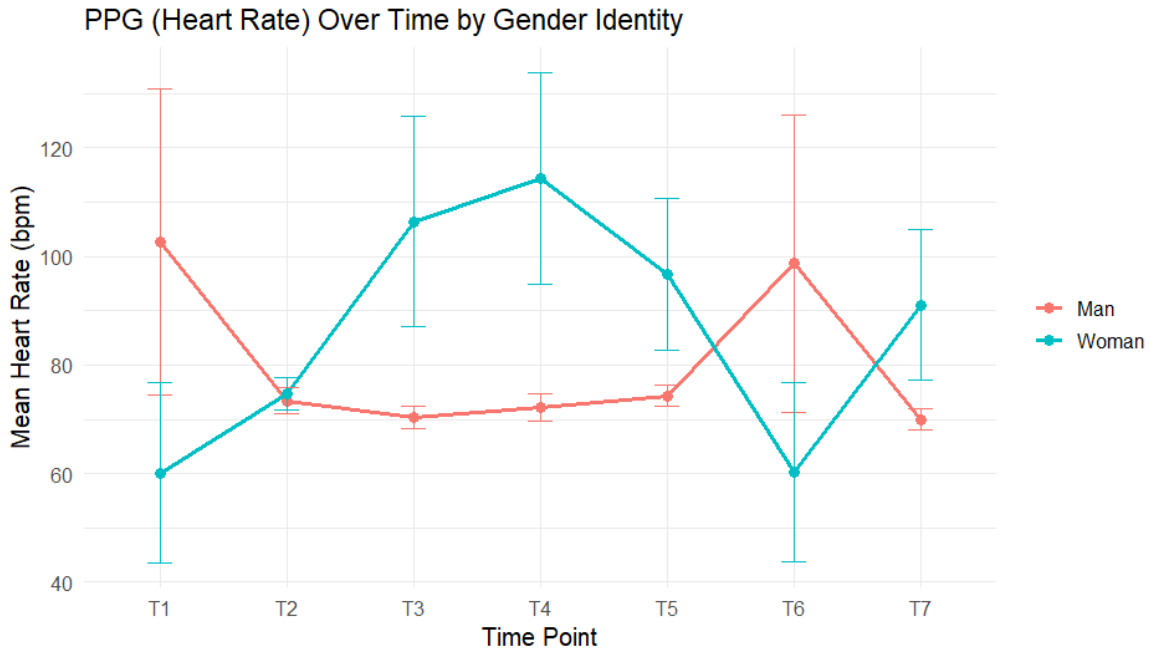
Comparison of Recovery Scores Across Psychological and Physiological Measures by Condition



Note: Error bars shown are ± 1 standard error

Figure 5

Interaction Between Heart Rate (PPG) Over Time by Gender Identity



Note: Error bars shown are ± 1 standard error. Additionally, the TSST was administered during T3-T5, with experimental manipulation occurring after T5.

Figure 6

Correlation between ADHD symptomology and Self-Reported Stress Recovery in Social media use Condition

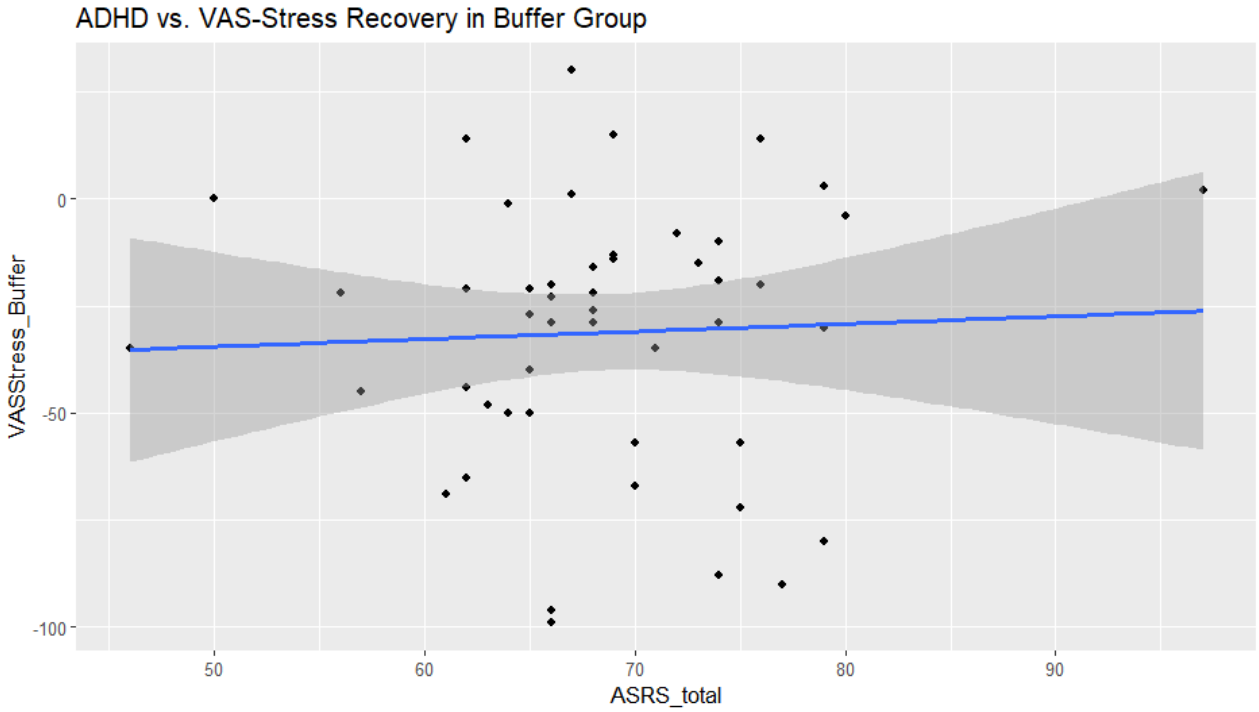


Figure 7

Standardized Effects of Social Media Themes on Stress Recovery