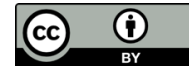


Journal of Boredom Studies (ISSN 2990-2525)

Issue 4, 2026, pp. 1–24

<https://doi.org/10.5281/zenodo.21275104>

<https://www.boredomsociety.com/jbs>



INTERNATIONAL SOCIETY
of BOREDOM STUDIES



Trait and State Boredom in Adults with Elevated ADHD Symptoms: The Roles of ADHD Symptoms and Attention Control

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How to cite this paper: Santer, J., & Orban, S. A. (2026). Trait and State Boredom in Adults with Elevated ADHD Symptoms: The Roles of ADHD Symptoms and Attention Control. *Journal of Boredom Studies*, 4. <https://doi.org/10.5281/zenodo.21275104>

Abstract: Boredom encompasses both stable individual differences and momentary experiences, yet the mechanisms underlying boredom in ADHD remain unclear. The present study examined differences in trait and state boredom between adults with and without elevated ADHD symptoms, as well as the contributions of behavioral ADHD symptoms and performance-based attention control to these outcomes. Ninety-four undergraduate students completed self-report measures of ADHD symptoms, trait boredom (Short Boredom Proneness Scale [SBPS]; Boredom Susceptibility Scale [BSS]), and state boredom, an attention control task, and a laboratory boredom induction involving neutral and boring video conditions. Motor activity during the boredom induction task was measured using actigraphy. Results revealed that participants with elevated ADHD symptoms reported higher levels of trait boredom on both measures and greater overall state boredom. However, group differences in state boredom were fully accounted for by individual differences in trait boredom, and participants with elevated ADHD symptoms did not exhibit larger increases in state boredom during the boredom induction relative to controls. Motor activity increased during the boring condition for all participants, and while individuals with elevated ADHD symptoms showed higher overall motor activity across both videos, they did not demonstrate greater increases in motor activity during the boring video relative to controls. Furthermore, ADHD symptom severity predicted SBPS scores, whereas performance-based attention control predicted BSS scores. Both performance-based attention control and SBPS scores uniquely predicted baseline state boredom. These findings highlight complementary aspects of boredom in ADHD and suggest potential targets for intervention.

Keywords: attention deficit hyperactivity disorder; boredom; attention control; experimental boredom induction.

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Received 28 March 2026; Accepted 8 July 2026.

1. Introduction

Boredom is an aversive experience characterized by a desire to engage in meaningful activity, coupled with an inability to do so (Eastwood et al., 2012). For many, boredom is a situational, relatively brief, and unpleasant emotion that arises in monotonous or understimulating environments and is commonly referred to as *state boredom* (Hunter & Eastwood, 2018; O'Hanlon, 1981; Westgate & Steidle, 2020). Experimentally induced state boredom is associated with heightened frustration (van Hooft & van Hoof, 2018) and increased motivation to seek stimulation, even when that stimulation is unpleasant (Bench & Lench, 2019; Nederkoorn et al., 2016). In contrast, some individuals exhibit a chronic tendency toward boredom across contexts, even in situations others find engaging. This enduring vulnerability, referred to as *trait boredom* or *boredom propensity* (Farmer & Sundberg, 1986), has been linked to numerous adverse outcomes, including poorer occupational and academic outcomes, reduced intrinsic motivation, greater engagement in maladaptive behaviors, and elevated symptoms of depression and anxiety (Carriere et al., 2008; Goldberg et al., 2011; Mercer & Eastwood, 2010; O'Hanlon, 1981; Pekrun et al., 2010; Sommers & Vodanovich, 2000; Tze et al., 2016). Furthermore, trait boredom is particularly pronounced among individuals with attention deficit/hyperactivity disorder (Muris et al., 2026).

Cognitive theories suggest boredom arises from failures to regulate attention toward meaningful aspects of one's environment (Eastwood et al., 2012; Fisher, 1993), whereas arousal-based theories propose that boredom occurs when environmental stimulation is insufficient to meet an individual's optimal level of arousal (Csikszentmihalyi, 2000; De Chenne, 1988; Mercer-Lynn et al., 2014). Accordingly, state boredom is more likely in low arousal environments that tax sustained attention (Mikulas & Vodanovich, 1993), while trait boredom may reflect enduring differences in attentional capacity interacting with environmental demands (Eastwood et al., 2012). Consistent with this view, individuals high in trait boredom perform more poorly on tasks requiring sustained attention and vigilance (Hunter & Eastwood, 2018; Kass et al., 2003; Malkovsky et al., 2012) and report greater difficulty managing attention in daily life (Carriere et al., 2008; Malkovsky et al., 2012).

Tam et al. (2021) proposed the Boredom Feedback Model (BFM), an integrative attentional account that builds on both cognitive and arousal-based theories. BFM posits that boredom arises when there is inadequate attentional engagement (IAE) which reflects a discrepancy between one's desired and actual levels of attentional engagement. When this discrepancy reaches a noticeable threshold, boredom is experienced and attention shifts either outward (e.g., engaging in a more interesting or stimulating task), inward (e.g., mind wandering) or back toward the boring situation by actively reengaging with it, such as finding ways to make the task more interesting or meaningful. These shifts form a regulatory feedback loop aimed at resolving the discrepancy. When the loop fails to resolve, which may occur in individuals with chronic attentional difficulties, boredom persists, and adverse outcomes may follow. Importantly, BFM also proposes that trait boredom may reflect dysfunction of this feedback loop, with different profiles emerging depending on whether attentional deficits, lack of meaningful engagement, or both predominate.

Trait boredom is typically measured using self-report scales such as the Boredom Susceptibility subscale of the Sensation Seeking Scale (BSS; Zuckerman, 1964), the Boredom

Proneness Scale (BPS; Farmer & Sundberg, 1986), and the Short Boredom Proneness Scale (SBPS; Struk et al., 2017). The BSS emphasizes boredom arising from low environmental stimulation and a tendency to seek stimulation, whereas the BPS captures broader difficulties engaging meaningfully with one's environment, including disengagement and low motivation. Empirical work suggests these measures capture different aspects of the boredom experience (Mercer-Lynn et al., 2013). The SBPS was developed to address psychometric limitations of the BPS and provides a unidimensional measure of persistent difficulties sustaining engagement in meaningful activities. Together, the BSS and SBPS capture complementary aspects of trait boredom: stimulation-seeking responses to under-stimulation versus challenges in sustaining engagement, respectively. These aspects may reflect different behavioral manifestations of a shared attentional mechanism rather than wholly independent constructs.

Although ADHD is typically characterized by inattention, hyperactivity, and impulsivity, recent evidence suggests that elevated boredom is also an important feature of the disorder. A recent meta-analysis (Muris et al., 2026) found a robust overall effect ($r = .40$) indicating that ADHD symptoms are strongly linked with higher levels of boredom, highlighting its relevance as a core symptom rather than a peripheral feature. Indeed, medium to strong correlations between boredom propensity and ADHD symptoms have been documented in non-ADHD samples (Hunter & Eastwood, 2018; Kass et al., 2003; Mercer-Lynn et al., 2014) and studies of individuals with ADHD report strong correlations between ADHD symptoms and boredom propensity (Chou et al., 2018; Golubchik et al., 2020) as well as large group differences in trait boredom (Hsu et al., 2025; Orban et al., 2026) compared to non-ADHD controls. The chronic attentional difficulties characteristic of ADHD may render individuals particularly vulnerable to inadequate attentional engagement, predisposing them to more frequent and intense boredom experiences and impairing their ability to regulate out of boredom once it arises.

Several studies have examined potential mechanisms underlying boredom proneness in ADHD. One candidate mechanism is attention control, an executive function reflecting the ability to sustain goal-directed behavior by maintaining task-relevant information and resisting distraction (Draheim et al., 2022). Research suggests that individual differences in the ability to sustain and regulate attention influence vulnerability to boredom across settings (Tam et al., 2021). Deficits in attention control may therefore contribute to boredom by disrupting adequate attentional engagement. Specifically, when individuals struggle to maintain attentional engagement in the face of distraction, a discrepancy between desired and actual attention engagement may emerge, producing the conditions for boredom regardless of the objective stimulation level of the task. Although prior work has examined cognitive processes related to boredom in ADHD, these studies have largely focused on constructs other than attention control. For example, Golubchik et al. (2021) found that children with ADHD who had higher levels of boredom propensity demonstrated slower reaction times on a test of sustained attention, while Hsu et al. (2025) found that delay aversion—reflecting weaknesses in inhibitory control—partially mediated ADHD-related boredom. In contrast, only one study to date has directly examined attention control in relation to boredom in ADHD. Orban et al. (2026) found that young adults with elevated ADHD symptoms and boredom propensity performed worse on tasks of attention control and working memory, with these executive functions partially mediating the association between ADHD group status and boredom.

Together, these findings suggest that elevated boredom in ADHD may reflect both behavioral features of the disorder and underlying executive dysfunction. However, the relative contributions of these processes remain unclear. One possibility is that boredom arises from the behavioral symptom profile of ADHD, such as difficulties with focus and distractibility, which may increase vulnerability to disengagement from ongoing activities. Alternatively, boredom may stem from deficits in attention control that impair the ability to maintain attentional engagement across settings. The present study therefore examined whether ADHD symptoms and performance-based attention control differentially predict trait and state boredom.

State boredom is typically assessed via experimental induction followed by self-report using measures such as the Multi-Dimensional State Boredom Scale (MSBS; Fahlman et al., 2013), which includes multiple subscales and a total score reflecting overall state boredom intensity. Past research indicates a reciprocal relationship between attentional failures and state boredom, such that commission errors on a continuous performance test (CPT) predicted subsequent increases in state boredom, which in turn predicted further attentional errors on later trials, though this relationship did not emerge in the initial block of trials (Hunter & Eastwood, 2018). This suggests that momentary lapses in attention and boredom may mutually reinforce one another over time, contributing to the cycle of disengagement. When individuals have difficulty sustaining attention, they may disengage from the activity, consistent with the view that state boredom arises when a discrepancy between desired and actual attentional engagement reaches a threshold that triggers the subjective experience of boredom and motivates a shift toward more engaging alternatives (Tam et al., 2021).

Therefore, individuals with ADHD, who experience chronic difficulties regulating and sustaining attention, may be particularly susceptible to state boredom across settings. For example, children with ADHD exhibited reduced attention while watching a boring math video compared to neurotypical children, and group differences in attention were mediated by working memory such that when working memory was accounted for, attentional differences were no longer significant (Orban et al., 2018). Similarly, Hsu et al. (2020) found that children with ADHD reported higher levels of state boredom than controls on the MSBS, and boredom ratings were positively correlated with inattention indices on a CPT. These findings suggest that deficits in attentional engagement may lower the threshold for state boredom during monotonous tasks, contributing to greater susceptibility to boredom in ADHD.

Although relatively few studies have experimentally examined state boredom in adults with ADHD, Matthies et al. (2012) provides an important example. In their study, boredom was induced prior to a gambling task and self-reported boredom increased significantly following induction, though the primary aim was to examine risky decision-making rather than systematically measure state boredom. As a result, it remains unclear whether individuals with ADHD experience greater state boredom than controls across different situational contexts, or whether elevated boredom in ADHD reflects a more general vulnerability in attentional engagement that manifests regardless of task type.

Beyond subjective experiences of boredom, ADHD may also be associated with behavioral responses to boredom in monotonous settings. According to the Optimal Stimulation Model (Zentall & Zentall, 1983), individuals with ADHD may engage in increased motor activity (i.e., fidgeting) to regulate suboptimal arousal levels. Although arousal-based models of boredom

have traditionally emphasized low arousal as a core feature of boredom (Mikulas & Vodanovich, 1993), the relationship between boredom and arousal is more complex. A recent meta-analysis found that while boredom is commonly associated with low arousal, effect sizes varied substantially across studies, suggesting a nuanced and heterogeneous relationship between boredom and arousal (Stempfer et al., 2025). Indeed, boredom has been characterized as involving both sleepiness and restlessness simultaneously (Danckert et al., 2018) and arousal may not be a defining characteristic of boredom per se but rather reflects the person's attempts to respond to an unsatisfactory situation (Elpidorou, 2021). From this perspective, motor activity may reflect the restlessness component of the boredom experience rather than purely compensatory arousal regulation. Neuroimaging findings indicating underarousal and reduced prefrontal cortical activation in ADHD (Cortese et al., 2012; Hart et al., 2013) suggest that individuals with ADHD may be particularly vulnerable to the low arousal component of boredom, while their tendency toward hyperactivity may amplify the restless response. Although boredom-related motor activity has not been directly examined in ADHD samples, children with ADHD exhibit increased movement during cognitively demanding tasks (Dekkers et al., 2021; Kofler et al., 2016; Rapport et al., 2009; Sarver et al., 2015), suggesting that motor activity may function as a compensatory response to boredom when attentional engagement falters.

The present study examined ADHD-related differences in both trait and state boredom and investigated the relative contributions of self-reported ADHD symptoms and performance-based measures of attention control. Specifically, we addressed four research questions: (1) whether individuals with elevated ADHD symptoms report higher levels of trait boredom than controls; (2) whether individuals with elevated ADHD symptoms experience greater increases in state boredom following a boredom induction task; (3) whether boredom is associated with increased motor activity in individuals with elevated ADHD symptoms; and (4) whether performance-based attention control predicts trait and state boredom beyond ADHD symptom severity. We hypothesized that individuals with elevated ADHD symptoms would exhibit higher trait boredom on the SBPS and greater motor activity during the boring video condition. We also expected that both ADHD symptoms and performance-based attention control would predict SBPS and MSBS boredom. No specific hypotheses were formulated for state boredom during the boredom induction task or ratings on the BSS due to limited research examining these dimensions of boredom in ADHD populations or in relation to attention functioning.

2. Method

2.1. Participants

Ninety-seven undergraduate students from a southeastern university in the United States were recruited and participated in the current study. Most participants were recruited using an undergraduate research participation pool and were compensated with partial course credit for their general psychology course ($n = 69$). At the same time, additional students were recruited using on-campus advertisements ($n = 28$) and received a \$25 Amazon gift card as compensation. Interested participants completed an electronic prescreening survey to determine eligibility for inclusion in either the group of individuals with elevated ADHD symptoms or control group (as described below). Three participants initially assigned to the control group were excluded after

reporting a prior or current ADHD diagnosis. The final sample consisted of 94 participants with 78.7% identifying as female and 21.3% as male (M age= 19.78, SD age= 2.69). All participants provided their informed consent and the university's institutional review board approved the study prior to the onset of data collection.

2.2. Group Assignment

Thirty-nine participants were included in the elevated ADHD symptoms group based on exceeding threshold criteria on the Adult ADHD Self-Report Screening Scale (ASRS-5; Ustun et al., 2017) for a total score of 14 or greater OR on the Conners' Adult Rating Scale ($T \geq 60$; CAARS-S:S; Conners et al., 1999). This approach allowed us to maximize sensitivity in identifying individuals with elevated ADHD symptoms while minimizing the risk of excluding participants who may present with ADHD but differ in symptom reporting across instruments. In the group of individuals with elevated ADHD symptoms, nine participants reported a prior diagnosis of ADHD, nine participants reported a current diagnosis of ADHD, and four participants reported taking medication for ADHD including two who indicated medication use the morning of the research session. Fifty-five participants were included in the control group based on having a total score of 13 or less on the ASRS-5 AND a score within the average range on the ADHD Index Scale of the CAARS-S:S ($T < 60$). Exclusion criteria included those with neurological, sensory, or serious motor impairment, a history of seizure disorder, or psychosis. Comorbidities in the elevated ADHD symptoms group included learning disability ($n = 6$) and concussion ($n = 5$), with no reports of autism spectrum disorder; among controls, only one participant reported a concussion.

2.3. Measures

2.3.1. Self-Report Behavioral Measures

The Adult ADHD Self-Report Screening Scale for DSM-5 (ASRS-5; Ustun et al., 2017) measures symptoms of ADHD in adults. Six items are rated on a 5-point Likert scale (0= *never*, 4= *very often*). The scale evaluates the frequency of reported ADHD symptoms over the last 6 months (e.g., "How often do you have difficulty concentrating on what people are saying to you even when they are speaking to you directly?"; "How often do you put things off until the last minute?"). Total scores ≥ 14 are suggestive of ADHD (91.4% sensitivity; 96.0% specificity; Ustun et al., 2017). Scores below 14 reflect normal functioning.

The Conners' Adult ADHD Rating Scale–Self Report: Short Version (CAARS–S:S; Conners et al., 1999) measures ADHD symptoms in adults. The scale includes 26 items rated on a 4-point Likert scale (0= *not at all/never*, 3= *very much/very frequently*). Items assess the frequency and intensity of behaviors associated with ADHD recently (e.g., "I'm absent minded in daily activities," "I interrupt others when talking"). The CAARS–S:S yields subscale scores for Inattention/Memory Problems, Hyperactivity/Restlessness, Impulsivity/Emotional Lability, and Problems with Self-Concept, as well as an overall ADHD Index. Higher T-scores indicate greater symptom severity. T-scores ≥ 60 are considered above average (Conners et al., 1999).

The Short Boredom Proneness Scale (SBPS; Struk et al., 2017) is an eight-item self-report measure that uses a 5-point Likert scale (0= *strongly disagree*, 4= *strongly agree*). The scale is designed to measure one's propensity to boredom (i.e., trait boredom) reflecting persistent

difficulties sustaining engagement in meaningful activities over the past six months. Example items on the scale include “I find it hard to entertain myself” and “In most situations, it is hard for me to find something to do or see to keep me interested.” Higher scores reflect a higher propensity to boredom. The SBPS is a widely used shortened version of the original Boredom Proneness scale (BPS; Farmer & Sundberg, 1986) and has strong construct validity and internal consistency indices ($\alpha=0.88$; Struk et al., 2017).

The Boredom Susceptibility Scale (BSS) is a subscale of Zuckerman’s Sensation Seeking Scale – Form Five (SSS-V; Zuckerman et al., 1978). The BSS consists of 10 forced choice items and is intended to measure difficulty tolerating monotonous environmental stimulation. Example items include “I have projects in mind all the time, things to do.” and “I am often trapped in situations where I have to do meaningless things.” Prior research indicates modest internal consistency for the Boredom Susceptibility subscale (BSS), with a median coefficient alpha of .61 across studies (Deditius-Island & Caruso, 2002), split-half reliabilities ranging from .38 to .75 (Vodanovich, 2003), and acceptable test–retest reliability over three weeks ($r=.70$; Zuckerman, 1979). In the present study, internal consistency for the BSS was moderate (Cronbach’s $\alpha=.60$), consistent with prior studies. Higher scores reflect greater boredom susceptibility.

The Multidimensional State Boredom Scale (MSBS; Fahlman et al., 2013) assesses the intensity of momentary boredom as a transient emotional state. The 29-item self-report measure evaluates the degree to which individuals experience feelings such as disengagement, inattention, and lack of stimulation in the present moment (e.g., “Time is passing by slower than usual,” “I feel bored”). Items are rated on a 7-point Likert scale (1= *strongly disagree*, 7= *strongly agree*), with higher scores indicating greater state boredom. Although the MSBS includes five subscales (Disengagement, High Arousal, Low Arousal, Inattention, and Time Perception), a total score representing overall state boredom was used in the current study. The MSBS exhibits excellent internal consistency ($\alpha=.94$ to $.95$) and strong construct and convergent validity, reliably distinguishing experimentally induced boredom from non-boredom states and capturing state boredom beyond trait boredom and negative affect (Fahlman et al., 2013).

A demographic questionnaire was administered to indicate the participant’s age, gender, history of current and past ADHD diagnosis and medication use, and history of learning disability, autism spectrum disorder, or concussion.

2.3.2. Objective Behavioral Measures

An actigraph is a motion-sensitive device used to measure motor activity. The ActiGraph GT3X monitor (ActiGraph, Pensacola, FL, USA) is lightweight (27 g), compact ($3.8 \times 3.7 \times 1.8$ cm), and powered by a rechargeable lithium polymer battery. It contains a solid-state tri-axial accelerometer that records movement along three axes: vertical (Y), horizontal right–left (X), and horizontal front–back (Z). In addition to axis-specific data, the device calculates Vector Magnitude (VM), which represents the combined magnitude of acceleration sampled across all three axes. The GT3X captures time-varying accelerations ranging from approximately 0.05 to 2.5 G. Acceleration signals are digitized using a 12-bit analog-to-digital converter at a sampling rate of 30 Hz. The digitized signal is then passed through a digital filter that restricts the frequency bandwidth to 0.25–2.5 Hz. Activity data are aggregated into 10-second epochs, and output is

expressed in activity “counts.” These counts are linearly associated with the intensity of the participant’s physical activity during each epoch. Actigraphs were secured immediately above the participant’s left and right ankles using Velcro watch bands. A third device was worn on the non-dominant wrist, as participants used their dominant hand for completing tasks and questionnaires.

ActiLife software version 6.13.4 (ActiGraph LLC, Pensacola, FL, USA) was used to initialize the device and download the time-stamped VM Average Counts. ActiLife Software calculates VM Average counts by dividing total VM counts by the number of epochs. For example, an average VM count value of 30 indicates that the participant generated an average of 30 activity counts per 10-second epoch during the wear period. VM average counts were further averaged across the three placement sites to reflect a mean activity level during the neutral and boring video tasks. A research assistant recorded the precise start and end times of each video, which were synchronized with actigraph time stamps. For analysis, seconds were rounded to the nearest whole minute.

2.3.3. Performance Based Measures

The sustained attention to cue task (SACT) is an accuracy-based vigilance task that measures attention control. First, participants are presented with a visual cue (+) in the center of the screen, which displays for two seconds on half of the trials and three seconds on the other half. After the cue, a 300-ms tone is presented and a large white circle cue is displayed at a random location on the screen. Participants are instructed to attend to the circle, which shrinks in size at a variable wait time (2s, 4s, 8s, and 12s equally distributed among trials) until it reaches a fixed size. Following the wait time, a distractor component (a white asterisk symbol) flashes at 100ms on screen, 100ms off, and 100ms back on for a total of 300ms. Finally, a 3 X 3 array consisting of four letters (i.e., B, D, P, and R) was displayed at the center of the circle cue. The target letter was presented in dark gray font in the center of the array for 125ms before being replaced with a ‘#’ symbol. The nontarget letters were presented in black font and remained visible on the screen. After 1000ms, a response screen appeared, and participants were instructed to select the correct target letter with the option to choose between B, D, P, or R each time. Sixty-four total trials were administered with 6 practice trials that provided feedback to participants. Accuracy rate (i.e., number of correct trials) was used as a dependent variable as recommended (Draheim et al., 2021).

2.4. Boredom Induction

Participants were randomly assigned to either a neutral or boring video condition. In the neutral condition, participants watched the first 40 minutes from the 90-minute documentary *In Search of Memory* (Seeger, 2009), which chronicles the life and research of neuroscientist Eric Kandel. In the boring condition, participants viewed the first 90 seconds of the documentary, which looped continuously for 40 minutes. This design was informed by prior research demonstrating that repeated exposure to a short, minimally engaging video segment reliably induces boredom. The film has been used successfully in prior studies utilizing boredom induction techniques (Havermans et al., 2015; Nederkoorn et al., 2016). Although previous studies have often employed longer durations (e.g., 60 minutes or more), a 40-minute induction was selected to

balance effectiveness with feasibility and to reduce participant burden. All videos were presented on the same desktop computer.

2.5. Procedure

Prior to the research session, participants completed a screening survey via Qualtrics to determine their eligibility, which included a demographic questionnaire, the ASRS-5, and the CAARS-S:S. Eligible participants were then scheduled for a single 90-minute in-person laboratory session. Upon arrival, participants were seated alone at a desk facing a desktop computer. Each session was conducted and monitored by a research assistant who remained out of view, except when presenting instructions for questionnaires and computer tasks. After obtaining informed consent, actigraphs were placed on the participant's non-dominant wrist and both ankles. The ADHD measures were then readministered to confirm eligibility, and the responses collected during the laboratory session were used for all subsequent analyses. Participants next completed the computerized SACT. Following the SACT, participants completed measures of trait boredom (i.e., SBPS, BSS) and pre-video state boredom (i.e., MSBS) to assess baseline state boredom. Participants were then randomly assigned to view either the boring or neutral video for 40 minutes. Immediately following the video, participants completed the post-video MSBS to assess changes in state boredom following the video tasks. Finally, participants were debriefed regarding the purpose of the study and dismissed.

2.6. Power Analyses and Missing Data

Missing data was minimal. Actigraphy data from four participants were lost due to technical error. SACT data from 8 participants were lost due to experimenter ($n=7$) or technical error ($n=1$), resulting in a sample of 86 participants for regression analyses involving the SACT. BSS data from three participants were missing due to questionnaire error ($n=2$) and misinterpretation of instructions ($n=1$), resulting in a sample of 91 for t tests and mixed ANCOVA analyses and 85 for regression analyses involving the BSS. These data losses were unrelated to participant characteristics or study condition. All analyses were conducted using SPSS Version 31.

Post hoc sensitivity analyses using G*Power determined the minimum detectable effect size with 80% power and $\alpha = .05$ for each analysis (see Appendix A). For the independent samples t -tests, medium effect sizes could be reliably detected (SBPS: $d = 0.59$, $n = 94$; BSS: $d = 0.60$, $n = 91$). For the mixed ANOVA, small-to-medium effects could be detected for main effects and two-way interactions ($f = 0.10$, $n = 94$), though power for interaction effects involving group was limited (observed power = .08-.23). For the mixed ANCOVA, small-to-medium within-subjects ($f = 0.12$) and medium between-subjects ($f = 0.30$), could be detected ($n = 91$). For the actigraph ANOVA, medium effects could be detected ($f = 0.30$, $n = 90$). For the regression analyses, small-to-medium effects could be detected (Models 1 ($n=86$) and 2 ($n=85$): $f^2 = 0.12$ Model 3 ($n=85$): $f^2 = 0.15$).

3. Results

An independent measures t -test was conducted to determine whether individuals with elevated ADHD symptoms exhibit higher trait boredom than controls. A statistically significant difference in trait boredom depending on group membership was found for both the SBPS, $t(92) = -7.97$, $p <$

.001, two-tailed, $d = 1.67$ and the BSS, $t(89) = -2.20$, $p = .030$, two-tailed, $d = 0.47$. Specifically, individuals with elevated ADHD symptoms reported significantly higher levels of trait boredom on both measures than controls. It should be noted that the observed effect size for the BSS group difference ($d = 0.47$) fell slightly below the detectable threshold for this analysis ($d = 0.60$), suggesting that this finding should be interpreted with some caution and warrants replication in larger samples. See Table 1 for means and standard deviations.¹

Table 1. Means, Standard Deviations, and Independent Samples t Tests

Variable	ADHD			Control			Group Differences		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>d</i>
Age	39	19.3	1.1	54	20.1	3.4	1.4	.169	0.29
ASRS-5	39	15.6	3.3	55	7.6	2.9	-12.58	<.001**	2.63
CAARS-S:S	39	66.6	5.8	55	45.8	6.8	-15.59	<.001**	3.26
SBPS	39	17.4	4.6	55	8.8	5.6	-7.97	<.001**	1.67
BSS	39	3.2	2.0	52	2.3	1.9	-2.20	.030*	0.47
Pre-Video MSBS	39	110.9	25.3	55	80.7	29.1	-5.23	<.001**	1.09
Post-Video MSBS	39	134.1	29.0	55	100.4	36.7	-4.77	<.001**	1.00
Motor Activity	36	77.6	46.5	54	58.8	37.9	-2.10	.038*	0.45
SACT	38	49.8	11.3	48	56.4	6.7	3.41	.001**	0.74
	<i>n</i> Male		<i>n</i> Female	<i>n</i> Male		<i>n</i> Female			
Gender	5		34	15		40			

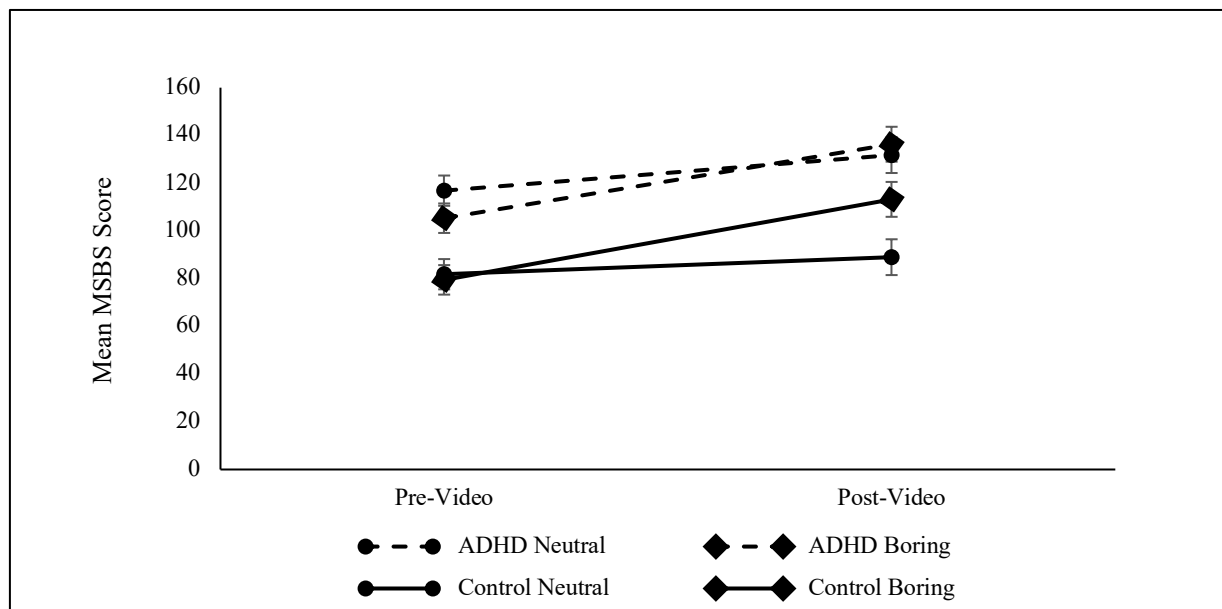
Note: ASRS-5 = Adult ADHD Self-Report Rating Scale 5th Edition; BSS = Boredom Susceptibility Scale; CAARS-S:S = Conner's Adult ADHD Rating Scale Self Report Short Form; M = mean; MSBS = Multidimensional State Boredom Scale; SACT = Sustained Attention to Cue Task; SD = standard deviation; SBPS = Short Boredom Proneness Scale. Measures reflect total scores; Motor Activity reflects actigraph measured average vector magnitude count; * $p < .05$; ** $p < .01$.

To examine whether individuals with elevated ADHD symptoms experience greater state boredom during a boring video, a 2 (Group: ADHD vs. Controls) x 2 (Video Condition: Neutral vs. Boring) x 2 (Time: pre-video state boredom [MSBS₁] vs. post-video state boredom [MSBS₂]) mixed factorial ANOVA was conducted (see Figure 1), with Group and Video condition as between subject variables and Time as a within-subject variable. A significant main effect for Group was found, $F(1, 90) = 28.72$, $p < .001$, $\eta^2_p = .24$, such that individuals with elevated ADHD symptoms reported significantly higher state boredom overall ($M = 122.55$, $SE = 4.52$) than those in the control group ($M = 90.86$, $SE = 3.81$). A significant main effect of Time was also observed, $F(1, 90) = 88.99$, $p < .001$, $\eta^2_p = .50$, indicating that all participants reported significantly more state boredom after watching the videos ($M = 117.55$, $SE = 3.43$), than before ($M = 95.86$, $SE = 2.90$). There was also a significant Time x Video Condition interaction, $F(1, 90) = 21.55$, $p < .001$, $\eta^2_p = .19$, indicating that changes in boredom over time differed by video condition. Follow-up Bonferroni-adjusted comparisons revealed that boredom increased significantly from pre- to post-video in both the boring ($M_{diff} = 32.37$) and neutral video ($M_{diff} = 11.02$) conditions ($ps < .001$). As expected, the increase in state boredom was significantly greater in the boring condition

¹ For brevity, participants meeting threshold criteria for elevated ADHD symptoms are referred to as the "ADHD group" in statistical reporting and tables throughout this section. This terminology does not imply a formal clinical diagnosis. All interpretive language refers to this group as "individuals with elevated ADHD symptoms."

than in the neutral condition, as reflected in the significant Time $\times$ Video interaction, supporting the effectiveness of the boredom induction task. However, the three-way interaction (Group $\times$ Time $\times$ Video Condition) was not significant, which indicates individuals with elevated ADHD symptoms and control participants were affected similarly by the boring and neutral videos in terms of their changes in state boredom over time. In other words, participants with elevated ADHD symptoms did not become more bored after watching the boring video compared to control participants. In addition, there was no significant main effect of Video Condition (collapsed across time), Group $\times$ Time interaction, or a Group $\times$ Video Condition interaction. See Table 2.

Figure 1. Mean State Boredom Pre- and Post-video by Group and Video Condition. Error Bars Represent Standard Errors. MSBS= Multi-dimensional State Boredom Scale.



Because trait boredom differed substantially between groups, ANCOVA was used to determine whether group differences in state boredom persisted after accounting for individual differences in trait boredom. Specifically, a 2 (Group: ADHD vs. Control) $\times$ 2 (Video Condition: Boring vs. Neutral) $\times$ 2 (Time: pre-video vs. post-video) mixed ANCOVA was conducted on state boredom, with SBPS and BSS included as covariates to control for trait boredom. The main effect of Time remained significant, $F(1, 85) = 6.53, p = .012, \eta_p^2 = .07$, indicating that boredom significantly increased from pre- to post-video across both videos controlling for trait boredom. The Time $\times$ Video Condition interaction also remained significant, $F(1, 85) = 21.59, p < .001, \eta_p^2 = .20$, suggesting that the increase in boredom was greater for participants in the boring video condition, controlling for levels of trait boredom. Importantly, the previously significant main effect of Group was no longer significant after controlling for trait boredom, $F(1, 85) = 0.63, p = .429$. This indicates that differences in state boredom between participants with elevated ADHD symptoms and control participants were accounted for by individual differences in trait boredom. See Table 2 for ANOVA and ANCOVA statistical results.

Table 2. Mixed Factorial ANOVA and ANCOVA Examining State Boredom.

Source	ANOVA				ANCOVA			
	<i>df</i>	<i>F</i>	<i>p</i>	η_p^2	<i>df</i>	<i>F</i>	<i>p</i>	η_p^2
Between-Subjects Effects								
Group	1, 90	28.72	<.001**	.24	1, 85	0.63	.429	.01
Video	1, 90	0.40	.531	.01	1, 85	1.57	.213	.02
Group x Video	1, 90	1.49	.226	.02	1, 85	1.06	.306	.01
Within-Subjects Effects								
Time	1, 90	88.99	<.001**	.50	1, 85	6.53	.012*	.07
Time × Group	1, 90	0.30	.586	.01	1, 85	0.31	.581	.01
Time × Video	1, 90	21.55	<.001**	.19	1, 85	21.59	<.001**	.20
Time × Group × Video	1, 90	1.30	.257	.01	1, 85	0.31	.582	.01

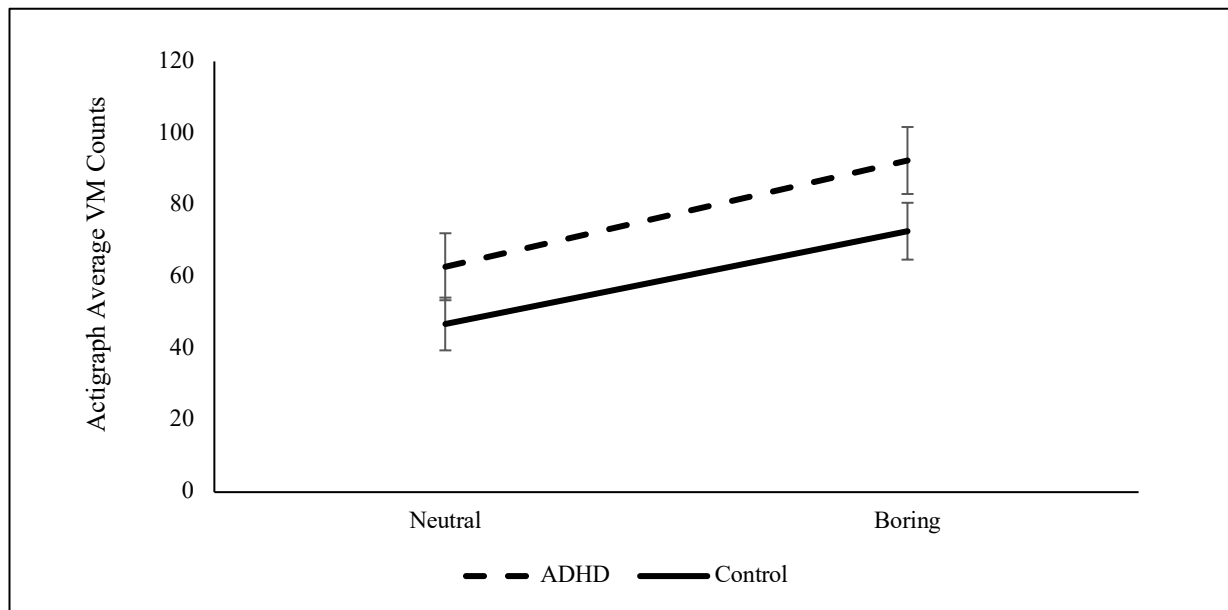
Note: Group= ADHD vs Control; Time= pre-video vs post-video; Video= Neutral vs Boring. ANCOVA covariates: SBPS and BSS; * $p < .05$; ** $p < .01$.

A 2 (Group: ADHD vs. Control) x 2 (Video Condition: Boring vs. Neutral) ANOVA on actigraph-measured activity level revealed a significant main effect of Video Condition, $F(1, 90) = 10.57$, $p = .002$, $\eta_p^2 = .11$, indicating that participants moved more during the boring video ($M = 82.55$, $SE = 6.12$) than the neutral video ($M = 54.82$, $SE = 5.94$). There was also a significant main effect of Group, $F(1, 90) = 4.37$, $p = .040$, with the elevated ADHD symptoms group ($M = 77.59$, $SE = 6.60$) exhibiting more motor activity than the control group ($M = 59.77$, $SE = 5.40$). The Group x Video Condition interaction was not significant, $F(1, 90) = 0.05$, $p = .826$, suggesting that the increase in activity from neutral to boring videos was similar across groups (See Figure 2). These results suggest that individuals with elevated ADHD symptoms exhibit generally higher motor activity, while all participants increase their activity levels in response to a boring task.

We next examined whether performance-based attention control predicts boredom above and beyond ADHD behavioral symptoms using separate multiple linear regression analyses. Prior to conducting regression analyses, we ran zero-order bivariate correlations to examine relations between our measure of performance-based attention control (i.e., SACT) and behavioral measures of boredom and ADHD (see Table 3). Results revealed significant, negative correlations between performance on the SACT and the SBPS ($r = -.358$), the BSS ($r = -.291$), MSBS₁ ($r = -.424$) and the ASRS-5 ($r = -.459$), indicating that worse performance on the SACT was associated with increased trait boredom, state boredom, and ADHD symptoms. Consistent with prior research, the two measures of trait boredom were not correlated ($r = .136$). Strong positive correlations were found between the SBPS and MSBS₁ ($r = .709$) and the ASRS-5 ($r = .721$); whereas the BSS was not significantly related to the MSBS₁ ($r = .078$). The correlation

between BSS and ASRS-5 was marginally significant ($r = .205$; $p = .051$). Finally, a significant, positive correlation was found between the MSBS₁ and ASRS-5 ($r = .527$).

Figure 2. Actigraph Average Vector Magnitude (VM) Counts by Group and Video Condition. Error Bars Represent Standard Errors.



Three linear regression models were conducted, testing SACT performance as a predictor separately for SBPS, BSS, and MSBS₁ (i.e., pre-video MSBS scores), controlling for ASRS-5 scores. In Model 1, SACT and ASRS-5 were entered in as predictors of SBPS. The model was significant, $F(2, 85) = 43.93$, $p < .001$, and explained 51% of the variance in trait boredom as measured by the SBPS, $R^2 = .514$. ADHD symptoms as measured by the ASRS-5 served as a significant predictor of SBPS ($b = 0.92$, $SE = 0.11$, $\beta = .70$, $t = 8.13$, $p < .001$), but SACT did not ($b = -0.03$, $SE = 0.06$, $\beta = -.04$, $t = -0.42$, $p = .677$). In other words, ADHD behavioral symptoms, rather than performance-based attention control predicted trait boredom as measured by the SBPS. In Model 2, SACT and ASRS-5 were entered in as predictors of BSS. The model was significant, $F(2, 84) = 4.05$, $p = .021$, and explained 9% of the variance in trait boredom as measured by the BSS, $R^2 = .090$. In contrast to the results of the SBPS, performance-based attention control as measured by the SACT served as a significant predictor of BSS ($b = -0.05$, $SE = 0.03$, $\beta = -.26$, $t = -2.16$, $p = .034$), but ASRS-5 did not ($b = 0.03$, $SE = 0.05$, $\beta = .08$, $t = 0.66$, $p = .511$). In other words, when controlling for ADHD symptoms, performance-based attention control independently predicted BSS. In Model 3, SACT, ASRS-5, SBPS, and BSS were entered in as predictors of state boredom as measured by MSBS₁. The model was significant, $F(4, 84) = 23.43$, $p < .001$, and explained 54% of the variance in state boredom as measured by the MSBS₁, $R^2 = .54$. Interestingly, both performance-based attention control as measured by the SACT and trait boredom as measured by the SBPS served as significant predictors of MSBS₁ (SACT: $b = -0.73$, $SE = 0.29$, $\beta = -.23$, $t = -2.56$, $p = .012$; SBPS: $b = 3.21$, $SE = 0.51$, $\beta = .68$, $t = 6.31$, $p < .001$), but ASRS-5 ($b = -0.44$, $SE = 0.71$, $\beta = -.07$, $t = -0.62$, $p = .534$) and BSS ($b = -0.63$, $SE = 1.23$, $\beta = -$

.04, $t = 0.52$, $p = .607$) did not. In other words, performance-based attention control and trait boredom as measured by the SBPS predict state boredom above and beyond ADHD symptoms.

Table 3. Zero-Order Bivariate Correlations.

Variable	ASRS-5	SBPS	BSS	MSBS ₁	SACT
1. ASRS-5	-				
2. SBPS	.721**	-			
3. BSS	.205	.136	-		
4. MSBS ₁	.527**	.709**	.078	-	
5. SACT	-.459**	-.358**	-.291**	-.424**	-

Note: * indicates $p < .05$, ** indicates $p < .01$; ASRS-5 = Adult ADHD Self-Report Rating Scale 5th Edition; BSS = Boredom Susceptibility Scale; MSBS = Multidimensional State Boredom Scale; SACT = sustained attention to cue task; SBPS = Short Boredom Proneness Scale.

4. Discussion

The present study examined whether adults with elevated ADHD symptoms exhibit higher trait boredom, greater state boredom and motor activity during a boredom induction task, and whether performance-based attention control predicts trait and state boredom beyond ADHD symptom severity. Consistent with prior research, individuals with elevated ADHD symptoms reported significantly higher levels of trait boredom than controls on both the SBPS and BSS, with a particularly large effect for the SBPS ($d = 1.67$) and a medium effect for the BSS ($d = 0.47$). These findings align with previous work documenting strong associations between ADHD symptoms and trait boredom in both ADHD and non-ADHD samples (Chou et al., 2018; Golubchik et al., 2020; Hunter & Eastwood, 2018; Kass et al., 2003; Mercer-Lynn et al., 2014; Muris et al., 2026), and extend prior findings of large group differences in trait boredom between individuals with and without ADHD (Hsu et al., 2025; Orban et al., 2026). These findings are consistent with the Boredom Feedback Model (BFM; Tam et al., 2021) which posits that chronic difficulties maintaining adequate attentional engagement may predispose individuals to more frequent and intense boredom experiences, and that chronic boredom may reflect dysfunction of the attentional feedback loop. Collectively, these findings support the robust link between ADHD and trait boredom and provide a foundation for examining how different aspects of boredom may differentially relate to ADHD symptomatology and attentional control.

Consistent with prior literature, our findings suggest that although the SBPS and BSS both assess trait boredom, they show divergent patterns of association with ADHD symptoms, attention control, and state boredom, consistent with the possibility that they capture different aspects of trait boredom (Gerritsen et al., 2014; Mercer-Lynn et al., 2013, 2014). Further supporting this interpretation, the two measures were not correlated in the present sample, consistent with prior research (Mercer-Lynn et al., 2013). The SBPS is generally characterized by disengagement, low motivation, and withdrawal, whereas the BSS reflects frustration, desire for stimulation, and sensation-seeking (Gerritsen et al., 2014; Greenson, 1951; Mercer-Lynn et al., 2013). These aspects of boredom also appear to differ in reinforcement sensitivity: BPS/SBPS scores have been linked to punishment sensitivity and internalizing symptoms such as depression (Gerritsen et al., 2014; Goetz et al., 2014; Malkovsky et al., 2012), whereas the BSS has been

associated with reward sensitivity, sensation seeking, and externalizing tendencies including anger and hyperactivity (Dahlen et al., 2004; Gerritsen et al., 2014; Malkovsky et al., 2012). This pattern is consistent with BFM's account of chronic boredom, which suggests that trait boredom may stem from (1) trait-like attentional factors, including individual differences in the ability to sustain attention and regulate attention allocation and (2) long-term factors related to whether one can engage in sufficiently meaningful activities (Tam et al., 2021).

The present findings tentatively suggest that the BSS may be particularly sensitive to trait-like attentional factors, as it was predicted by objective attention control performance independent of ADHD symptoms. Individuals with high BSS scores may be motivated to engage with their environment but experience frustration when attentional resources are insufficient to sustain engagement, leading to feelings of anger and motivation to escape the current situation (Dahlen et al., 2004; Goetz et al., 2014; Greenson, 1951). In this way, stimulation-seeking boredom (i.e., BSS) may reflect a mismatch between reward motivation and the ability to maintain cognitive engagement. The SBPS, predicted by behavioral ADHD symptoms, may tap into trait-like attentional factors, long-term difficulties engaging meaningfully with activities, or both – as ADHD is characterized by chronic weaknesses in attention systems (Tsal et al., 2005) and difficulties engaging in meaningful activities (Kazemy-Pour et al., 2025). It is worth noting that Orban et al. (2026) found that performance-based attention control, measured using a composite of multiple tasks, partially mediated the relation between ADHD symptoms and SBPS scores, suggesting that executive dysfunction may also contribute to disengagement-related boredom when assessed more comprehensively than in the present study. To our knowledge, these findings provide preliminary empirical support for the BFM's framework while also highlighting the complexity of mapping specific boredom measures onto different sources of trait boredom, an important direction for future research.

The boredom induction task successfully increased state boredom across all participants. Individuals with elevated ADHD symptoms did not report larger increases in state boredom than controls during the boring condition; rather, they reported higher overall state boredom across both videos. Importantly, this group difference was no longer significant after controlling for trait boredom, suggesting that elevated state boredom in those with elevated ADHD symptoms may reflect enduring individual differences in trait boredom rather than heightened sensitivity to specific monotonous situations. This is consistent with the BFM's framework that chronic difficulties maintaining adequate attentional engagement may predispose individuals to elevated boredom across settings rather than heightened reactivity to specific situational demands.

The absence of significant Group x Video interactions should be interpreted with caution given that the present study had limited statistical power to detect small interaction effects involving group (observed power = .20). It is therefore possible that true differences in boredom reactivity between individuals with elevated ADHD symptoms and control participants exist but went undetected in the present study. That said, one theoretical explanation for the absence of these interactions is that both videos may have been experienced as relatively under-stimulating by participants with elevated ADHD symptoms. These individuals reported higher overall boredom across conditions and demonstrated elevated trait boredom, suggesting a generalized susceptibility to boredom. If the neutral video was also perceived as somewhat monotonous, the relative difference in stimulation between conditions may have been attenuated for this group,

reducing the likelihood of detecting differences in reactivity. This interpretation is consistent with theoretical accounts proposing that individuals with ADHD require higher levels of environmental stimulation to maintain optimal arousal and engagement (Zentall & Zentall, 1983). A promising direction for future research is to examine boredom reactivity across tasks that vary in stimulation (e.g., neutral, boring, and highly engaging) to determine whether state boredom systematically differs as a function of task stimulation in individuals with ADHD, ideally using larger samples adequately powered to detect interaction effects.

Performance-based attention control and SBPS scores uniquely predicted baseline state boredom, whereas ADHD symptom severity and BSS scores did not. This pattern is consistent with BFM's framework, which suggests that inadequate attentional engagement is a proximal trigger for state boredom, such that individuals who struggle to maintain attentional engagement objectively, as well as those who with a chronic tendency toward disengagement, may be particularly vulnerable to experiencing boredom in the moment. This finding also partially aligns with prior work demonstrating that sustained attention performance predicts baseline state boredom in children with ADHD (Hsu et al., 2020) and extends these findings to adults by showing that both SBPS scores and attention control performance contribute to state boredom. The absence of a significant effect for BSS is also noteworthy, as stimulation-seeking boredom may function more as a behavioral response to state boredom than as a predictor of it, consistent with BFM's framework that boredom motivates attention shifts outward toward more stimulating alternatives (Tam et al., 2021). Finally, the finding that ADHD symptom severity did not independently predict state boredom after accounting for attention control and trait boredom suggests that the relationship between ADHD and state boredom may be better explained by these underlying mechanisms than by behavioral symptoms alone, consistent with the ANCOVA finding that group differences in state boredom were accounted for by trait boredom.

Actigraph-measured motor activity increased in all participants during the boring video compared to the neutral video, consistent with prior research linking motor restlessness to boredom (Danckert et al., 2018). Participants with elevated ADHD symptoms also exhibited higher overall motor activity across both videos, although both groups increased movement to a similar degree during the boring condition. These findings are consistent with recent evidence suggesting that boredom involves both low and high arousal experiences (Danckert et al., 2018; Stempfler et al., 2025), with motor restlessness reflecting attempts to reengage with the environment in response to an unsatisfactory situation (Elpidorou, 2021). Rather than simply compensating for low arousal, motor activity during boredom may reflect a broader attempt to restore engagement with the environment. For example, adults with ADHD exhibited greater fidgeting during later and correct trials of a sustained attention task, consistent with the idea that motor movements help maintain engagement over time (Son et al., 2024). Similarly, fidgeting has been associated with improved task performance in individuals with ADHD, indicating that movement may play a functional role in attentional regulation rather than merely reflecting ubiquitous or disruptive behavior (Dekkers et al., 2021; Hudec et al., 2015; Kofler et al., 2016; Rapport et al., 2009; Sarver et al., 2015). The finding that both groups increased motor activity similarly during the boring video suggests that this restlessness response to boredom may be a general phenomenon, with individuals with elevated ADHD symptoms showing an elevated baseline level of motor activity across both conditions.

Several limitations warrant consideration. First, reliance on self-report measures introduces the possibility of shared method variance and response biases, though actigraph and performance-based measures partially address this concern. Second, ADHD status was determined using self-report symptom scales rather than gold-standard diagnostic procedures (e.g., clinical interview, confirmation of impairment across settings), and comorbid psychiatric conditions were not systematically assessed. For example, affective symptoms such as depression or anxiety may influence both trait and state boredom. Therefore, future research should employ gold-standard diagnostic procedures and assess psychiatric comorbidities. Third, the sample consisted of primarily young adult female university students, which limits generalizability to other age groups and clinical populations. Because ADHD is more commonly diagnosed in males, the female-skewed sample may not fully capture the boredom profile of individuals with ADHD more broadly. Future research should prioritize more diverse and clinically representative samples. Fourth, the between-subjects design, while appropriate for avoiding order and carryover effects in the boredom induction task, resulted in approximately 19–29 participants per cell in the mixed factorial ANOVA. As a result, the study had limited statistical power to detect interaction effects involving group, with observed power ranging from .08 to .23 for these effects. The absence of significant Group x Video Condition and three-way interactions should therefore be interpreted cautiously, as true differences in boredom reactivity between ADHD and control participants may exist but have gone undetected. Future research should employ larger samples or within-subjects designs where feasible to improve power for detecting interaction effects. Fifth, attention control was assessed using a single performance-based task, which may not fully capture the breadth of executive processes relevant to boredom in ADHD. Prior work using composite measures of attention control has found stronger associations with boredom proneness (Orban et al., 2026), suggesting future research should employ multiple indices of cognitive control. Sixth, findings involving the BSS should be interpreted with some caution. Its forced-choice format may reduce internal consistency compared to Likert-based measures (Zuckerman, 2007), though internal consistency in the current sample was comparable to prior studies (Deditius-Island & Caruso, 2002). Additionally, while the BSS group difference was statistically significant, the observed effect size ($d = 0.47$) fell slightly below the detectable threshold for this analysis ($d = 0.60$), suggesting that replication in larger samples is warranted to confirm the reliability of this finding. Finally, the present study did not assess arousal directly, which limits interpretation of the motor activity findings in relation to theoretical accounts of boredom and arousal. Future research should include physiological measures of arousal to better understand the relationship between boredom, motor activity, and arousal in ADHD.

Despite these limitations, the present findings have important implications for intervention strategies targeting boredom in individuals with ADHD. The results suggest that boredom may serve as a meaningful signal of underlying attentional difficulties, highlighting the potential utility of helping individuals recognize and respond to boredom in a more adaptive manner. Consistent with BFM, interventions may be most effective when tailored to the underlying source of boredom: targeting attentional regulation for individuals whose boredom stems primarily from trait-like attentional difficulties and supporting meaningful engagement for those whose boredom reflects long-term difficulties finding satisfying activities (Tam et al., 2021). For example, training in emotion awareness may enable individuals to identify boredom as a cue to re-engage, prompting the use of strategies such as scheduling brief breaks, alternating

tasks, or incorporating social elements (e.g., studying with a partner). Interventions may also benefit from reducing attentional demands during cognitively effortful activities, such as breaking tasks into smaller, more manageable components, distributing work across shorter, structured intervals, and introducing external incentives to support sustained engagement. Additionally, given that boredom is often associated with tasks perceived as monotonous or lacking personal relevance (Danckert & Merrifield, 2018; Mercer-Lynn et al., 2014), strategies that enhance task meaning or introduce optimal levels of challenge may further mitigate disengagement. Finally, the observed patterns of motor activity suggest that allowing for movement or incorporating structured physical activity may support reengagement with the environment during tasks with insufficient environmental stimulation. Together, these approaches highlight the importance of targeting both attentional control and environmental modification to reduce boredom and improve functioning in individuals with ADHD.

Acknowledgements

This research was funded by an Undergraduate Research and Inquiry (URI) grant awarded by the University of Tampa (GR3266 22/23).

Declaration of Interest Statement

The authors have no conflicts of interest to disclose.

Use of Artificial Intelligence

During the reviewing-editing stage, the authors used ChatGPT (OpenAI, March 2026 version) to improve grammatical clarity. No AI tools were used to generate research data, interpret results, or draft substantive content.

Authorship Contribution (CRediT)

Jenna Santer and Sarah A. Orban: Conceptualization, Data curation, Formal analysis, Fundraising, Research, Methodology, Management of project, Resources, Software, Supervision, Visualization, Writing-first draft, Writing-reviewing and editing.

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Appendix A. Sensitivity Analyses and Observed Power.

Analysis	<i>n</i>	Minimal Detectable Effect Size	Effect Size Interpretation	Observed Power
T-Tests				
SBPS group comparison	94	$d = 0.59$	Medium	1.00
BSS group comparison	91	$d = 0.60$	Medium	.59
Mixed ANOVA				
MSBS: main effects and two-way interactions	94	$f = 0.10$	Small	.10 (Video Condition); 1.00 (Time; Group; Time x Video Condition)
MSBS: interaction effects involving group	94			.08 (Time x Group); .20 (Time x Group x Video Condition); .23 (Group x Video Condition)
Mixed ANCOVA				
MSBS: between-subjects effects	91	$f = 0.30$	Medium	.12 (Group); .18 (Group x Video Condition); .24 (Video Condition)
MSBS: within- and within/ between-subjects effects	91	$f = 0.12$	Small	.71 (Time); 1.00 (Time x Video Condition)
MSBS: interaction effects involving group	94			.09 (Time x Group; Time x Group x Video Condition); .18 (Group x Video Condition)
Between-Subjects ANOVA				
Actigraph Motor Activity	90	$f = 0.30$	Medium	.06 (Group x Video Condition); .54 (Group); .90 (Video Condition);
Linear Regressions				
Model 1: SBPS (2 predictors)	86	$f^2 = 0.12$	Small-Medium	1.00
Model 2: BSS (2 predictors)	85	$f^2 = 0.12$	Small-Medium	.72
Model 3: MSBS ₁ (4 predictors)	85	$f^2 = 0.15$	Medium	1.00

Note: SBPS = Short Boredom Proneness Scale; BSS = Boredom Susceptibility Scale; MSBS = Multidimensional State Boredom Scale. Effect sizes are reported as Cohen's d for t-tests, f for ANOVAs and ANCOVAs, and f^2 for linear regressions. Interpretation based on Cohen's (1988) conventions: for d , small = 0.20, medium = 0.50, large = 0.80; for f , small = 0.10, medium = 0.25, large = 0.40; for f^2 , small = 0.02, medium = 0.15, large = 0.35.