ADHD, Intuitive Eating, Interoceptive Awareness, and Meaning Mindset: Are they interrelated?

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Abstract

Intuitive eating is an approach often used for eating disorder recovery, and individuals with ADHD are at high risk for eating disorders. Individuals with Attention-Deficit/Hyperactivity Disorder (ADHD) may also have impaired interoceptive awareness, and interoceptive awareness may be associated with intuitive eating. It is also possible for meaning-making through a meaning mindset to be associated with interoceptive awareness, which could in turn facilitate intuitive eating. This study examined the relationships among ADHD symptoms, interoceptive awareness, intuitive eating, and meaning mindset. In particular, the indirect effects of interoceptive awareness and meaning mindset as mediators between ADHD symptoms and intuitive eating were investigated. Seventy-six adults between the ages of 18 and 63 years (mean age: 32.78 years) with varying levels of ADHD symptoms (37 participants with diagnosed ADHD) completed online questionnaires that included the Adult ADHD Self-Report Scale, Intuitive Eating Scale-2, Multidimensional Assessment of Interoceptive Awareness, and Adult Identity and Meaning Scale. Findings showed that higher ADHD symptoms were related to lower interoceptive awareness. Higher interoceptive awareness was also related to more intuitive eating. In addition, higher meaning mindset was related to higher interoceptive awareness, higher intuitive eating, and lower ADHD symptoms. Interoceptive awareness mediated between ADHD symptoms and intuitive eating, and meaning mindset mediated between ADHD symptoms and intuitive eating. Results from this study suggest that interoceptive awareness may be impaired in individuals with ADHD, and that interoceptive awareness mediates between ADHD symptoms and intuitive eating. Also, meaning mindset may be considered for its clinical implications in supporting interoceptive awareness and intuitive eating.

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Summary

Attention-Deficit/Hyperactivity Disorder (ADHD) is characterized by significant difficulties with attention and/or hyperactivity/impulsivity (Barkley, 1990), and individuals with ADHD have been identified as at risk for Eating Disorders (EDs) (Baraskewich & Climie, 2022). Intuitive eating is an adaptive approach to eating that is often an indicator of ED recovery (Koller et al., 2020). Interoceptive awareness involves the ability to recognize internal bodily signals, and has been implicated in both intuitive eating and EDs (Jenkinson, Taylor, & Laws, 2018). Research also suggests the potential for interoceptive awareness to be associated with ADHD (Kutscheidt et al., 2019). Meaning-making is characterized by a Meaning Mindset, which may be a possible strategy for enhancing interoceptive awareness (Armstrong et al., 2018). Although ADHD, interoceptive awareness, intuitive eating, and meaning mindset are important constructs, there is a paucity of studies that concurrently examine their interrelations. This study investigates how ADHD, intuitive eating, interoceptive awareness, and meaning mindset are associated with each other, with the ultimate goal of enhancing psychosocial interventions for ADHD and EDs.

Attention-Deficit/Hyperactivity Disorder (ADHD)

ADHD is a neurodevelopmental disorder characterized by three presentations of symptoms: predominant inattentiveness, predominant hyperactiveness/impulsiveness, and a combined presentation of inattentiveness and hyperactivity/impulsivity (American Psychiatric Association, 2022). In 2007, it was estimated that 5.3% of the population worldwide had ADHD. Given the lifelong impact of ADHD and the increasing rate of adult ADHD diagnoses, the worldwide prevalence rate for adults has likely increased (Katzman et al., 2017; Xu et al., 2018). Indeed, according to national population surveys, the prevalence

of ADHD in Canada has increased by 4% between 1997-2016, with an estimated prevalence of 2.9% of adults between the ages of 20-64 years diagnosed with ADHD (Hesson et al., 2018; Xu et al., 2018).

ADHD symptoms are known to impact an individual's executive functioning, which refers to the brain's ability to activate, organize, integrate, and manage various functions required for memory, planning, self-regulation, internalization of speech, and so forth (Katzman et al., 2017; Wilens & Spencer, 2010). Not everyone with ADHD will suffer impairments in each area listed above, however, these difficulties tend to present together. For adults with the Predominantly Inattentive Presentation of ADHD, symptoms may include challenges with paying attention to detail, organizing multiple tasks, meeting deadlines, remembering personal items, and not being easily distracted (Katzman et al., 2017). For an individual with ADHD, Predominantly Hyperactive/Impulsive Presentation, impairments may include extreme restlessness, excessive talking, interrupting others, and difficulty waiting one's turn (Katzman et al., 2017; Wilens & Spencer, 2010).

Although many individuals experience challenges with time management, restlessness, and forgetfulness, the threshold required for a clinical diagnosis of ADHD based on the Diagnostic and Statistical Manual of Mental Disorders – 5 Text Revision (DSM-5-TR; American Psychiatric Association, 2022) involves a significant degree of interference of these symptoms on one's ability to function in home, social, and work or academic settings (Katzman et al., 2017; Wilens & Spencer, 2010). Disorders that co-occur with ADHD include Substance-Use Disorders, Bipolar Disorder, Depressive Disorders, and Anxiety Disorders (Katzman et al., 2017). In addition to other commonly co-occurring psychological disorders, ADHD has been found to co-occur with EDs (Bleck, DeBate, & Olivardia, 2015).

Eating Disorders (EDs)

EDs are psychological disorders characterised by severe disturbances in one's eating behaviours in response to disturbing thoughts and emotions (American Psychiatric Association, 2022). The DSM-5-TR (American Psychiatric Association, 2022) has outlined seven types of feeding and eating disorders, all of which have their respective diagnostic criteria. Among these types of EDs, the most diagnosed are Anorexia Nervosa, Bulimia Nervosa, Binge Eating Disorder, and Otherwise Specified Feeding and Eating Disorder (National Eating Disorder Association, 2023). Based on recent statistics, between 2-3% of the population are diagnosed with an ED in Canada and approximately 9% of the global population are diagnosed with an ED, with most of these diagnoses in adolescents and young adults (Rittenhouse, 2021). According to the National Eating Disorders Association (2023), 0.3-1% of young women and men between the ages of 16-28 years meet criteria for Anorexia Nervosa or Bulimia Nervosa at any given point.

In addition to general prevalence rates, studies have documented a significant rise in ED symptomology across the globe during the COVID-19 pandemic (Otto et al., 2021; Tavolacci et al., 2021). In fact, a systematic review by Devoe et al. (2022) reported a 16% increase in adult hospital admissions related to EDs within the first two years of the pandemic. Despite EDs having the highest mortality rate (between 10-15%) of any mental disorder due to the severe physiological implications of the disorder, such as heart complications, neurological impairments, and endocrinological complications (Walter, 2022), research has shown that EDs are less seriously perceived compared to other mental health diagnoses possibly due to the associated stigma (Rose et al., 2021; Smink, van Hoeken & Hoek, 2012).

Although ED symptoms are characterised by negative food-related beliefs and behaviours, risk factors point to underlying causes that go beyond the food itself (Polivy &

Herman, 2002). Negative body image and poor self-concept are widely recognized risk factors for disordered eating and EDs, and for many, ED symptoms can manifest to create or sustain a sense of control over one's life (Polivy & Herman, 2002). Many studies have found that depression and anxiety are more prevalent among those with EDs (Tan et al., 2023), and an individual experiencing anxiety and depression may turn to food and/or their bodies to control their worries and to create a sense of meaning and purpose in their life. Turning to food to cope with anxiety and obtain a semblance of control may also have been exacerbated by the recent COVID-19 pandemic, which has resulted in increased isolation, feelings of hopelessness, and additional stressors (Devoe et al., 2022).

Treatments for Attention-Deficit/Hyperactivity Disorder and Eating Disorders

Current approaches to adult ADHD treatment involve medication and psychosocial intervention (Geffen & Forster, 2018). Pharmacotherapy is one of the most common interventions to alleviate ADHD symptoms in adults, with methylphenidate and amphetamines being more frequently prescribed than other medications (Moriyama et al., 2013). Stimulant medication appears to be most effective in managing core ADHD symptoms on a short-term basis, and has been found to be related to improved mental health (Fredriksen et al., 2014; Moriyama et al., 2013). In addition to medication, non-pharmacological interventions for adult ADHD treatment include Cognitive Behavioural Therapy and Mindfulness-Based Therapies. Cognitive Behavioural Therapy, which emphasises the interplay between cognitions, emotions, and behaviours, appears to be an effective therapeutic approach to reducing ADHD symptoms related to executive functioning and self-regulation (Liu et al., 2023). As many individuals with ADHD experience subsequent mental health challenges such as anxiety and depression, significant decreases in mental health symptoms secondary to Cognitive Behavioural Therapy interventions have been observed (Liu et al., 202; Lopez et al., 2018). Improved outcomes for ADHD symptom management

have been identified in individuals by combining Cognitive Behavioural Therapy and pharmacotherapy (Lopez et al., 2018).

Mindfulness-based therapies have also been identified as a potential treatment approach to managing ADHD symptoms in both child and adult populations (Fullen et al., 2020). Mindfulness practices emphasize experiential processes that utilize similar pathways required in attention and self-regulation (Sumantry & Stewart, 2021). Recent systematic reviews revealed significant improvements in ADHD symptoms including inattention, hyperactivity, impulsivity, and emotion regulation in adults with ADHD, secondary to mindfulness interventions (Lee et al., 2017; Sanchez-Soto & Sanchez-Suricalday, 2023). Other psychological treatments such as Dialectical Behavioural Therapy and neurofeedback have also been explored as potential treatment options for adults with ADHD (Fullen et al., 2020).

With respect to ED treatment, ED recovery often involves a multidisciplinary approach that includes a family physician or nurse practitioner, a dietitian, and a therapist (Ozier & Henry, 2011). Given the complex nature of EDs, enhanced interventions are needed to prevent and support individuals through full recovery. Nutrition therapy to address nutrient deficiencies is one of the primary goals of ED recovery, along with normalizing eating patterns (Ozier & Hebert, 2011). A multidisciplinary approach is helpful, and this is achieved through the collaboration of registered dietitians and therapists, who may provide Cognitive Behavioural Therapy, Dialectical Behavioural Therapy, and Family-Based Therapy (Vogel et al., 2021). Long-term goals of treatment include an improved relationship with food and body and adequate nutrient intake based on hunger and satiety cues (de Vos et al., 2017). Indeed, given that hunger and satiety signals are often impacted in individuals with Anorexia Nervosa, Bulimia Nervosa, and Binge Eating Disorder, their ability to notice and respond to their hunger and fullness cues can be a clinical indicator of recovery (de Vos et al., 2017).

In addition to the above psychosocial treatments, Mindfulness-Based Therapies have been shown to decrease ED symptomology, as many components of mindfulness have been associated with increased body satisfaction, less binge eating and emotional eating behaviours, and higher levels of interoception (Adams et al., 2012; Lazar et al., 2005; Sala et al., 2020). Additionally, intuitive eating, an eating practice that contains elements of mindfulness, has been found to be positively correlated with self-compassion, distress tolerance, body image, and self-esteem (Schoenefe & Webb, 2013). In fact, a 2-year study by Richard et al. (2017) found that inpatient and outpatient ED patients were more likely to honour their hunger and satiety cues when their relationship with food and their bodies improved. The intuitive eating framework as it applies to ED recovery continues to be examined as a treatment approach, and research in the field suggests the need to improve existing ED treatment approaches given high rates of mortality and relapse (van Hoeken & Hoek, 2020).

Interoceptive Awareness

Interoceptive awareness refers to our ability to detect, understand, and respond to the body's internal signals, such as body temperature, hunger, and thirst (Craig, 2015). Contrary to exteroception (awareness of external environment) and proprioception (awareness of the body within its space), interoception is an adaptive mechanism that allows individuals to perceive sensations within the body as it relates to emotions, digestion, pain, and so forth (Craig, 2015). Interoception is multidimensional as many elements are involved in the conscious and unconscious processes of communication within the body. In general, interoceptive awareness refers to one's ability to consciously interpret internal signals (Mehling et al., 2018).

Mindfulness-based interventions utilize interoception as a core process to foster and reinforce the mind-body connection by way of interpreting and relating to the body (Mehling,

Todd & Schuman-Oliver, 2022). Interoceptive awareness can be divided into eight specific domains: noticing, not distracting, not worrying, attention regulation, emotional awareness, self-regulation, body listening, and trusting (Mehling et al., 2018). Based on Mehling et al. (2018), the following descriptions are entailed for each dimension: Noticing involves being aware of various body sensations. Not distracting involves not being easily distracted from these body sensations. Not worrying indicates not being emotionally distressed when experiencing physical discomfort. Attention regulation refers to being able to keep focusing on bodily sensations. Emotional awareness involves being aware of emotions related to physical sensations. Self-regulation involves being able to focus on bodily sensations to regulate one's distress. Body listening involves tuning into the body for insight. Finally, trusting involves one's capacity to view bodily sensations as non-threatening and rely on them.

Eating Disorders and Interoceptive Awareness

Research indicates that interoceptive awareness deficits are related to EDs. Studies suggest a positive correlation between interoceptive awareness and ED recovery both in the short- and long-term. In a meta-analysis, Jenkinson et al. (2018) found significant interoception deficits in individuals with lower BMIs compared to those with higher BMIs, suggesting that interoceptive awareness is impaired in individuals with restrictive ED subtypes, such as anorexia nervosa. Interestingly, Brown et al. (2020) examined body mistrust as a potential overriding factor in one's ability to respond to their somatic signals among adults and adolescents with ED. Their results suggest that body mistrust may be the mechanism by which interoceptive awareness and EDs are maintained, as feeling unsafe in one's body and having a strong desire to lose weight were predictors of prognosis and remission rates.

Similarly, Merwin et al. (2010) investigated the relation between interoceptive awareness and EDs with respect to non-acceptance of emotional experiences. They found that ED symptoms, more specifically restriction, may be potential avoidant responses to affective arousal such that restrictive and binge eating behaviours amplify internal somatic experiences (e.g., hunger), thereby distracting one from their affective experience. This avoidance of emotion in individuals with eating pathologies may be related to reduced IA. Overall, research suggests that individuals with EDs have significant impairments in interoception. More research is needed to better understand the relation between interoceptive awareness and eating as it would further inform the purpose of intuitive eating as a clinical approach to ED recovery.

Intuitive Eating

Intuitive eating is an adaptive approach to nutrition that relies heavily on hunger and satiety signals (Tribole & Resch, 2020). It is informed by the notion that our bodies contain physiological mechanisms that are designed to help humans survive and thrive by nourishing their bodies adequately to meet their needs (Tribole & Resch, 2020). Hunger is a biological system comprised of physiological and hormonal processes designed to communicate the body's need for food (Stevenson et al., 2015). With the rise of diet and wellness culture, a prominent narrative around nutrient restriction and weight loss have taken the attention away from recognizing and responding to these internal messages. Therefore, intuitive eating relies on human biology to signal to our brains when, what, and how much to eat, thus reinforcing the mind-body connection (Tribole & Resch, 2020). However, adequate nutrition goes beyond the body's ability to produce hunger and satiety hormones. It also relies on the person's ability to recognize the presence of hunger cues, thus, requiring a degree of interoception (Stevenson et al., 2015).

Intuitive eating is an eating style that promotes a positive relationship with food and body, and has also been shown to be associated with improved health outcomes as an alternative to dieting. Many studies have found that weight loss diets are not effective, nor do they warrant any positive physical or psychological health outcomes in the long term, yet research has shown that intuitive eating is related to lower Body Mass Index and improved psychological well-being (Van Dyke & Drinkwater, 2013). In fact, intuitive eating has been shown to increase well-being and decrease ED symptomology (Tylka & Wilcox, 2006). A systematic review by Bruce and Ricciardelli (2016) examined intuitive eating in relation to eating behaviours, attitudes, body image, and emotional functioning. The results suggested that intuitive eating was associated with less disordered eating and greater emotional functioning, thus, promoting healthier physical and psychological well-being.

Interestingly, a systematic review by Paslakis et al. (2021) assessed for implicit biases (i.e., an automatic bias) in individuals with EDs with regards to food and body cues. It was concluded that implicit biases predicted an individual's food choices when their cognitive abilities were low (e.g., being distracted) or when they had high levels of impulsivity. They also suggested that implicit impulses to eat certain types of foods may be regulated by explicit biases such as body image, diet culture, and fatphobia, thus increasing ED symptomology, essentially suggesting that intrinsic motivation related to eating behaviours may be significantly impacted by one's social environment. Given associations between biases and intuitive eating, these results help in understanding the relationship between intuitive eating and EDs.

Intuitive eating is understood to be achievable by individuals who can attune to their hunger and satiety cues accurately, and therefore has been negatively associated with disordered eating (Bruce & Ricciardelli, 2016). Underscoring the link between intuitive eating and EDs, a 2-year study examined whether intuitive eating is achievable for

individuals recovering from Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder Not Otherwise Specified in young adult women (Richard et al., 2017). Participants were patients who were admitted to a residential eating disorder program and who completed a series of pre- and post-admission questionnaires. The authors found that intuitive eating could be taught and learned by individuals in inpatient and residential ED treatment programs. Indeed, participants' acceptance in responding to their body's hunger and satiety cues appeared mediated by their improved relationship with food and their bodies.

In addition to improved eating, intuitive eating has been found to be positively correlated with self-compassion, distress tolerance, body image, and self-esteem (Schoenefeld & Webb, 2013). Such outcomes are consistent with other studies suggesting that correlates of intuitive eating include body acceptance and appreciation (Andrew et al., 2015; Avalos & Tylka, 2006; Tylka & Homan, 2015). In fact, the acceptance model of intuitive eating developed by Avalos and Tylka (2006) suggests that intuitive eating may be developed when individuals experience acceptance of their bodies from others, suggesting that intuitive eating is likely to occur when body appreciation and body trust is high. Since intuitive eating promotes positive relationships with food and body image, intuitive eating appears to be an important precedent and approach to eating disorder recovery.

Intuitive Eating and Interoceptive Awareness

Studies have shown that the ability to eat intuitively is related to interoceptive awareness (Craig, 2015; Herbert et al., 2013; Jenkinson et al., 2018; DeVille, Erchull & Mailloux, 2021). Herbet et al. (2013) found a significant relation between participants' interoceptive sensitivity and their ability to recognize and respond to hunger and satiety cues for those recovered and without an ED, with BMIs within the healthy range. Intuitive eating scores did not differ between the recovered group and the control group without an ED. In

fact, both groups demonstrated high levels of intuitive eating, suggesting that intuitive eating is achievable when one has recovered from an ED.

If hunger and satiety are reliant on interoception, what happens when one's interoceptive pathways are interrupted? DeVille, Erchull, and Mailloux (2021) found that reliance on hunger and satiety cues mediated the relationship between interoceptive accuracy and ED risk among female university students. They proposed that impaired interoceptive sensitivity interrupts one's ability to respond to hunger and satiety cues, which sustain patterns of under and/or overeating, thus reinforcing ED behaviours and increasing ED risk. The results showed that interoception was positively and significantly correlated with intuitive eating. These findings are consistent with the literature suggesting that many EDs, namely Anorexia Nervosa, Bulimia Nervosa, and Binge Eating Disorder, are correlated with interoceptive awareness deficits in adults (Jenkinson et al., 2018; Merwin et al., 2010; Perry et al., 2021). Further considerations pertaining to interoceptive awareness deficits, EDs, and intuitive eating should be explored.

ADHD and Interoceptive Awareness

Although the evidence for the association between interoceptive awareness and EDs is strong, there exists much less research on the relationships between ADHD and interoceptive awareness. Wider research and theory suggest that impaired interoceptive awareness may be associated with challenges with self-regulation among individuals with ADHD, as it requires the ability to monitor one's internal state (Beheshti et al., 2020; Betul Usta & Karas, 2021). However, few studies have directly examined associations between interoceptive awareness in terms of detection of bodily signals and ADHD. In one of these studies, Wiersema and Godefroid (2018) examined difficulties in interoceptive awareness among individuals with and without ADHD using the heartbeat detection task. The heartbeat detection task assesses one's ability to accurately recognize their heartbeat, which requires the ability to recognize

internal stimuli (Wiersema and Godefroid, 2018). They found no significant difference between the participants with and without ADHD with respect to objective and subjective interpretations of interoceptive awareness.

In contrast, a similar experimental study by Kutscheidt and colleagues (2019) found that individuals with ADHD showed poorer ability to detect internal bodily signals in a heartbeat detection task compared to a non-ADHD control group, therefore suggesting impaired interoceptive awareness in adults with ADHD. Overall, existing research on interoceptive awareness among individuals with ADHD are limited and with mixed results. However, the wider literature suggests that interoceptive awareness and ADHD may be related given the centrality of interoceptive awareness in self-regulation (Price & Hooven, 2018). Thus, more research is required to understand how interoceptive awareness is related to ADHD symptoms.

ADHD, EDs, and Intuitive Eating

Research shows an association between ADHD and EDs, suggesting that ADHD symptoms may be associated with challenges in eating intuitively. Indeed, eating challenges have been identified as a common issue among the ADHD population, and individuals with ADHD have been identified as a high-risk demographic for EDs, more specifically for bulimia and binge/purge tendencies than restrictive tendencies (Baraskewich & Climie, 2022; Hirst et al., 2017; Fernandez-Aranda et al., 2013; Svedlund et al., 2020). In fact, results from a 1-year follow-up study by Svedlund et al. (2020) found that poor ED recovery was related to binge-eating, loss-of control eating, and purging among individuals with inattentive symptoms of ADHD. This study suggests that ADHD symptoms can be present in individuals with EDs and may sustain ED-related behaviours.

Other studies have reported similar conclusions. For instance, results from Baraskewich & Climie (2022) found that ADHD symptoms were associated with ED

symptoms in a sample of students between the ages of 18-22 years. The authors suggest that the results may be attributable to shared executive functioning deficits, poor emotion regulation, and mood challenges among both disorders, with more significant associations with ED symptoms in particular with the inattentive symptoms of ADHD. Testa et al. (2020) assessed the impact of ADHD symptoms on dropout rates of ED treatment recovery in a clinical sample of female adults with eating disorders. They found that the severity of ED symptoms mediated the relationship between ADHD and ED treatment outcomes. Indeed, findings suggest that ADHD symptoms may be a contributor to the dropout rate at various stages of ED treatment. Similarly, Svedlund et al. (2020) found that as ED recovery progressed, self-reported ADHD symptoms decreased, suggesting that a higher degree of ADHD symptoms may have a negative impact on ED symptom recovery. Furthermore, a systematic review by Kaisari et al. (2018) found that ADHD is associated with disordered eating.

The associations between ADHD and EDs are complex as research indicates a bi-directional relationship (Devoe et al., 2022; Tan et al., 2023). Individuals with EDs (most commonly Anorexia Nervosa or Bulimia Nervosa), are at high risk for malnutrition due to weight loss and inadequate nutrient and caloric intake, which can in turn manifest into disrupted neurobiological pathways, which can present as certain symptoms of ADHD, such as inability to concentrate and poor executive functioning (Ptacek et al., 2016; Setnick, 2010; Wilens & Spencer, 2010). Interestingly, there appears to be some overlap in nutrient deficiencies between individuals with EDs and individuals with ADHD, such as in iron and vitamin D (Lange et al., 2023; Setnick, 2010). Such nutrient deficiencies have the potential to exacerbate symptoms of both EDs and ADHD (Lange et al., 2023). Indeed, the literature points to higher risk of malnutrition in individuals with EDs which in turn may perpetuate the severity of ADHD symptoms (Ptacek et al., 2016; Setnick, 2010).

The literature also suggests that ADHD symptoms such as impulsivity, time blindness, and inattentiveness may perpetuate ED behaviours such as skipping meals, food fixations, and purging, leading to nutrient deficiencies (Ptacek et al., 2016). In fact, Anderberg et al. (2016) found that ghrelin (a hunger hormone) was associated with impulsive behaviour, novelty seeking, and the food-reward system in rats. Although it is understandable that a hunger hormone would precipitate a degree of impulsivity as a primal response for food, the results found that ghrelin played a role in impulsive behaviour outside of hunger. Although this study with animals has its limitations with respect to generalizability, it presents additional factors to consider in the interplay between ADHD and eating behaviours. Given some overlap in symptoms and etiological mechanisms for ADHD and EDs, it is difficult to disentangle the directionality of such a relationship.

Although a number of studies exist with respect to ADHD and EDs, and much can be inferred regarding the relationship between ADHD and intuitive eating given the links between ED and intuitive eating, there is a dearth of studies examining ADHD and intuitive eating in particular. Some results on ADHD and intuitive eating per se can be found in Kaisari et al. (2018)'s review, in which the association between ADHD symptoms and binge/restrictive eating behaviours was examined using the Reliance on Hunger and Satiety subscale from the Intuitive Eating Scale-2 (IES-2). Higher inattentive symptoms were associated with lower levels of awareness and reliance on hunger/satiety, which in turn were related to restrictive eating behaviours. Similar results were found for individuals with hyperactive/impulsive symptoms, such that these symptoms were associated with restrictive eating behaviours and lower levels of reliance on hunger/satiety. The existing links between EDs and intuitive eating as well as EDs and ADHD corroborates this result showing the negative relationship between ADHD symptoms and intuitive eating.

ADHD, Intuitive Eating, and Interoceptive Awareness

Strong links exist in the literature regarding ADHD and EDs, EDs and interoceptive awareness, and EDs and intuitive eating. More research is needed to understand the presence of interoceptive awareness in individuals with ADHD, and the associations of ADHD with the specific construct of intuitive eating. Given the wider literature, interoceptive awareness may be a common mechanism underlying the association between ADHD and EDs. Understanding the role of interoceptive awareness among ADHD and intuitive eating may inform more efficient and effective interventions for individuals with both diagnosed ADHD and ED.

A review of the literature yields only one study that has examined ADHD, intuitive eating, and interoceptive awareness. This recent study by Martin, Dourish and Higgs (2023) examined the constructs of interoceptive awareness, ADHD, intuitive eating, and EDs among adult men and women in the United Kingdom. Their results suggest that intuitive eating is a mediator between ADHD inattentive symptoms and both restrictive eating and binge eating. In addition, interoceptive accuracy but not interoceptive awareness mediated the relationship between ADHD inattentive symptoms and binge eating behaviours. Indeed, they found that a self-perceived ability to accurately detect body signals, rather than a self-perception of simply being aware of body signals per se, was related to ADHD inattentive symptoms and binge eating. Given that only one study to date has examined these relationships, the current study will be important to add meaningfully to the research literature and inform psychosocial interventions for ADHD and ED. The present study therefore includes measurement of a construct expected to be important to understanding interoceptive awareness in context of ADHD and intuitive eating, that is, meaning-mindset.

Meaning-Making in Relation to ADHD, Interoceptive Awareness, and Intuitive Eating

The theory of logotherapy is based on the idea that meaning in one's life contributes to one's desire and motivation for living a fulfilling life, and therefore, helps individuals to pursue their unique purpose (Schulenberg et al., 2008). Meaning mindset refers to a mindset that leads to greater meaningfulness, compassion, and resilience (Armstrong, Desson, St. John, & Watt, 2019). Informed by Third Wave Positive Psychology (Lomas et al., 2021), Meaning mindset is an orientation toward recognizing valued moments and experiences, and connecting with others and/or with situations through agency, positive self-concept, openness to experience, and hope for the future (Armstrong & Potter, 2022; 2023). Meaning mindset, as well as approaches that enhance such a mindset, is inversely associated with externalizing and internalizing concerns, including ADHD and mood symptoms (Armstrong et al., 2019).

Further support for the potential importance of meaning mindset for ADHD symptoms comes from mindfulness-based therapies, which also involves a mindset of acceptance and openness to experience. Such mindfulness interventions are often used to increase an individual's awareness of their thoughts, emotions, and physical sensations, cultivating a sense of acceptance (Cairncross & Miller., 2016; Weng et al., 2021). Research suggests that mindfulness-based treatment may cultivate interoceptive awareness in individuals with ADHD (Fissler et al., 2016; Weng et al., 2021). Indeed, a meta-analysis by Cairncross and Miller (2016) examined the outcomes of mindfulness-based treatments on symptoms of inattention, hyperactivity and impulsivity in individuals diagnosed with ADHD. Results indicated that symptoms of inattention and hyperactivity were reduced in the course of these treatments.

More recent systematic reviews have also found significant improvements in attention, hyperactivity, and impulsivity after mindfulness-based treatments among individuals with ADHD (Lee et al., 2017; Sanchez-Soto & Sanchez-Suricalday, 2023). In

addition, Mitchel et al. (2013) examined the impact of mindfulness-based interventions on executive functioning in adults with ADHD. They conducted an 8-week long mindfulness program, and the results from the pre- and post-treatment self-reports revealed improvements in executive functioning. The correlation between mindfulness-based therapies and decreased ADHD symptoms suggest that meaning mindset may be important to understand in context of interoceptive awareness, with the aim of improving ADHD symptoms.

In addition to individuals with ADHD struggling with core ADHD symptoms given the stigma associated with ADHD symptoms, many with ADHD feel judged and criticised by others, resulting in low self-esteem, sensitivity towards criticism, and increased self-criticism (Beaton et al., 2022; McKeague et al.,2015). Such secondary psychological consequences may lead to avoidant and maladaptive coping strategies, thus further exacerbating feelings of low self-worth as well as functional impairment (Farmer et al., 2023; Kaisari et al., 2018; Martin, Dourish and Higgs, 2023). It is possible for meaning mindset to be helpful with regulating ADHD symptoms and challenges associated with these symptoms, such as by reducing negative mood and enhancing self-compassion. Indeed, programs that enhance meaning mindset also have been found to enhance mood (Armstrong et al., 2019), and research suggests the importance of self-compassion for individuals with ADHD and mental well-being. For instance, Farmer et al. (2023) explored the mediating role of self-compassion in mental health, emotion regulation, and ADHD symptoms among university students. They found that poor mental health was highly correlated with low self-compassion, and that low self-compassion combined with emotion regulation difficulties may influence the relationship between ADHD and mental well-being.

Turning to eating pathologies, EDs have been associated with feelings of hopelessness, meaninglessness, and challenges with emotional regulation (Devoe et al., 2022; Polivy & Herman, 2002). Relevant to meaning mindset, a study by Marco, Canabate and

Pérez (2019) found that meaning in life was a significant variable in ED severity, more specifically for individuals with Anorexia Nervosa, which suggests that higher meaning in life could act as a protective factor towards beliefs and behaviours around food and body dissatisfaction. Similarly, a meta-analysis by Linardon et al. (2018) explored numerous correlates to intuitive eating, including gender, body mass, eating disorders, as well as adaptive (positive body image, self-compassion, wellbeing) and maladaptive (depressive and anxiety symptoms) psychological constructs. Their findings suggest that those with better mental health and well-being are more likely to be guided by their hunger and satiety signals. Finally, Koller et al. (2020) examined the presence of positive body image among individuals fully recovered from EDs and individuals without an ED in relation to their ability to eat intuitively. Results suggest that individuals with positive body image scored highly on intuitive eating.

In addition, meaning mindset is oriented towards openness to experience (Armstrong & Potter, 2022). This openness to experience can be with respect to internal or external experience. It is therefore possible for meaning mindset to be associated with interoceptive awareness, which in turn could facilitate intuitive eating. Additional support for the relevance of meaning mindset for EDs stem from studies showing positive implications of mindfulness-based interventions on eating challenges (Sala et al., 2020). Taken together, research suggests that a positive psychology framework, emphasizing aspects related to a meaning mindset may be protective against the development of eating disorders.

On the whole, given the potential relevance of meaning-mindset to ADHD, EDs, interoceptive awareness, and intuitive eating, it will be important to understand how meaning mindset is related to these constructs. Meaning Mindset has been identified as a potential adaptive strategy for enhancing emotional awareness (Armstrong & Potter, 2022; Armstrong et al., 2019), which in turn requires interoceptive awareness (Pollatos, Gramann, & Schandry,

2007). Meaning mindset also appears to have shared goals with mindfulness-based interventions, with a common focus on openness to experience in the here and now (Smalley et al., 2009). An exploration of its associations with constructs related to ADHD and EDs is an important step towards understanding how such a perspective might inform ADHD and ED treatments. Overall, no studies have simultaneously examined the associations between ADHD, intuitive eating, interoceptive awareness, and meaning mindset. The current study represents a significant contribution to the empirical and clinical literature.

Current Study

This cross-sectional study examined how ADHD symptoms are related to interoceptive awareness, intuitive eating, and meaning-mindset among a sample of adults with varying ADHD symptoms. It was predicted that individuals with higher ADHD symptoms will score lower on measures of interoceptive awareness, intuitive eating, and meaning mindset, compared to individuals with lower ADHD symptoms. In addition, interoceptive awareness was predicted to be a mediator between ADHD symptoms and intuitive eating. Similarly, meaning mindset was predicted to be a mediator between ADHD symptoms and intuitive eating. Such results would be consistent with the possibility that individuals with higher ADHD severity are more likely to have difficulties with interoceptive awareness, which in turn relates to challenges in eating intuitively. Such a pattern of findings would also indicate that meaning-making may offer a potential unique component to ADHD and intuitive eating interventions. The results of this study and future related research may help inform clinicians and guide treatment decisions, ultimately improving the quality of life for individuals with ADHD and co-occurring eating challenges. This study will also help add to existing research to ultimately continue to broaden our understanding of the psychological and physiological mechanisms of eating-related challenges among individuals with ADHD.

Methods

A sample of seventy-six participants was recruited for this study. Recruitment occurred after ethics approval was attained for this study. Recruitment notices were distributed in local coffee shops near universities in Ottawa, Ontario, on the Saint Paul University email listserv, and on social media (i.e., Facebook and Instagram). Participants met recruitment criteria for this study if they were 18 or more years of age and currently living in Ontario, Canada. Interested participants emailed the thesis student at Saint Paul University to schedule a 15-minute telephone interview. During this telephone call, eligibility for the study was reviewed along with the consent form. If a prospective participant met eligibility criteria for the study and provided consent to participate, questions from the Adult ADHD Self-Report Scale Symptom Checklist (ASRS-v1.1; Kessler et al., 2005) were asked regarding symptoms of ADHD. Participants then received a link to the online consent form and questionnaires for the study.

The online questionnaires examined the main study variables of intuitive eating, interoceptive awareness, and meaning-making, along with other variables to better understand the study sample, which include symptoms of EDs and other mental disorders along with demographic information. The online consent form and questionnaires were administered via Survey Monkey, an online survey platform. Participants were assigned a participant number, and all ethical processes were adhered to. Grant funding through Saint Paul University was awarded for the purpose of paying participant honourariums. A $5 online gift card was received by each participant as an honourarium in appreciation for their participation in the study.

Measures

Main Variables with Subscales Used for Exploratory Analyses

Adult ADHD Self-Report Scale Symptom Checklist (ASRS-v1.1)

The ASRS-v1.1 (Kessler et al., 2005) is comprised of 18 questions used to identify ADHD symptoms in terms of inattentiveness and hyperactivity/impulsivity in adults, and reflects DSM-5-TR criteria. This questionnaire does not confirm nor provide a clinical diagnosis for ADHD, and was administered during the telephone interview to assess for ADHD symptoms in participants for the purpose of the study. Participants responded to items in the questionnaire by reflecting on their experiences over the last six months, and selected one of the following response options for each question: *never, rarely, sometimes, often*, or *very often*. The measure included two domains of symptoms: (1) inattentiveness, and (2) hyperactivity/impulsivity. An example of a question from this questionnaire in the inattentiveness domain is, *How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?* A sample item from the hyperactivity/impulsivity domain is, *How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?* This measure has demonstrated high reliability in ADHD and non-ADHD samples (Silverstein et al., 2017), as well as adequate validity (de Glind et al., 2013; Kessler et al., 2005). This questionnaire yields specific subscales and an overall total score that were used in this study, with higher scores indicating more severe ADHD symptoms.

Intuitive Eating Scale-2 (IES-2)

To operationalize intuitive eating, the IES-2 (Tylka & Kroon van Diest, 2013) was used. This self-report questionnaire has 23 items that are rated on a 5-point Likert scale, with the following descriptors: *strongly disagree, disagree*, *neutral*, *agree*, and *strongly agree*. The IES-2 measures intuitive eating across four dimensions: (1) unconditional permission to

eat, reflecting one's response to eating in response to hunger cues and cravings without judgment, (2) eating for physical rather than emotional reasons, referring to eating in response to hunger cues and not to cope with emotional distress, (3) reliance on hunger and satiety cues, reflecting one's ability to recognize when and how much to eat based on the body's hunger and satiety signals, and (4) body-food choice congruence, referring to the ability to select foods for the purpose of supporting certain functions of the body.

A sample question from the domain of unconditional permission to eat is, *I try to avoid certain foods high in fat, carbohydrates, or calories.* A sample question from the domain of eating for physical rather than emotional reasons is, *I find myself eating when I am lonely, even when I'm not physically hungry*. In the domain of reliance on hunger and satiety cues, a sample question is, *I trust my body to tell me when to eat*. In the domain of body-food choice congruence, a sample question is, *I mostly eat foods that give my body energy and stamina*. The IES-2 has been validated across multiple populations, and in particular, has demonstrated solid reliability and validity in both clinical and non-clinical adult populations (Tylka & Kroon van Diest, 2013). This questionnaire contains individual subscales and an overall score total, which were used in this study. Greater intuitive eating is represented by higher scores on this measure.

Multidimensional Assessment of Interoceptive Awareness-2 (MAIA-2)

To measure interoceptive awareness in this study, the MAIA-2 (Mehling et al., 2018) questionnaire was used. This questionnaire is comprised of 37 items, which are rated on a 6-point Likert scale, with the following descriptors: *Never* (0), *Always* (6). In general, this measure assesses how one understands and responds to one's internal messages. There are eight dimensions of interoception measured: (1) noticing, which refers to identifying the presence of uncomfortable, comfortable and neutral body sensations, (2) not distracting, which refers to one's ability to not distract themselves from sensations of discomfort, such as

pain, (3) not worrying, which indicates one's ability to not experience emotional distress related to physical discomfort, (4) attention regulation, which refers to one's ability to sustain and control their attention towards bodily sensations, (5) emotional awareness, which is the connection between one's physical sensations and emotional state, (6) self-regulation, which refers to one's ability to regulate psychological distress by redirecting awareness towards their body sensations, (7) body listening, which refers to intentional attunement of the body's insight, and (8) trusting, which refers to one's ability to trust their body's sensations and interpret them as safe.

Examples of a question from each subscale are: *When I am tense I notice where the tension is located in my body* (noticing*), I ignore physical tension or discomfort until they become more severe* (not distracting), *When I feel physical pain, I become upset* (not worrying), *I can maintain awareness of my inner bodily sensations even when there is a lot going on around me* (attention regulation), *I notice how my body changes when I am angry* (emotional awareness), *when I feel overwhelmed I can find a calm place inside* (self-regulation), *I listen for information from my body about my emotional state* (body listening), *I am at home in my body* (trusting). This measure has been widely used across the field in different languages and has demonstrated high reliability and validity both in clinical and non-clinical adult populations (Mehling et al., 2018). This measure has an overall total score and specific subscales. Higher scores are reflective of more interoceptive awareness.

Adult Identity and Meaning Scale (AIMS)

The AIMS was developed and adapted for adults by Dr. Armstrong based on her psychometrically-valid Child Identity and Purpose Questionnaire-Interactive scale (Ch.I.P.-I; Armstrong et al., 2019). The AIMS is a 12-item self-report measure of meaning mindset that assesses aspects of meaning-making such as having agency over thoughts, feelings, and behaviour, a positive self-concept, hope for the future, and openness to feelings and other

experiences. Scores for each item range from 0 to 10 on a sliding scale that the participant can move to choose their level of agreement. An initial assessment of the psychometric properties of the AIMS found high validity and reliability (Watt, 2020). The AIMS yields an overall total score, which was used in this study. Higher meaning mindset is indicated by higher scores on this scale.

Additional Exploratory Variables

Eating Disorder Examination Questionnaire - Short Version (EDE-QS)

The EDE-QS (Gideon et al., 2016) is a 12-item questionnaire that assesses for behaviours and perceptions related to Anorexia Nervosa, Bulimia Nervosa and Binge Eating Disorder. Questions in the EDE-QS include a 4-point Likert scale for response ratings ranging from 0 to 3. The response ratings are *0 days* (0), *1-2 days* (1), *3-5 days* (2), *6-7 days* (3). The first 10 questions of the scale are related to the frequency of a participant's ED-related behaviours in the last 7 days (example item: *Has thinking about your weight or shape made it very difficult to concentrate on things you are interested in such as working, following a conversation or reading?*). The remaining 2 questions are related to a participant's beliefs around food and their body (example item: *How dissatisfied have you been with your weight or shape?*). This questionnaire has evidence of strong internal consistency and validity among various populations (Gideon et al., 2016; Mitchell et al., 2021; Prnjak et al., 2020). The overall total score of this questionnaire was used, with higher scores meaning more ED symptoms.

Interactive Symptom Assessment - Adult (I.S.A-Adult)

The I.S.A-Adult was developed and adapted for adults by Dr. Armstrong based on her psychometrically-valid Interactive Symptom Assessment for children (I.S.A; Armstrong et al., 2022). The original scale demonstrated face and content validity (Armstrong et al., 2022), and the I.S.A.-Adult has been found to have good internal consistency (Halabi, 2023). The

ISA-Adult is a 12-item self-report measure of general mental health and well-being that assesses both internalizing and externalizing mental health symptoms: mood symptoms, anxiety symptoms, attentional concerns, behavioural concerns, as well as obsessions and compulsions. A sample statement from this assessment tool is for the area of mood symptoms is, *Over the past week, I've been feeling happy most of the time/Over the past week, I've been feeling sad most of the time.* A sample item from the area of anxiety symptoms is, *I was not worried or fearful this week / I was feeling worried or fearful a lot this week*. A sample item from the domain of attentional concerns is, *I found it easy to concentrate and focus this week / I found it hard to concentrate and focus this week*. A sample item from the area of behavioural concerns is, *I did not have arguments or fights with family or friends this week / I often had arguments with family or friends this week*. As well, a sample item from the domain of obsessions and compulsions is, *I didn't worry about dirt, germs or something bad happening to myself or someone I love this week / I worried about dirt, germs, or something bad happening to myself or someone I love this week*. Scores for each item range from 0 to 10 on a sliding scale that the participant can move to choose their perceived level of functioning for each item, from optimal functioning to problematic. This measure's overall total score was used in this study with more mental disorder symptoms shown by higher scores.

Demographics Questionnaire

To further understand the sample, participants provided responses to a demographics questionnaire that was developed for the purpose of this study, which included questions about participant age, sex, gender, ethnicity, education, employment, clinical diagnoses, and medication use.

Data Analysis

Means and standard deviations were calculated to summarize the responses. Bivariate correlations were conducted to analyze the data. Correlation analyses investigated the

particular domains of overall ADHD symptoms, overall intuitive eating, overall interoceptive awareness, and overall meaning mindset to examine the relationships between the main variables. The PROCESS macro (Hayes, 2012) for Statistical Package for the Social Sciences (SPSS; IBM, 2023) was used to examine: (1) overall interoceptive awareness as a mediator between overall ADHD symptoms and overall intuitive eating, and (2) meaning mindset as a mediator between overall ADHD symptoms and overall intuitive eating. To further explore the relationships between subscales of the main variables in relation to overall main variables, bivariate correlations for the subscales of the main variables were conducted in relation to overall variables. Additional correlations were conducted to explore the pattern of results as it relates to ED symptoms, various mental disorders, and demographic variables.

Results

Sample Characteristics and Descriptive Statistics

For the seventy-six participants in the study, the mean age was 32.78 years (*SD* = 10.65), and the age range was 18 to 63 years. With respect to biological sex, 80% of participants self-identified as female, and 20% of participants self-identified as male. Participants identified their ethnicity as follows: 62 participants identified themselves as White (81.50%), four participants identified as Black (5%), three participants identified as East Asian (4%), two participants identified as Middle Eastern (3%), two participants identified as South Asian (2.60%), one participant identified as Latin American (1.30%), and two participants identified as Other (2.60%). Among these two participants, one indicated having mixed ethnicity and the other indicated having Turkish ethnicity.

Participants indicated the following regarding their level of education: thirty-two (42.10%) reported being a standard University or College graduate, twenty-six (34%) reported having had graduate or professional training, fourteen (18.40%) reported receiving partial College/University or special training, two (2.60%) reported receiving a post-

secondary certificate and two (2.60%) reported being High School graduates. Seventeen (22.40%) participants reported not being employed at the time of the study, and fifty-one (67.10%) participants reported being employed during their participation in the study. Participants reported the following to be their annual household income before taxes at the time of the study: eighteen (23.70%) reported their yearly income to be between $100,000-$149,000, seventeen (22.40%) reported their yearly income to be between $50,000-$74,000, nine (11.80%) reported their yearly income to be between $75,000-$99,000, eight (10.50%) reported their yearly income to be $200,000 or over, eight (10.50%) reported their yearly income to be between $5,000-$19,000, seven (9.20%) reported their yearly income to be between $20,000-$34,000, two (2.60%) reported their yearly income to be between $35,000-$49,999, two (2.60%) reported their yearly income to be between $150,000-$199,999, and two (2.60%) reported their yearly income to be less than $5,000. See Table 1 for a summary of demographic variables.

Out of the total study sample, thirty-seven (48.70%) participants reported having an ADHD diagnosis and 29 (38.10%) reported taking medication to manage their ADHD symptoms at the time of the study. Nine (11.80%) participants reported being diagnosed with an ED in the past, and no participants reported an active ED at the time of the study. See Table 2 for the means and standard deviations of main variables and their subscales.

Main Analyses

To examine the magnitude and significance of associations between the overall constructs of ADHD symptoms, intuitive eating, interoceptive awareness, and meaning mindset, an analysis of bivariate correlations among these four variables occurred. With regards to correlates with overall ADHD symptoms, overall ADHD symptoms were not significantly correlated with overall intuitive eating. However, higher overall ADHD symptoms were related to poorer overall interoceptive awareness, $r = -.35$, $p < .01$. Greater

overall ADHD symptoms were also correlated with lower overall meaning mindset, $r = -.27$, $p < .05$, and inversely, greater meaning mindset was associated with lower overall ADHD symptoms. With respect to intuitive eating, higher overall intuitive eating was associated with better overall interoceptive awareness, $r = .44$, $p < .001$. Higher overall intuitive eating was also related to greater overall meaning mindset, $r = .34$, $p < .01$. Turning to interoceptive awareness, higher overall interoceptive awareness was associated with higher overall meaning mindset, $r = .07$, $p < .001$. See Table 3 for a summary of these results. In addition, see Figure 1.0 for a visual depiction of significant correlations between main variables.

With respect to mediation analyses, overall interoceptive awareness was a significant mediator between overall ADHD symptoms and overall intuitive eating, indirect effect = -.20, 95% CI = -.36, -.07. Similarly, meaning mindset was a significant mediator between overall ADHD symptoms and overall intuitive eating, indirect effect = -.11, 95% CI = -.25, -.01.

Exploratory Analyses

Main Variable Subscales in Relation to Main Variables

Exploratory analyses investigated correlations between individual subscales of each of the main variables in the study in relation to the overall scores of the main variables. Separating ADHD symptoms based on inattentiveness versus hyperactivity/impulsivity and examining their associations with the main study variables, the associations between ADHD inattentive symptoms and ADHD hyperactive/impulsive symptoms each in relation to overall ADHD symptoms was significant, $r = .93$, $p < .001$ for ADHD inattentive symptoms, and $r = .90$, $p < .001$ for ADHD hyperactive/impulsive symptoms. ADHD inattentive symptoms were marginally significantly related to overall intuitive eating, $r = -.20$, $p = .09$. The association between ADHD inattentive symptoms and overall interoceptive awareness was negative, $r = -.37$, $p < .01$, and the correlation between ADHD hyperactive/impulsive symptoms and overall

interoceptive awareness was also negative, $r = -.26$, $p < .05$. Turning to meaning mindset, only ADHD inattentive symptoms were found to be negatively correlated with meaning mindset, $r = -.27$, $p < .05$. Interestingly, there was also a marginally significant association between ADHD hyperactive/impulsive symptoms and meaning mindset, $r = -.22$, $p = .06$. See Table 4 for more details.

In addition, the four specific intuitive eating subscales in relation to the overall main constructs were examined. The intuitive eating subscale of eating for physical rather than emotional reasons was significantly correlated with overall intuitive eating, $r = .85$, $p < .001$, overall interoceptive awareness, $r = .28$, $p < .02$, and overall meaning mindset, $r = .25$, $p < .05$. The intuitive eating subscale of reliance on hunger and satiety cues was significantly correlated with overall intuitive eating, $r = .78$, $p < .001$, marginally significantly associated with overall ADHD symptoms, $r = -.22$, $p = .06$, and significantly associated with overall interoceptive awareness, $r = .55$, $p < .001$, and overall meaning mindset, $r = .38$, $p < .001$. The intuitive eating subscale of body-food choice congruence was significantly associated with overall intuitive eating, $r = .48$, $p < .001$, overall interoceptive awareness, $r = .31$, $p < .01$, and overall meaning mindset, $r = .29$, $p < .05$. Finally, the intuitive eating subscale of unconditional permission to eat was significantly correlated with overall intuitive eating, $r = .56$, $p < .001$, and overall interoceptive awareness, $r = -.30$, $p < .05$. See Table 5 for more details.

For the specific interoceptive awareness subscales in relation to the other main constructs, several associations were found. The interoceptive awareness subscale of noticing was significantly associated with overall interoceptive awareness, $r = .50$, $p < .001$, and overall meaning mindset, $r = .26$, $p < .05$. The interoceptive awareness subscale of not distracting was associated with overall interoceptive awareness, $r = .49$, $p < .001$, overall ADHD symptoms, $r = -.39$, $p < .001$, overall intuitive eating, $r = .32$, $p < .01$, and overall

meaning mindset, $r = .26$, $p < .05$. The interoceptive awareness subscale of not worrying was significantly associated with overall interoceptive awareness, $r = .29$, $p < .05$, marginally significantly associated with overall ADHD symptoms, $r = -.22$, $p = .05$, and significantly related to overall meaning mindset, $r = .21$, $p = .07$. The interoceptive awareness subscale of attention regulation was significantly related to overall interoceptive awareness, $r = .81$, $p < .001$, overall ADHD symptoms, $r = -.34$, $p < .01$, and overall meaning mindset, $r = .44$, $p < .001$, as well as marginally significantly related to overall intuitive eating, $r = .20$, $p = .08$. The interoceptive awareness subscale of emotional awareness was significantly correlated with overall interoceptive awareness, $r = .65$, $p < .001$, overall intuitive eating, $r = .25$, $p < .05$, and overall meaning mindset, $r = .39$, $p < .001$. The interoceptive awareness subscale of self-regulation was significantly associated with overall interoceptive awareness, $r = .73$, $p < .001$, marginally significantly correlated with overall ADHD symptoms, $r = -.20$, $p = .08$, and significantly correlated with overall intuitive eating, $r = .33$, $p < .01$, and overall meaning mindset, $r = .48$, $p < .001$. The interoceptive awareness subscale of body listening was significantly associated with overall interoceptive awareness, $r = .71$, $p < .001$, overall intuitive eating, $r = .29$, $p < .05$, and overall meaning mindset, $r = .46$, $p < .001$. Finally, the interoceptive awareness subscale of trusting was significantly correlated with overall interoceptive awareness, $r = .61$, $p < .001$, overall intuitive eating, $r = .60$, $p < .001$, and meaning mindset, $r = .50$, $p < .001$. See Table 6 for more details.

Eating Disorder Symptoms, Mental Disorder Symptoms, and Demographic Variables in Relation to Main Variables

This study also included variables assessing ED-related symptoms along with symptoms of various mental disorders and other demographic variables. ED-related symptoms were positively correlated with overall ADHD symptoms, $r = .24$, $p < .05$, negatively correlated with overall intuitive eating, $r = -.74$, $p < .001$, negatively correlated

with overall interoceptive awareness, $r = -.42$, $p < .001$, and negatively correlated with overall meaning mindset, $r = -.38$, $p < .001$. With respect to mental disorder symptoms, results revealed a significant association between these symptoms and overall ADHD symptoms, $r = .44$, $p < .001$, overall intuitive eating symptoms, $r = -.27$, $p < .05$, overall interoceptive awareness, $r = -.42$, $p < .001$, and overall meaning mindset, $r = -.67$, $p < .001$. See Table 7 for more details.

No significant associations were found between the overall main variables with participants' level of education, household income, biological sex, and identified gender. However, the sample size of this study limited the extent to which meaningful analyses could be conducted on these correlations as well as other correlations between overall main variables and further demographic variables, such as participant ethnicity.

Discussion

This thesis explored the interrelations between ADHD, intuitive eating, interoceptive awareness, and meaning mindset, and also explored interoceptive awareness and meaning mindset as potential mediators between ADHD and intuitive eating. The aim of this study is to ultimately understand potential mechanisms involved in ADHD and EDs, thereby informing clinical interventions to potentially improve treatment outcomes for both disorders. It was hypothesized that higher overall ADHD symptoms would be associated with lower overall levels of intuitive eating, interoceptive awareness, and meaning mindset. Higher overall meaning mindset was predicted to be associated with fewer overall self-reported ADHD symptoms, and higher overall levels of interoceptive awareness and intuitive eating. Interoceptive awareness was predicted as a mediator between ADHD symptoms and intuitive eating, and meaning mindset was predicted as a mediator as well between ADHD symptoms and intuitive eating. Results found that higher overall ADHD symptoms were associated with lower overall interoceptive awareness and lower overall meaning mindset. However, the

relationship between overall ADHD symptoms and overall intuitive eating was not significant, although it trended in the predicted negative direction. Research has shown that mediation or indirect effects can occur in the absence of a significant total effect (Hayes, 2009), and indeed, even in the absence of a fully significant association between overall ADHD symptoms and overall intuitive eating, there was significant mediation by interoceptive awareness between ADHD and intuitive eating, and also significant mediation by meaning mindset between ADHD and intuitive eating.

Exploratory analyses were conducted to examine the individual subscales of the main study variables and the overall main variables. Interestingly, the inattentive symptoms of ADHD were marginally related to intuitive eating, with a trend suggesting that higher inattentive ADHD symptoms were related to lower intuitive eating. No significant nor marginally significant correlation was found between ADHD hyperactive/impulsive symptoms and intuitive eating. Both higher ADHD inattentive symptoms and higher ADHD hyperactive/impulsive symptoms were significantly related to lower interoceptive awareness. Similarly, higher ADHD inattentive symptoms were significantly related to lower meaning mindset, whereas higher ADHD hyperactive/impulsive symptoms were marginally significantly related to lower meaning mindset. The intuitive eating subscales of eating for physical rather than emotional reasons, reliance on hunger and satiety cues, and body-food choice congruence were all significantly positively associated with overall interoceptive awareness and overall meaning mindset. Higher scores on these intuitive eating dimensions were thus related to higher interoceptive awareness and meaning mindset. Interestingly, only the specific intuitive eating subscale of reliance on hunger and satiety cues was marginally significantly associated with overall ADHD symptoms, indicating a trend towards higher reliance on hunger and satiety cues being related to lower ADHD symptoms.

With respect to the subscales of interoceptive awareness, high scores on the noticing, not distracting, attention regulation, emotional awareness, self-regulation, body listening, and trusting subscales of interoceptive awareness were positively related to meaning mindset. The remaining interoceptive awareness subscale of not worrying was also marginally significantly associated with meaning mindset in the positive direction. The not distracting, emotional awareness, self-regulation, body listening, and trusting subscales of interoceptive awareness were all positively associated with overall intuitive eating. In addition, the attention regulation subscale of interoceptive awareness was marginally significantly associated with overall intuitive eating in the positive direction. The not distracting and attention regulation subscales of interoceptive awareness were both significantly associated with overall ADHD symptoms in the negative direction, and the not worrying and self-regulation subscales of interoceptive awareness were marginally significantly associated with overall ADHD symptoms again in the negative direction.

ADHD and Intuitive Eating

Although overall ADHD symptoms were not related to overall intuitive eating, higher ADHD inattentive symptoms were marginally significantly related to lower overall intuitive eating. Additionally, higher scores on the intuitive eating subscale of reliance on hunger and satiety cues were marginally significantly associated with lower overall ADHD symptoms. This pattern of findings suggests the possibility that higher ADHD inattentive symptoms may be related to lower intuitive eating, perhaps in terms of lower reliance on hunger and satiety cues. Although these correlations were not statistically significant within the study's sample, the findings suggest that higher ADHD symptomology may correspond to lower levels of intuitive eating, and lower responsiveness to hunger and satiety cues in particular.

These results resemble the findings of Kaisari et al. (2018), which showed that reliance on hunger and satiety cues was a mediator between ADHD inattentive symptoms and

ED symptoms. Although research on this topic is still evolving, individuals with ADHD are considered at risk for EDs (Baraskewich & Climie, 2022; Martin et al., 2023), and there is evidence to suggest that individuals with ADHD may have challenges in discerning signals of hunger and satiety compared to individuals without ADHD, and such a disparity has led researchers to inquire about the potential influence of ADHD symptoms on the fundamental biological mechanisms underlying hunger and satiety awareness (Herbert et al., 2013; Kaisari et al. (2018); Kutscheidt et al., 2019; Martin, Dourish and Higgs, 2023; Sahin et al., 2014). It is possible that inattentive symptoms may decrease intuitive eating levels and in particular the ability to eat based on hunger and satiety signals. The findings of Ptacek et al. (2016) and Svedlund et al. (2020) support this interpretation, suggesting that a higher degree of ADHD inattentive symptoms such as time blindness and forgetfulness may perpetuate disturbances in eating behaviour consistent with the intuitive eating paradigm.

It is important to note that overall ADHD scores were not significantly associated with overall intuitive eating scores, and that subscale analyses of both ADHD and intuitive eating were exploratory, with results of marginal significance. It is important to therefore qualify these findings and their interpretation. However, the consistency of these findings with the existing literature as well as the fact that higher overall ADHD symptoms were significantly related to lower overall interoceptive awareness, which were in turn related to lower overall intuitive eating in this study supports the interpretation that the ADHD symptoms of inattention are associated with lower reliance on hunger and satiety cues in this sample. It is possible that results of exploratory analyses were marginally significant due to the sample size of this study, and that a larger sample size may yield fully significant results. In any case, the fact that overall ADHD symptoms were not significantly related to overall intuitive eating per se, but was related to interoceptive awareness, which was actually related to overall intuitive eating shows that ADHD on the whole may be more strongly and directly

related to interoceptive awareness rather than intuitive eating as a whole. This interpretation is supported by the significant findings of mediation by interoceptive awareness between ADHD and intuitive eating, which is consistent with the idea that interoceptive awareness plays a role in recognizing hunger and satiety cues (Robinson et al., 2021).

ADHD and Interoceptive Awareness

Results from the current study indicated a significant negative correlation between overall interoceptive awareness and overall ADHD symptoms, suggesting that the higher the presence of ADHD symptoms, the lower the interoceptive awareness, which is consistent with results from Kutscheidt and colleagues (2019). Wider research has explored the associations between interoceptive awareness and ADHD symptoms, suggesting that interoceptive awareness may be impaired in individuals with ADHD, thereby contributing to common challenges among this population (Beheshti et al., 2020; Betul Usta & Karas, 2021). Given the limited research and mixed findings of previous studies (Wieserma & Godefroid, 2018), this main result from the current study adds considerably to the literature, thus encouraging a deeper exploration and examination of ADHD and interoceptive awareness. In particular, the results from this study contribute to the relatively understudied area of ADHD within adults (Bishop et al., 2023).

Exploratory analyses of individual subscales of main variables indicate that both inattentive and hyperactive/impulsive subscales of ADHD symptoms were associated in the same direction with interoceptive awareness, such that higher inattentive and hyperactive/impulsive symptoms were associated with lower interoceptive awareness. Closer examination of the subscales of interoceptive awareness showed that the specific correlations between overall ADHD symptoms and the not distracting and attention regulation subscales were significant. In addition, the specific interoceptive awareness subscales of not worrying and self-regulation were marginally significantly related to overall ADHD symptoms. These

distinct results may be important as not all interoceptive awareness domains were significantly associated with ADHD, even though all eight interoceptive awareness subscales were positively correlated with the overall interoceptive awareness score.

Critchley et al. (2004) demonstrated that external stimuli influence interoception, suggesting that individuals with ADHD may exhibit greater impairment in interoceptive awareness due to increased distractibility. It may be that individuals with ADHD who show higher distractibility symptoms may be more likely to experience challenges with interoception. Regarding the marginally significant findings of the not worrying and self-regulation domains of interoceptive awareness, it may be that the distractibility of worries and inability to self-regulate that may also be ADHD-related, also influence difficulty with interoceptive awareness. Overall, it is important again to qualify these specific results as exploratory, and also with some findings being only marginally significant. The main finding of this study supports the relationship between interoceptive awareness and ADHD, and the exploratory findings provide potential hypotheses of subsets of interoceptive awareness to explore in future research when exploring behavioural and psychological challenges in adults with ADHD.

Interoceptive Awareness and Intuitive Eating

Consistent with the literature in the field (Robinson et al., 2021), this study's findings indicate a positive correlation between overall interoceptive awareness and overall intuitive eating, suggesting that elevated levels of interoceptive awareness is related to higher levels of one's ability to eat intuitively. This main finding adds to current research showing deficits in interoception for individuals with difficulty with intuitive eating, such as EDs (Martin et al., 2019; Jenkinson, Taylor, & Laws, 2018). More specifically, interoceptive awareness may be a strong predictor of the ability to recognize hunger and satiety signals, and to eat for physical rather than emotional reasons. As interoception pertains to one's ability to discern internal

bodily signals, elevated interoception correlates with an enhanced ability to recognize sensations indicative of hunger and satiety (Martin et al., 2019; Jenkinson et al., 2018). Indeed, research in this field has identified difficulties with interoceptive awareness as a potential transdiagnostic marker of EDs (Martin et al., 2019).

Upon exploratory examination of the specific associations between dimensions of interoceptive awareness and intuitive eating, the following interoceptive awareness subscales were found to be significantly correlated with overall intuitive eating: not distracting, emotional awareness, self-regulation, body listening, and trusting. The interoceptive awareness subscale of attention regulation was marginally significantly associated with overall intuitive eating. Although previous literature has found interoception and intuitive eating to be correlated, these results point to additional potential considerations related to the strong association between these variables. Intuitive eating has been associated with positive eating behaviours, attitudes, body image, and emotional functioning, such that intuitive eating is developed when individuals experience acceptance of their bodies from others, and when body appreciation and body trust are high (Avalos & Tylka, 2006; Bruce & Ricciardelli, 2016). Therefore, consistent with the findings of Critchley et al. (2004), an environment which promotes positive self-concept, mental health, and adaptive eating behaviours, may reduce the influence of external stimuli on interoception. Hence, cultivating interoception through paying attention, awareness of emotions, regulating the self, and listening and trusting one's body may relate to responding appropriately to hunger and satiety and less disordered eating. Although these specific findings in the current study are of an exploratory nature and therefore require future research, they highlight potential areas of interoception to further investigate. Overall, the main finding of this study linking intuitive eating and interoceptive awareness underscores the need to examine the complexities of interoception and eating behaviours in future research.

Meaning Mindset

The main findings of this study also showed that higher meaning mindset was associated with lower overall ADHD symptoms, higher overall intuitive eating, and higher overall interoceptive awareness. Meaning mindset was also found as a significant mediator between ADHD symptoms and intuitive eating. Meaning mindset is an orientation toward recognizing meaningful experiences and connecting with others through agency, positive self-concept, openness to experience, and hopefulness (Armstrong et al., 2019). That higher overall ADHD symptoms was associated with lower meaning mindset is unsurprising, as a meaning mindset is reflective of one's general mental health, meaning that better mental health relates to better overall ability to have a meaning mindset, through the capacity to find and cultivate meaning within oneself, one's relationships and one's experiences (Armstrong et al., 2019). In fact, many studies have found that individuals with ADHD have lower levels of mental health, such as having lower self-esteem (Beaton et al., 2022; McKeague et al., 2015). The fact that overall ADHD symptoms were associated with meaning mindset in this study is consistent with an association between ADHD and poor mental health. Though exploratory, additional analyses found that ADHD inattentive symptoms were significantly positively associated with meaning mindset, and ADHD hyperactive/impulsive symptoms were marginally significantly positively correlated with meaning mindset. Although the marginal significance and the exploratory nature of these findings need to be acknowledged, the pattern of findings suggest a possibility that higher levels of both inattentive and hyperactive/impulsive symptoms of ADHD may be associated with lower meaning mindset. Such results are consistent with the main result of overall ADHD symptoms and meaning mindset.

Another main finding in the current study was that greater meaning mindset was related to more overall intuitive eating. This is consistent with meaning mindset being a

mediator between ADHD symptoms and intuitive eating. Though of an exploratory nature, the subscales of eating for physical rather than emotional reasons, reliance on hunger and satiety cues, and body-food choice congruence were significantly positively associated with meaning mindset. These associations suggest that meaning mindset is relevant to multiple domains of intuitive eating. Meaning mindset may cultivate positive self-concept and body acceptance, openness to experiences with respect to one's relationship with food and one's bodies, and meaningful awareness of internal and external experiences (Armstrong et al., 2019). Consistent with this idea, Lindardon et al. (2021) and Paslaki et al. (2021) found that recognition of hunger and satiety cues were supported by better mental health and well-being. Additionally, mental health and well-being is affected by one's environment, and therefore external factors promoting body acceptance and a balanced relationship with food and self-compassion may consequently cultivate body trust and listening, thereby supporting one's likelihood to recognize and respond to signals of hunger and satiety (Lindardon et al., 2021; Paslaki et al., 2021). Results from this study are consistent with current literature, and exploratory analyses suggest specific factors to consider when understanding determinants of intuitive eating.

Higher meaning mindset was also associated with higher interoceptive awareness as another main finding of this study. Exploratory analyses indicated that meaning mindset was associated in the positive direction with seven of eight subscales of interoceptive awareness and marginally significantly associated with the remaining interoceptive awareness subscale, that is, not worrying. The link between meaning mindset and interoceptive awareness is consistent with the approach of meaning mindset, which involves acceptance and openness to experiences (Armstrong et al., 2019). Such openness to experience can involve openness and awareness of both internal and external experiences. Therefore, a self-awareness of bodily experiences would be consistent with greater meaning-making, and thus, greater meaning

mindset. Although the limitations of exploratory findings need to be acknowledged, the results showing that almost all subscales of interoceptive awareness may be relevant to meaning mindset makes tentative suggestions for future studies attempting to distinguish areas of interoceptive awareness that may be most relevant to meaning mindset. It may be that interoceptive awareness as a whole in its various domains is consistent with meaning mindset.

Additional Results

In this sample, higher overall ADHD symptoms were related to more ED and mental disorder symptoms. Similarly, less intuitive eating was related to more ED and mental disorder symptoms. Additionally, lower interoceptive awareness was correlated with worse symptoms of ED and mental disorder. Finally, lower meaning mindset was associated with more ED and mental disorder symptoms. These results are consistent with the literature on ADHD, EDs, mental disorders, and meaning-making, suggesting that mental disorder symptoms, and ED-related symptoms in particular, are associated with higher ADHD symptoms, less intuitive eating, less interoceptive awareness, and less meaning-making in life (e.g., Katzman et al., 2017, Marco et al., 2021; Sedgwick et al., 2019; Lattimore et al., 2017; Van Dyke & Drinkwater, 2013).

Limitations

This study assessed the variables of ADHD, intuitive eating, interoceptive awareness, and meaning mindset using self-report questionnaires. Self-report measures are commonly used in the fields of research related to the constructs in this study (e.g., Katzman et al., 2017, Marco et al., 2021; Sedgwick et al., 2019; Lattimore et al., 2017; Van Dyke & Drinkwater, 2013), and have advantages in terms of ease of use as well as insight into personal psychological constructs that may not be readily measured by other methods. However, self-report questionnaires require subjective interpretations of one’s experience in relation to the

topic at-hand, which may leave room for misinterpretation. In addition, no studies in the field have concurrently examined the connections between ADHD, intuitive eating, interoceptive awareness, and meaning mindset, which makes this study unique and a significant contribution to the literature. However, the exploratory nature of the analyses outside of the main study hypotheses needs to be highlighted. Although helpful in terms of exploring potential patterns of associations between the subscales of the main variables and generating possible future hypotheses to be tested, it will be important for future research to investigate these findings.

Marginally significant results in this study were reported to provide further information regarding the data collected. However, it is important to note that marginally significant findings need also to be interpreted tentatively as possible trends in the data that require additional research to understand appropriately. Relatedly, the sample size of this study may have limited power to detect significant effects. Future studies could include a larger sample size. Further, the demographics of the sample may limit the generalizability of the results. The majority of the sample in this study were female, of White ethnicity, and with generally high levels of education and mid-to-high levels of household income. Most of the sample was currently employed. More than half of the sample indicated identifying as a woman in terms of gender identity and all participants were from Ontario, Canada. To increase generalizability of the study, future research should examine research questions with a sample with greater diversity in biological sex, gender identity, ethnicity, education, income, employment, and location of residence.

Approximately 48% of participants in this study had a formal ADHD diagnosis, and 38% were taking medication for ADHD at the time of the study. It will be important for future studies to examine research questions among a clinical sample of participants with diagnosed ADHD as well as a community sample of participants without diagnosed ADHD,

to better understand potential differences between samples. Additionally, future research should examine the potential relation of ADHD medication with these main variables. No significant differences were found in overall main variables based on demographic variables such biological sex, gender identity, income, and education. However, the study sample size limited these analyses, underscoring the need for future research with a larger sample size to conduct these analyses more meaningfully. Given research suggesting gender differences (Lindaron et al., 2018) related to eating, and the relatively limited research exploring ADHD in adult women (Holthe & Langvik, 2017), such research will be important.

Conclusions

This study examined the relationships between ADHD symptoms, interoceptive awareness, intuitive eating, and meaning mindset, and the mediation roles of interoceptive awareness and meaning mindset between ADHD symptoms and intuitive eating. Based on the pattern of results, intuitive eating may be more challenging for individuals with high ADHD symptoms through the mediator of lower interoceptive awareness. It is possible that ADHD inattentive symptoms in particular may be associated with intuitive eating through interoceptive awareness. Furthermore, results indicate that meaning mindset is significantly associated with elevated levels of interoception and intuitive eating, and that it mediates between ADHD symptoms and intuitive eating. This study is the first to simultaneously examine ADHD, intuitive eating, interoceptive awareness, and meaning mindset, and to examine interoceptive awareness and meaning mindset as mediators between ADHD and intuitive eating. These findings point to the importance of focusing on the links between interoceptive awareness with ADHD and intuitive eating to understand how interoceptive awareness may be a shared etiological mechanism between ADHD and EDs. Such an understanding can lead to advanced treatment approaches for individuals with ADHD, individuals with ED, and individuals with co-occurring ADHD and ED.

Findings suggest that meaning mindset is relevant to high ADHD symptoms, low intuitive eating, and low interoceptive awareness. In particular, results from this study indicated that having a meaning mindset was significantly correlated with interoceptive awareness, meaning that individuals with stronger meaning mindset demonstrated higher levels of interoceptive awareness. As well, meaning mindset was a mediator between ADHD symptoms and intuitive eating. Thus, adapting existing meaning mindset interventions (e.g., Armstrong et al.'s (2019) DREAM program involving teaching meaning mindset skills to children, and Fabes's (2024) Meaning Mindset program for men experiencing homelessness) for an ED population may be beneficial. Further, meaning mindset parallels mindfulness interventions, and ongoing studies suggest the potential for mindfulness-based therapies to be beneficial for individuals with ADHD and EDs (Turgon et al., 2019). Mindfulness-based interventions may utilize and enhance interoceptive pathways to regulate attention and embodiment (Fissler et al., 2016; Lee et al., 2017; Sanchez-Soto & Sanchez-Suricalday, 2023). Meaning mindset may be considered as a treatment approach for clinicians supporting individuals with either an ED or ADHD and both. Future research should continue to set the foundation for ultimately exploring how meaning mindset can be integrated into a psychosocial intervention to address eating challenges among adults with ADHD.

The narrative around EDs and ADHD emphasizes the potential impact of ADHD symptoms on subsequent eating challenges, therefore suggesting the need to manage ADHD symptoms to improve eating behaviours. However, the results of this study represent a step towards offering an alternative perspective, suggesting that impaired elements of interoception in ADHD may need to be addressed to improve eating behaviour. Strategies to support meaning-making to aid in discerning hunger and satiety cues represent new potential components of treatment for combined ADHD and ED. Understanding the interconnections in the variables in this study as well as potential mediators help therapists better determine

what psychological phenomenon to prioritize, thereby promoting cost- and time-efficient mental health interventions. Overall, the results from this study contribute both empirically and clinically to the current body of research and practice seeking to understand the intersections between ADHD, interoception, eating behaviours, and meaning mindset.

Table 1 *Demographic variables*

Variable	%	Variable	%
Biological Sex		Education Level	
Male	19.7	High School	2.6
Female	80.3	Post-Secondary certification	2.6
Gender		Partial College/University	18.4
Man	19.7	Standard College/University	42.1
Woman	54.3	Graduate studies	34
Non-Binary	2.6	Annual Household Income	
Ethnicity		Less than 5,000$	2.6
Black	5	Between 5,999-19,999$	10.5
East Asian	4	Between 20,000-34,999$	9.2
Indigenous	0	Between 35,000-49,999$	2.6
Latin American	1.3	Between 50,000-74,999$	22.4
Middle Eastern	2.6	Between 75,000-99,999$	11.8
South Asian	2.6	Between 100,000-149,999$	23.7
White/Caucasian	81.5	Between 150,000-199,999$	2.6
Other	2.6	200,000$ or higher	10.5
ADHD Diagnosis		Current Employment	
Yes	48.7	Employed	77.6
No	51.3	Not Employed	22.4
ADHD Medication intake			
Yes	38.1		
Not at this time	31.7		
Not applicable	30.2		

Note. ADHD = Attention-Deficit/Hyperactivity Disorder.

Table 2 *Means and standard deviations of main variables and their subscales*

Variables	*M*	*SD*
ASRS Overall	61.42	11.43
ASRS Inattentive	31.56	6.81
ASRS Hyperactive/Impulsive	29.85	5.67
IES-2 Overall	72.13	15.33
IES-2 Hunger and Satiety	16.37	5.07
IES-2 Eating for Physical Rather than Emotional Reasons	21.04	7.14
IES-2 Body Food Choice Congruence	7.57	2.43
IES-2 Unconditional Permission to Eat	18.86	4.51
MAIA-2 Overall	95.47	21.75
MAIA-2 Noticing	10.60	3.50
MAIA-2 Not Distracting	11.44	5.34
MAIA-2 Not Worrying	10.54	4.02
MAIA-2 Attention Regulation	14.02	5.46
MAIA-2 Emotional Awareness	13.80	4.15
MAIA-2 Self-Regulation	8.46	3.09
MAIA-2 Body Listening	5.32	2.55
MAIA-2 Trusting	6.75	3.40
AIMS Overall	769.35	191.05

Note. ASRS = Adult ADHD Self-Report Scale. IES-2 = Intuitive Eating Scale. MAIA-2= Multidimensional Assessment of Interoceptive Awareness. AIMS = Adult Identity and Meaning Scale.

Table 3

Two-tailed bivariate correlations of main variables

Variables	1	2	3	4
1. ASRS Overall	-			
2. IES-2 Overall	-.17	-		
3. MAIA-2 Overall	-.35**	.44**	-	
4. AIMS Overall	-.27*	.34**	.61**	-

Note. ASRS = Adult ADHD Self-Report Scale. IES-2 = Intuitive Eating Scale. MAIA-2= Multidimensional Assessment of Interoceptive Awareness. AIMS = Adult Identity and Meaning Scale. *$p < .05$, ** $p < .01$, ***$p < .00$.

Table 4

Two-tailed bivariate correlations of ADHD subtypes and main variables

Variables	ASRS Overall	IES-2 Overall	MAIA-2 Overall	AIMS Overall
Inattentive symptoms	.93**	-.20 †	-.36**	-.27*
Hyperactive/Impulsive symptoms	.90**	-.11	-.26*	-.22 †

Note. ASRS = Adult ADHD Self-Report Scale. IES-2 = Intuitive Eating Scale. MAIA-2= Multidimensional Assessment of Interoceptive Awareness. AIMS = Adult Identity and Meaning Scale. *$p < .05$, ** $p < .01$, ***$p < .00$. Marginal significance is indicated by † in the table cell.

Table 5

Two-tailed bivariate correlations of IES-2 subscales and main variables

Variables	ASRS Overall	IES-2 Overall	MAIA-2 Overall	AIMS Overall
IES-2 Eating for Physical rather than Emotional reasons	-.15	.85**	.28*	.25*
IES-2 Hunger and Satiety	-.22 †	.78**	.55**	.38**
IES-2 Food and Body Choice Congruence	.04	.48**	.31**	.29*
IES-2 Unconditional Permission to Eat	.20	.56**	-.29*	-.22

Note. ASRS = Adult ADHD Self-Report Scale. IES-2 = Intuitive Eating Scale. MAIA-2= Multidimensional Assessment of Interoceptive Awareness. AIMS = Adult Identity and Meaning Scale. *$p < .05$, ** $p < .01$, ***$p < .00$. Marginal significance is indicated by † in the table cell.

Table 6

Two-tailed bivariate correlations of MAIA-2 subscales and main variables

Variables	ASRS Overall	IES-2 Overall	MAIA-2 Overall	AIMS Overall
MAIA-2 Noticing	.06	.06	.50**	.26*
MAIA-2 Not Distracting	-.40**	.32**	.49**	.26*
MAIA-2 Not Worrying	-.22 †	.16 †	.29*	.21
MAIA-2 Attention Regulation	-.34**	.20 †	.81**	.44**
MAIA-2 Emotional Awareness	-.16	.25*	.65**	.39**
MAIA-2 Self Regulation	-.20 †	.33**	.73**	.48**
MAIA-2 Body Listening	-.11	.29*	.70**	.46**
MAIA-2 Trusting	-.13	.60**	.60**	.50**

Note. ASRS = Adult ADHD Self-Report Scale. IES-2 = Intuitive Eating Scale. MAIA-2= Multidimensional Assessment of Interoceptive Awareness. AIMS = Adult Identity and Meaning Scale. *$p < .05$, ** $p < .01$, ***$p < .00$. Marginal significance is indicated by † in the table cell.

Table 7

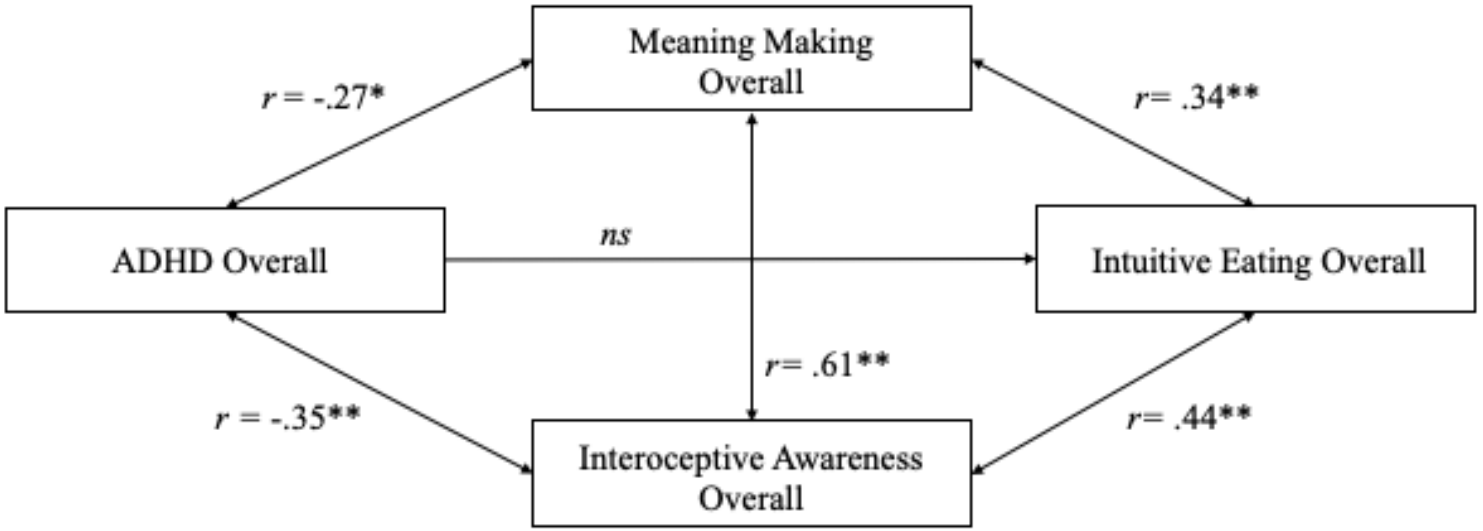
Two-tailed bivariate correlations between ED Symptoms, mental health symptoms, and main variables

Variables	ASRS Overall	IES-2 Overall	MAIA-2 Overall	AIMS Overall
EDE-QS Overall	.24*	-.74**	-.42**	-.38**
I.S.A. Overall	-.24*	.12	.28*	.49**

Note. ASRS = Adult ADHD Self-Report Scale. IES-2 = Intuitive Eating Scale. MAIA-2= Multidimensional Assessment of Interoceptive Awareness. AIMS = Adult Identity and Meaning Scale, EDE-QS = Eating Disorder Examination Questionnaire Short, I.S.A. = Interactive Symptom Assessment. *$p < .05$, ** $p < .01$, ***$p < .00$.

Figure 1

Summary of significant correlations between main variables



Notes: *$p < .05$, ** $p < .01$, ***$p < .001$

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