Does attachment style moderate the relationship between negative urgency and adult ADHD symptoms?

by

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Abstract

Few studies have examined adult ADHD's connection to negative urgency, a form of impulsive emotion dysregulation. Adults high in ADHD symptoms may be more prone to negative urgency due to neural differences in self-regulation, reward and emotion. Identifying malleable personality traits that buffer the relationship between ADHD and negative urgency is crucial. Attachment style, closely tied to emotion regulation, could interact with ADHD symptoms, amplifying the risk of negative urgency. My studies examine 1) the relationship between adult ADHD symptoms and negative urgency and 2) the interaction effect of attachment style and ADHD symptoms on negative urgency. In two studies (one pre-registered replication), ADHD symptoms (inattentiveness and hyperactivity-impulsivity) were positively associated with negative urgency. Fearful avoidant attachment consistently increased the relationship between ADHD symptoms and negative urgency, suggesting high ADHD symptoms paired with fearful avoidance increases the propensity to cope with negative emotions via negative urgency. These results build upon prior research on emotion dysregulation in adult ADHD and may guide targeted, attachment-focused therapy for emotion dysregulation in adult ADHD.

Preface

This thesis is an original work by Paige Faulkner. The research projects in this thesis received research ethics approval from the University of Alberta Research Ethics Board for Study 1 (Protocol Pro00098760) and Study 2 (Protocol Pro00138713).

Acknowledgements

Thank you to my supervisor, Kyle Nash, for your mentorship, guidance, and kindness. You encouraged me to achieve goals I thought were out of my reach. Thank you to Tiana Rust, who made my time as a teaching assistant an incredibly positive experience. Thank you to each undergraduate student and volunteer in the lab who brought invaluable joy, insight, dedication, and collaboration to data collection. Thank you to Shafa Mazidi, David Simpson, and Valery Kalinin for your team spirit when accomplishing big and small tasks.

Table of Contents

List of Tables

List of Figures

Introduction

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by an age-inappropriate level of inattentiveness and/or hyperactivity-impulsivity that causes functional impairment across multiple settings (American Psychiatric Association, 2013). For diagnosis, individuals may score high in one or both of the main symptom categories: inattentiveness and hyperactivity-impulsivity. Inattentive symptoms include persistent and impairing difficulty sustaining attention, completing tasks, listening to others, managing time, avoiding careless mistakes, and remembering essential items and activities (American Psychiatric Association, 2013). Hyperactive-impulsive symptoms include persistent and impairing amounts of fidgeting, restlessness, talking, interrupting others, difficulty in staying in one place and difficulty waiting their turn (American Psychiatric Association, 2013). ADHD onset occurs in childhood, affecting 5-7% of children and adolescents and 3-5% of adults (Roberts et al., 2015). There is a large body of literature connecting emotion dysregulation and ADHD. However, ambiguity exists in which aspects of emotion regulation are diminished in ADHD and some forms of emotion dysregulation have gained little research attention.

ADHD and Emotion Dysregulation

Emotion regulation is an effortful process to modify or lessen an emotional state to achieve a goal (Gross et al., 2015), while emotion dysregulation is an inability to modify or lessen emotions that interferes with achieving goals and daily functioning (Cole et al., 2019; Thompson, 2019). Several studies find a relationship between ADHD and emotion dysregulation. Meta-analyses reveal elevated emotion dysregulation in ADHD across childhood, adolescence, and adulthood (Beheshti et al., 2020; Bunford et al., 2020; Maire et al., 2020). Emotion dysregulation in children with ADHD predicts ADHD symptom persistence into

adulthood and subsequent impairment in occupational, educational, driving, and financial outcomes (Barkley & Fischer, 2010). In adult ADHD, persistent emotion dysregulation predicts functional impairment (Boldadki et al., 2019). Emotion dysregulation in ADHD is not better explained by comorbid psychiatric disorders (Barkley & Fischer, 2010) and is elevated in non-comorbid ADHD (Skirrow & Asherson, 2013). Additionally, it lessens in response to stimulant medication in adult ADHD (Moukhtarian et al., 2017). A twin study reveals emotion dysregulation shares heritability with ADHD (Astenvald et al., 2022), and neuroimaging research points to fronto-limbic neural network differences as an explanation for emotion dysregulation in ADHD (Franke et al., 2018; Nigg & Casey, 2005).

The strong cumulative evidence that emotion dysregulation is prevalent in ADHD across the lifespan has implications for diagnostic protocols. For example, in the DSM-5, emotion dysregulation is a supporting feature of the ADHD diagnosis (American Psychiatric Association, 2013). Others have argued emotion dysregulation should be a core component of the disorder (Soler-Gutiérrez et al., 2023). However, the significant heterogeneity in emotion dysregulation definitions across studies has resulted in no cohesive understanding of emotion dysregulation in ADHD. Further, there are some types of emotion dysregulation that have little or no research.

Negative Urgency: An Emotion Dysregulation Facet Relevant to ADHD

One type of emotion dysregulation understudied with ADHD is emotion-based impulsivity, which is one's inability to control impulsive behaviour during heightened emotional states. Emotion-based impulsivity is divided into positive and negative urgency. Positive urgency involves engaging in impulsive behaviour following positive affect, whereas negative urgency involves engaging in impulsive behaviour following negative affect (Cyders & Smith, 2007; Whiteside & Lynam, 2001). Those high in negative urgency maladaptively regulate emotional

distress through impulsive behaviours, offering short-lived relief that ultimately has greater costs in the long term (Anestis et al., 2007). For example, problem gamblers report engaging in impulsive behaviours as a coping strategy for emotional distress (Kim et al., 2019.). Negative urgency relies upon negative reinforcement because impulsive behaviours produce short-lived relief from negative affect increasing the likelihood of repeating the impulsive behavior. However, this pattern of behaviour does not develop adaptive coping skills in the long term (Cyders et al., 2016).

Negative urgency is a risk factor for a broad list of risky maladaptive behaviours and psychopathology. Negative urgency is associated with elevated substance use disorders (Anestis et al., 2007; Berg et al., 2015; Coskunpinar et al., 2013; Dir et al., 2013), behavioural addictions (Kim et al., 2019), non-suicidal self-injury (Berg et al., 2015; Dir et al., 2013; Peckham et al., 2020), suicidality (Anestis et al., 2011; Berg et al., 2015), binging and purging behaviours (Anestis et al., 2007; Berg et al., 2015; Dir et al., 2013), borderline personality disorder (Berg et al., 2015), excessive reassurance-seeking (Anestis et al., 2007), and aggression (Bresin, 2019). ADHD is comorbid with many similar conditions. For example, ADHD is associated with greater levels of substance use disorders (Ohlmeier et al., 2008; Roberts et al., 2014), non-suicidal self-injury (Allely, 2014; Swanson et al., 2014; Taylor et al., 2014), suicidality (Taylor et al., 2014), and binging behaviours (El Archi et al., 2020). The overlapping comorbidities between ADHD and negative urgency warrant investigation of a relationship between the two.

ADHD's underlying neurobiological differences in executive functioning, reward sensitivity, and emotional processing (Grimm et al., 2021; Soler-Gutiérrez et al., 2023) could also increase vulnerability to negative urgency. Some studies find some association between ADHD and negative urgency, however, the results are inconsistent across studies. One study

found negative urgency interacted with a lack of premeditation to predict inattentive symptoms in men but not women (Gomez & Watson, 2023). Another study found that negative urgency and substance use disorders were elevated in adults with combined inattentive and hyperactive/impulsive subtypes of ADHD (Lopez et al., 2015). The few studies examining this relationship are inconsistent and warrant further research to make conclusions. One purpose of the current studies is to clarify whether ADHD symptoms are associated with negative urgency. I propose that adults with ADHD may be higher in negative urgency based on ADHD's neurobiological vulnerabilities, ADHD's connection broadly to emotion dysregulation, shared comorbid disorders, and prior studies suggesting some form of association.

Potential Moderator: Attachment Style

If it is confirmed that adult ADHD symptoms are linked to higher negative urgency, identifying modifiable influences to lessen their relationship has beneficial implications for the disorder trajectory. Attachment style has the potential to influence their relationship. Unlike most intrinsic personality traits, attachment style is unique because it is derived largely from early caregiver relationships in childhood and prior romantic relationships in adulthood (Ainsworth et al., 1978; Bartholomew & Horowitz, 1991). Therefore, it is a personality trait that could be modifiable through early intervention. Attachment style is a viable candidate for influencing the relationship between ADHD and negative urgency because attachment style influences emotion regulation. Moreover, prior research on caregiver relationships, a proxy for attachment style, shows positive outcomes for those with ADHD. Lastly, ADHD and attachment style start in childhood and continue to develop throughout adolescence, offering ample time for interaction between ADHD symptoms and attachment style to influence emotion regulation.

Basics of Attachment Theory

Attachment theory suggests that the attachment behavioral system evolved as a necessity, motivating children to seek out their caregivers for protection, food, and socio-emotional needs (Bowlby 1969/1982). When distressed, children engage in proximity-seeking behaviors signaling their need for caregiver support (Ainsworth et al., 1978). Consistent and appropriately responsive caregivers thwart the child's distress allowing the child to develop a secure base in a caregiver. If caregivers are unavailable or unresponsive to the child's proximity-seeking behaviors, the child will resort to secondary attachment strategies, including anxiety or avoidance (Main, 1990). Attachment anxiety involves a preoccupation with the caregiver's availability to provide security and heightened efforts to gain the caregiver's attention. Attachment avoidance includes distrust of others, excessive self-reliance, and denial of one's attachment needs (Main, 1990). Persistent use of attachment-related anxiety or avoidance is maladaptive because they result in excessive activation or suppression of negative emotions, respectively (Mikulincer & Shaver, 2019).

Attachment style is a persistent pattern of expectations, emotions, and behaviours within close relationships which is formed by past experiences and continues into adulthood (Bowlby 1988; Mikulincer & Shaver, 2005). The four adult attachment styles are secure, anxious-preoccupied, dismissive-avoidant, and fearful-avoidant (Bartholomew & Horowitz, 1991). Secure individuals have low anxiety and avoidance, fostered by consistent caregiver relationships. Secure individuals feel comfortable depending on others while maintaining a healthy amount of independence. Insecure attachment stems from inconsistent early caregiver relationships, leading to a persistent reliance on secondary attachment strategies. The three styles of insecure attachment are dismissive-avoidant, anxious-preoccupied, and fearful-avoidant. Dismissive-avoidant individuals have high avoidance and low anxiety, manifesting in excessive

independence and distrust of others. Anxious-preoccupied individuals have high anxiety and low avoidance, manifesting in a high need for intimacy, excessive reassurance from partners, and hypervigilance toward rejection. Fearful-avoidant individuals have high avoidance and anxiety, manifesting in a conflictual desire for and discomfort with emotional closeness.

Attachment Styles and Emotion Dysregulation

Attachment style influences emotion dysregulation, making it a good candidate to moderate the relationship between ADHD and negative urgency (Mikulincer & Shaver, 2019). Secure individuals feel confident in their lovability, competence and ability to rely on others' support, serving as resiliency against daily negative emotions and distress (Mikulincer & Shaver, 2019). Securely attached individuals are less likely to appraise threats catastrophically, feel more confident managing threats and employ more adaptive emotion regulation strategies (Mikulincer & Shaver, 2019). Secure attachment is associated with lower psychological distress and post-traumatic stress disorder symptoms after traumatic events (Shallcross et al., 2014). The resiliency and coping skills associated with secure attachment could suppress the relationship between ADHD symptoms and negative urgency. For example, perceiving threats as less extreme and manageable may allow individuals with high ADHD symptoms to effectively regulate emotions elicited by the threat rather than resort to negative urgency to quell negative emotions.

Anxious-preoccupied individuals excessively activate and ruminate on negative emotions. For example, Anxious-preoccupied individuals automatically attend to distressing stimuli, hindering task performance (Silva et al., 2012). Following social exclusion, anxious-preoccupied individuals show increased dorsal anterior cingulate cortex and anterior insula activity, two regions involved in distress (DeWall et al., 2012). Additionally, anxious-preoccupied individuals reported the highest intensity of negative emotions for sad memories

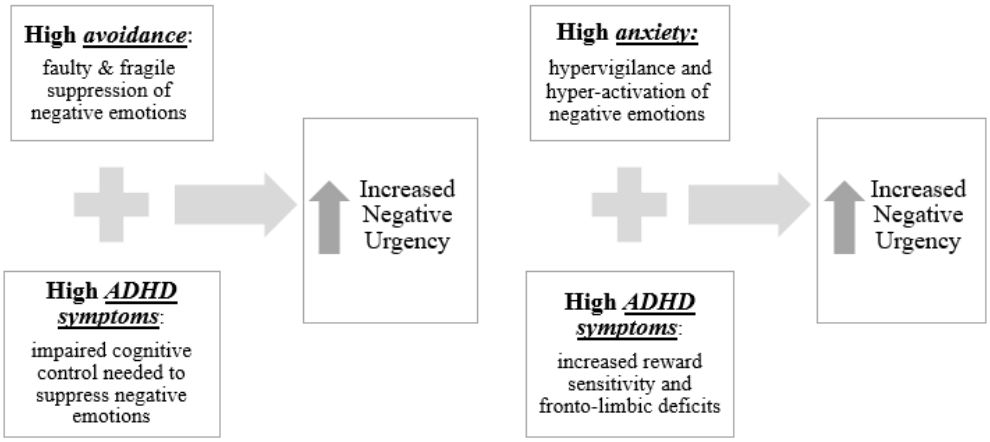
compared to other attachment styles (Mikulincer & Orbach, 1995). Anxious-preoccupied individuals' hyperactivation of negative emotions may intensify the link between ADHD and negative urgency. For example, anxious-preoccupied attachment may intensify negative emotions, which individuals high in ADHD symptoms cannot regulate effectively and instead resort to negative urgency to cope with negative emotions.

Dismissive-avoidant individuals excessively suppress negative emotions. In response to stress, dismissive-avoidant individuals employ cognitive distancing (Holmberg et al., 2011) and have difficulty accessing negative memories (Mikulincer & Orbach, 1995). While dismissive-avoidant individuals excel at suppressing negative emotions under normal conditions (Fraley & Shaver, 1997), high cognitive loads can disrupt this ability (Chun et al., 2015). Dismissive-avoidant individuals experience the most mental health deterioration amid chronic stressors (Berant et al., 2008). Overall, dismissive-avoidant attachment is associated with faulty inflexible emotion regulation. For those high in ADHD symptoms, this attachment style may be ineffective at regulating negative emotions. Therefore, I predict dismissive-avoidant attachment would intensify the relationship between ADHD and negative urgency.

The literature on fearful avoidant individuals' emotion regulation is sparse. Given their high anxiety and avoidance, fearful-avoidant individuals may oscillate between excessive activation and suppression of negative emotions. The effortful process of managing conflicting motivations of anxiety and avoidance may exacerbate negative emotions, which could be especially difficult for those with ADHD to manage. Therefore, fearful-avoidant attachment may heighten the relationship between ADHD symptoms and negative urgency.

Figure 1.

Proposed Interaction of ADHD and Attachment Style on Negative Urgency.



To my knowledge, no research has explored attachment style's role in moderating the link between ADHD and negative urgency. However, there is research on caregiver relationships' influence on ADHD outcomes. Studies indicate that greater parental warmth towards children with ADHD positively correlates with reduced symptoms over time (Shelleby & Ogg, 2020). Parental ADHD symptoms may impact children with ADHD's attachment style due to the high heritability of the disorder (Larsson et al., 2014). Parental ADHD symptoms are positively associated with home chaos, inconsistent discipline, and non-supportive responses to children's negative emotions, potentially heightening attachment insecurity in children with ADHD (Mokrova et al., 2010; Woods et al., 2021). Insecure attachment is higher in individuals with ADHD compared to the general population (Storebø et al., 2016; Wylock et al., 2023). Therefore, attachment style is a crucial trait to examine as a buffer for the connection of ADHD symptoms and negative urgency.

Current Studies

Study 1 explores the correlation between ADHD symptoms (inattentiveness and hyperactivity-impulsivity) and negative urgency in adults. Hypothesis 1 predicts a positive

association between inattentiveness and negative urgency. Hypothesis 2 predicts a positive association between hyperactivity-impulsivity and negative urgency. If confirmed, these findings would underscore negative urgency as a risk factor for adults with high ADHD symptoms. Additionally, Study 1 also examines how attachment style moderates this relationship. I will separate all four attachment styles because they are distinct theoretical concepts, and grouping them may diminish the insight gained from the analyses. Hypothesis 3 predicts secure attachment style will diminish the relationship between inattentiveness and negative urgency, while anxious-preoccupied, dismissive-avoidant, and fearful-avoidant styles will strengthen it. Hypothesis 4 predicts that a secure attachment style will diminish the relationship between hyperactivity-impulsivity and negative urgency, while anxious-preoccupied, dismissive-avoidant, and fearful-avoidant styles will strengthen it. Hypothesis 3 and 4 align with research suggesting secure individuals have resilient emotion regulation, whereas all three insecure attachment styles have emotion dysregulation. If Hypotheses 3 and 4 are confirmed, this would indicate that for those high in ADHD symptoms, secure attachment serves as a form of protection against negative urgency. Study 2 is a pre-registered replication testing the same four hypotheses again.

Study 1

Methods

Participants and Procedure

Participants were recruited through online advertisements, posters, and in-class presentations between September and December 2019 as part of a larger longitudinal study. Wave 1 data, collected in 2019, is not part of this study. Two and a half years later, participants from Wave 1 were eligible for three phases in Wave 2. Phase 1 measured inattentive and hyperactive-impulsive symptoms between February and May of 2022. Phase 2 (May to

September 2022) measured the participant's attachment style. Phase 3 (September to December 2022) measured negative urgency and follow-up measures of inattentive and hyperactive-impulsive symptoms. Participants received compensation for the completion of each study phase in Wave 2. Participants (N = 61; modal age = 21 age-range = 18-22 years old; female = 66%; male = 27%; gender minority = 5%) completed the initial ADHD, attachment style, and negative urgency scales. 54 participants completed the 6-month follow-up ADHD scales (modal age = 21; age-range = 18-22 years old; female = 65%; male = 30%; gender minority = 5%[1]).

Materials

ADHD Subclinical Symptom Scale. Participants completed a six-item questionnaire adapted from the DSM-5 ADHD criteria. The scale included three hyperactivity-impulsivity items ("Restless, always up on the go" "Excitable, impulsive" "Made inappropriate noises when you shouldn't have") and three inattentiveness items ("Failed to finish things you started" "Daydreamed" "Distractible or attention span was a problem"). Participants selected the response that best described them in the past year, ranging from not at all to very much on a 4-point Likert scale. Scores for each symptom category were averaged separately, as ADHD subtypes do not necessitate high scores in both. Higher scores indicated greater symptom severity.

Negative Urgency. Participants reported their tendency to engage in impulsive decisions following negative emotions. A four-item subscale from Cyders et al. (2014) Short UPPS-P Impulsive Behavior Scale measured negative urgency ("When I feel bad, I will often do things I later regret in order to make myself feel better now." "Sometimes when I feel bad, I can't seem to

[1] Sample size limited due to attrition rate of larger longitudinal study. Results were obtained via exploratory analyses. Participants had to complete 3 different phases of study to complete all three questionnaires used in current study.

stop what I am doing even though it is making me feel worse." "When I am upset, I often act without thinking." "When I feel rejected, I will often say things that I later regret."). Participants indicated how much they agreed with each statement on a 5-point Likert scale. Scores were averaged, with higher scores indicating greater levels of negative urgency.

Attachment Style. Hazan and Shaver's (1987) 3-item adult attachment scale measured participants' levels of avoidance and anxiety on a 5-point Likert scale. Rather than Hazan and Shaver's original 3-category model (secure, anxious, avoidant), I adopted a four-category model in line with current attachment style models (secure, anxious-preoccupied, dismissive-avoidant, fearful-avoidant). The anxiety item and avoidance item were the two dimensions used to derive the four attachment styles (Brennan et al., 1998), with each style categorized as -/+ 1 SD from the mean avoidance and anxiety score (see Appendix A).

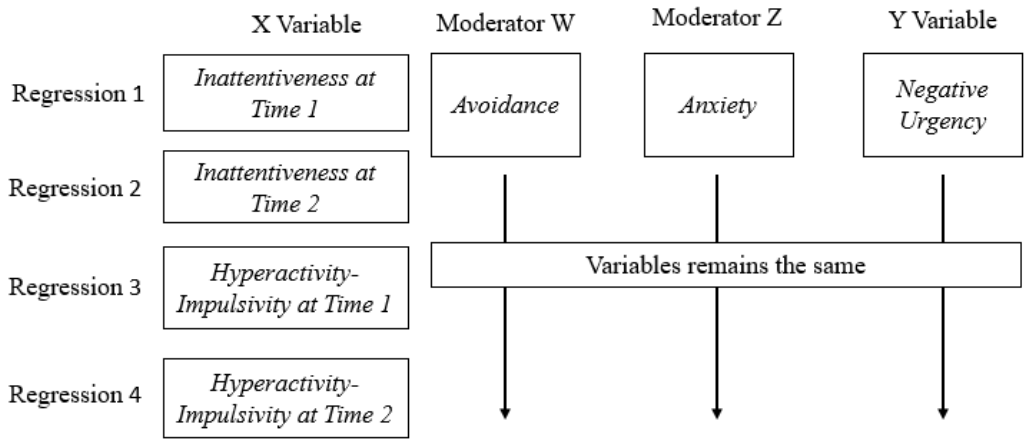
Data Analysis

Hyperactive-impulsive and inattentive scores were analyzed separately, as ADHD subtypes do not necessitate high scores in both. Inattentive and hyperactive-impulsive symptoms were measured twice, allowing for a within-sample replication of results. Time 1 (T1) and Time 2 (T2) represent the initial and six-month follow-up ADHD scale measures. For T1 analyses, I included all participants who completed T1 ADHD symptoms scales regardless of whether they completed T2 to avoid limiting the sample size even more. For Hypotheses 1 and 2, I ran four correlations to test the association between ADHD symptoms and negative urgency. For Hypotheses 3 and 4, four moderated multiple regressions (Model 3 in PROCESS, Hayes 2013) examined the interaction effect of attachment style and ADHD symptoms on negative urgency. Each regression entered either inattentiveness (T1/T2) or hyperactivity-impulsivity (T1/T2) as the X variable. Attachment avoidance and anxiety were moderators (W and Z, respectively).

Negative urgency was the Y variable for all regressions. The data met the assumptions for moderation and there were no outliers. Continuous independent and moderator variables were mean-centered. I set statistical significance at $p < .05$ for each hypothesis.

Figure 2.

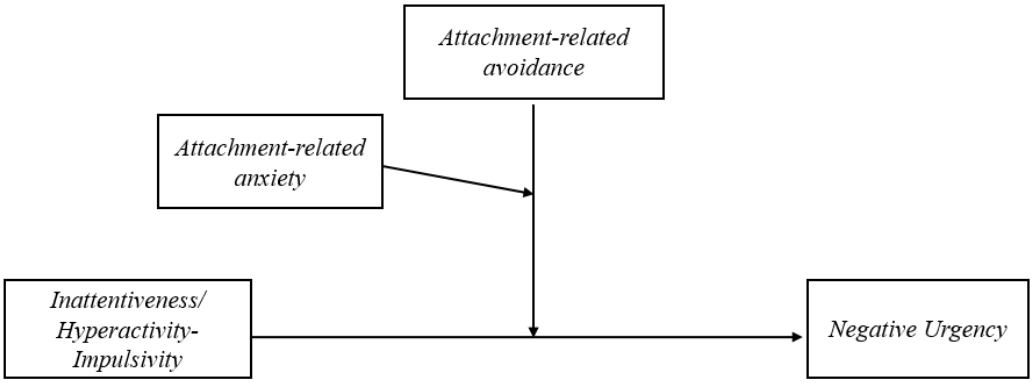
Moderated Multiple Regressions in Study 1



Note. Four moderated multiple regressions are required because ADHD symptoms were measured at two different points and inattentiveness and hyperactivity-impulsivity are analyzed separately.

Figure 3.

Moderated Multiple Regression Model for Hypothesis 3 and 4



Note. Adapted version of Model 3 from PROCESS (Hayes 2013). Attachment style moderates the relationship between ADHD symptoms and negative urgency.

Results

Correlation Analysis

Hypothesis 1. Inattentiveness at time 1 was positively associated with negative urgency scores, $r = .46$, $p < .001$ (see Figure B1). Inattentiveness at time 2 (follow-up) was positively associated with negative urgency scores, $r = .47$, $p < .001$ (see Figure B2).

Hypothesis 2. Hyperactivity-impulsivity at time 1 was positively associated with negative urgency scores, $r = .39$, $p < .01$ (see Figure B3). Hyperactivity at time 2 (follow-up) was positively associated with negative urgency scores, $r = .37$, $p < .01$ (see Figure B4).

Moderated Multiple Regressions

Hypothesis 3. There was no significant interaction effect of inattentiveness at time 1 and attachment style (inattentiveness (T1) x avoidance x anxiety) $b = .23$, se = .13, $t = 1.72$, $p = .09$, 95% CI = [-.04, .50]. Similarly, there was no significant interaction effect of inattentiveness at time 2 and attachment style (inattentiveness (T2) x avoidance x anxiety) $b = .19$, se = .10, $t = 1.78$, $p = .08$, 95% CI = [-.03, .40]. Simple slope analysis demonstrated that fearful-avoidant attachment interacted with inattentiveness (T1) to significantly predict greater negative urgency, $b = 1.02$, se = .34, $t = 2.99$, $p < .01$, 95% CI = [.34, 1.70] Secure attachment also interacted with inattentiveness (T1) to significantly predict greater negative urgency, $b = .71$, se = .26, $t = 2.70$, $p < .01$, 95% CI = [.18, 1.23]. When inattentiveness was measured six months later (T2), simple slope analysis demonstrated that again fearful-avoidant attachment interacted with inattentiveness (T2) to significantly predict greater negative urgency, $b = .77$, se = .29, $t = 2.77$, $p < .01$, 95% CI = [.21, 1.33]. At time 2, secure attachment no longer significantly interacted with inattentiveness to predict greater negative urgency, $b = .46$, se = .24, $t = 1.93$, $p = .06$, 95% CI = [-.02, .95]; although, the results were close to reaching significance.

Hypothesis 4. There was no significant interaction between hyperactivity-impulsivity at time 1 and attachment style (hyperactivity-impulsivity (T1) x avoidance x anxiety), $b = .18$, se = .17, $t = 1.06$, $p > .05$, 95% CI = [-.16, .53]. There was significant interaction between hyperactivity-impulsivity at time 2 and attachment style (hyperactivity-impulsivity (T2) x avoidance x anxiety), $b = .33$, se = .15, $t = 2.16$, $p < .05$, 95% CI = [.02, .64]. Simple slope analysis demonstrated none of the attachment styles were significantly positively associated with hyperactivity-impulsivity (T1) and negative urgency; though, fearful-avoidant individuals were close to reaching significance ($p = .06$). When hyperactivity-impulsivity was measured six-months later (T2), simple slope analysis demonstrated that only fearful-avoidant attachment was positively associated with the relationship between hyperactivity-impulsivity and negative

Figure 4.

Study 1 Interaction of Attachment Style and Inattentiveness on Negative Urgency

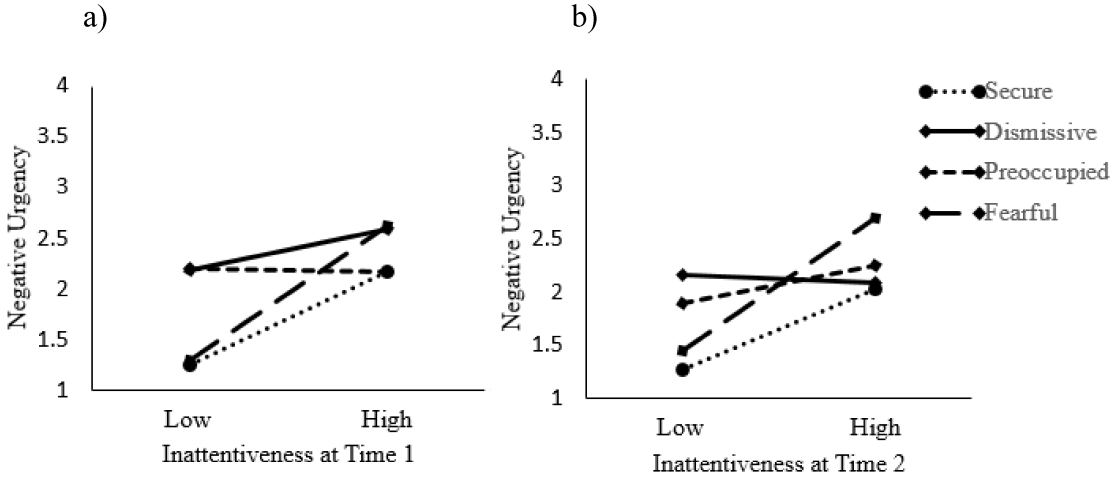


Figure 4. **a)** A non-significant interaction effect ($p = .09$) of inattentive symptoms at time 1 (T1) and attachment style on negative urgency. Simple slope analysis: The simple slope of inattentiveness (T1) on negative urgency for *secure attachment* was positive and significant ($p < .001$). The simple slope of inattentiveness (T1) on negative urgency for *anxious-preoccupied attachment* was non-significant ($p = .49$). The simple slope of inattentiveness (T1) on negative urgency for *dismissive-avoidant attachment* was non-significant ($p > .05$). The simple slope of inattentiveness (T1) on negative urgency for *fearful-avoidant attachment* was positive and significant ($p < .01$). **b)** A non-significant interaction effect ($p = .08$) of inattentive symptoms at time 2 (T2) and attachment style on negative urgency. Simple slope

analysis: The simple slope of inattentiveness (T2) on negative urgency for *secure attachment* was non-significant ($p = .06$), but approaching significance. The simple slope of inattentiveness (T2) on negative urgency for *anxious-preoccupied attachment* was non-significant ($p = .88$). The simple slope of inattentiveness (T2) on negative urgency for *dismissive-avoidant attachment* was non-significant ($p > .05$). The simple slope of inattentiveness (T2) on negative urgency for *fearful-avoidant attachment* showed a positive significant effect ($p < .01$).

Figure 5.

Study 1 Interaction of Attachment Style and Hyperactivity-Impulsivity on Negative Urgency

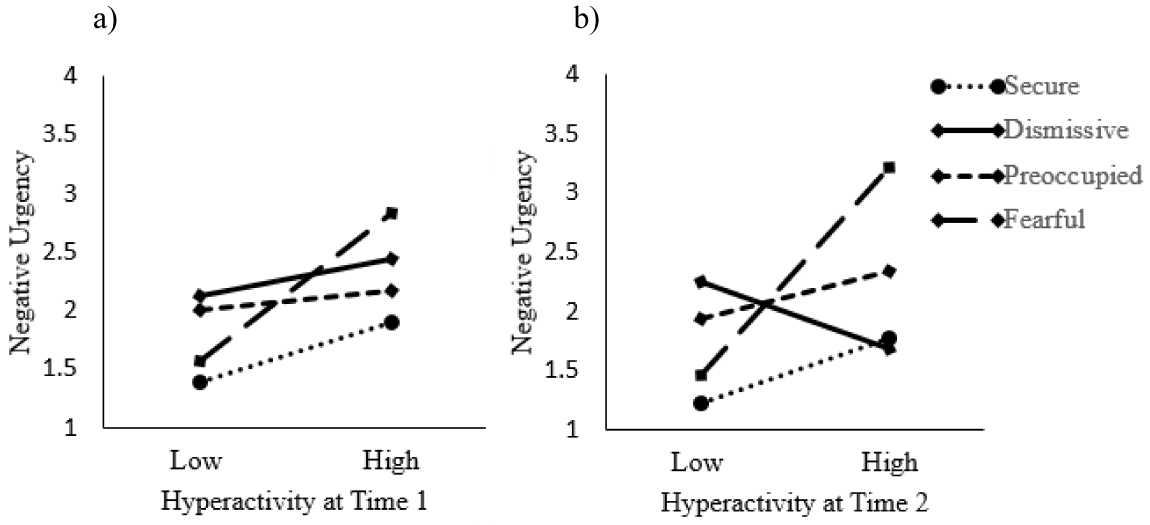


Figure 5. **a)** A non-significant interaction effect ($p > .05$) of hyperactivity-impulsivity at time 1 (T1) and attachment style on negative urgency. Simple slope analysis found no indication of interaction effect between any attachment style and hyperactivity-impulsivity (T1). Only *fearful-avoidant attachment* was close to reaching a positive significant relationship ($p = .06$). **b)** There was a significant interaction effect ($p < .05$) of hyperactivity-impulsivity symptoms at time 2 (T2) and attachment style on negative urgency. Simple slope analysis: The simple slope of hyperactivity-impulsivity (T2) on negative urgency for *secure attachment* was non-significant effect ($p > .05$). The simple slope of hyperactivity-impulsivity (T2) on negative urgency for *anxious-preoccupied attachment* was non-significant effect ($p > .05$). The simple slope of hyperactivity-impulsivity (T2) on negative urgency for *dismissive-avoidant attachment* was non-significant ($p > .05$). The simple slope of inattentiveness (T2) on negative urgency for *fearful-avoidant attachment* showed a positive significant effect ($p < .001$).

Table 1

Simple Slopes Analysis Across Four Moderated Moderation Regressions, Study 1

	Inattentiveness T1		Inattentiveness T2		Hyperactivity-impulsivity T1		Hyperactivity-impulsivity T2	
	N = 61		N = 54		N = 61		N = 54	
	b	t	*b*	t	*b*	t	*b*	t
Secure	.71	2.70**	.46	1.93	.45	1.40	.42	1.10
Preoccupied	.31	.70	-.05	-.16	.27	.34	-.43	-1.34
Dismissive	-.02	-.07	.23	.74	.14	.59	.31	.84
Fearful	1.02	2.99**	.77	2.78**	1.10	1.95	1.35	3.75***

* p < .05, ** p < .01, *** p < .001

Discussion

As predicted in Hypothesis 1 and 2, inattentiveness and hyperactivity showed consistently significant positive associations with negative urgency. Then, I examined attachment style as a moderator. Simple slopes analysis revealed a consistent pattern that fearful-avoidance was associated with a positive relationship between ADHD symptoms (inattentiveness and hyperactivity-impulsivity) and negative urgency. This suggests fearful-avoidant individuals who are high in either ADHD symptom domain are at increased risk of negative urgency, and thus more prone to act impulsively following negative emotions. Surprisingly, secure attachment was associated with a positive relationship between ADHD symptoms (inattentiveness and hyperactivity-impulsivity) and negative urgency. This conflicts with the majority of the research suggesting secure individuals have enhanced emotion regulation and resiliency against negative emotions (Mikulincer & Shaver, 2019). Both anxious-preoccupied and dismissive-avoidant attachment did not have a significant association with the relationship between ADHD symptoms

and negative urgency. This suggests if individuals are anxious-preoccupied or dismissive-avoidant, it may act as a buffer between ADHD and negative urgency.

Rationale for Replication

The data collected for study 1 was part of a larger study spanning three years, with data collection occurring at four different points. Of the 313 participants who completed the initial study, 61 completed the ADHD scales measured at time 1, the attachment style questionnaire, and the negative urgency scale. Only 54 individuals completed the follow-up ADHD scales measured at time 2. The sample sizes at T1 and T2 are small due to large attrition rates, which greatly limits the statistical power and increases the risk of false positives. Additionally, there is a risk of non-response bias due to longitudinal data collection methodology (Prince, 2012). Although the remaining participants did not differ in gender, age, ethnicity, nationality, or parental education from the original participants who provided data in Wave 1 or Wave 2, there is a risk of non-response bias in other domains. For example, there could be systematic differences in the level of motivation and commitment necessary to complete all three study phases. This data collection method may also be biased against those high in inattentive ADHD symptoms, who experience difficulty with time management and keeping appointments, which could result in not completing the three phases of Wave 2 data collection. The 61 and 54 participants may systematically differ in relevant personality from the 313 initial participants. This could make this sample systematically non-representative of the larger population.

Study 2

Methods

Study 2 replicates Study 1 with a larger sample size. Unlike Study 1, all questionnaires are administered in a single sitting, and the attachment-style questionnaire better reflects current

models of attachment. I pre-registered Study 2 (https://osf.io/nqsm8), predicting that ADHD symptoms would significantly positively predict negative urgency, aligning with Study 1's results. Additionally, I predicted secure attachment would lessen the relationship between ADHD and negative urgency, contradicting Study 1's results. This decision was grounded in theoretical reasoning rather than the results of Study 1 because of Study 1's aforementioned limitations. Exclusions were planned for individuals failing a comprehension check, a measure of participant's attention during the study. However, due to sample size concerns and potentially excluding those high in inattentive ADHD symptoms, no exclusions were made based on this criterion.

Participants and Procedure

Participants enrolled in an undergraduate psychology course at the University of Alberta completed the online study to receive class credit (N = 186; modal age = 19; age range = 18-39; females = 63%; males = 30%, gender minority = 3.1%)[2]. Ethics approval was granted by the University of Alberta Human Research Board (Pro00138713).

Materials

ADHD Subclinical Symptom Scale. Participants completed the six-item ADHD self-report scale used in Study 1 to measure inattentiveness and hyperactivity-impulsivity.

Negative Emotion-based Impulsivity. Participants completed the 4-item negative urgency self-report scale used in Study 1.

[2] G*Power analysis indicated a sample size of 385 would be sufficient to achieve a power of .80 for a moderated multiple regression analysis (Model 3 in PROCESS, Hayes 2013). Due to time constraints, participant data collection was stopped at 186.

Experience in Close Relationships Questionnaire. Adult attachment style was measured via the 36-item Experience in Close Relationships-Revised (ECR-R) questionnaire, with 18 items measuring avoidance and 18 items measuring anxiety (Fraley et al., 2000). Avoidance and anxiety were the two dimensions used to derive the four attachment styles (Brennan et al., 1998). Each attachment style was categorized as -/+ 1 standard deviation from the mean ECR-avoidance and ECR-anxiety score.

Data Analysis

Using the same model as Study 1, two moderated multiple regression analysis (Model 3 in PROCESS, Hayes 2013) examined the interaction effect of ADHD symptom scores and attachment style on negative urgency. Unlike Study 1, ADHD symptom scores were only measured once. The first moderated multiple regression entered inattentiveness as the X variable and the second entered hyperactivity-impulsivity as the X variable. For both regressions, attachment-related avoidance and attachment-related anxiety variables were entered as moderator variables W and Z, respectively. Negative urgency was entered as the Y variable for both regressions.

Results

Correlation Analysis

Hypothesis 1. Inattentiveness was positively associated with negative urgency scores, $r = .38$, $p < .001$, replicating Study 1's results and pre-registered the prediction (see Figure B5).

Hypothesis 2. Hyperactivity-impulsivity was positively associated with negative urgency scores, $r = .25$, $p < .001$, replicating Study 1's results and the pre-registered prediction (see Figure B6).

Moderated Multiple Regressions

Hypothesis 3. There was no significant interaction effect of inattentiveness and attachment style (inattentiveness x avoidance x anxiety) b = -.11, se = .11, t = - 1.00, p > .05, 95% CI = [-.31, .10]. Simple slope analysis demonstrated that secure attachment significantly interacted with inattentiveness to predict greater negative urgency for only secure, b = .26, se = .11, t = 2.41, p < .05, 95% CI = [.05, .47], and dismissive-avoidant individuals, b = .52, se = .17, t = 3.02, p <.01, 95% CI = [.18, .86]. However, anxious-preoccupied, b = .26, se = .15, t = 1.82, p =.07, 95% CI = [-.02, .55], and fearful-avoidant individuals were close to reaching significance, b = .29, se = .15, t = 1.90, p =.06, 95% CI = [-.01, .59]. See table 2 for a comparison of simple slopes analysis across Study 1 and 2.

Hypothesis 4. There was no significant interaction between hyperactivity-impulsivity and attachment style (hyperactivity-impulsivity x avoidance x anxiety), b = -.21, se = .13, t = -1.57, p >.05, 95% CI = [-.46, .05]. Simple slope analysis revealed that increased hyperactivity-impulsivity significantly predicted increased negative urgency for only anxious-preoccupied individuals, b = .39, se = .17, t = 2.30, p < .05, 95% CI = [.06, .72]. Increased hyperactivity-impulsivity was not significantly associated with increased negative urgency for secure, b = -.02, se = .16, t = -.10, p > .05, 95% CI = [-.33, .30], dismissive-avoidant, b = .32, se = .21, t = 1.47, p >.05, 95% CI = [-.11, .74], or fearful-avoidant individuals, b = .26, se = .15, t = 1.68, p > .05, 95% CI = [-.05, .56]. See table 3 for a comparison of simple slopes results across Study 1 and 2.

Figure 6

Study 2 Interaction Effect of Attachment Style and ADHD Symptoms on Negative Urgency

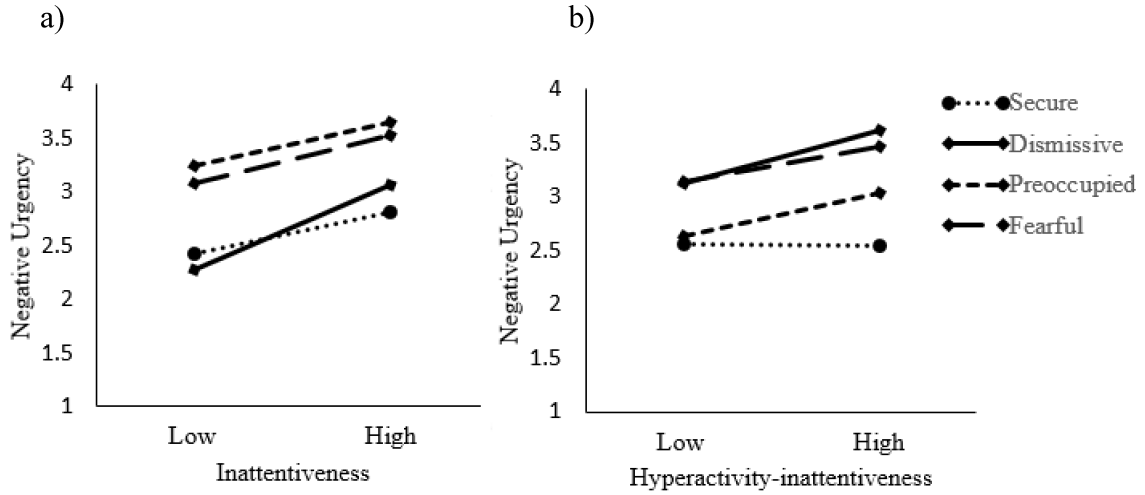


Figure 6. **a)** A non-significant interaction effect ($p > .05$) of inattentiveness and attachment style on negative urgency. Simple slope analysis: The simple slope of inattentiveness on negative urgency for *secure attachment* was significant ($p < .05$). The simple slope of inattentiveness on negative urgency for *anxious-preoccupied attachment* was non-significant ($p = .07$). The simple slope of inattentiveness on negative urgency for *dismissive-avoidant attachment* was significant ($p < .01$). The simple slope of inattentiveness on negative urgency for *fearful-avoidant attachment* was non-significant ($p = .06$), although close to reaching significance. **b)** There was no significant interaction effect ($p > .05$) of hyperactivity-impulsivity and attachment style on negative urgency. Simple slope analysis: The simple slope of hyperactivity-impulsivity on negative urgency for *secure attachment* was non-significant ($p > .05$). The simple slope of hyperactivity-impulsivity on negative urgency for *anxious-preoccupied attachment* was significant ($p < .05$). The simple slope of hyperactivity-impulsivity on negative urgency for *dismissive-avoidant attachment* was non-significant ($p > .05$). The simple slope of hyperactivity-impulsivity on negative urgency for *fearful-avoidant attachment* non-significant ($p > .05$).

Discussion

In line with study 1 results and the pre-registered hypotheses 1 and 2, inattentiveness and hyperactivity were consistently significantly associated with negative urgency. This adds more evidence indicating negative urgency is an emotion dysregulation facet heightened in ADHD. I predicted secure attachment would be negatively associated with the relationship between ADHD symptoms and negative urgency. Surprisingly, across Study 1 and 2, secure attachment interacted with inattentiveness to predict greater negative urgency. In Study 1, fearful-avoidant attachment positively interacted with both inattentiveness and hyperactivity-impulsivity to

predict greater negative urgency. However, in Study 2, this interaction was only close to reaching significance. As it was close to reaching significance for both inattentiveness and hyperactivity-impulsivity, it may still suggest fearful-avoidance strengthens the relationship between hyperactivity-impulsivity and negative urgency.

General Discussion

ADHD and Negative Urgency

Research suggests that adults with ADHD commonly experience emotion dysregulation, yet studies often overlook negative urgency, an important facet of emotion dysregulation. Prior studies examining adult ADHD and negative urgency are inconsistent (Gomez & Watson, 2023; Lopez et al., 2015). I explored whether the ADHD symptoms were positively associated with negative urgency. Studies 1 and 2 revealed that inattentiveness and hyperactivity-impulsivity positively correlate with negative urgency. Building on prior research on emotion dysregulation in ADHD, negative urgency appears to be another facet of emotion dysregulation elevated in this population. This has important implications for assessing the risk of other comorbid psychiatric disorders and impairment in adult ADHD. For example, one study found negative urgency mediated the relationship between ADHD symptoms and substance use, indicating negative urgency as a potential target for intervention cases with comorbid substance use disorders (Egan et al., 2017). ADHD and negative urgency are both associated with increased substance use disorders, behavioural addictions, binging behaviours, non-suicidal self-injury, and suicidality (Berg et al., 2015; El Archi et al., 2020; Roberts et al., 2014; Taylor et al., 2014). Future studies could examine whether negative urgency mediates the relationship between ADHD and those co-morbid disorders as well.

Attachment Style Moderation

Confirmation of the link between adult ADHD symptoms and heightened negative urgency underscores the importance of identifying factors that can mitigate their association. I examined attachment style as a moderator because, unlike many inherent traits, attachment style is largely shaped by early caregiver relationships. This offers the potential for modification through early intervention. Also, secure attachment style is linked to effective emotion regulation, and insecure attachment styles are linked to emotion dysregulation (Mikulincer & Shaver, 2019). Therefore, I proposed secure attachment would diminish the relationship between high ADHD symptoms and negative urgency; whereas the three insecure attachment styles would strengthen the relationship between ADHD symptoms and negative urgency. My predictions were mostly not supported, although some themes emerged throughout the results.

Surprisingly, there was a significant positive association of secure attachment on the relationships between inattentiveness and negative urgency in Study 1 (T1) and Study 2. Study 1 (T2) was also close to reaching significance. This contradicts what I predicted, instead suggesting that negative urgency may be heightened in securely attached individuals high in inattentiveness. A speculative explanation is that inattentiveness is associated with more deficits in executive function and regulatory processing than hyperactivity-impulsivity (Nigg et al., 2005) and those with secure attachment may not have developed as many strategies to inhibit motivations to act impulsively. When secure attachment is accompanied by high inattentive symptoms, poor top-down regulation emotions and behaviours could increase impulsive behaviours to cope with negative emotions. Secure individuals could also be less concerned about negative outcomes to relationships when engaging in impulsive actions following negative emotions. In other words, secure individuals' confidence that they are lovable may be a

detriment when coupled with high inattentiveness. Although secure attachment is generally a beneficial trait, there may be occurrences where it has less positive impacts (McNulty & Fincham, 2012).

Study 1 (T1 and T2) found a significant positive association of fearful-avoidant attachment on the relationship between inattentiveness and negative urgency. In Study 2, the results pointed in the same direction, but were only approaching significance (p = .06). A similar pattern emerges when looking at fearful-avoidance's impact on the relationship between hyperactivity-impulsivity and negative urgency. Study 1 (T1 and T2) found fearful-avoidant attachment was associated with a positive relationship between hyperactivity-impulsivity and negative urgency; however, in Study 2, the results pointed in the same direction, but were only approaching significance (p = .09). This may indicate that fearful avoidance increases the relationship between ADHD and negative urgency. However, due to the lack of significant results in Study 2, the consistency in the within-sample replication results of Study 1 may be characteristic of that sample and not the broader population.

Table 2

Simple Slopes Comparison of Inattentiveness and Attachment Style on Negative Urgency

	Study 1 T1		Study 1 T2		Study 2	
	N = 61		N = 54		N = 186	
	b	t	*b*	t	*b*	t
Secure	.71	2.70**	.46	1.93	.26	2.41*
Preoccupied	.31	.70	-.05	-.16	.26	1.82
Dismissive	-.02	-.07	.23	.74	.52	3.02**
Fearful	1.02	2.99**	.77	2.78**	.29	1.90

* p < .05, ** p < .01, *** p < .001

Table 3

Simple Slopes Comparison of Hyperactivity-Impulsivity and Attachment Style on Negative Urgency

	Study 1 T1		Study 1 T2		Study 2	
	N = 61		N = 54		N = 186	
	b	t	*b*	t	*b*	t
Secure	.45	1.40	.42	1.10	-.02	-.10
Preoccupied	.27	.59	-.43	-1.34	.39	2.30*
Dismissive	.14	.34	.31	.84	.32	1.47
Fearful	1.10	1.95	1.35	3.75***	.26	1.68

* p < .05, ** p < .01, *** p < .001

There was not a replicated significant interaction effect between ADHD and attachment-related style on negative urgency. However, in Study 2, there was a significant positive main effect of attachment anxiety, which is high in anxious-preoccupied attachment (see Table B5 and Table B6). To my knowledge, there have not been any studies directly testing the relationship between anxious-preoccupied attachment and negative urgency. Anxious-preoccupied attachment was an even stronger predictor of negative urgency than inattentiveness or hyperactivity-impulsivity. These results may be explained by research suggesting anxious-preoccupied attachment is associated with hyper-activation of negative emotions (DeWall et al., 2012; Mikulincer & Orbach, 1995; Silva et al., 2012). In anxious-preoccupied individuals, hyper-activation of negative emotions could increase motivation to alleviate negative emotions via impulsive behaviour. This also aligns with research suggesting negative urgency is associated with excessive reassurance seeking (Anestis et al., 2007), which is also a feature of anxious-

preoccupied attachment. Avoidant attachment did not significantly predict negative urgency. One explanation could be that avoidant individuals tend not to experience the intensity or frequency of negative emotions that would persistently motivate them to act impulsively as a coping method. This could be due to individuals with avoidant-attachment's ability to suppress emotions or an overall tendency to avoid situations such as intimate relationships that could bring about negative emotions (Fraley & Shaver, 1997; Mikulincer & Orbach, 1995).

Limitations

There are several limitations to these studies. First, I used a dimensional perspective to measure ADHD symptoms within an undergraduate sample. Therefore, these results may not apply to those with clinically diagnosed ADHD. However, my sample may capture some of those who once met the clinical threshold for ADHD but now are sub-threshold as adults which is often the case in non-persistence ADHD (Franke et al., 2018). Still, replication of this study with a clinically diagnosed ADHD group and non-ADHD group would offer greater insight into the relationship between ADHD and negative urgency. Second, all measures are self-report which could bias the results due to common method variance. Third, the sample size of study 1 is very small and significantly underpowered. Another study using similar measures and methods of moderation had a sample of 550 (Gomez & Watson, 2023). For Study 2, the number of participants for a moderated multiple regression may also be underpowered.

Future Direction and Practical implications

Screening adults with ADHD symptoms for negative urgency could be used to identify individuals at high risk for other psychopathology. In children with ADHD, those with emotion dysregulation are more likely to have their ADHD symptoms persist into adulthood (Barkley & Fischer, 2010). A future study could explore if negative urgency similarly contributes to

symptom persistence from childhood to adulthood. Also, my results could lead to further research into prevention and mitigation of negative urgency in individuals with ADHD. There are no therapeutic modalities directly aiming to alleviate negative urgency in individuals. One avenue that could reduce the relationship between ADHD and negative urgency is to enhance individuals with ADHD's distress tolerance. Distress tolerance is one's ability to withstand negative emotional states, which could be helpful for those high in negative urgency (Leyro et al., 2010). Researching the effect of distress tolerance-focused therapeutic modalities such as acceptance and commitment therapy or mindfulness based cognitive therapy could be beneficial in reducing the relationship between adult ADHD symptoms and negative urgency. Lastly, more research on the influence of attachment style on ADHD and negative urgency could also be beneficial. For example, longitudinal studies could examine how change in attachment over time reduces or increases negative urgency in individuals with ADHD.

Conclusion

My studies explore the link between adult ADHD symptoms and negative urgency, as well as the interaction of attachment style and ADHD symptoms on negative urgency. Both studies found positive associations between ADHD symptoms (inattentiveness and hyperactivity-impulsivity) and negative urgency. Fearful avoidant attachment consistently showed a positive association with the link between ADHD symptoms and negative urgency. Surprisingly, secure attachment consistently showed a positive association with the relationship between inattentiveness and negative urgency. These findings extend prior research on emotion dysregulation in adult ADHD and bridge connections between attachments and ADHD's influence on emotion dysregulation.

References

Ainsworth, M.D.S., Blehar, M.C., Waters, E., Wall, S. (1978). *Patterns of Attachment: Assessed in the Strange Situation and at Home*. Hillsdale, NJ: Erlbaum.

Allely, C. S. (2014). The association of ADHD symptoms to self-harm behaviours: A systematic PRISMA review. *BMC Psychiatry*, *14*(1), 133. https://doi.org/10.1186/1471-244X-14-133

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Association. https://doi.org/10.1176/appi.books.9780890425596

Anestis, M. D., Bagge, C. L., Tull, M. T., & Joiner, T. E. (2011). Clarifying the role of emotion dysregulation in the interpersonal-psychological theory of suicidal behavior in an undergraduate sample. *Journal of Psychiatric Research*, *45*(5), 603–611. https://doi.org/10.1016/j.jpsychires.2010.10.013

Anestis, M. D., Selby, E. A., & Joiner, T. E. (2007). The role of urgency in maladaptive behaviors. *Behaviour Research and Therapy*, *45*(12), 3018–3029. https://doi.org/10.1016/j.brat.2007.08.012

Astenvald, R., Frick, M. A., Neufeld, J., Bölte, S., & Isaksson, J. (2022). Emotion dysregulation in ADHD and other neurodevelopmental conditions: A co-twin control study. *Child and Adolescent Psychiatry and Mental Health*, *16*(1), 92. https://doi.org/10.1186/s13034-022-00528-0

Barkley, R. A., & Fischer, M. (2010). The Unique Contribution of Emotional Impulsiveness to Impairment in Major Life Activities in Hyperactive Children as Adults. *Journal of the American Academy of Child & Adolescent Psychiatry*, *49*(5), 503–513. https://doi.org/10.1016/j.jaac.2010.01.019

Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology*, *61*(2), 226–244. https://doi.org/10.1037/0022-3514.61.2.226

Beheshti, A., Chavanon, M.-L., & Christiansen, H. (2020). Emotion dysregulation in adults with attention deficit hyperactivity disorder: A meta-analysis. *BMC Psychiatry*, *20*(1), 120. https://doi.org/10.1186/s12888-020-2442-7

Berant, E., Mikulincer, M., & Shaver, P. R. (2008). Mothers' attachment style, their mental health, and their children's emotional vulnerabilities: A 7-year study of children with congenital heart disease. *Journal of Personality*, *76*(1), 31–66. https://doi.org/10.1111/j.1467-6494.2007.00479.x

Berg, J. M., Latzman, R. D., Bliwise, N. G., & Lilienfeld, S. O. (2015). Parsing the heterogeneity of impulsivity: A meta-analytic review of the behavioral implications of the UPPS for psychopathology. *Psychological Assessment*, *27*(4), 1129–1146. https://doi.org/10.1037/pas0000111

Bodalski, E. A., Knouse, L. E., & Kovalev, D. (2019). Adult ADHD, emotion dysregulation, and functional outcomes: Examining the role of emotion regulation strategies. *Journal of Psychopathology and Behavioral Assessment*, *41*(1), 81–92. https://doi.org/10.1007/s10862-018-9695-1

Bowlby, J. (1969/1982). *Attachment and loss: Vol. 1. Attachment* (2nd ed.). New York: Basic Books (1st ed. published in 1969).

Bowlby, J. (1988). *A secure base: Clinical applications of attachment theory*. London: Routledge

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In *Attachment theory and close relationships.* (pp. 46–76). The Guilford Press.

Bresin, K. (2019). Impulsivity and aggression: A meta-analysis using the UPPS model of impulsivity. *Aggression and Violent Behavior*, *48*, 124–140. https://doi.org/10.1016/j.avb.2019.08.003

Bunford, N., Dawson, A. E., Evans, S. W., Ray, A. R., Langberg, J. M., Owens, J. S., DuPaul, G. J., & Allan, D. M. (2020). The difficulties in emotion regulation scale–parent report: A psychometric investigation examining adolescents with and without ADHD. *Assessment*, *27*(5), 921–940. https://doi.org/10.1177/1073191118792307

Chun, D. S., Shaver, P. R., Gillath, O., Mathews, A., & Jorgensen, T. D. (2015). Testing a dual-process model of avoidant defenses. *Journal of Research in Personality*, *55*, 75–83. https://doi.org/10.1016/j.jrp.2015.02.002

Cole, P. M., Ashana Ramsook, K., & Ram, N. (2019). Emotion dysregulation as a dynamic process. *Development and Psychopathology*, *31*(3), 1191–1201. https://doi.org/10.1017/S0954579419000695

Coskunpinar, A., Dir, A. L., & Cyders, M. A. (2013). Multidimensionality in impulsivity and alcohol use: A meta-analysis using the UPPS model of impulsivity. *Alcoholism: Clinical and Experimental Research*, *37*(9), 1441–1450. https://doi.org/10.1111/acer.12131

Cyders, M. A., Coskunpinar, A., & VanderVeen, J. D. (2016). Urgency: A common transdiagnostic endophenotype for maladaptive risk taking. In V. Zeigler-Hill & D. K. Marcus (Eds.), *The dark side of personality: Science and practice in social, personality, and*

clinical psychology. (pp. 157–188). American Psychological Association. https://doi.org/10.1037/14854-009

Cyders, M. A., Littlefield, A. K., Coffey, S., & Karyadi, K. A. (2014). Examination of a short English version of the UPPS-P impulsive behavior scale. *Addictive Behaviors*, *39*(9), 1372–1376. https://doi.org/10.1016/j.addbeh.2014.02.013

Cyders, M. A., & Smith, G. T. (2007). Mood-based rash action and its components: Positive and negative urgency. *Personality and Individual Differences*, *43*(4), 839–850. https://doi.org/10.1016/j.paid.2007.02.008

DeWall, C. N., Masten, C. L., Powell, C., Combs, D., Schurtz, D. R., & Eisenberger, N. I. (2012). Do neural responses to rejection depend on attachment style? An fMRI study. *Social Cognitive and Affective Neuroscience*, *7*(2), 184–192. https://doi.org/10.1093/scan/nsq107

Dir, A. L., Karyadi, K., & Cyders, M. A. (2013). The uniqueness of negative urgency as a common risk factor for self-harm behaviors, alcohol consumption, and eating problems. *Addictive Behaviors*, *38*(5), 2158–2162. https://doi.org/10.1016/j.addbeh.2013.01.025

Egan, T. E., Dawson, A. E., & Wymbs, B. T. (2017). Substance use in undergraduate students with histories of attention-deficit/hyperactivity disorder (ADHD): The role of impulsivity. *Substance Use & Misuse*, *52*(10), 1375–1386. https://doi.org/10.1080/10826084.2017.1281309

El Archi, S., Cortese, S., Ballon, N., Réveillère, C., De Luca, A., Barrault, S., & Brunault, P. (2020). Negative affectivity and emotion dysregulation as mediators between ADHD and disordered eating: A systematic review. *Nutrients*, *12*(11), 3292. https://doi.org/10.3390/nu12113292

Fraley, R. C., & Shaver, P. R. (1997). Adult attachment and the suppression of unwanted thoughts. *Journal of Personality and Social Psychology*, *73*(5), 1080–1091. https://doi.org/10.1037/0022-3514.73.5.1080

Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology*, *78*(2), 350–365. https://doi.org/10.1037/0022-3514.78.2.350

Franke, B., Michelini, G., Asherson, P., Banaschewski, T., Bilbow, A., Buitelaar, J. K., Cormand, B., Faraone, S. V., Ginsberg, Y., Haavik, J., Kuntsi, J., Larsson, H., Lesch, K.-P., Ramos-Quiroga, J. A., Réthelyi, J. M., Ribases, M., & Reif, A. (2018). Live fast, die young? A review on the developmental trajectories of ADHD across the lifespan. *European Neuropsychopharmacology*, *28*(10), 1059–1088. https://doi.org/10.1016/j.euroneuro.2018.08.001

Gomez, R., & Watson, S. (2023). Associations of UPPS-P negative urgency and positive urgency with ADHD dimensions: Moderation by lack of premeditation and lack of perseverance in men and women. *Personality and Individual Differences*, *206*, 112125. https://doi.org/10.1016/j.paid.2023.112125

Grimm, O., Van Rooij, D., Hoogman, M., Klein, M., Buitelaar, J., Franke, B., Reif, A., & Plichta, M. M. (2021). Transdiagnostic neuroimaging of reward system phenotypes in ADHD and comorbid disorders. *Neuroscience & Biobehavioral Reviews*, *128*, 165–181. https://doi.org/10.1016/j.neubiorev.2021.06.025

Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry*, *26*(1), 1–26. https://doi.org/10.1080/1047840X.2014.940781

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. The Guilford Press.

Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, *52*(3), 511–524. https://doi.org/10.1037/0022-3514.52.3.511

Holmberg, D., Lomore, C. D., Takacs, T. A., & Price, E. L. (2011). Adult attachment styles and stressor severity as moderators of the coping sequence. *Personal Relationships*, *18*(3), 502–517. https://doi.org/10.1111/j.1475-6811.2010.01318.x

Kim, H. S., Poole, J. C., Hodgins, D. C., McGrath, D. S., & Dobson, K. S. (2019). Betting to deal: Coping motives mediate the relationship between urgency and problem gambling severity. *Addiction Research & Theory*, *27*(2), 95–103. https://doi.org/10.1080/16066359.2018.1455188

Leyro, T. M., Zvolensky, M. J., & Bernstein, A. (2010). Distress tolerance and psychopathological symptoms and disorders: A review of the empirical literature among adults. *Psychological Bulletin*, *136*(4), 576–600. https://doi.org/10.1037/a0019712

Lopez, R., Dauvilliers, Y., Jaussent, I., Billieux, J., & Bayard, S. (2015). A multidimensional approach of impulsivity in adult attention deficit hyperactivity disorder. *Psychiatry Research*, *227*(2–3), 290–295. https://doi.org/10.1016/j.psychres.2015.03.023

Main, M. (1990). Cross-cultural studies of attachment organization: Recent studies, changing methodologies, and the concept of conditional strategies. *Human Development*, *33*(1), 48–61. https://doi.org/10.1159/000276502

Maire, J., Galera, C., Bioulac, S., Bouvard, M., & Michel, G. (2020). Emotional lability and irritability have specific associations with symptomatology in children with attention deficit

hyperactivity disorder. *Psychiatry Research*, *285*, 112789. https://doi.org/10.1016/j.psychres.2020.112789

Mikulincer, M., & Orbach, I. (1995). Attachment styles and repressive defensiveness: The accessibility and architecture of affective memories. *Journal of Personality and Social Psychology*, *68*(5), 917–925. https://doi.org/10.1037/0022-3514.68.5.917

Mikulincer, M., & Shaver, P. R. (2019). Attachment orientations and emotion regulation. *Current Opinion in Psychology*, *25*, 6–10. https://doi.org/10.1016/j.copsyc.2018.02.006

Mokrova, I., O'Brien, M., Calkins, S., & Keane, S. (2010). Parental ADHD symptomology and ineffective parenting: The connecting link of home chaos. *Parenting*, *10*(2), 119–135. https://doi.org/10.1080/15295190903212844

Moukhtarian, T. R., Cooper, R. E., Vassos, E., Moran, P., & Asherson, P. (2017). Effects of stimulants and atomoxetine on emotional lability in adults: A systematic review and meta-analysis. *European Psychiatry*, *44*, 198–207. https://doi.org/10.1016/j.eurpsy.2017.05.021

Nigg, J. T., & Casey, B. J. (2005). An integrative theory of attention-deficit/ hyperactivity disorder based on the cognitive and affective neurosciences. *Development and Psychopathology*, *17*(03). https://doi.org/10.1017/S0954579405050376

Nigg, J. T., Stavro, G., Ettenhofer, M., Hambrick, D. Z., Miller, T., & Henderson, J. M. (2005). Executive functions and adhd in adults: Evidence for selective effects on ADHD symptom domains. *Journal of Abnormal Psychology*, *114*(4), 706–717. https://doi.org/10.1037/0021-843X.114.3.706

Ohlmeier, M. D., Peters, K., Wildt, B. T. T., Zedler, M., Ziegenbein, M., Wiese, B., Emrich, H. M., & Schneider, U. (2008). Comorbidity of alcohol and substance dependence with

attention-deficit/hyperactivity disorder (ADHD). *Alcohol and Alcoholism*, *43*(3), 300–304. https://doi.org/10.1093/alcalc/agn014

Peckham, A. D., Jordan, H., Silverman, A., Jarvi Steele, S., Björgvinsson, T., & Beard, C. (2020). From urges to action: Negative urgency and nonsuicidal self-injury in an acute transdiagnostic sample. *Archives of Suicide Research*, *24*(3), 367–383. https://doi.org/10.1080/13811118.2019.1625831

Prince, M. (2012). Epidemiology. In *Core Psychiatry* (pp. 115–129). Elsevier. https://doi.org/10.1016/B978-0-7020-3397-1.00009-4

Roberts, W., Peters, J. R., Adams, Z. W., Lynam, D. R., & Milich, R. (2014). Identifying the facets of impulsivity that explain the relation between ADHD symptoms and substance use in a nonclinical sample. *Addictive Behaviors*, *39*(8), 1272–1277. https://doi.org/10.1016/j.addbeh.2014.04.005

Shelleby, E. C., & Ogg, J. (2020). Longitudinal relationships between parent involvement, parental warmth, ADHD symptoms, and reading achievement. *Journal of Attention Disorders*, *24*(5), 737–749. https://doi.org/10.1177/1087054719859075

Silva, C., Soares, I., & Esteves, F. (2012). Attachment insecurity and strategies for regulation: When emotion triggers attention. *Scandinavian Journal of Psychology*, *53*(1), 9–16. https://doi.org/10.1111/j.1467-9450.2011.00924.x

Skirrow, C., & Asherson, P. (2013). Emotional lability, comorbidity and impairment in adults with attention-deficit hyperactivity disorder. *Journal of Affective Disorders*, *147*(1–3), 80–86. https://doi.org/10.1016/j.jad.2012.10.011

Soler-Gutiérrez, A.-M., Pérez-González, J.-C., & Mayas, J. (2023). Evidence of emotion dysregulation as a core symptom of adult ADHD: A systematic review. *PLOS ONE*, *18*(1), e0280131. https://doi.org/10.1371/journal.pone.0280131

Storebø, O. J., Rasmussen, P. D., & Simonsen, E. (2016). Association between insecure attachment and ADHD: Environmental mediating factors. *Journal of Attention Disorders*, *20*(2), 187–196. https://doi.org/10.1177/1087054713501079

Swanson, E. N., Owens, E. B., & Hinshaw, S. P. (2014). Pathways to self-harmful behaviors in young women with and without ADHD: A longitudinal examination of mediating factors. *Journal of Child Psychology and Psychiatry*, *55*(5), 505–515. https://doi.org/10.1111/jcpp.12193

Taylor, M. R., Boden, J. M., & Rucklidge, J. J. (2014). The relationship between ADHD symptomatology and self-harm, suicidal ideation, and suicidal behaviours in adults: A pilot study. *ADHD Attention Deficit and Hyperactivity Disorders*, *6*(4), 303–312. https://doi.org/10.1007/s12402-014-0139-9

Thompson, R. A. (2019). Emotion dysregulation: A theme in search of definition. *Development and Psychopathology*, *31*(3), 805–815. https://doi.org/10.1017/S0954579419000282

Whiteside, S. P., & Lynam, D. R. (2001). The Five Factor Model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences*, *30*(4), 669–689. https://doi.org/10.1016/S0191-8869(00)00064-7

Woods, K. E., Mazursky-Horowitz, H., Thomas, S. R., Dougherty, L. R., & Chronis-Tuscano, A. (2021). The unique effects of maternal ADHD symptoms and emotion dysregulation on parenting behavior. *Journal of Attention Disorders*, *25*(5), 672–684. https://doi.org/10.1177/1087054719829820

Wylock, J.-F., Borghini, A., Slama, H., & Delvenne, V. (2023). Child attachment and ADHD: A systematic review. *European Child & Adolescent Psychiatry*, *32*(1), 5–16. https://doi.org/10.1007/s00787-021-01773-y

Zheng, Y., Pingault, J.-B., Unger, J. B., & Rijsdijk, F. (2020). Genetic and environmental influences on attention-deficit/hyperactivity disorder symptoms in Chinese adolescents: A longitudinal twin study. *European Child & Adolescent Psychiatry*, *29*(2), 205–216. https://doi.org/10.1007/s00787-019-01346-0

Appendix A

Avoidance and anxiety means (s.d.) for each attachment style

	Attachment-Related Avoidance	Attachment-Related Anxiety
1. Secure	-1 s.d.	-1 s.d.
2. Preoccupied	-1 s.d.	+1 s.d.
3. Dismissive	+1 s.d.	-1 s.d.
4. Fearful	+1 s.d.	+1 s.d.

Note. Secure attachment was measured as -1 SD on the attachment-related anxiety scale and -1SD on the attachment-related avoidance scale. *Anxious-preoccupied attachment* was measured as + 1 SD on the attachment-related anxiety scale and - 1SD on the attachment-related avoidance scale. *Dismissive-avoidant* attachment was measured as - 1 SD on the attachment-related anxiety scale and - 1SD on the attachment-related avoidance scale. *Fearful-avoidant* attachment style was measured as + 1 SD on the attachment-related anxiety scale and + 1SD on the attachment-related avoidance scale**.**

Appendix B

Figure B1

Correlation between Negative Urgency and Inattentiveness (T1), Study 1

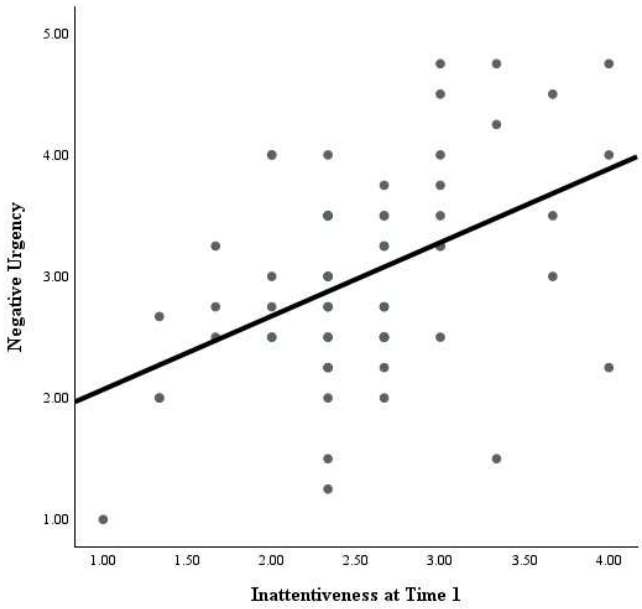


Figure B2

Correlation between Negative Urgency and Inattentiveness (T2), Study 1

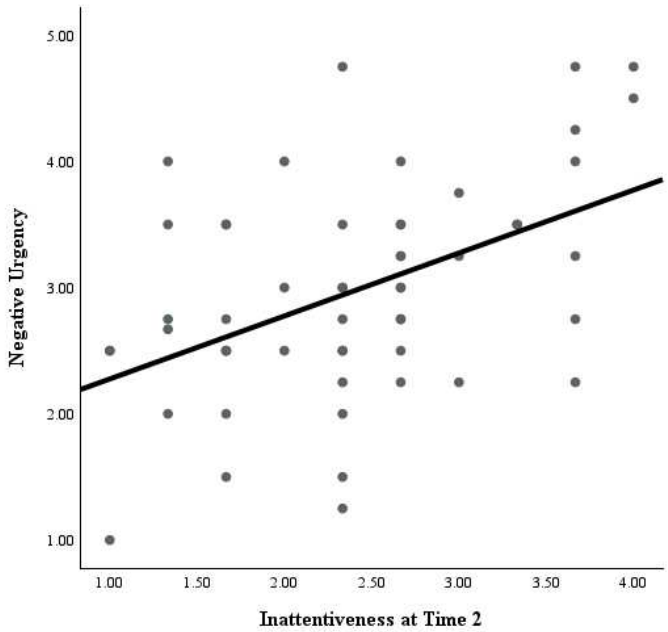


Figure B3

Correlation between Negative Urgency and Hyperactivity-impulsivity (T1), Study 1

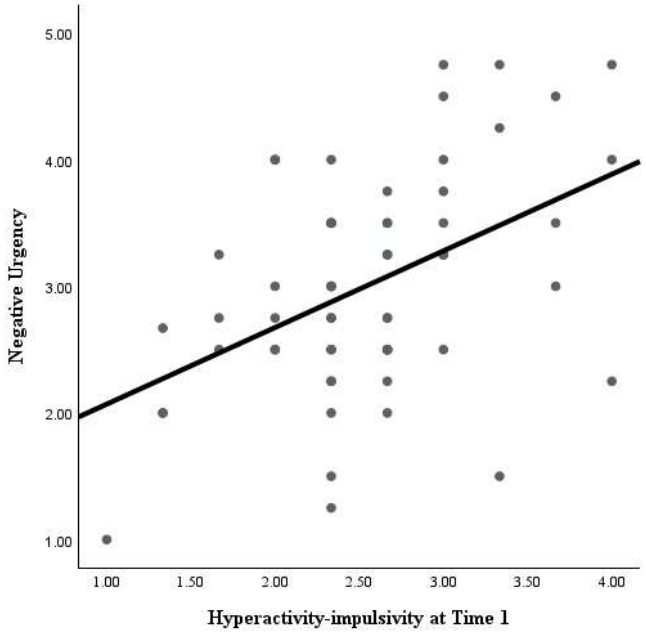


Figure B4

Correlation between Negative Urgency and Hyperactivity-impulsivity (T2), Study 1

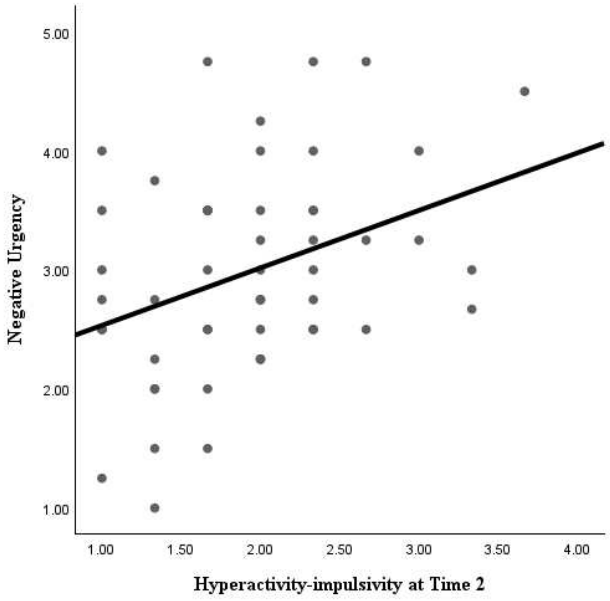


Figure B5

Correlation between Negative Urgency and Inattentiveness, Study 2

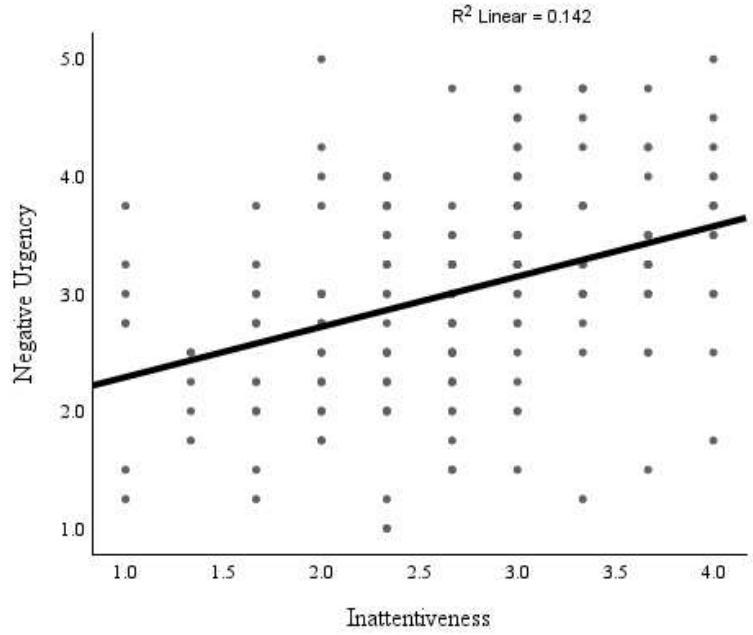


Figure B6

Correlation between Negative Urgency and Hyperactivity-impulsivity, Study 2

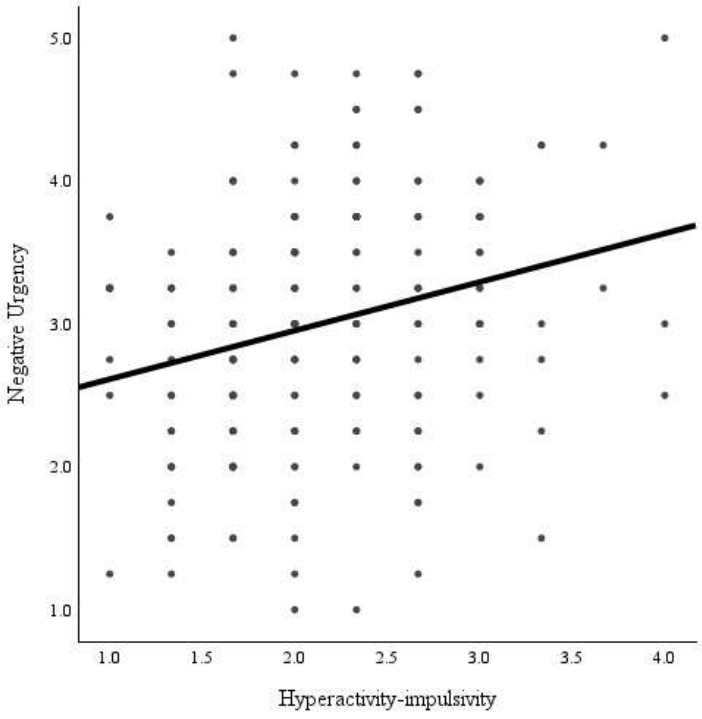


Table B1

Interaction Effect of Attachment Style and Inattentiveness (T2) on Negative Urgency, Study 1

	b	se	t	p	95% CI
Intercept	2.06	.10	21.09	<.001***	[1.86, 2.25]
Inattentiveness (T1)	.05	.16	3.12	<.01**	[.18, .83]
Avoidance	.01	.08	.11	.91	[-.15, .17]
Inattentiveness (T1) * Avoidance	.00	.14	-.04	.97	[-.28, .27]
Anxiety	.09	.08	1.11	.27	[-.07, .26]
Inattentiveness (T1) * Anxiety	.13	.13	1.01	.32	[-.13, .40]
Avoidance* Anxiety	-.15	.06	-2.38	.02*	[-.27, -.02]
Inattentiveness (T1) * Avoidance * Anxiety	.23	.13	1.72	.09	[-.04, .50]

* p < .05, ** p < .01, *** p < .001

Note. Coefficient values for all results are unstandardized.

Table B2

Interaction Effect of Attachment Style and Inattentiveness (T2) on Negative Urgency, Study 1

	b	se	t	p	95% CI
Intercept	1.98	.11	18.26	<.001***	[1.76, 2.20]
Inattentiveness (T1)	.35	.14	2.49	.02*	[.07, .64]
Avoidance	.08	.09	.81	.42	[-.11, 0.26]
Inattentiveness (T1) * Avoidance	.12	.11	1.04	.30	[-.11, .35]
Anxiety	.10	.10	1.06	.29	[-.09, .30]
Inattentiveness (T1) * Anxiety	.01	.11	.06	.95	[-.22, .24]
Avoidance* Anxiety	-.08	.08	-1.07	.29	[-.24, -.07]
Inattentiveness (T1) * Avoidance * Anxiety	.19	.10	1.77	.08	[-.03, .40]

* p < .05, ** p < .01, *** p < .001

Note. Coefficient values for all results are unstandardized.

Table B3

Interaction Effect of Attachment Style and Hyperactivity-Impulsivity (T2) on Negative Urgency, Study 1

	b	se	t	p	95% CI
Intercept	2.05	.11	19.29	<.001***	[1.84, 2.27]
Hyperactivity-Impulsivity (T1)	.49	.19	2.66	.01**	[.12, .87]
Avoidance	.07	.10	.75	.46	[-.12, .27]
Hyperactivity-Impulsivity (T1) * Avoidance	.10	.18	.58	.56	[-.25, .45]
Anxiety	.15	.09	1.75	.09	[-.02, .33]
Hyperactivity-Impulsivity (T1)* Anxiety	.16	.18	.89	.38	[-.20, .54]
Avoidance* Anxiety	-.09	.07	-1.20	.23	[-.23, .06]
Hyperactivity-Impulsivity (T1) * Avoidance * Anxiety	.18	.17	1.06	.29	[-.16, .53]

* p < .05, ** p < .01, *** p < .001

Note. Coefficient values for all results are unstandardized.

Table B4

Interaction Effect of Attachment Style and Hyperactivity-Impulsivity (T2) on Negative Urgency, Study 1

	b	se	t	p	95% CI
Intercept	1.98	.10	19.70	<.000***	[1.78, 2.19]
Hyperactivity-Impulsivity (T2)	.41	.16	2.56	.01**	[.09, .74]
Avoidance	.20	.09	2.34	.02*	[.03, .38]
Hyperactivity-Impulsivity (T2) * Avoidance	.34	.15	2.29	.03*	[.04, 64]
Anxiety	.14	.09	1.54	.13	[-.04, .33]
Hyperactivity-Impulsivity (T2)* Anxiety	.04	.13	.31	.76	[-.22, .30]
Avoidance* Anxiety	-.05	.08	-.62	.54	[-.20, .11]
Hyperactivity-Impulsivity (T2) * Avoidance * Anxiety	.33	.15	2.16	.04*	[.02, .64]

* p < .05, ** p < .01, *** p < .001

Note. Coefficient values for all results are unstandardized.

Table B5

Interaction Effect of Attachment Style and Inattentiveness on Negative Urgency, Study 2

	b	se	t	p	95% CI
Intercept	3.01	.06	52.02	<.001***	[2.90, 3.13]
Inattentiveness (T1)	.33	.07	4.44	<.001***	[.18, .48]
Avoidance	-.03	.09	-.37	.71	[-.20, .14]
Inattentiveness (T1) * Avoidance	.09	.10	.96	.34	[-.10, .29]
Anxiety	.49	.09	5.37	<.001***	[.31, .67]
Inattentiveness (T1) * Anxiety	-.08	.11	-.68	.50	[-.29, .14]
Avoidance* Anxiety	-.09	.10	-.97	.34	[-.28, .10]
Inattentiveness (T1) * Avoidance * Anxiety	-.11	.11	-1.00	.32	[-.31, .10]

* p < .05, ** p < .01, *** p < .001

Note. Coefficient values for all results are unstandardized

Table B6

Interaction Effect of Attachment Style and Hyperactivity-Impulsivity on Negative Urgency, Study 2

	b	se	t	p	95% CI
Intercept	3.02	.06	50.24	<.001***	[2.90, 3.13]
Hyperactivity-Impulsivity (T2)	.24	.09	2.61	<.01**	[.06, .48]
Avoidance	.07	.09	.85	.40	[-.10, .41]
Hyperactivity-Impulsivity (T2) * Avoidance	.07	.13	.53	.60	[-.19, .32]
Anxiety	.43	.09	4.90	<.001***	[.26, .61]
Hyperactivity-Impulsivity (T2)* Anxiety	.12	.12	.96	.34	[-.12, .35]
Avoidance* Anxiety	-.16	.10	-1.53	.13	[-.36, .05]
Hyperactivity-Impulsivity (T2) * Avoidance * Anxiety	-.21	.13	-1.57	.12	[-.46, .05]

* p < .05, ** p < .01, *** p < .001

Note. Coefficient values for all results are unstandardized

Appendix C

Table C 1

Correlation Matrix, Study 1

Variable	1.	2.	3.	4.	5.	6.	7.
1. Negative urgency	--						
2. Inattentiveness T1	.459**	--					
3. Inattentiveness T2	.469**	.761**	--				
4. Hyperactivity-impulsivity T1	.391**	.362**	.403**	--			
3. Hyperactivity-impulsivity T1	.365**	.278*	.413**	.616**	--		
6. Attachment anxiety	.249	.049	.148	.013	.054	--	
7. Attachment avoidance	.185	.281*	.378**	.250	.141	.108	--

$p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table C2

Correlation Matrix, Study 2

Variable	1.	2.	3.	4.	5.	6.	7.
1. Negative urgency	--						
2. Inattentiveness	.377**	--					
3. Hyperactivity-impulsivity	.252**	.497**	--				
4. Inattentiveness (ASRS-V1.1)	.425**	.711**	.461**	--			
5. Hyperactivity-impulsivity (ASRS-V1.1)	.283**	.461**	.644**	.599**	--		
6. Attachment anxiety	.464**	.226**	.223**	.240**	.274**	--	
7. Attachment avoidance	.172*	.138	.048	.207**	.048	.380**	--

$p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Note. Variables 4. And 5. are participants' scores on the Adult ADHD Self-Report Scale (ASRS-V1.1) Symptom Checklist for inattentiveness and hyperactivity-impulsivity. These are added to correlation matrix to indicate parallel forms reliability for the 3-item ADHD scales used in Study 2.