Childhood Trauma and Eating Attitudes and Behaviours: Exploring the Role of Daily Stressors and Perfectionistic Thinking

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The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to the work of others.

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Abstract

Introduction: Childhood trauma has been consistently linked to a number of adverse health outcomes and behaviours in adulthood, including a greater likelihood of disordered eating attitudes and behaviours. Furthermore, childhood trauma has been implicated in the development of stress and perfectionistic thinking, which have, separately, been linked to disordered eating outcomes. However, the impact of childhood trauma on daily disordered eating outcomes amongst non-clinical populations, has not been examined in conjunction with daily stress and daily perfectionistic thinking.

Method: A multi-level, prospective, daily diary design was utilised, whereby 135 participants over the age of 18 completed background measurements of childhood trauma, perfectionism, disordered eating outcomes, and stress. Participants subsequently completed a seven-day diary that captured daily perceived stress, perfectionistic cognitions, and eating attitudes and behaviours. Hierarchical linear modelling was used to analyse the influence of daily stress and perfectionistic thinking on daily eating outcomes, with childhood trauma examined as a moderator.

Results: Results demonstrated a significant main effect of childhood trauma on daily relationship with food, concerns over food and weight gain, and restrictive and compensatory practices, but not on a disordered idea of eating or feeling toward eating. Furthermore, higher levels of daily perceived stress were significantly associated with higher scores on disordered relationships with food and concerns over food and weight gain, with childhood trauma found to moderate the relationship between daily stress and restrictive and compensatory practices, such that greater levels of disordered eating were evident in those with higher levels of childhood trauma. Increases in daily perfectionistic thinking were associated with increased daily concerns over food and weight gain but did not significantly affect the remaining four daily eating outcomes. Additionally, childhood trauma did not moderate any of the perfectionistic thinking-eating outcome relationships.

Discussion: Experiences of childhood trauma have a significant adverse impact on some, but not all, disordered eating attitudes and behaviours. Stress and perfectionistic thinking were found to have less of an impact on disordered eating attitudes and behaviours when measured at the daily level. The importance of examining experiences of childhood trauma in the assessment, formulation, and intervention of disordered eating behaviours is emphasised.

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Introduction

Childhood Trauma

The consequences of childhood trauma are such that it has been labelled a public health issue, with wide-ranging impacts at the individual, societal, and worldwide level (Lambert et al., 2017). In addition, the impact on health and wellbeing has subsequent financial costs, with the burden of adverse childhood experiences estimated to be almost $400 billion in Europe alone (Bellis et al., 2019).

Defining Childhood Trauma

Childhood trauma is defined as any event that involves "actual or threatened death, serious injury or accident, or sexual violence" (American Psychiatric Association, 2013). When referring to childhood trauma, distinct categories of abuse (physical and sexual) and neglect (physical and emotional) are often referenced (Buchanan et al., 2020).

Childhood trauma can be distinguished from childhood adversity, a broader term that encompasses extremely stressful events, threats, or dangers to a child's safety (Felitti et al., 1998). Whilst childhood trauma typically measures various categories of abuse and neglect, childhood adversity also encompasses experiences of household dysfunction, including familial mental illness or substance misuse, parental separation or divorce, having a relative who is incarcerated or involved in criminality, and witnessing domestic violence (Boullier & Blair, 2018). A further distinction between childhood adversity and trauma relates to how individuals respond; for example, whilst adversities can result in trauma, not all will be experienced by children as traumatic with long-lasting, distressing impacts (Bartlett & Sacks, 2019).

For the purpose of the present study, the definition of childhood trauma will be used throughout to refer to experiences of abuse (physical, sexual, and emotional) and neglect (physical and emotional). Much of the research examining the impact of childhood trauma on the outcomes of interest has also incorporated measurement of adverse childhood experiences. Despite the additional focus on childhood adversity, they are included in the present literature review in order to contribute to the wider literature on the impact of childhood trauma.

Prevalence of Childhood Trauma

High rates of childhood trauma have been documented worldwide. In 2019, the Centres for Disease Control and Prevention published data collected from over 60,000 participants across 25 states in America, finding that 60% reported at least one adverse childhood experience (including physical and sexual abuse, and neglect), with over 15%

experiencing four or more (Merrick et al., 2019). A representative cohort study of young people in England and Wales found that 31.1% of over 2000 participants reported exposure to trauma; of these, 21.5% reported trauma of an interpersonal nature, such as physical maltreatment or sexual abuse. Of these, a quarter also reported a later diagnosis of post-traumatic stress disorder resulting from childhood traumatic experiences (Lewis et al., 2019).

Additionally, within England and Wales, it has been reported that one in five adults (aged between 18 and 74 years old) had experienced at least one form of abuse (physical or sexual abuse, or witnessing domestic violence or abuse of others) prior to the age of 16 (Office for National Statistics, 2020). This equated to 8.5 million people, or 20.7% of the population at the time. Approximately 44% of adults in the survey had experienced more than one type of abuse. It was noted within the report that those who did not know or did not wish to answer were excluded, and therefore actual numbers may indeed be much higher due to under-reporting or non-disclosure, reflecting undoubtedly high levels of childhood trauma amongst the population (Office for National Statistics, 2020).

Results from prevalence studies reflect an "unmet clinical need" amongst populations who have experienced childhood trauma (Bloomfield, 2019). As a result of such a significant impact on a substantial proportion of the population, understanding the consequences related to health and wellbeing as a result of childhood trauma is vital, with calls for evidence-based research to contribute to the literature and our understanding, and to inform preventative efforts (Butchart et al., 2006; Sara & Lappin, 2017).

Childhood Trauma and Health

The experience of trauma in childhood has been consistently linked to a number of adverse health outcomes in adolescence and adulthood, impacting both psychological and physical wellbeing (Petruccelli et al., 2019).

Psychological Outcomes

Firstly, experiencing childhood trauma is a predictor for future suicidal risk (Angelakis et al., 2019; O'Connor et al., 2018; O'Connor et al., 2020b). A systematic review of 68 independent studies investigating the relationship between childhood trauma and suicide concluded that all measured types of childhood maltreatment were associated with a significantly increased risk for suicidal ideation in adulthood (Angelakis et al., 2019). The same review found a two-to-three-fold increased risk of suicide attempts in adulthood dependent on the type of childhood trauma experienced (the highest risk was for sexual abuse, the lowest for emotional neglect). Physical neglect did not significantly increase the risk for future suicide attempts; however, this was explained as partially due to the lack of studies investigating this specific category of abuse. Elsewhere, research found that, in a

group of individuals who had made attempts to end their own life, almost 80% retrospectively reported experiencing at least one type of childhood trauma that was categorised as moderate or severe (O'Connor et al., 2018). Such research is indicative of the consequences of childhood trauma on psychological wellbeing.

Childhood trauma has also been linked to poor mental health and psychological illness in adulthood; impacting both the likelihood of being diagnosed with a psychological disorder (Li et al., 2016; McKay et al., 2021), as well as the trajectory and onset of such (Teicher & Samson, 2013).

It has been found that individuals who report any form of childhood trauma (from categorised of physical abuse, sexual abuse, and neglect) were twice as likely to later be diagnosed with a depressive disorder, and almost three times as likely to be diagnosed with an anxiety disorder, compared to those reporting no childhood abuse (Li et al., 2016). The same analysis concluded that 0.3% cases of depressive or anxiety disorder could be attributed to childhood trauma, with a 10% reduction of cases of physical and sexual abuse potentially reducing diagnoses of depression and anxiety by 9.5 million and 9.1 million respectively (Li et al., 2016).

Elsewhere, a combined systematic review and meta-analysis found that neglect, emotional abuse, and physical abuse (but not sexual abuse) were significantly associated with receiving a psychiatric disorder diagnosis in adulthood (McKay et al., 2021). Furthermore, amongst individuals with depressive and anxiety disorders, those reporting childhood trauma have shown significantly earlier emergence of symptoms and disorder onset, as well as reporting significantly greater symptom severity and clinical features, a poorer trajectory, and a greater likelihood of episode reoccurrence (Hovens et al., 2021; Teicher & Samson, 2013).

Researchers investigating the link between childhood trauma and later psychological wellbeing have noted the large variability in how trauma exposure is measured and how psychiatric disorders are defined (McKay et al., 2021). For example, in the aforementioned research by Li et al. (2016), studies included in the analysis required a clear assessment of childhood trauma via external methods (such as court reports), as opposed to self-report measures alone. Such methods were deemed more reliable, reducing the potential of retrospective recall bias; however, the lack of usage of standardised measures was acknowledged as a limitation. Additionally, the requirement for externally reported accounts of abuse resulted in inclusion of the most severe cases (such as those resulting in court cases or convictions), therefore potentially discounting individuals who have experiences of childhood trauma that they have not disclosed elsewhere (Li et al., 2016).

Nevertheless, researchers have continued to highlight the importance of researching the impact of childhood trauma as a key focus within mental illness prevention and health promotion (Li et al., 2016; McKay et al., 2021). Indeed, such large-scale studies have reported a clear link between experiences of childhood trauma and poorer psychological outcomes in adulthood, including increased suicidal ideation and attempt, diagnoses of psychological disorder, and poorer disorder trajectory (Angelakis et al., 2019; Hovens et al., 2021; O'Connor et al., 2020; Teicher & Samson, 2013).

Physical Health Outcomes

In addition to exploring the link between childhood trauma and psychological wellbeing, research has also explored the impact on physical health outcomes (Fellitti et al., 1998; Gilbert et al., 2015; Merrick et al., 2019; Petruccelli et al., 2019).

Strong relationships have been found between exposure to adverse childhood trauma (including all categories of abuse) and an increased incidence of heart, lung, and liver diseases in adulthood (Fellitti et al., 1998). Elsewhere, exposure to trauma in childhood was associated with increased odds of coronary and respiratory diseases in adulthood, higher likelihood of stroke, and a greater risk of developing diabetes (Gilbert et al., 2010). The authors discussed this trajectory in the context of findings linking childhood trauma to premature mortality (Brown et al., 2009), and the potential involvement of toxic stress leading to physiological changes and eventual chronic illness diagnosis. The measurement of childhood experiences did not determine their severity or frequency, however the authors concluded by stating that the research demonstrated a clear dose-response effect in which adults with several health conditions had experienced greater exposure to childhood adversity (Gilbert et al., 2010).

Elsewhere, a large-scale study in the United States of American found that exposure to childhood adversity resulted in higher odds of having a chronic health condition associated with the country's leading causes of mortality and morbidity (including coronary heart disease and stroke) (Merrick et al., 2019). A cumulative effect was noted, whereby the odds increased in line with the number of experienced adversities. The results also showed an association between experiences of childhood trauma and poorer socioeconomic status, and whilst this was seen as evidence for the wide-ranging impact of childhood trauma, it would be difficult to disentangle this and determine a true cause-effect relationship (for example, whether poorer socioeconomic status resulted in poorer health outcomes, or whether experiencing childhood trauma was more influential). Despite this, the research contributed to the literature demonstrating elevated rates of poor health conditions and status amongst those who have experienced childhood trauma (Merrick et al., 2019).

Of note within the aforementioned research was the additional measurement of "risk behaviours", including heavy alcohol usage and current smoking status, also linked to

experiences of childhood trauma (Merrick et al., 2019). Indeed, within the literature, it has been recognised that there has been less of a focus on how childhood trauma impacts more objective or non-clinically defined measures of health (Beilharz et al., 2020; Petruccelli et al., 2019). In addition to diagnosed health conditions, childhood trauma has been deemed a risk factor for a number of adverse behavioural health outcomes in adulthood (Hughes et al., 2017).

A systematic review and meta-analysis showed that experiences of childhood adversity significantly correlated with almost all measured negative health outcomes, including poor sleep, problematic alcohol usage, tobacco usage and illicit substance misuse (Petruccelli et al., 2019). It was acknowledged that the majority of included studies were retrospective and observational in nature, regarded as a limitation concerning both the reliability and validity of results. However, the paper highlighted the importance of the breadth of the impact of trauma on health and lifestyle outcomes, and emphasised the importance of continued research into the relationship (Petruccelli et al., 2019).

Elsewhere, a study sought to investigate the association between childhood trauma and health behaviours amongst a community group of adults, deemed “non-clinical”, with no diagnosed medical or psychiatric conditions (Beilharz et al., 2020). Participants who had experienced childhood trauma reported significantly poorer sleep quality, poorer emotional wellbeing and general health, lower energy, and were almost seven times as likely to have experienced sleep difficulties throughout the night. Additionally, they demonstrated significantly higher heart rate when exposed to a stressor, taking significantly longer to return to resting heart rate in comparison to the non-trauma group (Beilharz et al., 2020). The overall age range for participants was not reported, however mean ages for trauma and non-trauma groups were 22.31 and 21.65 years old respectively. The authors highlighted this group to be considered as healthy young adults, yet amongst those who had experienced childhood trauma, poorer health behaviours and outcomes were observed, including impacts on autonomic function and stress response.

The results of such have highlighted the importance of measuring a range of health outcomes and behaviours amongst non-clinical, community samples when considering the impact of childhood trauma (Beilharz et al., 2020; Hughes et al., 2017; Petruccelli et al., 2019).

Childhood Trauma and Eating

One specific outcome of interest, that has been explored in relation to childhood trauma, is that of eating, including both eating disorders and more generalised eating attitudes and behaviours.

Childhood Trauma and Eating Disorders

Eating disorders can be defined as a disturbance of eating habits or behaviours, which results in impairment of overall health or functioning (Fairburn & Harrison, 2003). Both the behaviours exhibited by an individual with an eating disorder (such as bingeing, purging, or restricting food) and the associated cognitions (such as negative beliefs about food or own appearance) are of importance (NICE, 2020). Lifetime prevalence rates for diagnosis of any eating disorder within the general population have been reported as 0.91%, with specific rates for anorexia nervosa, bulimia nervosa, and binge eating disorder reported as 0.16%, 0.63%, and 1.53% respectively (Qian et al., 2022).

When considering the experience of childhood trauma amongst individuals who have later been diagnosed with an eating disorder, high prevalence rates have been found. For example, the overall prevalence of childhood trauma was two to four times higher (dependent on category of abuse) amongst individuals with a diagnosed eating disorder in comparison to healthy controls (Molendijk et al., 2017). Stronger links were reported specifically for bulimia, binge eating disorder, and anorexia of the restrictive subtype (Molendijk et al., 2017). Elsewhere, individuals with an eating disorder diagnosis have reported high rates of childhood sexual abuse (Smolak & Murnen, 2002), neglect (Pignatelli et al., 2015), and physical abuse (Caslini et al., 2016).

Earlier research examining the association between childhood trauma and eating disorder diagnosis focused predominantly on sexual abuse, with a systematic review aiming to examine the relationship based on previous inconsistent findings (Smolak & Murnen, 2002). A review of the literature firstly showed that the studies could be divided into two groups, depending on whether participants were categorised based on their experience of childhood sexual abuse (present or not), or eating disorder diagnosis (diagnosed or not). Statistically significant effect sizes were evident for both types of study, showing evidence of a small association between eating disorder diagnosis and childhood sexual abuse. However, within studies where participants were firstly categorised based on experience of sexual abuse or not, effect sizes were over twice as large. The importance of well-designed studies and chosen methodology was highlighted when considering the need for future research (Smolak & Murnen, 2002).

Childhood neglect was recognised as a less-documented type of trauma, with fewer studies examining the relationship with eating disorders (Pignatelli et al., 2015). A meta-analysis of 13 cross-sectional, longitudinal studies examined the prevalence of childhood neglect amongst 1039 participants who had been diagnosed with an eating disorder in adulthood. Amongst participants, the prevalence of childhood physical neglect ranged from 20% to over 74%, and childhood emotional neglect from 33.3% to 69%. Statistical analysis showed that, for those with a diagnosed eating disorder, the weighted mean prevalence of emotional neglect was 53.5% and physical neglect 45.4%. The researchers concluded by

acknowledging the need for research to be extended to examine the relationship between childhood trauma and eating, within a framework of other potential risk or influencing factors (Pignatelli et al., 2015).

More recently, a systematic review focused on the specific categories of childhood trauma and relation to diagnoses of eating disorders (Caslini et al., 2016). Results showed a consistent, positive association between experiences of childhood sexual abuse and bulimia and binge eating disorder, but not for anorexia when adjusting for publication bias. Physical abuse was associated with all eating disorder diagnoses, and there was a positive association between emotional abuse and bulimia and binge eating disorder (Caslini et al., 2016).

A range of explanations have been proposed regarding such findings. For example, specifically relating to experiences of neglect, it was suggested that a lack of emotional validation in childhood may result in the emergence of problematic and disordered eating symptomology, which develops as a coping strategy to manage overwhelming feelings, ultimately leading to clinical diagnosis for some (Pignatelli et al., 2015). Elsewhere, it was proposed that abuse can negatively impact the perception of body image, leading to eating disorder symptoms to overcome such dissatisfaction (Caslini et al., 2016). The latter study concluded by recognising the variation in eating disorder presentation, and the importance of evaluating all types of childhood trauma in relation to eating disorders and problematic eating behaviours to inform our understanding of the onset, aetiology, and individual differences in symptom presentation (Caslini et al., 2016).

Indeed, research has found that, amongst individuals diagnosed with an eating disorder who had also experienced childhood trauma, scores were significantly higher than non-trauma groups on measures of food restriction, concerns over weight and shape, and reduced daily functioning (Guillaume et al., 2016). Within this study, only individuals who had been hospitalised as a direct consequence of eating disorder symptoms were recruited for the study, and therefore the increased severity of current disorder symptomology may be reflective of this.

However, similar findings have been found amongst non-hospitalised individuals with a diagnosis of any eating disorder (Molendijk et al., 2017). A meta-analysis reported the results of 82 studies where participants had experienced physical, sexual, or emotional abuse, and had a lifetime diagnosis of any eating disorder; some studies incorporated comparison with healthy or psychiatric control groups. Stronger links were reported specifically for bulimia, binge eating disorder, and anorexia of the restrictive subtypes. Additionally, those who had experienced childhood trauma had an earlier age of disorder onset, a higher frequency of bingeing and purging episodes, and increased usage of laxatives or diuretics to control weight.

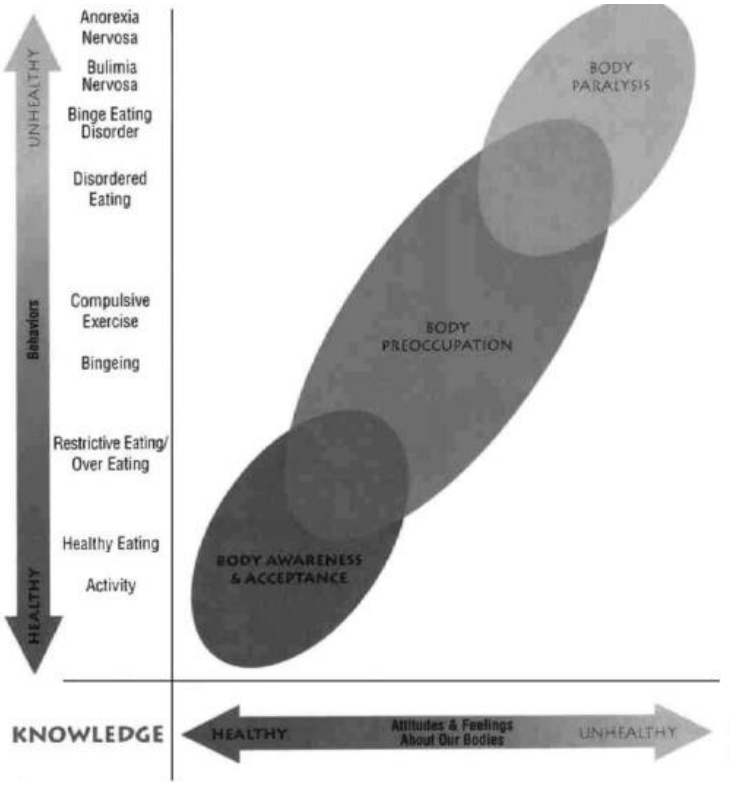
Overall, research has found a consistent, stable link between childhood trauma and eating disorders, concerning both the relationship with trauma prevalence and later diagnosis, in addition to the severity and experience of disorder symptomology.

Disordered Eating Attitudes and Behaviours

It is not only clinically diagnosed eating disorders that are of importance when examining the relationship between childhood trauma and eating outcomes. Indeed, there is evidence that many eating disorders remain undiagnosed (Bryant et al., 2022), despite large percentages of individuals presenting with eating attitudes and behaviours that may be considered disordered (da Luz et al., 2018). A continuum of eating has been proposed, documenting a progression from those considered normal or healthy eaters, through to those exhibiting disordered eating behaviours and attitudes, with eating disorders lying at the uppermost end (Scarano & Kalodner-Martin, 1994). It has been found that individuals at various points on the proposed continuum differ in regards to their eating behaviours, related cognitions (to food, body image, and weight), and perception of self (Scarano & Kalodner-Martin, 1994).

A visual depiction of such, named "Building the Relationship between Body Image and Disordered Eating" (BRIDGE), documented the progression from healthy to unhealthy body image along a horizontal axis, and healthy to unhealthy eating behaviours vertically (Russell & Ryder, 2001). This is displayed in Figure 1.

Figure 1: The relationship between Body Image and Eating Disorders (taken from Russell & Ryder, 2001).



The authors proposed that individuals fall into one of three circles; body acceptance (representing healthy attitudes and behaviours); body preoccupation, and body paralysis (representative of the unhealthiest or most disordered attitudes and behaviours) (Russell & Ryder, 2001). They acknowledged that individuals may move in and out of any of the circles at any given time, without developing an eating disorder, concluding that whilst clinical diagnoses are rare, the attitudes and behaviours representative of them are not (Russell-Mayhew, 2007).

Disordered eating encompasses both eating-related attitudes and behaviours. For example, attitudes may relate to the ideas, beliefs and assumptions that impact our relationship with food and influence the choices we make about what, how much, and when we eat; disordered attitudes may include excessive preoccupation with such (Alvarenga et al., 2010a). Disordered eating behaviours may include bingeing, purging, laxative or diuretic abuse, and restrictive dieting by food avoidance or calorie restriction (Emery et al., 2021).

Varying prevalence rates for disordered eating behaviours have been reported, ranging from almost eight percent through to over 22% in Western Asia, dependent on the disordered eating measurement used (Alfalahi et al., 2022). Elsewhere, restrictive dieting and binge eating were found to be the most frequent self-reported disordered eating behaviours amongst a meta-analysis of prevalence studies, although percentage rates varied widely depending on when measurements were taken (at one timepoint or lifetime rates) (Ortega-Luyando et al., 2015).

Childhood Trauma and Non-Clinical Eating Outcomes

When considering the potential links between childhood trauma and eating outcomes, it is therefore also important to consider research into non-clinical outcomes that may be indicative of such disordered eating attitudes and behaviours, without meeting diagnosis. Indeed, childhood trauma has been linked to pathological or disrupted attitudes amongst non-clinical populations, without an eating disorder diagnosis (Emery et al., 2021; Fuemmeler et al., 2009; Hasselle et al., 2017; Smyth et al., 2018).

Studies have differed as to how they measure disordered outcomes amongst those without diagnoses, and on the measurement of childhood trauma experiences. Firstly, there are a selection of studies that have used eating measures typically administered amongst populations with an eating disorder diagnosis (Hasselle et al., 2017; Smyth et al., 2018).

Eating Disorder measures

One such study sought to investigate the impact of cumulative childhood trauma experiences on eating outcomes (Hasselle et al., 2017). A sample of college students were asked about their experiences of childhood trauma, measured by a retrospective self-

reported questionnaire of childhood victimization. Disordered eating was measured using the SCOFF questionnaire, a five-item questionnaire that was originally developed as a screening tool for the core features of anorexia and bulimia nervosa (Morgan, 1999). It was deemed appropriate for usage in this study as researchers noted its applicability as a screening tool, capturing behaviours and attitudes such as purging, loss of control when eating, dramatic weight loss, distorted body image, and food-related cognitions (Hasselle et al., 2017). Overall, the results found that the greater number of childhood trauma or victimization episodes reported, the greater levels of disordered eating evident at the measured timepoint.

However, the study did not focus explicitly on childhood trauma, incorporating additional victimization experiences such as property crime or witnessing violence. Additionally, the SCOFF measure is most reflective of diagnosable eating disorder criteria, potentially missing a range of other eating attitudes and behaviours that may not reach clinical levels. Finally, all participants were college students between the ages of 18 and 24; the sample was justified by researchers due to early adulthood being a key period for the development of problematic or disordered eating behaviours (Hasselle et al., 2017), however, the impact on those older than this age group remained unknown.

Elsewhere, an association between childhood trauma and eating disturbance was reported, whereby experiencing severe trauma in childhood significantly correlated with restricted eating behaviours in adulthood (Smyth et al., 2008). The same study found that experiencing a greater cumulative number of traumatic childhood experiences significantly correlated with bingeing and purging behaviours in adulthood. Eating disturbance was measured by the Eating Disorder Examination Questionnaire (EDE-Q), a self-report questionnaire designed to capture key eating disorder symptomology (Fairburn & Beglin, 1993).

Interestingly, within this study, participants completed measures of eating on the EDE-Q at two timepoints; college entry, and at the end of the first semester. Results were indicative of a prospective effect, whereby increases in restrictive eating, bingeing, and purging at the second timepoint (compared to the first) were observed only in participants who reported a higher severity of childhood trauma (Smyth et al., 2008). This was deemed as evidence of a cross-sectional relationship between trauma and disordered eating outcomes at two separate timepoints.

However, the sample consisted purely of college students, enrolling for the first time, directly from high school. The researchers explained that this allowed the opportunity to examine the impact of historical trauma on eating outcomes in the context of a major life event, such as moving away to college, with the two timepoints (the start and end of the semester) reflecting an adjustment period (Smyth et al., 2008). However, it is reasonable to propose that moving away from home for the first time and academic stress may have

influenced current eating behaviours regardless of childhood trauma experiences. Additionally, reports of childhood trauma were not obtained via a validated measure, but instead by participant self-ratings of the nature, quantity, and severity of traumatic events. The researchers acknowledged that future research within the area should include a more detailed assessment of childhood trauma (Smyth et al., 2008).

Therefore, despite these two key studies examining the link between childhood trauma and eating outcomes in non-clinical populations, the noted methodological factors make further research a priority. For example, there is a need for more diverse participant groups, not those limited to college students. Additionally, these studies utilised measures typically used to screen for eating disorders, which may not have effectively captured disordered eating attitudes and behaviours that may not meet clinical diagnosis or be evident through measurement of disorder symptomology alone (Hasselle et al., 2017; Smyth et al., 2008).

Childhood Trauma and Non-Clinical Measures of Eating

Indeed, another category of studies have focused on examining the association between childhood trauma and non-clinical eating outcomes; that is, other attitudes and behaviours that may be disordered, but not reflective of a diagnosable eating disorder, and those not captured by questionnaires designed for usage amongst populations with eating disorders (Fuemmeler et al., 2009; Emery et al., 2021).

One such study investigated the impact of childhood abuse and neglect in relation to disordered eating outcomes in adulthood, amongst a sample of over 15,000 participants (Fuemmeler et al., 2009). Overall, it was found that participants with any history of childhood trauma were significantly more likely to report problematic eating outcomes later in life, with some gender-specific outcomes evident. Results found that childhood sexual abuse was a significant predictor of weight in adult men (but not women), with obese men more likely to report a history of sexual abuse. Women who had experienced childhood physical abuse were significantly more likely to report skipping meals in order to lose weight; those who had experienced childhood physical or sexual abuse were also more likely to report being told they had an eating disorder and report a fear of losing control when eating (Fuemmeler et al., 2009).

However, problematic eating (as so termed by the researchers) was only captured by two items; being afraid to eat in case you are unable to stop, and being told by a doctor that you have an eating disorder (Fuemmeler et al., 2009). Regarding the latter, it was unclear how many participants had received a formal eating disorder diagnosis. Furthermore, childhood trauma was measured by asking participants to retrospectively recall whether they had experienced each of the three categorises (physical or sexual abuse, and neglect), and not using a standardised measure. Despite this large-scale study documenting a relationship

between childhood trauma and disordered eating outcomes in adulthood, aspects of the methodology make it difficult to draw conclusions as to the exact impact (Fuemmeler et al., 2009).

More recently, Emery et al. (2021) sought to extend research into childhood trauma and eating outcomes, noting that the majority of previous studies had been conducted using female, undergraduate student samples. Regression risk analyses were conducted to investigate the impact of childhood maltreatment on overeating, binge eating, extreme and unhealthy weight control behaviours, chronic dieting, and weight and shape concerns (categorised as "disordered eating"). Firstly, over a third of the sample reported maltreatment in childhood; most commonly, this was neglect and physical abuse. Almost 60% of the sample had engaged in at least one of the disordered eating behaviours in adulthood; most frequently, this was unhealthy weight control, weight and shape concerns, and overeating.

Results of the regression risk analyses found that experiencing any of the measured forms of childhood maltreatment was associated with a greater risk for all disordered eating outcomes, when measured retrospectively over the past year (Emery et al., 2021). The only exception to this was extreme weight control behaviours, attributed to the lower overall numbers of participants endorsing this category. This could also be indicative of the importance of capturing a range of eating attitudes and behaviours, not restricted to those considered to be more extreme. Additionally, when distinguished by type of abuse, sexual abuse was associated with an increased risk for overeating and weight and shape concerns, emotional abuse for binge eating, and emotional neglect for overeating, binge eating, and unhealthy weight control behaviours (Emery et al., 2021).

However, within this study, eating outcomes were measured within the past year, and therefore outcomes prior to this or indeed reflective of current eating attitudes and behaviours were not captured (Emery et al., 2021). Additionally, measures of disordered eating were not standardised, either asking one question capturing each category or simply querying how often a person had dieted across the past year. Regarding childhood trauma, although an adapted measure of the "gold-standard" Childhood Trauma Questionnaire (CTQ) (Bernstein et al., 1994) was included amongst other measures of trauma, when measuring non-sexual abuse (including physical and emotional abuse, and neglect), only those committed by a family member were recorded. This potentially discounted participants who had experienced childhood trauma and abuse from non-familial perpetrators. Furthermore, responses for physical abuse were dichotomized as "Yes" or "No" according to criteria such as "being hit by a family member so hard it left bruises or marks", discounting other types of physical abuse measured within the CTQ. This potentially left many of the sample with experiences of childhood trauma unaccounted for or excluded in later analysis.

A further study summarised the results of a longitudinal project, which included over 3000 participants, who had been asked about their history of adverse childhood experiences and eating and weight behaviours at differing timepoints across the study (Yoon et al., 2022). The results found that the highest risk ratios were for physical neglect and binge eating (amongst females), and emotional abuse and unhealthy weight control behaviours (amongst males). No associations between adverse childhood experiences and the other measured disordered eating behaviours (including concerns or anxieties over weight and shape, chronic dieting, and general overeating) were found. Interestingly, physical neglect and emotional abuse showed stronger links with the two specified disordered eating behaviours over and above other measured adversities, such as household substance misuse and familial dysfunction (despite the latter being the most reported adversity) (Yoon et al., 2022). Therefore, it would be reasonable to continue to examine childhood trauma specifically (as opposed to adversities more generally) in relation to a wide range of disordered eating attitudes and behaviours.

To summarise, although previous research has documented evidence of a relationship between experiences of childhood trauma and disordered eating attitudes and behaviours in adulthood, there are a number of methodological aspects that make the results difficult to generalise. For example, participant samples have commonly included undergraduate students or those in early adulthood, as opposed to those across the adult age range (Hasselle et al., 2017; Smyth et al., 2018). Studies have not always incorporated standardised measures to determine childhood trauma or disordered eating (Feummeler et al., 2009), or have adapted scales typically used within eating disorder samples. Finally, studies have often administered measures at one timepoint only or asked participants to retrospectively recall eating habits based on the previous year or within a fixed period (Emery et al., 2021; Yoon et al., 2022), potentially missing the real-time fluctuation and impact on current eating outcomes.

Therefore, there is a further need to explore the effects of childhood trauma on eating attitudes and behaviours amongst wider participant groups. Additionally, it is important to consider a wide range of eating outcomes, not those solely reflecting eating disorders or pathological eating. A recent paper considering the role of childhood trauma in health outcome research stated that future research should seek to investigate the impact of such, whilst also seeking to determine the mechanisms that may link them (O'Connor, 2021).

Explanations of the Childhood Trauma and Eating Outcomes Relationship

There is, therefore, a well-documented association between experiences of childhood trauma and eating outcomes in adulthood. Research has progressed to determine

explanations of the relationship and to examine potential pathways between childhood trauma and eating outcomes.

Most research has focused on potential mediators by identifying factors hypothesised to be influenced by childhood trauma experiences, that may have a subsequent impact on eating behaviours. For example, one study using a participant sample of eating disorder patients examined the impact of psychological symptoms of depression and obsessive-compulsive behaviours on the relationship between childhood trauma and eating psychopathology (Kong & Bernstein, 2009). The results found that childhood trauma was a significant predictor of eating psychopathology, a relationship that was entirely mediated by depressive, but not obsessive-compulsive, symptoms. Elsewhere, a study utilising a non-clinical undergraduate sample concluded that the relationship between childhood trauma and disordered eating outcomes was significantly mediated by both dissociation and emotion dysregulation (Moulton et al., 2015).

Certain variables have attracted more attention within the literature. A systematic review into mediating variables of childhood trauma and eating disorder development, using both clinical and non-clinical populations, reported the most researched factors to be anxiety and depression symptomology, and dissociation (Rabito-Alćon et al., 2021). Other variables that had been examined as mediators included self-esteem and self-criticism, emotion regulation, and core beliefs, in addition to food and weight related concepts such as food addiction and body dissatisfaction. All of the studies identified within the review were of a cross-sectional design.

However, less evident in the literature is the consideration of childhood trauma as a moderator when examining additional variables in the eating attitudes and behaviours relationship. This is despite previous research identifying childhood trauma as an important moderating factor in the investigation of health and wellbeing outcomes, including daily perceived stress (O'Connor et al., 2018; O'Connor et al., 2020a). One study aimed to determine whether childhood trauma moderated the impact of a serotonin allele (proposed to be implicated in eating behaviours) and problematic eating (Stoltenberg et al., 2012). Results found that participants carrying the lower expression allele, who also had experiences of childhood trauma, demonstrated significantly greater eating difficulties (including bingeing, purging, and receiving treatment for an eating disorder). Although this study was focused on a genetic variable, it demonstrated the importance of considering the impact of childhood trauma as a moderating variable (Stoltenberg et al., 2012).

However, there is a dearth of research introducing childhood trauma as a moderator to determine its impact on the strength and direction of relationships between variables and the eating outcomes literature, making this a key aim of the current thesis. Additionally, certain variables have not been researched to the same extent (outside of those investigated as potential mediators in the aforementioned review; Rabito-Alćon et al., 2021), and

therefore their potential role in the relationship is less established. This includes factors that have been separately implicated in theoretical explanations of childhood trauma and eating outcomes more generally, such as stress and perfectionism. Their role in the impact of health overall will be summarised in the following section, in addition to research examining their links with childhood trauma and eating outcomes more specifically.

Stress

Defining Stress

Although many variations exist regarding the definition of stress, it has been generally conceptualised as a mental, physical, and emotional response to actual or anticipated events, resulting in worry, feelings of psychological strain, pressure, and a reduced ability to cope (Fink, 2010; Lazarus & Folkman, 1984; Manosso et al., 2022).

Stress and Health

Stress has been implicated in much of the research into health outcomes, and has been found to impact health via both direct and indirect pathways. From a direct, biological perspective, experiencing stress can result in altered bodily systems, such as heightened or diminished cortisol (the "stress hormone") levels and responses, dysregulation of the autonomic nervous system, and increased heart rate and blood pressure (O'Connor et al., 2021). Indirectly, stress can also affect overall health by altering behaviours, and indeed, has been found to be associated with health-related behaviours and outcomes, including increased alcohol consumption and smoking, decreased exercise and physical activity, and alterations in eating habits (O'Connor et al., 2021; Umberson et al., 2008).

Childhood Trauma and Stress

As noted by O'Connor et al. (2021), when investigating the impact of stress on health outcomes, it is also important to consider the role of childhood trauma and early life adversity. As the early years of life are a key developmental period, the experience of trauma within childhood has a significant impact on how individuals adapt and respond to their environments (Perry & Pollard, 1998).

It has been proposed that early adverse experiences can alter bodily stress systems, which subsequently impacts how individuals may respond to stress as well as influence biological systems. For example, in a sample of participants who displayed suicidal ideation and risk, those who reported more than one type of childhood trauma (that was classed as moderate or severe) displayed the lowest cortisol levels in respond to an acute stressor (O'Connor et al., 2018). Additionally, higher levels of perceived stress have been reported

amongst participants who have experienced trauma in childhood, including a greater perceived inability to cope, lower self-efficacy, and increased nervousness and worry (Betz et al., 2020).

Elsewhere, poor health behaviours have been linked to the experience of adversity or trauma in childhood via pathways whereby stressful events were seen to modify limbic functioning and result in altered cognitions, affect regulation, and stress reactivity (Lovallo, 2013). Additionally, Taylor (2010) proposed that stress experienced in childhood can have an impact across the lifespan via various mechanisms (such as individual threat responses, genetic predisposition, and psychological resources) to result in poorer health outcomes in adulthood. Therefore, it would be logical to extend the research into the role of childhood trauma in the relationship between stress and health behaviours, specifically eating.

Stress and Eating

Stress has been specifically examined in relation to eating behaviours, with research finding variability in both the amounts and types of food consumed under conditions of stress (O'Connor & Conner, 2011; Torres & Nowson, 2007). For example, under conditions of stress, between-person differences are evident whereby some people report increasing their food consumption, others report eating much less than usual, and a smaller minority do not appear to significantly alter their eating habits (Yau & Potenza, 2013).

The degree and perception of experienced stress is also important. For example, under conditions of mild to moderate stress, individuals reported eating more, in comparison to severe levels of stress whereby they reported eating much less (Stone & Brownell, 1994). Elsewhere, both greater self-reported perceived stress and exposure to chronic stressors (including those related to work, family, and relationships) were significantly associated with greater intake of unhealthy foods, increased hunger and binge eating, and reduced control when eating (Groesz et al., 2012).

A recent meta-analysis investigating the relationship between stress and eating reported a significant, positive association between the experience of stress and overall food intake amongst adult populations (Hill et al., 2021); that is, food intake was found to be greater under conditions of high stress. Additionally, the research found that stress influenced both healthy and unhealthy food consumption, with levels decreasing and increasing respectively. A similar meta-analysis investigated the relationship between stress and eating in children and adolescents, finding no overall significant relationship, but small significant effects for moderating variables of age and healthy versus unhealthy food consumption (Hill et al., 2018). The studies included in both meta-analyses measured overall food intake and type of food consumed (healthy versus unhealthy) as the main outcomes, and were not concerned with other outcomes of interest in the current thesis, such as an individual's attitude or relationship to food.

Indeed, the majority of research has tended to focus on the type of food consumed, such as overall calorie intake, healthy versus unhealthy food consumption, and between-meal snacking (O'Connor & Conner, 2011). A minority of studies have sought to investigate the impact of stress on disordered or non-clinical eating attitudes and behaviours. Such research has focused on examining emotional eating, binge eating, purging, or extreme dieting behaviours amongst participants exposed to time-limited periods of stress, such as undergraduate students facing examination periods (Costarelli & Patsai, 2013) or job stress amongst participants with high-pressured roles, such as healthcare staff (King et al., 2009). Indeed, such research has found that high levels of exam or work stress resulted in either increased food consumption or, in contrast, extreme restriction, to manage worries; losing control when eating; and subsequent feelings of guilt after bingeing (Costarelli & Patsai, 2013; King et al., 2009).

Whilst these specific sources of stress are undoubtedly important to contribute to our understanding of the impact on eating outcomes, the influence of perceived daily stressors are somewhat less clear. Furthermore, many of the stress-eating studies have adopted laboratory-based designs where individuals are exposed to an artificially enforced acute stressor, or cross-sectional designs that measure stress and eating at only one timepoint (Torres & Nowson, 2007). Such studies may lack generalisability and are unable to capture daily, real-time fluctuations in both stress and eating outcomes.

Additionally, it has been concluded that certain variables have not been researched to the same extent when considering the stress-eating relationship, including those relating to personality (such as perfectionism) and the impact of multiple variables within the same research study (O'Connor & Conner, 2011). A paper summarising the research into stress and eating outcomes concluded that although a consistent link is evident, future research should focus on understanding why, including potential mechanisms and pathways that may explain the link (Araiza & Lobel, 2018).

Childhood Trauma, Stress and Eating

Research has also been extremely limited when considering the role of childhood trauma in the relationship between stress and eating outcomes. Conclusions from research into the relationship have identified the possible role of the stress response system, in that individuals who have experienced early trauma may have developed altered stress response systems that subsequently results in emotional dysregulation and the management of such through disordered eating (Caslini et al., 2016).

There is some research that has specifically incorporated childhood trauma, stress, and eating outcomes within the same study. One such study included measures of childhood trauma (to capture sexual, physical, and emotional abuse) to assess the impact on Body Mass Index (BMI) and stress-related eating (including eating to cope or distract from

negative emotions, and binge eating) (Mason et al., 2015). Results found that childhood trauma was significantly associated with a slight increased risk of binge eating and coping-motivated eating, and an overall increased BMI. However, results were inconsistent when considering the type of abuse, with researchers concluding that a focus on stress-related eating may be most relevant for individuals with experiences of childhood physical abuse or violence (Mason et al., 2015).

Elsewhere, a study examined how childhood trauma affects stress responses and physiological processes within eating disorder populations specifically (Monteleone et al., 2020). Within a sample of individuals diagnosed with either anorexia or bulimia, it was found that the cortisol awakening response was diminished in those with a history of childhood trauma, in comparison to those without. Additionally, levels of the enzyme salivary alpha-amylase (proposed to be a marker of sympathetic nervous system activity, due to levels increasing under physical and psychological stress) were significantly lower in those with histories of childhood trauma compared to those without. The implication of such findings was that, in those with both a history of childhood trauma and an eating disorder diagnosis, stressors would be perceived as comparably stronger and more detrimental, resulting in an increased risk for stress-related effects. The research concluded that the findings supported the concept of vulnerability in managing stress in individuals with an eating disorder diagnosis and a history of childhood trauma (Monteleone et al., 2020).

Therefore, despite research linking stress to a range of eating outcomes, and the proposed importance of childhood trauma within this relationship, there has been a limited focus on incorporating all within the same research studies. Additionally, research has not, to date, focused on stress and eating attitudes and behaviours at non-clinical levels, whilst also considering the impact of childhood trauma, making this a key aim of the current research.

Perfectionism and Perfectionistic Thinking

Defining Perfectionism

A further area of interest in relation to childhood trauma and eating attitudes and behaviours is that of perfectionism. Perfectionism has been defined and conceptualised with a key focus on two specific aspects; firstly, the recognition that perfectionism is a multi-dimensional construct; and secondly, with a key focus on cognitive factors (Flett & Hewitt, 2002). Regarding the former, it was proposed that viewing perfectionism as unidimensional would potentially miss out on key interpersonal components of perfectionism related to the self and others (Hewitt & Flett, 1991). As a result, three dimensions of perfectionism have

been identified: self-oriented (related to setting, evaluating, and striving toward high standards for oneself); other-oriented (perceptions of others as imperfect and imposing unrealistic standards upon others); and socially-prescribed (the belief that others pressure oneself to be perfect and set expectations in relation to this).

In addition to a focus on trait components, perfectionism has also been conceptualised with a focus on the cognitive elements (Flett et al., 1998). Perfectionistic thinking relates to the automatic cognitions that one should be perfect, or strive for perfection at all times, with mistakes perceived negatively; such thoughts act as motivation to continue to attain high standards (Flett et al., 1998). The development of the Perfectionistic Cognitions Inventory (Flett et al., 1998) allowed for the measurement of perfectionistic thinking.

Perfectionism has been viewed as both maladaptive and adaptive dependent on the degree to which individuals feel they can strive for and meet standards in relation to themselves and others (Lo & Abbott, 2013). For example, perfectionism and associated thoughts may not always be pathological when considering those individuals who set high standards for themselves but are not critical of mistakes or deviation from these, allowing them to celebrate their successes without striving for more or perfection (Frost et al., 1990).

Perfectionism and Childhood Trauma

When considering the role of childhood trauma, early childhood experiences have been hypothesised to impact the development and experience of perfectionism in later life. Theoretically, the Social Reaction Model, proposed by Flett and colleagues, hypothesises that children who have been exposed to adversity (such as physical abuse or neglect) develop perfectionistic traits and place high expectations on themselves to be perfect in order to reduce the likelihood of further adverse occurrences, and in an attempt to evoke control and predictability over their circumstances (Flett et al., 2002).

Similarly, the Perfectionism Social Disconnection Model (Hewitt et al., 2017) highlighted the importance of early childhood experiences, including that of trauma, in the development of perfectionism in later life. The model proposes that a number of childhood relational experiences, such as disrupted or failed attachment, can result in a child viewing themselves as unworthy, others as unavailable, and therefore with a desire to be viewed as perfect to attract more positive interactions or love from others. Both models have focused on the idea that perfectionism develops in part as a response to trauma, by way of seeking to avoid such experiences occurring again (Flett et al., 2002; Hewitt et al., 2017).

Early research into the association between childhood experiences and perfectionism in adulthood focused on examining parental styles and attachment on the subsequent development of perfectionistic presentation (Flett et al., 1995). For example, associations have been found between an authoritarian parenting style and elevated scores on self-

oriented and socially prescribed domains of perfectionism (Flett et al., 1995). Research has also found that the development of maladaptive perfectionism in childhood is significantly associated with the experience of harsh parenting, defined as a controlling and critical parental style (Enns et al., 2022). Elsewhere, it has been found that adverse parenting (categorised as an overall lack of support, warmth, and involvement), and anxious and avoidant attachment styles, were significantly correlated with socially prescribed perfectionism and perfectionistic self-presentation in adulthood (Ko et al., 2019).

However, limited research has focused on interpersonal and traumatic childhood experiences, such as sexual abuse, physical abuse, and neglect, and its impact on perfectionism and perfectionistic thinking. Despite the aforementioned models proposing the importance of early traumatic experiences, very little research has empirically examined the link (Hewitt et al., 2017).

One such study measured adverse childhood experiences and perfectionism amongst a group of undergraduate students (Chen et al., 2019). Results found that participants who reported adversity in childhood also reported significantly higher levels of socially prescribed perfectionism and elevated non-display of imperfection in adulthood, results that were deemed to be consistent with the Social Reaction Model (Flett et al., 2002). Although this research demonstrated the potential impact of childhood experiences on perfectionism in adulthood, childhood experiences were covered more broadly, including family dysfunction (incorporating parental separation and divorce), familial mental illness, and family incarceration. Whilst distressing, such adverse experiences may not be perceived in the same context as childhood trauma, and it was acknowledged by the researchers that future research should incorporate alternative self-report measures of childhood traumatic experiences (Chen et al., 2019).

A further study did this by administering the short form of the Childhood Trauma Questionnaire (Bernstein et al., 2003) and the Frost Multidimensional Perfectionism Scale (Frost et al., 1990) to examine the impact of childhood trauma on maladaptive perfectionism in a sample of university students (Dobos et al., 2021). In addition, the research considered the impact of emotional dysregulation, social support, and academic anxiety. Overall, results showed that perfectionism scores significantly correlated with scores on the CTQ, and childhood trauma was the second strongest predictor of the maladaptive perfectionism score (emotional regulation being the strongest predictor). Study limitations were acknowledged, such as using a predominantly female sample only derived from undergraduate students. The researchers concluded by highlighting the importance of further research into childhood trauma as an antecedent to perfectionism (Dobos et al., 2021). Moreover, it is also important to note that there is a lack of research focusing on perfectionistic cognitions in relation to experiences of childhood trauma.

Perfectionism and Eating Outcomes

Perfectionism has been linked to eating outcomes, in particular to the development of eating disorders and problematic eating attitudes and behaviours (Bardon-Cone et al., 2007). Indeed, one measure of eating disorder symptomatology, the Eating Disorder Inventory (EDI), includes a specific subscale to capture perfectionism, due it being a trait believed to be fundamental to the development of eating disorders (Garner et al., 1983). Within the original EDI development research, perfectionism was described in the context of individuals placing excessive expectations on oneself yet struggling with the pressure to consistently attain perfection.

Moreover, theoretical models that have attempted to explain the relationship have described perfectionism as a "necessary condition" for the development of eating disorders, alongside the influence of genetics, personality (such as trait self-esteem), and social pressures (such as sociocultural norms and attitudes) (Goldner et al., 2002). This model emphasised that there is a heightened self-awareness and desire to improve amongst individuals high on measures of perfectionism, and that, in attempts to overcome and manage this, some may seek to restrict, control, or adapt their eating habits.

A key literature review aimed to examine current knowledge of the relationship between perfectionism and eating disorder outcomes, as well as provide directions for future research (Bardon-Cone et al., 2007). Firstly, summarised studies showed that individuals who had been diagnosed with eating disorders (specifically, anorexia and bulimia) scored significantly higher on measures of multidimensional perfectionism, in comparison to healthy controls. Additionally, the review reported evidence of a link between individuals who retrospectively reported high traits of perfectionism in childhood and being diagnosed with an eating disorder later in life (with the recognition of associated difficulties of assessing premorbid perfectionism). The review concluded with a summary which emphasised the role of perfectionism in the development and maintenance of eating disorders across a range of studies varying in their methodology, whilst also acknowledging the need for future research investigating specific mechanisms that link the two (Bardon-Cone et al., 2007).

Additionally, perfectionism has been linked to disordered eating attitudes and behaviours amongst those without a diagnosis of eating disorders. One such study (Macedo et al., 2007) administered the Eating Attitudes Test (Garner et al., 1982), which measures eating outcomes that may be indicative of eating disorders, assessing behaviours and attitudes such as excessive weight monitoring, restrictive practices, preoccupation with foods and social eating. When administered along with the Multidimensional Perfectionism Scale (MPS) (Hewitt & Flett, 1991) within a sample of over 1000 undergraduate students, results found that those who scored higher on the MPS were significantly more likely to demonstrate dietary concerns, bulimic behaviours, and social pressure to eat (Macedo et al.,

2007). In addition, those who were categorised as the highest scorers on the EAT measure had significantly higher scores on the MPS. Similar results have been found in adolescent participant groups, with higher scores on a specific child-adolescent scale of perfectionism significantly and positively correlating with drive for thinness, bulimic behaviours, and social pressures to eat (Bento et al., 2010).

Elsewhere, a study examined perfectionism as measured by the Eating Disorders Inventory Perfectionism scale (Garner et al., 1983) in relation to specific self-reported disordered eating outcomes, including fasting, binging, purging, and diuretic and laxative abuse (Forbush et al., 2007). Using a range of statistical analyses, results found that the strongest associations were seen between higher scores of perfectionism and fasting and purging behaviours (Forbush et al., 2007). However, within the research it was acknowledged that the perfectionism scale of the EDI only captures self-oriented and socially-prescribed perfectionism, and therefore may not have captured other dimensions of perfectionism that have been deemed important.

Perfectionistic Cognitions and Eating

Indeed, most research has focused on examining multidimensional trait perfectionism, and has paid less attention to the role of perfectionistic cognitions and eating outcomes. With the recognition of this, one study sought to examine whether those high on personality dimensions of perfectionism (self-oriented and socially prescribed perfectionism) had higher levels of eating disturbance, and whether this relationship was mediated by perfectionistic thinking (Downey et al., 2014). It was hypothesised that participants who scored higher on these measures of perfectionism would display higher levels of perfectionistic thinking and that perfectionism variables would result in higher negative body image and anorexic and bulimic behaviours. Additionally, it was hypothesised that these relationships would be fully mediated by perfectionistic thinking.

Results showed that, where personality dimensions of perfectionism significantly correlated with anorexic and bulimic behaviours, these relationships were mediated by perfectionistic cognitions (Downey et al., 2014). This suggested that those higher on dimensions of perfectionism may engage in restrictive, bingeing or purging behaviours in the presence of increased perfectionistic cognitions. A possible explanation for this related to the desire to expect perfection of oneself or experience pressure from others that resulted in cognitions related to being perceived as perfect, resulting in disordered eating behaviours in order to cope and regain perfection. The researchers concluded by calling for further research that examined perfectionistic thinking in relation to disturbed or disordered eating outcomes, with a particular focus on the overall daily frequency of such cognitions.

Another study sought to examine the impact of perfectionistic cognitions, in addition to trait perfectionism, on bulimia-related cognitions and behaviours specifically

(Flett et al., 2011). Preliminary results showed that individuals with more frequent negative automatic thoughts also experienced a higher incidence of perfectionistic automatic thoughts and, subsequently, increased bulimic thoughts. Hierarchical regression analyses found that the introduction of the PCI explained an additional 24% of the variance in bulimic automatic thoughts, over and above that from trait measures of perfectionism, and an additional 18% of variance in bulimic automatic thoughts over and above those from more generalised negative automatic thoughts. The researchers concluded that perfectionistic cognitions demonstrated the strongest association with the incidence of bulimic thoughts and reflected this to be the first evidence of the role of the PCI in the eating disorder literature. They acknowledged that the examination of state-like perfectionistic cognitions was an important future focus when considering the relation to disordered eating outcomes, whilst recognising their methodology to be cross-sectional in nature as a limitation (Flett et al., 2011).

As identified in a recent systematic review, there appears to be a significant and positive association between perfectionism and symptoms of disordered eating (Vacca et al., 2021). However, little is known about the factors that influence this process, and research examining perfectionistic thinking as a factor in the childhood trauma and eating outcomes relationship is scarce. Whilst research has emphasised the potential role of perfectionistic cognitions in the development of disordered eating outcomes, little is known about the factors that may influence this process due to the lack of literature focused on this specific association. Additionally, research examining perfectionistic thinking as a factor in the childhood trauma and eating outcomes relationship is, at present, limited, warranting further exploration.

Daily Diary Approaches

One of the limitations of many of the studies that have sought to investigate the relationship between childhood trauma and health outcomes, including eating attitudes and behaviours, as well as factors that may influence this relationship, is their methodology and design. For example, studies have often been retrospective and observational in nature (Petruccelli et al., 2019), or cross-sectional and laboratory-based (O'Connor & Conner, 2011). Few studies have investigated the relationship using other methods or designs,

One method of measuring the impact of various psychological and cognitive processes and factors on health outcomes and behaviours (including eating outcomes) is via daily diary approaches. Daily diary designs allow for the measurement of both within and between-person variables, whereby participants act as their own controls. Additionally, they are appropriate for usage to capture micro-level processes, including fluctuations in cognitions, attitudes, and behaviours (Conner & Lehman, 2012; Gunthert & Wenze, 2011).

Daily diary methods also allow for the study of "natural history" patterns and aim to reduce retrospective recall bias; such methods have been effectively used within health research (O'Connor & Ferguson, 2008). This method was therefore appropriate for the present thesis which aimed to examine the between-person experiences of childhood trauma and within-person daily experiences of stress, perfectionistic thinking, and eating attitudes and behaviours.

Daily Stress and Eating

Within the literature, daily diary approaches have been utilised to measure factors impacting eating outcomes, particularly when investigating the role of perceived daily stress. For example, one such study recruited a sample of adults to examine the impact of daily hassles and eating styles on eating behaviour, including between-meal snacking and fruit and vegetable consumption (O'Connor et al., 2008). Results found an association between experienced daily hassles and increased between-meal snacking of foods high in fat and sugar, stronger in those with certain eating styles (such as emotional eating and restrained eating). Additionally, experiencing daily hassles was associated with a decreased consumption of main meals and vegetables.

Elsewhere, a daily diary study across seven consecutive days sought to examine the impact of stress on eating motives and snacking choice in a group of children and adolescents, aged 10 to 17 years old (Debeuf et al., 2018). Background measures included a measurement of emotional eating and emotion regulation to capture both maladaptive and adaptive strategies. Daily stress was assessed by asking participants how stressed they had felt since breakfast, aiming to capture stressors that may have occurred in the context of school or with peers. Participants were also asked how many snacks they had eaten, along with their hunger and motive to eat. Using a multilevel modelling approach, results showed a significant positive correlation between experiences of daily stress and desire to eat but showed no correlation with daily snacking (Debeuf et al., 2018). Those who scored highly on the trait measure of emotional eating showed less of a decrease in their desire to eat and snacking behaviours when experiencing stress in comparison to those with a lower emotional eating style. The measure of trait emotion regulation was not found to moderate the relationships. The results were interpreted to mean that higher levels of stress can result in increased motivation and desire to eat to manage and regulate emotions following a stressful period. It was suggested that the lack of association between stress and snacking behaviours could be a result of eating habits and snacks being controlled by parental or carer figures, with younger children having less control over what and when they may eat (Debeuf et al., 2018).

A further daily diary study identified the importance of incorporating other variables in addition to stress to determine the impact on daily eating outcomes

(Reichenberger et al., 2018). The researchers incorporated the measure of daily positive and negative emotions and daily motivation to eat (whether due to hunger or to taste). The study used an ecological-momentary assessment where participants were prompted to complete diary entries at five timepoints throughout the day, answering questions relating to perceived stress, emotions, and eating, and whether they had eaten predominantly due to taste or hunger since the previous prompt. Results found that higher perceived levels of daily stress resulted in significantly decreased taste-based eating but had no impact on hunger-based eating. Positive emotions resulted in significant increases in taste-based eating. Researchers interpreted these findings to suggest that, even when under stress, individuals experience hunger and the evolutionary drive to eat even if they do not subsequently consume food for the purpose of experiencing taste (Reichenberger et al., 2018).

Additionally, within the study, when participant eating style was entered into the analysis model, it did not influence the stress-eating relationship, but moderated the non-significant relationship between taste eating and negative emotions (Reichenberger et al., 2018). This suggested that those who experienced greater intensity of negative emotions during the course of the day experienced less desire to eat for taste alone, only if they were categorised as an emotional eater. Overall, the results suggested that other daily factors in addition to stress would benefit from being studied in more depth.

Similar to non-daily diary studies, the majority of research summarised within this section has measured eating outcomes purely in the context of what is being consumed (for example, high versus low fat foods, and between-meal snacks) and motivation to do so (differentiating between hunger or taste-based desire). What has been less clear in the literature is the impact of daily stress on daily eating when outcomes are focused on attitudes toward eating (such as links with emotions, beliefs about food, or eating in social contexts).

One daily diary study examined the relationship between daily stress and eating behaviours that were deemed problematic, amongst a sample of adolescents (aged between 14 and 17 and categorised as generally healthy overall) (Hsu & Raposa, 2021). Results showed that experiencing a higher level of perceived stress (in comparison to own average level of stress across the seven-day study period) resulted in a significantly increased likelihood of eating to cope with difficult emotions, but not for other eating outcomes (such as restrained eating or food cravings).

The study also sought to investigate the impact of negative life events on eating behaviour (Hsu & Raposa, 2021). Analysis at the between-person level showed that those who had experienced a greater number of negative life events during the course of the study demonstrated more problematic eating behaviours, specifically an increased craving for tasty foods, and difficulty stopping when eating tasty foods.

Therefore, whilst daily diary studies have sought to investigate the impact of stress on eating outcomes, few studies have investigated eating attitudes and behaviours at non-clinical levels. Moreover, whilst there have been additional analyses within such studies (such as negative life events across the study period, or incorporation of eating style), no studies have, to date, considered the impact of childhood trauma in the relationship between daily stress and eating outcomes.

Daily Perfectionism and Eating

The literature is extremely limited when examining daily diary designs in relation to perfectionism or indeed specifically perfectionistic cognitions and the association with eating outcomes.

Boone et al. (2012) stated that the majority of studies of perfectionism focused on trait measures at one timepoint when examining the association with eating outcomes, and therefore sought to investigate whether perfectionism varies on a daily basis and whether this affects eating. Specifically, they investigated eating disorder symptoms amongst an adolescent sample (Boone et al., 2012). Participants completed seven consecutive daily diaries, each evening before bed, which assessed daily perfectionism in the form of personal standards and evaluative concerns (adapted from the MPS) and daily bulimic behaviours, drive for thinness, and body dissatisfaction (adapted from the EDI).

There was significant variability in both daily subscales of perfectionism, suggesting this fluctuated over the course of the seven-day study. On days where individuals set higher standards for themselves, they experienced an increased desire for thinness; and on days where individuals engaged in increased critical self-evaluation, they experienced higher levels of binge eating (Boone et al., 2012). Whilst this study is one of the only to examine perfectionism and eating at the daily level, it focused on adaptations from trait measures of perfectionism and eating disorder related symptoms. What remains absent within the literature is research focusing on perfectionistic cognitions at the daily level, and attitudes and behaviours toward eating not adapted from eating disorder measures.

Daily Diary Summary

Overall, daily diary studies have been shown as an effective design to measure the impact of daily variables on eating outcomes. More research has focused on the impact of stress, with little research considering perfectionistic thinking at the daily level and its subsequent impact on eating outcomes. Additionally, there is a dearth of research that investigates daily eating attitudes and behaviours that are not reflective of eating disorder symptomatology.

The Current Thesis

A review of the literature highlighted some key research aims, based on gaps and areas of methodological weakness.

Firstly, the majority of studies researching eating attitudes and behaviours have used populations diagnosed with eating disorders, predominantly female or undergraduate samples, or have administered questionnaires and measures reflective of eating disorder symptomology. There has been a lack of research using measures designed to capture the continuum of normal through to disordered eating, in participant samples more representative of the general population. There is a lack of studies utilising community samples to identify non-clinical eating outcomes, in populations that may not have necessarily received a diagnosis of any eating disorder.

Furthermore, childhood trauma has, at present, been considered less within the eating outcomes research. Although stress and perfectionism have, separately, been highlighted in the literature on eating outcomes, no research to date has examined these together in conjunction with the role of childhood trauma.

Whilst previous research has examined specific categories of childhood trauma in relation to diagnosed eating disorders, childhood trauma has not been examined in relation to daily disordered eating outcomes. The current thesis aimed to establish whether there is a main effect of childhood trauma on disordered eating outcomes, in addition to daily stress and perfectionistic thinking, and therefore did not distinguish between abuse and neglect types.

To summarise, this thesis aims to examine the impact of childhood trauma on non-clinical eating attitudes and behaviours, whilst also considering the impact of daily perceived stress and perfectionistic thinking.

Research Questions

This thesis aims to examine the following research questions:

1. Is there a main effect of childhood trauma on daily eating outcomes, whereby childhood trauma directly influences daily eating attitudes and behaviours?
2. Are more maladaptive or disordered eating attitudes and behaviours evident on days with [a] more stressors, and [b] greater perfectionistic thinking?
3. Are the above relationships (in #2) moderated by childhood trauma, such that the effects of daily stress and perfectionistic thinking on eating attitudes and behaviours are stronger in those who have experienced high levels of childhood trauma (in comparison to those with lower levels or no experience of childhood trauma)?

Research Hypotheses

The research questions are linked to the hypotheses below, represented diagrammatically (in Figures 2, 3, and 4):

1. It is hypothesised that higher levels of childhood trauma will be associated with more maladaptive or disordered eating attitudes and behaviours.

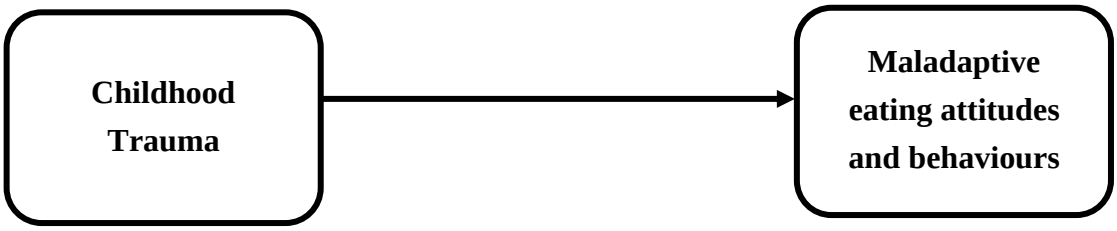


Figure 2: Hypothesis 1

2. It is hypothesised that higher levels of maladaptive or disordered eating attitudes and behaviours will be reported on days with more perceived daily stressors, and that this relationship will be moderated by childhood trauma (such that the effects of daily stress on eating attitudes and behaviours will be stronger in those who have experienced high levels of childhood trauma, in comparison to those with lower levels or no experiences of childhood trauma).

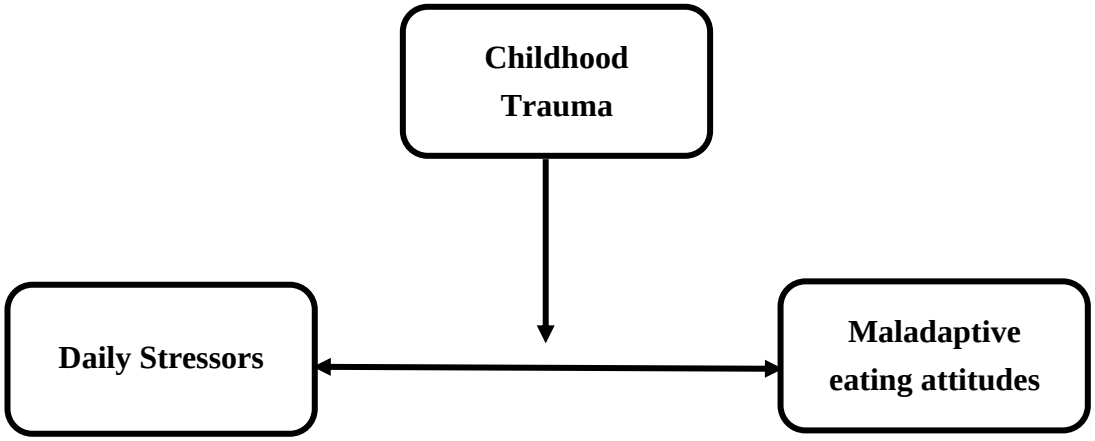


Figure 3: Hypothesis 2

3. It is hypothesised that higher levels of maladaptive or disordered eating attitudes and behaviours will be reported on days with increased perfectionistic thinking, and that this relationship will be moderated by childhood trauma (such that the effects of daily perfectionistic thinking on eating attitudes and behaviours will be stronger in

those who have experienced high levels of childhood trauma compared to those with lower levels or no experiences of childhood trauma).

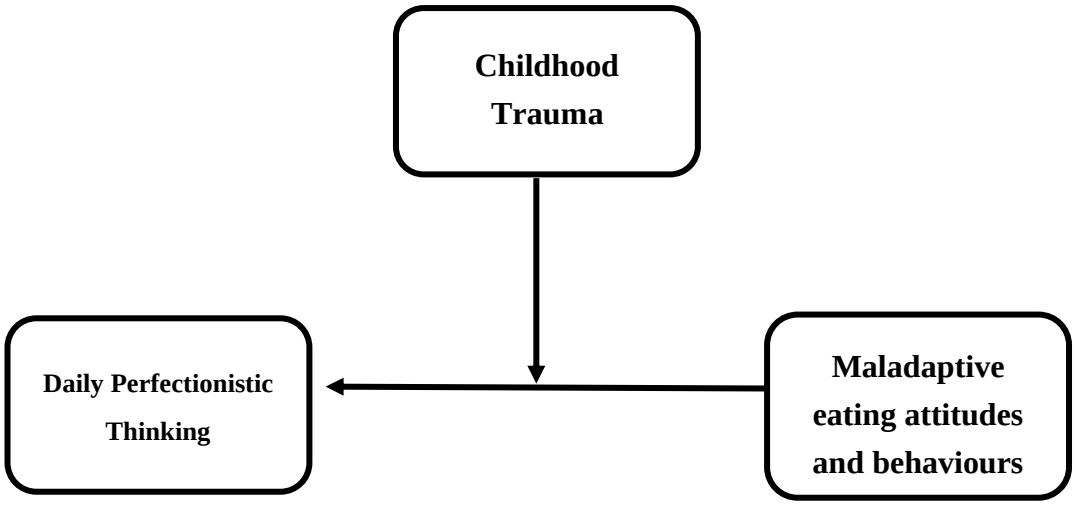


Figure 4: Hypothesis 3

Method

Design

A multi-level, prospective diary design was utilised, whereby participants completed an online diary, once per day, in the evening, for seven consecutive days. The diaries captured daily stress, daily perfectionistic thinking, and daily eating attitudes and behaviours. Diary completion was interval-contingent; that is, participants were required to complete the diary at specified intervals (once per day, in the evening) across the seven-day period.

A seven-day period was used in order maximise the likelihood of capturing variation in daily stressors, daily perfectionistic thinking, and daily eating outcomes across the course of a week (for example, encompassing what may be considered a typical working week and weekend routine). Additionally, a period of seven days for interval-contingent daily diary designs has been deemed as relatively low when considering participant burden (Connor & Lehman, 2012). Finally, daily diary studies lasting a period of seven days have been used in previous research into stress and eating outcomes (Debeuf et al., 2017; Hsu & Raposa, 2021; O'Connor et al., 2008) and perfectionism and eating outcomes (Boone et al., 2021).

Participants

Recruitment

Participants were recruited from the community in order to represent a non-clinical sample (the study did not specifically aim to recruit or target individuals with diagnosed eating disorders). Participants were required to be over the age of 18 years old and to have English as a first language (as all information and questionnaires were written in English).

The research opportunity was advertised on a variety of online platforms, including social media (Facebook, LinkedIn, Twitter), online participant recruitment websites (Call for Participants and Prolific), and research recruitment forums and pages (see Appendix A). On each post, a link was provided which directed participants to the Information Sheet, which provided detail on the study aims, requirements, and procedure (see Appendix B). Participants who wished to take part could click forwards to the consent form and provide consent by indicating a "Yes" or "No" to proceed to the background questionnaire. Selecting "No" would redirect participants to an exit page.

The first phase of recruitment ran from the 10th June 2022 to the 19th August 2022 (to inform the feasibility study). The second phase of recruitment ran from the 19th August 2022 to the 22nd of April 2023.

Participant numbers

Flowcharts detailing participant uptake, exclusion and completion rates are detailed in Figure 5 (Phase 1) and Figure 6 (Phase 2). Across both recruitment phases, a total of 589 participants completed the background questionnaire. Over half of participants were excluded for completing no subsequent daily diaries. Other reasons for exclusion included completing less than three daily diaries, having no matching unique user ID to collate background and daily diary questionnaires, and for being under the age of 18 years old.

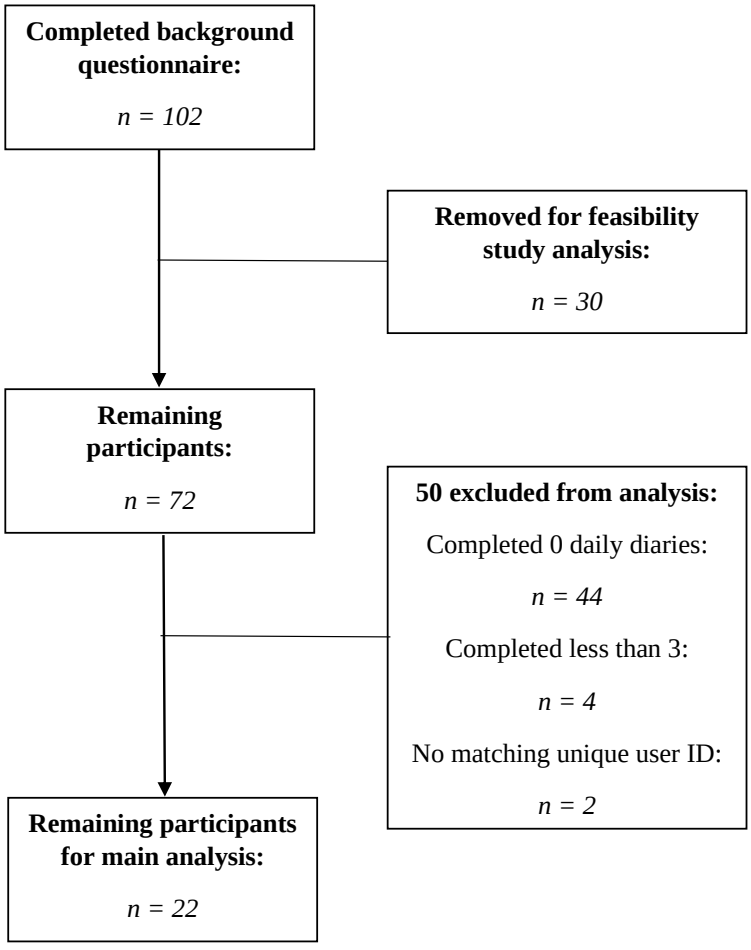


Figure 5: Recruitment Phase 1

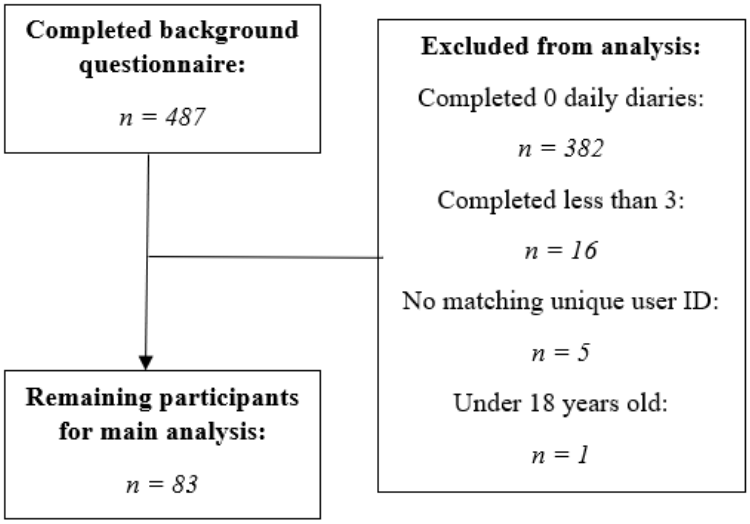


Figure 6: Recruitment Phase 2

Ethical Approval

Ethical approval was sought from the University of Leeds School of Psychology. Prior to approval, the panel queried the inclusion of a question directly asking about suicidal ideation and attempts. The query related to whether there is a risk associated with asking participants about suicidal ideation. Previous literature has concluded that acknowledging and asking about suicidal intent and behaviours can reduce suicidal ideation, in contrast to the widely held belief that enquiring may promote suicidal behaviour (Dazzi et al., 2014). This was communicated to the ethics panel, and approval was subsequently granted on February 2nd, 2022 (PSYC-454, see Appendix C).

Ethical Considerations

It was anticipated that participants may experience a degree of psychological upset or distress due to the nature of the measures used, in particular those enquiring about experiences of trauma, neglect, and abuse of a sexual, physical, or emotional nature as a child. However, it was not anticipated that prolonged psychological upset or distress would be experienced by participants, and all participants were adequately debriefed on completion of the study (see Appendix D).

Informed consent was gained from all participants. Within the initial information sheet presented prior to the questions on the background questionnaire, prospective participants were informed of the sensitive nature of certain measures involved in the research. Participants were also informed of and reminded of their right to withdraw from the study at any time should they feel distressed, and that they do not have to answer any questions they do not wish to by exiting the survey. Participants were made aware in the

information sheet that should they feel their mental health has worsened during the course of the study, they may consider withdrawing and seeking support.

In order to minimise the risk of distress, all participants were provided with a link to a resource sheet of confidential organisations offering support for those in distress or experiencing suicidal ideation (see Appendix E). Participants were encouraged to contact any of these services, or their General Practitioner should they feel any prolonged negative emotions during, or after, the study. The link for this resource sheet was also included at the end of each daily diary questionnaire.

Data Protection and Storage

Participants were assigned a unique participant code that was used in place of their name or other identifier. This code consisted of the participant's day of birth, the first letter of their mother's first name, and the last two digits of their phone number. Participants were asked to enter this at the beginning of each questionnaire, including the background questionnaire and each online daily diary entry. This allowed participant's background questionnaire to be linked to their daily diaries whilst allowing this information to remain anonymous as responses were not linked to names, emails, or any other identifier.

Data was collected via questionnaires hosted on the online platform, Online Surveys. All digital data was downloaded and stored in line with the University of Leeds data protection policy, which allowed for storage of highly confidential data on the OneDrive. University of Leeds accounts were password-protected, with DuoAuthentication in place.

Participants who completed all seven days of the diary were provided with a link to email the researcher's study email address to be entered into a prize draw for one of ten Amazon vouchers, worth between £5 and £50. In addition, participants who participated via Prolific were paid £1.50 for completion of the background questionnaire, as per Prolific hourly rates of £6 per hour of study completion.

Materials

All questionnaires were administered to participants using the online survey hosting platform, Online Surveys. All questionnaires were of self-report nature. Daily texts were sent containing each daily diary link to participants via VoodooSMS. For analysis, IBM SPSS Statistics v.26 was used to export and combine datasets, manage missing data, to obtain descriptive statistics and frequencies, and to produce boxplots of data distribution. HLM v.8.2 was used to conduct the main statistical analyses.

Measures

Background Questionnaire

The background questionnaire contained seven sections. Demographic information, including age, gender, ethnicity, and height and weight were gathered (see Appendix F). Height and weight were used to calculate participants' Body Mass Index (BMI). Whilst a reliance on BMI has been considered controversial within eating disorder services and research (due to the potential that those with disordered eating or symptoms of clinical diagnoses are labelled healthy based upon their BMI; Mishra & Harrop, 2023), it was included in the present study to provide an overview of general health relative to weight (as per Gutin, 2018). Participants were asked about their lifetime history of suicidal ideation and attempt. Given the association between childhood trauma and suicidal ideation and attempt (as per Angelakis et al., 2019; O'Connor et al., 2018; O'Connor et al., 2020b), these questions were included to firstly allow future research comparisons, and secondly to provide a richer understanding of the psychological wellbeing of the participant sample. Following this, participants completed the following self-report questionnaires (see Appendix G).

Childhood Trauma. Childhood trauma was measured using the Childhood Trauma Questionnaire-Short Form (CTQ-SF; Bernstein et al., 2003). The CTQ-SF is a 28-item, self-report measure designed to screen for experiences of trauma and has widespread usage amongst both clinical and non-clinical populations. Respondents are asked to retrospectively indicated whether they had experienced a number of occurrences during their childhood, with responses measured on a five-point Likert scale from 1 (= Never True) to 5 (= Often True). Higher scores are reflective of a higher incidence and severity of abuse. The items on the scale measure five categories of childhood trauma; emotional abuse (e.g. People in my family said hurtful or insulting things to me); physical abuse (I got hit so hard by someone in my family that I had to see a doctor or go to hospital); sexual abuse (Someone tried to touch me in a sexual way, or make me touch them); physical neglect (I didn't have enough to eat); and emotional neglect (I felt loved, reverse scored).

In the original study, the CTQ-SF demonstrated good criterion-related validity, when self-reported scores were compared with independent therapist ratings using a childhood maltreatment interview (Bernstein et al., 2003). Additionally, the CTQ-SF has demonstrated excellent internal consistency, structural validity, and good cross-cultural validity (Georgieva et al., 2021; Saini et al., 2019). A study on the psychometric properties of the CTQ-SF in a community sample reported internal consistency levels for the subscales as ranging from $a = 0.68$ (physical neglect) to $a = 0.95$ (sexual abuse), and a confirmatory factor analyses found items loaded on to the original five factors (Cruz et al., 2021).

Perfectionism. Perfectionism was measured using two questionnaires. The Perfectionism Cognitions Inventory (PCI; Flett et al., 1998; Flett et al., 2007) is a 25-item, self-report questionnaire measuring the frequency of perfectionist-related cognitions. Respondents are asked to rate how often a number of cognitions about perfectionism have occurred to them over the previous week, with items rated on a five-point Likert scale from 0 (Not at all) to 4 (All of the time*).* Items are summed to provide a total score, with higher scores indicative of increased incidence of perfectionistic cognitions. The PCI has been labelled as unique in its measurement of automatic thoughts that are associated with perfectionism (Flett et al., 2007). The PCI has been shown to have high internal consistency (a = 0.95) (Flett et al., 2007) and adequate test-retest reliability (.67, (p <.01) (Flett et al., 1998).

The Multidimensional Perfectionism Scale (MPS; Hewitt & Flett, 1991) is a 45-item questionnaire measuring three dimensions of perfectionism; self-oriented (those related to yourself), other-oriented (perfectionism in the context of others); and socially-prescribed (perfectionism based on societal expectation or pressure). Participants are asked to rate their agreement of a number of personal characteristics and traits, on a seven-point Likert scale from 1 (Disagree) to 7 (Agree). Higher scores are indicative of greater perfectionism. Internal reliability for the MPS has been found to range from 0.82 to 0.87 (Hewitt & Flett, 1991).

Eating. Eating attitudes and behaviours were measured using the Disordered Eating Attitude Scale – English version (Alvarenga et al., 2010a). The DEAS is a 25-item scale designed to measure an individual's relationship, beliefs, and attitudes toward food and eating. Specifically, the scale was designed to identify disordered eating attitudes and relationships with food that may be evident in individuals without an eating disorder diagnosis. The scale comprises five subscales: relationship with food, concerns about food and weight gain, restrictive and compensatory practices, feeling toward eating, and idea of normal eating. Descriptions for each scale are presented in Table 1.

Table 1: DEAS subscale description

Subscale	Description of subscale
Relationship with food	Represents attitudes related to the way individuals deal with food in terms of food control, food refusal, guilt, anger, desire, and shame.
Concerns about food and weight gain	Related to concerns about calories, intake control, obsessive thoughts about food, and weight gain.

Restrictive and compensatory practices	Represents restriction of food and calories, and attitudes aiming to compensate large or uncontrolled food intake.
Feeling toward eating	Related with feelings concerning pleasure and food memories, and how normal it feels to eat.
Idea of normal eating	Represents rigid nutrition concepts and beliefs.

The scale is divided into two parts. In Part I, respondents are firstly required to answer a question relating to how healthy and necessary they consider the consumption of a range of food types to be (such as sugar, breads, fruit and vegetables), with three potential answer options; often, occasionally, or not. Items are scored between 1 and 3 points depending on whether an individual answers "often", "occasionally" or "not" regarding the consumption of each type. Part I also contains 10 questions about food and eating with closed "Yes" or "No" responses, scored as either 1 or 5 points depending on the item they related to. The final question within Part 1 asks participants what their behaviour is after eating more than usual, with an option of 5 responses scored between 1 and 5 points.

Part II of the scale contains 13 questions rated on a 5-point Likert scale from "1 = Rarely/never" to "5 = Always". All but one of the items in this part are phrased as "I" statements relating to an individuals' relationship with food, such as "I feel guilty when I eat something that I thought I should not eat for some reason" and "I dream of a pill that would replace food".

Scores can be summed for each subscale as well as an overall total score. Higher scores on the DEAS are indicative of more disordered attitudes toward food and eating. The reliability of the DEAS as measured in the original study (using one group of undergraduate students and a comparative group of individuals with diagnosed eating disorders) was found to be good (a = 0.75) (Alvarenga et al., 2010b).

Stress. The Perceived Stress Scale (PSS-4; Cohen et al., 1983) is a brief, four-item questionnaire adapted from the original 14-item scale, designed to measure respondents' appraisal and experience of stress over the past month. Responses are rated on a 5-point Likert scale from "0 = Never" to "4 = Very Often", with higher scores indicative of higher levels of stress.

Daily Questionnaire

Participants were sent a text message once per day, in the evening, for seven consecutive days. The text message contained a link to the daily diary questionnaire and asked participants to complete this as soon as possible upon receiving. The daily

questionnaire was designed to measure daily experiences of stress, perfectionistic thinking, and eating attitudes and behaviours (see Appendix H).

Stress. Firstly, participants were asked to rate how stressed they felt today, with responses on a 5-point Likert scale from "Not at all stressed" to "Extremely stressed". In addition, the PSS-4 was adapted in order to measure participants' experienced stress that day. The items were adapted to ask participants how often they felt or thought a certain way today (opposed to within the past month, as in the original PSS-4). Each item was rated on a 5-point Likert scale from "Not at all stressed" to "Extremely Stressed".

Perfectionistic thinking. Perfectionistic thinking at the daily level was measured using an adapted version of the PCI. The five highest loading items from the original PCI (Flett et al., 2007) were taken and adapted to reflect cognitions that had occurred that day (as opposed to within the previous week as in the original measure). However, the two highest loading statements were deemed inappropriate due to the inclusion of the word "work"; this may not have been applicable to some participants due to current employment circumstances or individual perceptions of work. Therefore, the third to seventh highest loading items were adapted. For example, "I expect to be perfect" was adapted to read "I expected to be perfect" (see Table 2). Items were rated on a five-point Likert scale from, 0 = "Not at all" to 4 = "All of the time".

Table 2: PCI daily adaptation

Original	Adapted to daily level
I expect to be perfect	I expected to be perfect
I felt I should be perfect	I felt I should be perfect
I can't stand to make mistakes	I couldn't stand to make mistakes
I must be efficient at all times	I had to be efficient at all times
I have to be the best	I had to be the best

Eating attitudes and behaviours. Participants were firstly asked to answer how much they had eaten that day in comparison to usual, from three options (much less, the usual amount, or much more). Participants were asked how many portions of fruit and how many portions of vegetables they had eaten that day. In addition, participants were asked to rate the extent to which they feel that had eaten healthy snacks, unhealthy snacks, a healthy diet, or an unhealthy diet today. Participants were also asked to report any between-meal snacks they had consumed that day; ten free-response boxes were provided to type in the snack, along with a box to indicate the time this was consumed.

Between-meal snacks were coded into total number of snacks, total number of healthy snacks, and total number of unhealthy snacks. These categorisations were made using food composition tables (McCance & Widdowson, 2014). A snack was considered unhealthy if it contained high levels of sugar and/or fat. A food was classified as being high in (total) fat if it contained more than 17.5g of fat per 100g of food, and high in sugar if it contained over 22.5g of sugar per 100g of food. Examples of healthy snacks in the participant group included a banana, carrot sticks, and plain unsweetened yoghurt. Example of unhealthy snacks in the participant group included chocolate bars, crisps, and sugary cereal bars.

In order to measure disordered eating attitudes and behaviours across the course of the day, participants were asked to rate 10 statements based on how often they occurred "today". The 10 statements were daily adaptations of items drawn from the DEAS, Part II (as Part I did not appropriately translate to the daily level, due to its measurement of food perception). The top two loading items from each of the five subscales were adapted to reflect daily occurrences (see Table 3). For example, "Do you skip meals to avoid putting on weight?" was adapted to read "I skipped meals to avoid putting on weight". For one subscale, Feeling toward eating, the highest loading item did not appropriately translate to the daily level ("Do you have good memories relating to food?") and therefore the second and third highest loading items were used instead.

Table 3: DEAS daily adaptation

Subscale	**Original**	**Adapted to daily level**
Relationship with food	I try eating less in front of others in order to overeat when I am alone	I tried eating less in front of others in order to overeat when I was alone
	I am afraid to start eating and not be able to stop	I was afraid to start eating and not be able to stop
Concerns about food and weight gain	I quit eating a kind of food if I find out it has more calories than I thought	I stopped eating a kind of food because I found out it had more calories than I thought
	I worry about how much a certain kind of food or meal will make me gain weight	I worried about how much a certain kind of food or meal I ate would make me gain weight
Restrictive and compensatory practices	Have you ever spent one or more days without eating or only having liquids because you believed you could lose weight?	I didn't eat or only had liquids because I believed I could lose weight.

	Do you skip meals to avoid putting on weight?	I skipped meals to avoid putting on weight.
Feeling toward eating	Does eating ever feel unnatural to you?	Eating felt unnatural to me.
	Do you feel pleasure when you eat?	I felt pleasure when I ate.
Idea of normal eating	Do you believe it is normal to eat sometimes just because you are sad, upset or bored?	I ate because I was sad, upset, or bored.
	When I desire a specific kind of food, I know I won't stop eating it until I finished with it.	I didn't stop eating a type of food until I had finished with it.

Procedure

Following provision of informed consent via Online Surveys, participants were asked to firstly complete the background questionnaire containing measures designed to assess experiences of childhood trauma, trait perfectionism, eating attitudes and behaviours, and perceived stress.

Upon completion of the background questionnaire, participants were asked to send an email to the designated study email address (*eatingstudy2022@gmail.com*) with the subject line "Starting study tomorrow". Within this email, participants were asked to provide their mobile number to receive the texts containing the link to each online daily diary. The following day and for six consecutive days thereafter, participants were sent a text at 8pm containing a link to each daily diary and instructed to complete their diary as soon as possible.

Previous studies using daily diary methodology have sent diaries at 8pm or demonstrated high rates of completion when diaries are completed in the evening, prior to bed (Boone et al., 2012; Hsu & Raposa, 2020).

Following completion of the seventh and final daily diary, participants were debriefed. At this stage, participants also had the option of sending an email to the study email address to enter the prize draw for the study.

Preregistration

The study was pre-registered on AsPredicted (https://aspredicted.org/vb8xg.pdf) on the 29th July 2022. AsPredicted is a website used for researchers to pre-register research studies and document intentions regarding hypotheses, variables, analyses, and data collection prior to commencing the study (see Appendix I).

Feasibility study

A feasibility study was conducted to identify any issues with recruitment and questionnaire distribution, and to inform the power calculation to determine the required sample size. Within the literature, there were no directly comparable research studies and therefore it was decided that using the data from a select number of participants to run analyses on would be most appropriate to inform the power calculation.

Demographics

The first 30 participants with complete datasets (classed as completion of the background questionnaire and at least 3 daily diaries) were analysed. This resulted in 200 daily diaries from 30 participants. Demographic information for the 30 participants is presented in Table 4.

Ten participants identified as male and 20 as female. The average age of participants was 40.67 years old (SD = 20.04, range 19-93). Almost half of participants described their ethnic background as White (*n* = 14, 46.7%) and the majority described their nationality as British (*n* = 20, 66.7%). The average Body Mass Index (BMI) was 26.51 (SD = 8.37, range 18.34-62.83). Most participants were categorised as having a healthy (n = 13, 43%) or overweight (n = 11, 37%) BMI, according to the National Health Service criteria (NHS, 2022). Half of participants reported any lifetime suicidal ideation (n = 15, 50%) and a fifth reported any lifetime suicidal attempt (n = 6, 20%). Five participants indicated that they had a first-degree relative who had attempted or completed suicide (n = 5, 16.7%).

Table 4: Feasibility study - participant demographics

	n	%
Gender		
Male	10	33.3%
Female	20	66.7%
Ethnic Background		
White English/Welsh/Scottish/Northern Irish/British	14	46.7%
European	5	16.7%
White and Black African	5	16.7%
Indian	1	3.3%
Other	5	16.7%
Nationality		
British	20	66.7%
American	4	13.3%
Other	6	20%
Education		
Postgraduate degree	11	36.7%
Undergraduate degree	11	36.7%
A-Level/L3 or equiv.	6	20%
GCSE/O-Level/L2 or equiv.	2	6.7%
Body Mass Index		
Underweight	1	3%
Healthy	13	43%
Overweight	11	37%
Obese	5	17%

Descriptive Statistics

Descriptive statistics for Level 2 (between-person) variables are reported in Table 5.

Table 5: Feasibility study - Level 2 descriptive statistics

	Mean	SD	Range
Perceived Stress	6.33	3.54	0-14
Multidimensional Perfectionism Scale			
Self-oriented Perfectionism	66.93	17.21	21-99
Other-oriented Perfectionism	48.03	15.19	23-76
Socially-prescribed Perfectionism	54.8	15.96	15-83
Disordered Eating Attitude Scale			
Relationship with food	24.8	10.19	11-47
Concerns	7.5	3.07	4-14
Restrictive eating	9.47	4.61	4-18
Feelings toward	5.27	2.91	3-11
Normal eating	28.87	6.39	19-39
Total	46.8	21.27	7-88
Childhood Trauma Questionnaire			
Emotional abuse	10.7	5.12	5-25
Physical abuse	7.57	3.42	5-16
Sexual abuse	8.33	5.92	5-25
Emotional neglect	11.53	5.6	5-25
Physical neglect	8.33	3.36	5-17
Total	55.03	16.46	37-99

Descriptive statistics for Level 1 (within-person, daily) variables are reported in Table 6.

Table 6: Feasibility study - Level 1 descriptive statistics

	Mean	SD	Range
Daily Perceived Stress	6.01	3.49	0-16
Daily Perfectionistic Thinking	7.48	5.95	0-20
Disordered Eating Attitude Scale			
Relationship with food	2.98	1.59	2-9
Concerns about food and weight gain	3.2	1.76	2-9
Restrictive and compensatory practices	2.74	1.45	2-8
Feelings toward eating	4.75	1.59	2-10
Idea of normal eating	4.02	1.99	2-10

Analysis

Multilevel analyses were conducted using HLM-8.2 software. The analysis investigated whether the daily eating outcomes were predicted by either daily stress or daily perfectionistic thinking, and whether these relationships were moderated by childhood trauma. Level 1 models were examined to test the relationship between either daily stress or daily perfectionistic thinking, and each daily eating attitude and behaviour. Cross-level effects were also examined, to investigate whether daily eating outcomes and either daily stress or perfectionistic thinking were moderated by childhood trauma (Level 2).

Ten separate models were therefore run; firstly, each of the five DEAS subscales inputted at Level 1 as the outcome variable, along with daily stress as the predictor variable, with the total CTQ score inputted at Level 2 as the moderating variable, creating five individual models. Each of the five DEAS subscales were again inputted at Level 1, along with daily perfectionistic thinking, with the total CTQ score inputted at Level 2, creating a further five individual models.

The sample size was determined using a summary-statistics-based power analysis to detect a cross level effect informed by the feasibility study (Murayama et al, 2021). A power analysis was obtained for each of the ten calculations as above. The results of the analyses ranged from showing that a minimum sample of 5.56 participants was required to achieve 80% power ($t = 13.17$, $p = <0.001$) to showing that a minimum sample of 615.18 participants was required to achieve 80% power ($t = -0.6$, $p = 0.553$) depending on which of the relationships the analysis focused on. Therefore, an average of the ten output sample sizes was obtained which resulted in a mean of 173.9 participants. To account for attrition and drop out, the study aimed to recruit 200 participants.

Main Statistical Analysis

Data was excluded from analysis if less than three days of diaries were completed, to provide sufficient data for within-person analyses and to inform the research hypotheses. This provided a usable dataset of 674 daily diaries from 105 participants. Eight databases were exported from Online Surveys to IBM SPSS-26. This consisted of one file containing data from the background questionnaire, and seven files containing data for each of the daily diary responses. The daily diary files were collated by copying and pasting into one new database and ordering by participant's ID codes.

For the background questionnaire, all questions (aside from postcode) were compulsory to proceed and complete the questionnaire. Therefore, there were no missing

data points for participants who had completed the background questionnaire. Boxplots were computed and visually inspected to identify outliers. A number of outliers were identified, in particular concerning the DEAS variables at the daily level. In order to test the impact of replacing outliers, outliers that exceeded the mean plus three standard deviations were replaced with a value of three standard deviations from the mean. Analyses were computed using the original data (see Appendix J for HLM outputs) and the replaced outlier dataset in order to determine whether results differed. Analyses containing the replaced outliers differed from those where outliers were retained. Additionally, in order to determine the skewness of the data, histograms were computed and visually examined. The data for DEAS daily variables was skewed to the left, with most participants scoring toward the lower end of the range of potential response scores. To test whether dichotomising the DEAS daily variables impacted the results, participants who scored less than or equal to 2 were coded as 1, and participants who scored above 2 were coded as 2. However, when running analyses with the dichotomised variables, the results did not significantly differ from the method of replacing outliers. Therefore, it was decided that the approach of replacing outliers that exceeded the mean plus three standard deviations with a value of three standard deviations from the mean was most effective. These are the statistics reported in the Results section.

Multilevel analyses were conducted using HLM-8.2 software, which allowed for the effects of within and between-subject variables to be incorporated into the same analysis. The data contained a two-level hierarchical structure. Level 1 represented the within-person variation (daily stress, daily perfectionistic thinking, and daily eating attitudes and behaviours) and Level 2 represented the between-subject variation (childhood trauma). Level 1 variables were centred around the group mean (subtracting the individual's group mean from the individual's score) and Level 2 variables were grand mean centred. The Level 1 slope (models) were examined to investigate the relationship between either daily stress, or daily perfectionistic thinking, and daily eating attitudes and behaviours (represented by five subscale scores from the adapted DEAS).

For cross-sectional analyses, level 2 slope (models) were examined to test the association on either daily stress or daily perfectionistic thinking on daily eating attitudes and behaviours, and whether these relationships were moderated by childhood trauma. Therefore, to test cross-level interactions, either (1) perceived daily stress (level 1 variable) was added as the predictor for each daily eating attitudes and behaviour (level 1 variable), with childhood trauma (level 2 variable) added as a moderator, or (2) daily perfectionistic thinking (level 1 variable) was added as the predictor for each daily eating attitudes and behaviour (level 1 variable), with childhood trauma (level 2 variable) added as a moderator.

Cross-level effects were also examined to determine: (1) whether there was a main effect of daily stress OR daily perfectionistic thinking (level 1 variables) on daily eating

attitudes and behaviours (level 1 variable), and (2) whether the daily stress-eating or perfectionistic thinking-eating relationships (level 1) were moderated by childhood trauma (level 2). This modelling strategy was repeated for each of the five eating attitude and behaviour subscales.

An example of the form of the model is expressed below:

Level-1 Model

$$DEAS\_REL_{ti} = \pi_{0i} + \pi_{1i}*(PSS\_DAIL_{ti}) + e_{ti}$$

Level-2 Model

$$\pi_{0i} = \beta_{00} + \beta_{01}*(CTQ\_TOTA_i) + r_{0i}$$
$$\pi_{1i} = \beta_{10} + \beta_{11}*(CTQ\_TOTA_i) + r_{1i}$$

Where:

- $DEAS\_REL_{ti}$ indicates the outcome variable (in this example, the daily Relationship with food subscale) and PSS_DAIL_{ti} indicates the predictor variable (in this example, daily perceived stress).
- $\beta 00$ indicates the mean subscale score of the outcome variable (DEAS subscale).
- β_{01} indicates the main association between CTQ and the selected DEAS subscale.
- β_{10} indicates the association between daily stress and the selected DEAS subscale.
- β_{11} indicates the moderation effect of CTQ on the β_{10} relationship.

Significant cross-level interactions (β_{11}), where childhood trauma was found to moderate a stress-eating outcome or perfectionistic thinking-eating outcome, were examined using Preacher's simple slopes analysis for cross-level interactions (Preacher et al., 2006).

Results

Participant Demographics

105 participants were included in the main analyses. Demographic information for these participants is presented in Table 7.

The majority of participants identified as female (*n* = 84, 80%). 16 identified as male, four as non-binary, and one participant preferred not to answer. The average age of participants was 35.03 years old (*SD* = 13.24, range 18-72), with most participants falling within the "26-35" years old age bracket (*n* = 36, 34.3%). Most participants described their ethnic background as White (*n* = 77, 73.77%) and their nationality in a free-response box as British (*n* = 33) or English (*n* = 44). Additionally, most participants had been educated to undergraduate (*n* = 33, 31.43 %) or postgraduate-degree level (*n* = 39, 37.14%). Over half of participants reported experiencing any lifetime suicidal ideation (n = 55, 52.38%) and just over a quarter reported any lifetime suicidal attempt (n = 28, 26.67%). 15 participants reported that they had a first-degree relative who had attempted or completed suicide (n = 15, 14.29%).

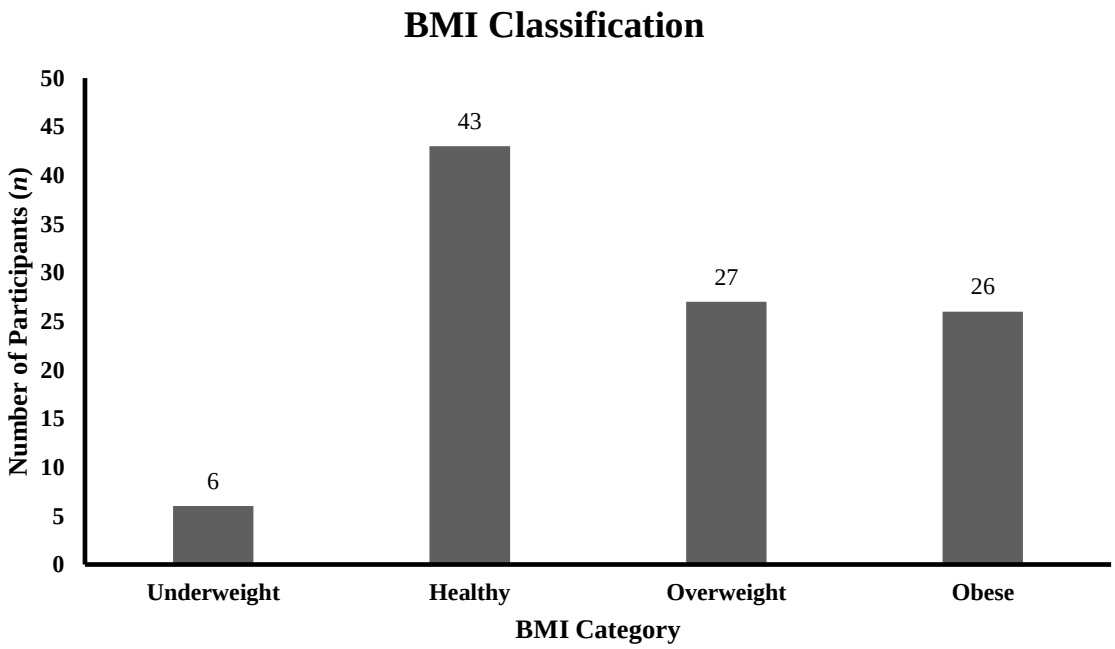
Table 7: Participant demographic information

	n	**%**
Gender		
Male	16	15.24%
Female	84	80.00%
Non-binary	4	3.81%
Prefer not to answer	1	0.95%
Ethnic Background		
White *English/Welsh/Scottish/N. Irish/ British*	77	73.33%
European	4	3.81%
White Asian	3	2.86%
White and Black Caribbean	3	2.86%
African	3	2.86%
White and Black African	2	1.90%
Irish	2	1.90%
Pakistani	2	1.90%
Chinese	2	1.90%
Indian	1	0.95%
Other	6	5.71%
Nationality		
British	33	31.43%
English	44	41.90%
American	10	9.52%
Scottish	3	2.86%
Canadian	2	1.90%
Irish	2	1.90%
Nigerian	2	1.90%
European	1	0.95%
Hong-Kong	1	0.95%
Malaysian	1	0.95%
New Zealand	1	0.95%
Education		
Undergraduate degree	33	31.43%
Postgraduate degree	39	37.14%
A-Level/L3 or equiv.	22	20.95%
GCSE/O-Level/L2 or equiv.	8	7.62%
Other	2	1.90%

Figure 7 displays the BMI classification for the total participant sample, calculated from self-reported height and weight. Three participants did not provide a weight, citing reasons as unknown or unable to verify, and feeling uncomfortable to weigh themselves.

Therefore, for three participants, a BMI figure could not be calculated. Of the remaining 102 participants, the average BMI was 26.54 (*SD* = 7.49, range 15.48-65.91). Most participants were categorised as having a healthy BMI (*n* = 43, %), according to NHS criteria (NHS, 2022). Similar numbers of participants were categorised as being overweight (*n* = 27, 26.5%) or obese (*n* = 26, 26.5%). The fewest participants were categorised as being underweight (*n* = 6, 5.9%).

Figure 7: BMI Classification



Descriptive Statistics

Table 8 displays the descriptive statistics for the Level 2 variables (from the background questionnaire). The average perceived stress score was 6.74 (*SD* = 3.40, range 0-16). Three participants scored the minimum possible total of 0 and one participant scored the maximum possible total of 16.

The average PCI score was 27.85 (*SD* = 18.56, range 0-66), which was lower than the normative data reported for a community sample in the original PCI validation paper (Flett et al., 1998). The highest scoring MPS subscale was Self-oriented Perfectionism, with participants scoring an average of 67.79 (*SD* = 18.78, range = 17-105). The lowest scoring MPS subscale was Other-oriented Perfectionism, with participants scoring an average of 50.05 (*SD* = 12.12, range 24-87).

The average total DEAS score was 85.43 (*SD* = 23.11, range 39-144); this was higher than the normative average of a student sample as reported in the original DEAS development paper (Alvarenga et al., 2010b). No participant scored the minimum DEAS total score of 37 or the maximum score of 190. The highest scoring DEAS subscale was idea of normal eating, with participants scoring an average of 34.23 (*SD* = 8. 29, range 16-56).

The average total CTQ score was 47.6 (*SD* = 20.36, range 25-108). For the total score, most participants were categorised as "None to Low" (*n* = 44, 41.9%), followed by "Moderate to Severe" (*n* = 39. 37.1%) and finally, "Low to Moderate" (*n* = 22, 21%). When considering the minimisation and denial subscale, 14 participants scored 1, five participants scored 2, and one participant scored 3.

Table 8: Level 2 descriptive statistics

	Mean	***SD***	**Range**
PSS	6.74	3.40	0-16
MPS			
Self-oriented Perfectionism	67.79	18.78	17-105
Other-oriented Perfectionism	50.06	12.12	24-87
Socially prescribed Perfectionism	56.79	15.73	16-99
PCI	27.85	18.56	0-66
DEAS			
Relationship with food	27.14	10.95	12-57
Concerns over food and weight gain	8.07	3.97	4-19
Restrictive and compensatory practices	10.21	5.19	4-20
Feelings toward eating	5.78	3.47	3-15
Idea of normal eating	34.23	8.29	16-56
Total	85.43	23.11	39-144
CTQ			
Emotional abuse	11.75	6.47	5-25
Physical abuse	7.56	4.18	5-23
Sexual abuse	7.89	5.67	5-25
Emotional neglect	11.91	5.61	5-25
Physical neglect	8.49	4.07	5-22
Total	47.6	20.36	25-108

Diary Completion

105 participants provided a total usable dataset of 674 daily diaries, to be included in the main analyses. Diary completion rates are presented in Table 9. The majority of participants returned a complete, seven-day diary set (n = 74, 70.48%). The most common days missed were days six and seven (n = 16 missed for each).

Table 9: Daily diary completion rates

	n	**%**
No. days of diary completion		
7	74	70.48%
6	15	14.29%
5	7	6.67%
4	4	3.81%
3	5	4.76%

Descriptive statistics for Level 1 variables (within the daily diaries) are displayed in Table 10. The average daily perceived stress score was 6.10 (*SD* = 3.66). 49 daily diaries reported a total daily stress score of the minimum possible score, 0, and 11 daily diaries reported a total daily stress score of the maximum possible score, 16. The average daily PCI score was 5.91 (*SD* = 5.47). 131 daily diaries reported a total daily PCI score of the minimum possible score, 0, and 21 daily diaries reported a total daily PCI score of the maximum possible score, 20.

Regarding the DEAS, the highest average daily subscale score was for feeling toward eating (mean = 4.65, *SD* = 1.60) and the lowest average subscale score was for relationship with food (mean = 2.64, *SD* = 1.49).

Participants reported consuming an average of 1.19 portions of fruit per day (*SD* = 1.24, range 0-7) and an average of 2.36 portions of vegetables per day (*SD* = 2.12, range 0-15). The mean total snacks per day was 2.06 (*SD* = 1.50, range 0-8). The average number of healthy snacks was 0.77 (*SD* = 1.02, range 0-7), which was less than the average number of unhealthy snacks at 1.29 (*SD* = 1.13, range 0-6).

Table 10: Level 1 descriptive statistics

	Mean	***SD***	**Range**
Daily Perceived Stress	6.10	3.66	0 – 16
Daily Perfectionistic Thinking	5.91	5.47	0 – 20
Disordered Eating Attitude Scale			
Relationship with food	2.64	1.49	2 – 10
Concerns about food and weight gain	3.15	1.95	2 – 10
Restrictive and compensatory practices	2.84	1.91	2 – 10
Feeling toward eating	4.65	1.60	2 – 10
Idea of normal eating	3.86	2.15	2 – 10
Food Consumption			
Portions of fruit	1.19	1.24	0-7
Portions of vegetables	2.36	2.12	0-15
Total snacks	2.06	1.50	0-8
Healthy snacks	0.77	1.02	0-7
Unhealthy snacks	1.29	1.13	0-6

Hypothesis 1: Main effect of CTQ on DEAS subscales

Slopes were firstly examined to test whether there was a main effect of the total CTQ score on daily DEAS subscales. The results from HLM analyses are displayed in Table 11.

Table 11: Main effect of CTQ on DEAS subscales

HLM effect	**Symbol**	**Coefficient**	***SE***	***p***
Intercept				
CTQ - DEAS_REL	β_{01}	0.032	0.006	<0.001
CTQ - DEAS_CON	β_{01}	0.032	0.008	<0.001
CTQ - DEAS_RES	β_{01}	0.036	0.007	<0.001
CTQ - DEAS_FEE	β_{01}	0.011	0.006	0.073
CTQ - DEAS_NOR	β_{01}	0.016	0.010	0.117

CTQ total childhood trauma score, *DEAS_REL* daily relationship with food, *DEAS_CON* concerns about food and weight gain, *DEAS_RES* restrictive and compensatory practices, *DEAS_FEE* feeling toward eating, *DEAS_NOR* idea of normal eating.

Table 11 shows that significant main effects of childhood trauma were found for three of the DEAS subscales. Firstly, there was a significant main effect of total CTQ score on the DEAS relationship with food subscale (β_{01} = 0.032, p = <0.001), indicating that higher levels of childhood trauma were associated with a higher daily disordered relationship with food. This is displayed in Figure 8.

Figure 8: Mean DEAS Relationship with food subscale score by CTQ Total category

(Error bars represent SEM)

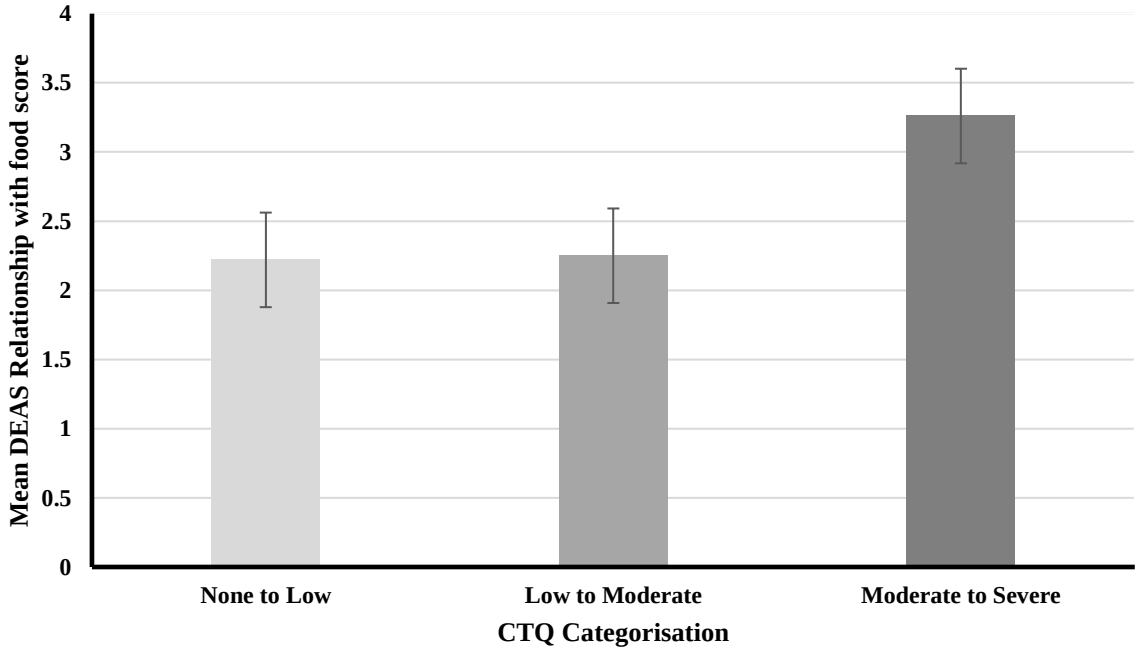


Figure 8 shows that the mean relationship with food daily subscale score was significantly higher in participants categorised as scoring "Moderate to Severe" on the CTQ (mean = 3.26, *SD* = 1.77) than participants categorised as scoring "None to Low" on the CTQ (mean = 2.22, *SD* = 0.72) and "Low to Moderate" (mean = 2.25, *SD* = 0.68).

A significant main effect was also found for the total CTQ score and the DEAS concerns about food and weight gain subscale (β_{01} = 0.032, p = <0.001), indicating that higher levels of childhood trauma were associated with greater daily concerns about food and weight gain. This is displayed in Figure 9.

Figure 9: Mean DEAS Concerns subscale score by CTQ Total category

(Error bars represent SEM)

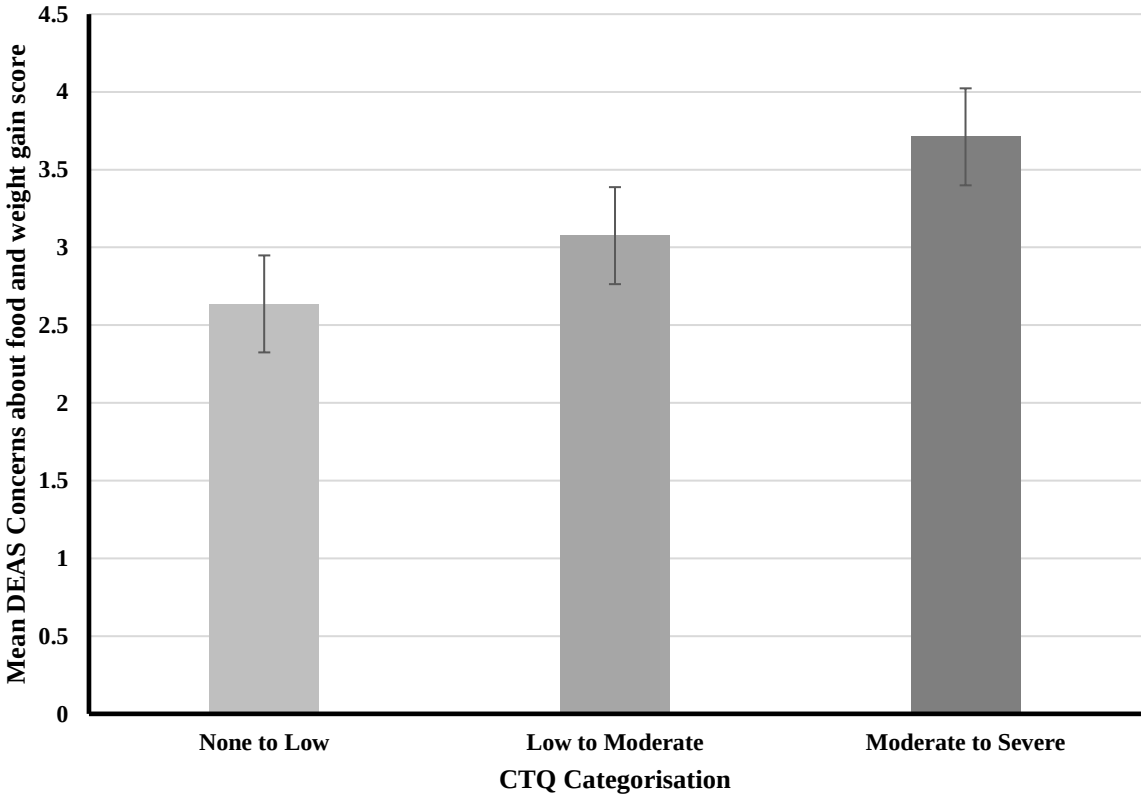


Figure 9 shows that the mean total DEAS concerns about food and weight gain score was significantly higher in participants categorised as scoring "Moderate to Severe" on the CTQ (mean = 3.71, *SD* = 2.25) than participants categorised as scoring "None to Low" on the CTQ (mean = 2.64, *SD* = 1.2) and "Low to Moderate" (mean = 3.08, *SD* = 1.84).

A final main effect was found for the total CTQ score and the DEAS restrictive and compensatory practices subscale (β_{01} = 0.036, p = <0.001). This indicated that higher levels of childhood trauma were associated with greater daily disordered relationship with food, concerns about food and weight gain, and restrictive and compensatory practices. This is displayed in Figure 10.

Figure 10: Mean DEAS Restrictive and compensatory subscale score by CTQ Total category

(Error bars represent SEM)

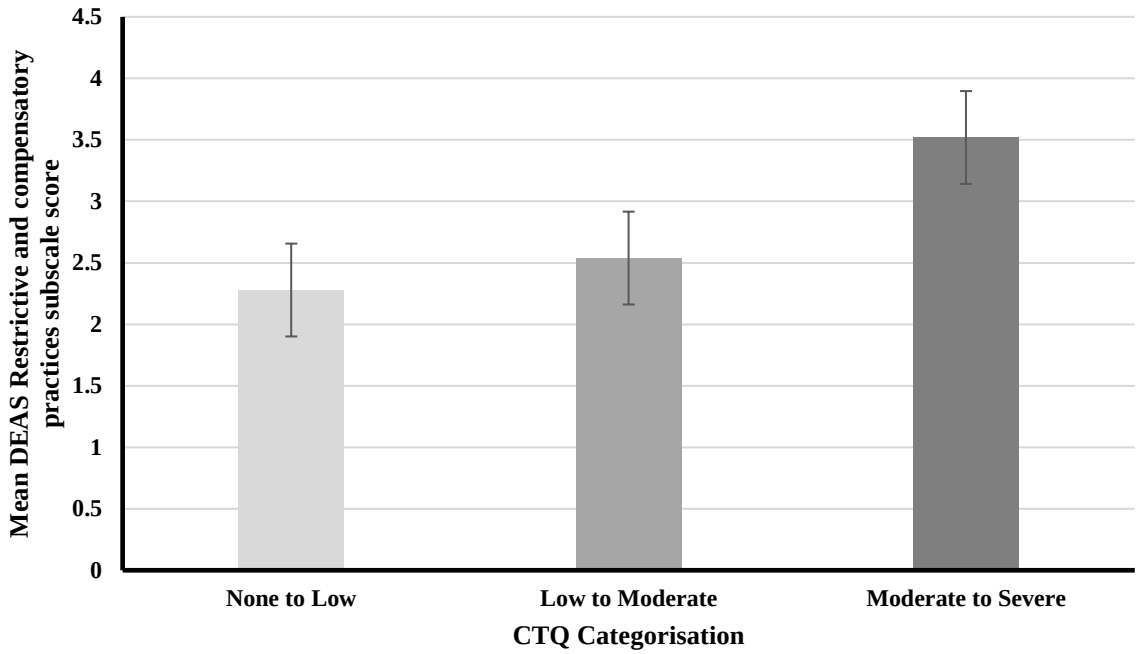


Figure 10 shows that the mean daily restrictive and compensatory practices subscale score was significantly higher in participants categorised as scoring "Moderate to Severe" on the CTQ (mean = 3.52, *SD* = 2.26) than participants categorised as scoring "None to Low" on the CTQ (mean = 2.28, *SD* = 1.03) and "Low to Moderate" (mean = 2.54, *SD* = 1.33).

The results showed there were no significant main effects of childhood trauma on the DEAS feeling toward eating subscale (β_{01} = 0.011, p = 0.07) or the DEAS idea of normal eating subscale (β_{01} = 0.016, p = 0.117).

Hypothesis 2: Daily Stress, Eating Outcomes, and CTQ Moderation

Models were examined to test whether more maladaptive or disordered eating attitudes and behaviours were evident on days with more perceived daily stress, and whether these relationships were moderated by childhood trauma. The results from HLM analyses are displayed in Table 12.

Table 12: Main effect of PSS on DEAS subscales with CTQ moderation

Model and Variables	β	Coefficient	*SE*	*p*
Relationship with food				
PSS – DEAS_REL	β_{10}	0.039	0.014	0.007
CTQ x PSS – DEAS_REL	β_{11}	0.001	0.0009	0.271
Concerns about food and weight gain				
PSS – DEAS_CON	β_{10}	0.039	0.018	0.039
CTQ x PSS – DEAS_CON	β_{11}	0.002	0.001	0.063
Restrictive and compensatory practices				
PSS – DEAS_RES	β_{10}	0.013	0.015	0.376
CTQ x PSS – DEAS_RES	β_{11}	0.001	0.0007	0.038
Feeling toward eating				
PSS – DEAS_FEE	β_{10}	-0.039	0.023	0.089
CTQ x PSS – DEAS_FEE	β_{11}	-0.0002	0.001	0.835
Idea of normal eating				
PSS– DEAS_NOR	β_{10}	0.057	0.029	0.056
CTQ x PSS – DEAS_NOR	β_{11}	-0.0009	0.001	0.508

PSS daily perceived stress, *CTQ* total childhood trauma score, *DEAS_REL* daily relationship with food, *DEAS_CON* concerns about food and weight gain, *DEAS_RES* restrictive and compensatory practices, *DEAS_FEE* feeling toward eating, *DEAS_NOR* idea of normal eating.

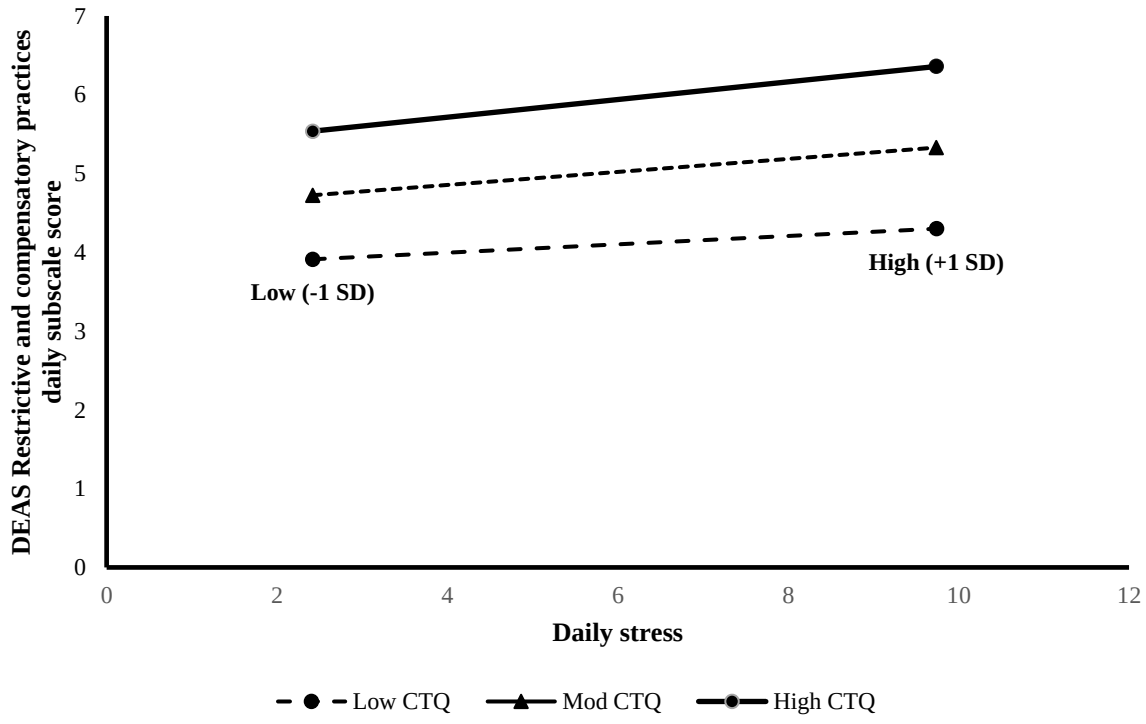
Table 12 shows that daily stress was positively and significantly associated with daily relationship with food ($\beta_{10} = 0.039$, $p = 0.007$). This indicated that, on days with higher levels of perceived stress, participants reported increased scores on the subscale relating to their relationship with food. Examining for moderation effects showed that the moderating effect of CTQ on this relationship was not significant ($\beta_{11} = 0.001$, $p = 0.271$).

Daily stress was also positively and significantly associated with daily concerns about food and weight gain ($\beta_{10} = 0.039$, $p = 0.039$). This indicated that on days with higher levels of perceived stress, participants reported increased scores relating to daily concerns about food and weight gain. Examining for moderation effects showed that the moderating effect of CTQ on this relationship was not significant ($\beta_{11} = 0.002$, $p = 0.063$).

Daily stress was not significantly associated with restrictive and compensatory practices ($\beta_{10} = 0.013$, $p = 0.376$), indicating that on days with increased stress, participants did not report significant alterations in their restrictive and compensatory practices toward food. However, when examining for moderation effects, CTQ was found to moderate this relationship ($\beta_{11} = 0.001$, $p = 0.038$). This interaction was decomposed using simple slopes following the steps outlined by Preacher et al. (2006). This is depicted in Figure 11.

Childhood trauma moderated the daily-stress restrictive and compensatory practices relationship, such that the impact of daily stress on restrictive practices was stronger in individuals with higher compared to lower levels of childhood trauma. Daily stress was significantly related to greater restrictive and compensatory practices at low (β = 0.053, p = 0.043), moderate (β = 0.083, p = 0.033), and high (β = 0.011, p = 0.03) levels of childhood trauma.

Figure 11: The relationship between daily stress and daily restrictive and compensatory practices at different levels of childhood trauma



Daily stress was not significantly associated with feeling toward eating (β_{10} = -0.038, p = 0.089), or idea of normal eating (β_{10} = 0.056, p = 0.056). CTQ did not moderate either of these relationships.

Hypothesis 3: Daily Perfectionistic Thinking, Eating Outcomes, and CTQ Moderation

Models were examined to test whether more maladaptive or disordered eating attitudes and behaviours were evident on days with increased perfectionistic thinking, and whether these relationships were moderated by childhood trauma. The results from HLM analyses are displayed in Table 13.

Table 13: Main effect of PCI on DEAS subscales with CTQ Moderation

Model and Variables	β	Coefficient	*SE*	*p*
Relationship with food				
PCI – DEAS_REL	β_{10}	0.014	0.009	0.114
CTQ x PCI – DEAS_REL	β_{11}	0.0001	0.0007	0.856
Concerns about food and weight gain				
PCI – DEAS_CON	β_{10}	0.029	0.014	0.039
CTQ x PCI – DEAS_CON	β_{11}	-0.0005	-0.473	0.637
Restrictive and compensatory practices				
PCI – DEAS_RES	β_{10}	0.013	0.016	0.428
CTQ x PCI – DEAS_RES	β_{11}	0.0005	0.001	0.613
Feeling toward eating				
PCI – DEAS_FEE	β_{10}	-0.021	0.017	0.224
CTQ x PCI – DEAS_FEE	β_{11}	-0.0009	0.0009	0.268
Idea of normal eating				
PCI – DEAS_NOR	β_{10}	0.033	0.019	0.083
CTQ x PCI – DEAS_NOR	β_{11}	-0.0005	0.001	0.625

PCI daily perfectionistic cognitions, *CTQ* total childhood trauma score, *DEAS_REL* daily relationship with food, *DEAS_CON* concerns about food and weight gain, *DEAS_RES* restrictive and compensatory practices, *DEAS_FEE* feeling toward eating, *DEAS_NOR* idea of normal eating.

Table 13 shows that daily perfectionistic thinking was positively and significantly associated with daily concerns about food and weight gain ($\beta_{10} = 0.029$, $p = 0.039$). This indicated that, on days with greater levels of perfectionistic thinking, participants reported increased scores relating to concerns over food and weight gain. Examining for moderation effects showed that the moderating effect of CTQ was not significant ($\beta_{11} = -0.0005$, $p = 0.637$).

Results showed that daily perfectionistic thinking was not significantly associated with relationship with food, restrictive and compensatory practices, feeling toward eating, or idea of normal eating.

Additional Analyses

Snacks

Additional analyses were conducted to determine whether there was a main effect of childhood trauma on between-meal snack consumption, whether daily stress and

perfectionistic thinking influenced between-meal snack consumption, and whether these relationships were moderated by childhood trauma.

The results showed that there was no significant main effect of childhood trauma on total daily snacks (β_{01} = -0.003, p = 0.626), daily unhealthy snacks (β_{01} = -0.001, p = 0.78), or daily healthy snacks (β_{01} = -0.002, p = 0.678). Daily stress was positively and significantly associated with total daily healthy snacks (β_{10} = 0.29, p = 0.036), suggesting that on days with greater stress, participants consumed a greater number of healthy snacks. There was no significant association between daily stress and daily total snacks (β_{10} = 0.039, p = 0.058) or daily unhealthy snacks (β_{10} = 0.008, p = 0.602).

The results showed that daily perfectionistic thinking was significantly associated with daily unhealthy snacks (β_{10} = 0.02, p = 0.035), suggesting that on days with greater perfectionistic thinking, participants consumed a greater number of unhealthy snacks. Daily perfectionistic thinking was not significantly associated with the number of total snacks consumed (β_{10} = 0.027, p = 0.065) or daily healthy snacks (β_{10} = 0.012, p = 0.207). Childhood trauma did not moderate any of the daily snack, daily stress, or daily perfectionistic thinking outcomes.

Fruit and Vegetable Consumption

Additional analyses were conducted to determine whether there was a main effect of childhood trauma on fruit or vegetable consumption, whether daily stress and perfectionistic thinking influenced fruit or vegetable consumption, and whether these relationships were moderated by childhood trauma.

There was no main effect for childhood trauma and fruit consumption (β_{01} = -0.005, p = 0.22). A significant main effect was found for childhood trauma and vegetable consumption (β_{01} = -0.02, p = <0.001), suggesting that the higher the score on the childhood trauma scale, the lower the portions of vegetables consumed per day.

The results showed that daily stress was not significantly associated with daily fruit (β_{10} = -0.03, p = 0.065) or vegetable consumption (β_{10} = 0.04, p = 0.097). Daily perfectionistic thinking was not significantly associated with daily fruit (β_{10} = 0.017, p = 0.20) or vegetable consumption (β_{10} = 0.02, p = 0.40). Additionally, childhood trauma did not moderate any of these relationships.

Discussion

Research has consistently demonstrated links between experiences of childhood trauma and health outcomes in adulthood (e.g., Petruccelli et al., 2019), including influencing the onset, aetiology, and presentation of eating disorders (Guillaume et al., 2016; Molendijk et al., 2017) and eating outcomes as measured by eating disorder questionnaires (Hasselle et al., 2017; Smyth et al., 2018). However, limited research has explored the role of childhood trauma in relation to eating attitudes and behaviours that may be considered disordered, in non-clinical populations, using non-clinical measures. Additionally, it has been theorised that stress and perfectionism may be experienced differently amongst individuals with high levels of childhood trauma (Lovallo, 2013; Flett et al., 2002), and, separately, influence their attitudes and behaviours toward eating (Bardon-Cone et al., 2007; Hill et al., 2021; O'Connor & Conner, 2011). However, little research has considered what role perfectionistic thinking may play within this relationship and, furthermore, limited research has considered these outcomes at the daily level whilst incorporating experiences of childhood trauma. Therefore, this thesis aimed to firstly examine the impact of childhood trauma on daily eating attitudes and behaviours, and secondly, to explore the impact of experiences of daily stress and daily perfectionistic thinking.

Childhood Trauma and Daily Eating Outcomes

The present findings demonstrated a main effect of childhood trauma on three of the five measured daily eating outcomes, partially supporting the first research hypothesis. The findings indicated that individuals with higher levels of childhood trauma demonstrated a significantly greater daily disordered relationship with food, higher concerns about food and weight gain, and increased restrictive and compensatory practices. However, individuals with higher levels of childhood trauma were not significantly more likely to experience a disordered idea of normal eating or feeling toward eating.

A number of these findings are consistent with previous literature that has focused on measuring eating outcomes at one timepoint, amongst both non-clinical populations and those diagnosed with eating disorders. For example, the present finding that individuals with higher levels of childhood trauma were more likely to report a fear of losing control when eating (represented within their relationship with food) is consistent with those reported by Fuemmeler et al. (2009), who measured eating outcomes at one timepoint. Additionally, the finding that participants higher in levels of childhood trauma were significantly more concerned with calorie intake, weight gain, and eating are similar to those reported amongst non-clinical populations (Emery et al., 2021) and eating disorder populations (Caslini et al., 2016; Guillaume et al., 2016). One of the most consistently reported findings that childhood

trauma impacts restrictive and compensatory practices, including skipping meals to lose weight, eating very little, and engaging in unhealthy weight control behaviours was also evident in the study results (Fuemmeler et al., 2009; Emery et al., 2021; Smyth et al., 2008; Yoon et al., 2022). Importantly, the current study may be deemed a valuable extension of such previous findings as it demonstrated significant interactions between childhood trauma and these eating outcomes at the daily level. This suggests that childhood trauma and difficulties with losing control when eating, concerns over food and weight gain, and restrictive practices to control weight are not limited to one measured time-point, but also evident at the daily level.

However, some results were inconsistent with previous findings. In the current study, participants with higher levels of childhood trauma did not report daily increases in eating to manage difficult emotions, such as being sad, bored, or angry. This contrasts with previous findings (such as Mason et al., 2015), and proposed explanations of disordered eating that suggest such behaviours are used to manage overwhelming or distressing feelings for those who have experiences of being invalidated in childhood (Pignatelli et al., 2015). However, previous research has also suggested that the belief of such emotions is also of importance, with episodes of disordered eating more likely to occur in individuals who view challenging and difficult emotions as uncontrollable (Strodl & Wylie, 2020). For individuals in the present study, it may be that experiencing sadness, boredom, or anger, did not result in disordered eating as the emotions were not perceived as intense or uncontrollable. Indeed, the impact of an individual's ability to regulate emotions is one of the most consistently researched in the literature on childhood trauma and later disordered eating (Rabito-Alćon et al, 2021), with research finding that trait emotion dysregulation significantly mediates the relationship (Moulton et al., 2015). Therefore, extending such research to examine the impact of daily emotional experience and regulation in conjunction with daily eating outcomes whilst also considering the role of childhood trauma may provide a more detailed explanation of the present finding.

Taken together, what are the implications of such findings? The consistent findings that childhood trauma impacts feeling toward eating, concerns over calories and weight, and restrictive and compensatory practices may be indicative of several explanations. One proposed explanation is that individuals with experiences of trauma in childhood have higher levels of body dissatisfaction and negative perceptions of their body image and weight, and therefore engage in increased food restriction and compensation to manage such (Caslini et al., 2016). Indeed, childhood trauma has been found to significantly affect an individual's perception of their body image and related cognitions such as disgust and shame (Bödicker et al., 2022). Furthermore, early experiences of childhood adversity result in greater comparisons to the self and internalizations of the ideal and are indicative of greater levels of body dissatisfaction, which subsequently result in greater disordered eating

behaviours, including restrictive and compensatory weight control practices (Vartanian et al., 2018). When considering the earlier mentioned BRIDGE continuum of disordered eating, body image is deemed as a key aspect that explains the link between bodily preoccupation and disordered eating behaviours (Russell-Mayhew et al., 2007). Whilst the perception of one's body image was not measured in the present study (and is therefore a potential area of importance for future research), participants did indeed demonstrate greater concerns regarding weight gain and food, which may subsequently have impacted what they ate, and potentially explain the additional finding that demonstrated an increase in skipping meals or only consuming liquids on certain days.

One potential limitation of adapting the DEAS to daily level was that it missed out the explicit item capturing bingeing or purging behaviours, which have previously been found to be significantly higher in individuals with histories of childhood trauma both with and without an eating disorder diagnosis (Emery et al., 2021; Molendijk et al., 2017; Smyth et al., 2018). As these are often deemed "extreme weight control behaviours" (Smyth et al., 2018), and the DEAS was designed to measure non-clinical eating attitudes and behaviours, it is unclear as to whether participants within the present study would have scored high on such measures at the daily level and may also be regarded as an area for future research. Nevertheless, participants did engage in daily restrictive and compensatory practices, specifically in the form of not eating, skipping meals, or only consuming liquids to avoid gaining weight.

The finding that individuals with higher levels of childhood trauma report significantly higher daily fears of losing control of eating also appears to be of particular importance. It has been proposed that individuals with histories of abuse experience a greater perceived loss of control over their general life circumstances, which extend to eating in the form of an increased fear of losing control over what and when they eat (Polivy & Herman, 2002). Furthermore, regaining control of eating may be a way of attaining pride and demonstrating self-management when other aspects of one's life feel most uncontrollable and in the context of previous experiences of abuse (Polivy & Herman, 2002), which may explain why individuals in the present study were also significantly more likely to skip meals or only consume liquids. Regarding the eating disorder literature, a fear of losing control when eating has often been associated with binge eating disorder or episodes of binge eating, and indeed, amongst individuals with experiences of childhood trauma, consistently strong links have been found for later emergence and diagnosis of binge eating disorder (Caslini et al., 2016; Molendijk et al., 2017). Furthermore, Scarano and Kalodner-Martin's continuum from normal to disordered eating states that a fear of losing control is a "potent" factor in understanding the differences between individuals with and without a diagnosis of bulimia disorder who engage in binge eating behaviours (Scarano & Kalodner-Martin, 1994). As previously stated, the DEAS daily adaptation did not

specifically capture bingeing or purging behaviour, and therefore daily incidences of such were not recorded in the present study. However, the novel finding here that individuals with higher levels of childhood trauma reported greater daily occurrences of eating less in front of others to overeat when alone is of potential importance, as such practices have been reported amongst individuals who binge eat (Westerberg & Waitz, 2013).

The finding that greater childhood trauma resulted in a greater disordered relationship with food, reflecting higher feelings of shame, anger, or guilt related to food, are perhaps not surprising. For example, feelings of shame have long been implicated in the development and maintenance of eating disorders (Goss & Allan, 2009), and experiences of abuse in childhood have also been linked to later body-related shame and eating difficulties (Gilbert & Thompson, 2002). Specific to non-clinical populations without a diagnosis of any eating disorder, it has been found that the absence of caring, soothing early life experiences results in increase self-criticism and body-oriented shame, which subsequently leads to greater levels of disordered eating (Gois et al., 2018). Results from the present study may therefore be partially explained by experiences of shame, which resulted in greater awareness of food consumption, as well as restrictive and compensatory practices to manage such. Whilst the exact nature and causality of this relationship cannot be determined in the present study, the finding that childhood trauma impacts an individual's daily relationship with food is indeed a novel one that may warrant further exploration whilst incorporating more extensive measurement of state-based shame.

Childhood Trauma and the Stress-Eating Relationship

This thesis also examined the role of daily stress in relation to eating outcomes, and whether childhood trauma moderated such relationships. The findings showed that higher levels of daily perceived stress were significantly associated with increases in disordered relationship toward food, and concerns about food and weight gain. On days where individuals reported greater levels of perceived stress, they also ate less in front of others to overeat alone, a fear of losing control when eating, worries over gaining weight, and occasions of stopping eating due to the calorie content of certain foods. Such findings are an extension of previous research that has focused on the measurement of stress and eating outcomes at one time point as opposed to the daily level (Hill et al., 2021; O'Connor & Conner, 2011). Where daily stress has been examined, the focus has predominantly been on eating outcomes such as between-meal snacking or fruit and vegetable consumption, as opposed to attitudes and other eating behaviours (O'Connor et al., 2008; Debeuf et al., 2018). In the present study, daily occurrences of stress resulted in an increase in healthy snacks, but not the total number of snacks or unhealthy snacks. This is somewhat surprising,

given that previous daily diary studies have found an association between daily stressors and a greater number of unhealthy snacks consumed (O'Connor et al., 2008). The findings may be subsequently explained in the context of those linking stress to a number of eating attitudes and behaviours, that may have impacted an individual's likelihood of consuming healthy snacks.

Whilst previous research has found that perceived stress results in a greater fear of losing control when eating (Groesz et al., 2012), the present study extends this by demonstrating this effect to also occur at the daily level. It is well-documented that stress impacts eating habits, with some individuals more likely to consume unhealthy foods or increase food consumption during stressful periods (Hill et al., 2018). It has been theorised that individuals demonstrate greater impulsivity, a lack of behavioural control and depletion of cognitive resources when under conditions of stress, and this can result in overeating to self-regulate (Yau & Potenza, 2013). Therefore, it may be that participant awareness of a tendency to rely on food during stressful days resulted in a greater fear of the likelihood of such happening, regardless of whether this subsequently occurred. Furthermore, the broad definitions of stress refer to a generalised sense of worry and reduction in perceived ability to cope; hence, a loss of control (Fink, 2010; Manosso et al., 2022), and the PSS-4 (at both trait and daily level) incorporates an item relating to perceived loss of control (Cohen et al., 1983). Therefore, it may be that a fear of losing control over eating at the daily level is an extension of more generalised worries or anxieties in the context of increased stressors. This may also relate to the present finding that increased daily stress results in greater concerns regarding weight gain and calorie intake. Furthermore, fears related to weight and losing control whilst eating may be one reason why participants did not consume a greater number of unhealthy snacks when faced with greater daily perceived stress.

Findings from the current study also showed that on days with greater perceived stress, individuals were not more likely to report feeling that eating was unnatural or a loss of pleasure when they ate. Previous findings have indicated that increases in daily stress result in decreased episodes of eating purely for taste (Reichenberger et al., 2018), suggesting individuals under stress continue to eat only when hungry, but perhaps not to enjoy or gain pleasure from the taste or act of consuming food. However, findings have also demonstrated that increased stress results in an increased craving for tasty foods (Hsu & Raposa, 2021), which are often deemed as more pleasurable to consume (Bédard et al., 2020). Whilst items relating to taste or hunger-based craving were not captured by the daily adaptation of eating measures in the present study, the finding that stress did not have a detrimental impact an individual's daily pleasure toward eating suggests they were still able to find enjoyment in consuming food when they did so, and perhaps not purely eating due to hunger.

Furthermore, on days with increased perceived stress, participants were not significantly more likely to report engaging in food restriction or compensation. As reported, previous research has found that the degree and type of experienced stress is important when considering the impact on eating outcomes and determining whether individuals go on to overeat or indeed restrict their food consumption (Costarelli & Patsai, 2013; Groesz et al., 2012; King et al., 2009; Stone & Brownell, 1994). In the present study, participants answered a daily adaptation of the PSS-4 and were not required to provide details on the exact nature of the stressor that they had experienced (e.g., whether this was related to work, academic pressures, relationships; or whether they were chronic or temporary). An alternative option may have been to provide participants with an open-ended response box to report daily occurrences that they perceived as stressful. Such methods have been utilised within daily diary studies previously in the form of asking participants to report hassles to differentiate from chronic stressors (Louch et al., 2017; Moss et al., 2021). This approach may have allowed for greater examination of the impact of the nature and experience of specific stressors or daily hassles, to either confirm or contrast with previous findings where this has been identified as an important factor in later determination of restrictive or compensatory eating practices.

The finding that individuals experiencing greater daily stress did not report significantly greater disordered eating in the form of eating to cope with sadness, anger, or boredom, is in contrast to previous findings where increased daily stress resulted in eating to cope with difficult emotions (Hsu & Raposa, 2021). One possible explanation of such is that individuals in the present study were able to manage or cope with increased daily stress via other methods besides eating. For example, research has shown that engaging in exercise significantly increased positive affect and the perception that exercise was an effective coping strategy amongst participants who score lower on a measure of disordered eating (Thome & Espelage, 2004). Another possible explanation of this non-significant finding could be that participants in the present study experienced greater positive emotions or experiences that reduced the impact of perceived stressors on daily eating attitudes and behaviours. For example, previous research has found that the experience of daily uplifts demonstrated a buffering effect on daily stress and eating outcomes (Moss et al., 2023). The implication of such was that on days with increased stress, positive experiences could counteract the effect on eating. Whilst that study only explored between-meal snacking as the eating outcome of interest, it represents an important finding in that the effects of stress on snacking behaviours were weaker when accounting for daily positive experiences. The present study did not account for daily positive experiences, however, may represent an area of future research to further examine the impact on daily stress and disordered eating attitudes and behaviours.

However, the finding that childhood trauma moderated the non-significant impact of daily stress and restrictive and compensatory practices is of interest. Whilst stress was not found to directly impact restrictive and compensatory practices, the impact of stress on skipping or restricting meals was found to be higher amongst individuals with higher, compared to lower, levels of childhood trauma. Although literature is limited, previous findings have suggested that individuals with higher levels of childhood trauma are more likely to engage in stress-related eating and eating as a means of coping (Mason et al., 2015). This contrasts the present finding noting the opposite effect: that participants were more likely to skip meals or restrict food when reporting higher levels of childhood trauma. It may be that the type of trauma experienced is of importance here. For example, stress-related eating has been found to be greater amongst participants with histories of physical abuse (Mason et al., 2015). As the present research did not distinguish between categories of abuse, it may be that other forms of abuse (such as sexual or emotional) have a greater effect on later restrictive or compensatory practices in the presence of stress, which affected the overall finding. Future research may seek to distinguish between sub-types of childhood trauma to determine whether certain types of abuse are more likely to influence the impact of daily stress on restrictive eating.

Childhood trauma did not moderate any of the other daily stress and eating outcome relationships. Given that the experience of trauma has been implicated in the relationship between stress, coping, and health outcomes, this finding was perhaps somewhat unexpected (Lovallo, 2013; Taylor, 2010). It is acknowledged that there has been limited research that focuses on the moderating effect of childhood trauma in the stress and non-clinical eating outcomes literature. Therefore, it may simply be that childhood trauma does not play as much of a role in the moderation of stress and the measured daily eating outcomes as originally hypothesised, and that the relationship between stress and eating is better accounted for in the measurement of alternative variables. For example, findings in the literature suggest that eating style influences an individual's vulnerability to the impacts of stress on eating outcomes, with greater significance found amongst emotional and restrained eaters (Araiza & Lobel, 2018), which is also evident when measured at the daily level (O'Connor et al., 2008).

Childhood Trauma and the Perfectionistic Cognitions-Eating Relationship

In relation to the role of perfectionistic cognitions, the results showed that, on days with greater perfectionistic thinking, participants also expressed a greater concern about food and weight gain, being more likely to report greater incidences of stopping eating food when finding out it contained more calories than expected, and greater concerns of certain foods making them gain weight. Daily perfectionistic thinking did not significantly impact

any of the other four disordered eating subscales, suggesting that days with increased perfectionistic cognitions did not also result in greater difficulties with individuals' relationship toward food, idea of normal eating, feeling toward eating, or restrictive and compensatory practices. These findings are perhaps somewhat unexpected for a number of reasons, not least because of the emphasised role of perfectionism in the development of disordered eating (Bardon-Cone et al., 2007; Goldner et al., 2002; Vacca et al., 2021). In particular, the finding that perfectionistic thinking did not lead to greater daily incidence of restrictive or compensatory practices is surprising, given that previous research has showed this to be a significant relationship (Downey et al., 2014; Flett et al., 2011).

There may be several explanations for such findings. Firstly, it may be that perfectionism is more likely to influence eating outcomes amongst individuals with the most disordered eating behaviours or those with clinical diagnoses. For example, research that has demonstrated significant associations between perfectionistic thinking and disordered eating utilised measures of anorexic and bulimic symptomology (Downey et al., 2014), or extended the capturing of cognitive elements to bulimic-focused thoughts (Flett et al., 2011). In the present study, whilst the average score on the background measure of disordered eating was higher than normative means previously reported (e.g., Alvarenga et al., 2010a), outcomes at the daily level showed fewer participants scoring toward the upper range. The current sample was perhaps representative of individuals who did not demonstrate high disordered eating outcomes at the daily level, and therefore perfectionistic thinking may have had less of an impact.

A further possible explanation for the lack of significant relationships here is the focus on perfectionistic cognitions specifically. Although important as perfectionistic cognitions account for the variability in state-like perfectionism as opposed to trait-focused measurement, it may be that individuals are more likely to demonstrate daily fluctuations in multi-dimensional aspects of perfectionism that subsequently impact their attitudes toward eating and eating behaviours. Indeed, previous research at the daily level found that multi-dimensional perfectionism did indeed vary day to day, and that setting higher standards for oneself and engaging in greater critical self-evaluation was more likely to lead to an increased desire for thinness and greater levels of binge eating (Boone et al., 2012). Although the examination of perfectionistic cognitions at the daily level is a novel aspect of this study, it may be that these have less of an impact than perfectionism measured as a multi-dimensional construct.

Nevertheless, the finding that greater daily perfectionistic thinking resulted in a greater disordered concern over food and weight gain is a novel one. The role of social expectations and pressures may be of importance here. For example, previous research within eating disorder populations has demonstrated links between high trait perfectionism and social pressure to eat, encompassing preoccupation with thinness from external sources,

as well as the pressure to gain weight (Macedo et al., 2007). Goldner's model of eating disorders also emphasises the role of social pressures, as sociocultural norms toward weight and shape (typically in the form of lower body weight being desired), as pertinent in the development of disordered eating (Goldner et al., 2002). It may be that, at the daily level, increases in perfectionistic thinking resulted in greater pressures to maintain normality regarding eating and weight, and therefore has a subsequent influence on cognitions linked to such.

A novel aspect of the present study was the consideration of childhood trauma in the perfectionism and eating outcomes relationship. Given that previous research has implicated the role of childhood trauma in both the development and maintenance of perfectionism (as per the Social Reaction and Social Disconnection models [Flett et al., 2002; Hewitt et al., 2017]), and the role perfectionism has on eating outcomes, it was hypothesised that childhood trauma would moderate these relationships. However, this hypothesis was not supported. Previous research has focused on multi-dimensional perfectionism whilst incorporating childhood trauma, finding that those scoring higher on domains of perfectionism were more likely to report adversity in childhood (Chen et al., 2019; Dobos et al., 2021). It may be that childhood trauma has less impact on the development of perfectionistic cognitions. Indeed, in the present study, the average score on the background PCI was lower than normative data from a community sample in the original validation study (Flett et al., 1998), which broadly suggests that participants in the present study did not demonstrate an overall degree of high perfectionistic thinking. Similar to the previously reported findings regarding stress, it may also be that other variables have a greater moderating effect on the perfectionistic thinking-eating outcomes relationship than experiences of childhood trauma. For example, body dissatisfaction has been shown to moderate the relationship between trait perfectionism and disordered eating (Boone et al., 2014). Current research that incorporates perfectionistic thinking and disordered eating outcomes remains scarce but may warrant further exploration outside of the context of childhood trauma.

Finally, it is possible that the noted relationships here between variables could be bidirectional in nature. For example, it is plausible to suggest that disordered eating attitudes and behaviours influence the occurrence of daily perfectionistic thinking, such that increased incidences of perfectionistic cognitions are evident on days with greater disordered eating outcomes. Similarly, disordered eating attitudes and behaviours may also impact daily perceived stressors. Whilst these variables were explored in the current thesis in line with pre-registered hypotheses, future research may seek to investigate these relationships using longitudinal designs that follow participants over an extended to investigate such bidirectionality.

Strengths and Limitations

Strengths

The current research has several strengths. Firstly, to the author's knowledge, this is the first study to investigate the impact of childhood trauma on a range of eating attitudes and behaviours (not necessarily reflective of an eating disorder) at the daily level, whilst also considering the role of daily stress and perfectionistic thinking. A number of the findings reported here are novel, in that they demonstrate childhood trauma to be related to a number of eating outcomes at the daily level, specifically an individual's relationship with food, concerns about food and weight gain, and restrictive and compensatory practices.

Study Design. The present study used a daily diary design, subsequently analysed using HLM techniques. Daily diary designs allow for the measurement of real-time variation in variables of interest relevant to clinical and health psychology, such as behavioural and personality outcomes that are likely to vary, including stress, perfectionistic cognitions, and eating outcomes (Nezlek, 2001; O'Connor & Ferguson, 2008). Participants act as their own controls, with multiple, repeated observations captured over a number of days. HLM analysis can account for data that is organised hierarchically, with variables contained amongst within and between-person levels. Furthermore, other designs and analytical approaches assume that data are independent. An advantage of HLM analysis is that it accounts for the assumption of independence, with the recognition that multiple data points collected from the same individual will be correlated.

Measure of eating outcome. The present study utilised the DEAS (Alvarenga et al., 2010b) as a measure of disordered eating attitudes and behaviours. The scale was designed with the recognition that, previously, researchers often utilised measures for screening of eating disorders when researching eating outcomes in non-clinical populations, which typically focus on symptomology related to diagnosis. Furthermore, few of the alternative measures capture aspects such as an individual's relationship and attitude toward food and eating (Alvarenga et al., 2010b). Whilst the DEAS has not been utilised as widely within the literature as other measurements of eating, it was deemed appropriate for the present study as the research questions aimed to capture both attitudes and behaviours related to eating, that may not be representative of a clinically diagnosed eating disorder.

Measurement of daily variables. The present study adapted measures of perfectionistic thinking and disordered eating attitudes and behaviours in order to capture daily occurrences of such. This is a novel element, as previous studies have typically focused on administration of measures at one timepoint alone (e.g., Emery et al., 2021), or contained a limited number of items to capture outcomes (e.g., Fuemmeler et al., 2009). Furthermore, where previous studies have sought to examine eating outcomes, these have often focused on the amount and type of food consumed in response to daily fluctuations, as

opposed to directly capturing attitudes that may be related to such. The present study extended such by capturing a range of eating attitudes and behaviours, such as an individual's relationship toward food, weight and food related concerns, the feeling of eating, and restrictive or compensatory measures. Little research has examined perfectionistic thinking at the daily level, again capturing a novel element of the present research.

Participant sample. The participant representation in the current study, specifically concerning age and level of education, may also be regarded as a strength. Previous research into childhood trauma and eating outcomes has often utilised participant groups consisting of young adolescents or student samples only (Hasselle et al., 2017; Smyth et al., 2008). Recruiting those over the age of 18 allowed the examination of a number of outcomes amongst adults across the lifespan, who may experience varying degrees of perfectionistic thinking, stress, and eating outcomes, not just those occurring in the context of academic pressures or specific significant life changes, such as moving away from home for the first time (as per e.g. Smyth et al., 2008).

Limitations

The above findings and strengths should also be taken into consideration alongside a number of limitations.

Study design. Whilst effective for the measurement of daily variables of interest, the associated limitations of the daily diary design are acknowledged. For example, daily diaries may still be subject to a minor degree of recall bias, particularly as variables were measured only once per day, in the evening. Participants' recollection of daily experiences of stress, perfectionistic thinking, and eating attitudes and behaviours may have differed throughout the day. Furthermore, diaries were sent at eight o'clock in the evening; for some individuals, this may have been too early to record certain snacks or eating outcomes. This may be especially true for individuals working shift patterns or who typically eat outside of the measured timeframe. Furthermore, as noted by Gunthert and Wenze (2011), repeated assessment over a number of days may influence participant response. For example, being repeatedly asked about certain attitudes and behaviours related to food and eating may have brought these into awareness and influenced behaviour or responses over the subsequent days.

Measurement of childhood trauma. Despite the CTQ-SF (Bernstein et al., 2003) being a well-validated measurement of trauma, it is acknowledged that this is also a retrospective, self-report tool that may be subject to a degree of response bias or repression. Scores in the present study may have represented under-reporting of actual abuse or neglect occurrence (Hardt & Rutter, 2004). It would have been beneficial to compare childhood

trauma scores in the current study, including those on the minimisation and denial subscale, to those of other similar studies (such as O'Connor et al., 2020a) in order to provide further information on how the sample compares. This may also have been of benefit for future research seeking to investigate the relationship between childhood trauma and disordered eating outcomes.

Daily variables. It is noted that there have been limited daily adaptations reflecting the variables of interest in the present study; namely, disordered eating attitudes and behaviours, and perfectionistic thinking. Whilst care was taken when adapting these (for example, by selecting the highest loading factor items and ensuring the phrasing continued to make sense), it may be that daily measures were not as effective at capturing the intended outcomes as their background counterparts. Additionally, the full scales were not adapted in order to reduce participant burden, however omissions of certain items may have resulted in certain aspects not being reflected.

Recruitment. The study aimed to recruit 200 participants, according to the power analysis informed by the feasibility study, in addition to accounting for potential dropout and attrition rates. A total of 135 participants had sufficient data be included in the feasibility study and final analyses, despite a total of 589 participants completing the background questionnaire. Large numbers of participants who completed the background questionnaire did not subsequently provide a mobile number in order to access the daily diary questionnaires. Within research adverts and the study information, this aspect of the study was clearly stated, with participants also prompted to send contact details to access diaries upon completion of the background questionnaire. Additionally, there were numbers of participants who completed less than three daily diaries, and therefore were excluded from the final analyses. Furthermore, a minority of participants completed all seven days, yet did not have a matching unique User ID and therefore both levels of their data could not be matched. Future research utilising a daily diary design should continue to emphasise the importance of daily diary completion and entering the same unique User ID per day to maximise response and retention rates.

Sampling. Whilst the study aimed to recruit a diverse sample of participants, the majority of respondents identified as female (80%), therefore it is acknowledged that findings may be more reflective of a predominantly female sample. Furthermore, most participants identified as English or British nationality, and therefore findings must also be taken into context regarding what may be viewed as typical or normal eating attitudes or behaviours, stressors, or perfectionistic thinking within this culture. Most participants also identified as White British, and therefore the generalisability of such findings to other ethnicities may be limited.

Access to daily diaries. Participants were required to have mobile number in the United Kingdom (+44 prefix) format in order to access the daily diaries. However, several

participants contacted the research email address providing a non-UK based mobile number, that was unable to be hosted on the platform of use or set up for daily diary links, and therefore they were unable to progress with the study. Future studies may seek to incorporate participants outside of the United Kingdom to examine the effect of childhood trauma on daily eating outcomes internationally and to limit restrictions on who may access the daily questionnaires. Furthermore, the completion of daily diaries was via an online survey link. This was appropriate for usage within the present study in order to maximise potential participant response and allow for easier access. However, it is acknowledged that an online method may have restricted access for those without mobile phone access or sufficient means of completing diaries online.

Implications

The findings presented here add to the literature regarding the wide-ranging impact of childhood trauma on health outcomes in adulthood, specifically focusing on the impact on disordered eating outcomes, concerning both attitudes and behaviours. The present finding that childhood trauma impacted a range of eating outcomes at the daily level has several implications.

Firstly, the study highlighted the importance of exploring experiences of childhood trauma amongst individuals displaying a number of disordered eating attitudes and behaviours outside of those typically associated with eating disorders. For health professionals, such as Clinical Psychologists, who are likely to encounter individuals with extensive trauma histories, it is important to explore feelings, beliefs, and behaviours toward eating, even if a person has not been clinically diagnosed with an eating disorder. Whilst disordered eating does not always result in a diagnosis of an eating disorder, many individuals endorse certain eating attitudes and behaviours that can be detrimental to later health (Ortega-Luvando et al., 2015; Russell-Mayhew et al., 2007), and therefore it is important to explore the nature and impact of such.

Furthermore, control has been widely reported within the eating outcomes literature, and indeed, a finding here was that childhood trauma was significantly associated with a daily fear of losing control over eating. However, recent research has noted that over-emphasising the role that personal control can have on disordered eating risks increased blaming or stigmatising toward individuals (Branley-Bell et al., 2023). Instead, it is proposed that the focus should be on understanding the difficult experiences that may result in individuals using eating-focused behaviours to cope (Branley-Bell et al., 2023). As the present study highlighted the impact of childhood trauma on a number of disordered eating outcomes at the daily level, this further emphasises the importance of clinicians' exploring

individual's histories and life experiences in disordered eating presentations, to develop a collaborative formulation and shared understanding of contributing factors and influences.

Furthermore, the findings showed that experiences of childhood trauma resulted in higher levels of daily shame, anger, or guilt related to food, and greater concerns relating to weight gain. The potential role of increased shame and body dissatisfaction in the link between childhood trauma and later disordered eating has a number of implications. Firstly, it highlights the potential role that compassion-focused interventions may have in addressing disordered eating behaviours amongst those with a history of childhood trauma. Compassion-focused therapies emphasise the importance of developing self-compassion in order to acknowledge and reduce levels of shame and self-criticism, that are likely to occur after traumatic experiences (Gilbert et al., 2018). As suggested above, this may also support the usage of non-blaming language used when assessing, formulating, and providing intervention to individuals experiencing disordered eating (Branley-Bell et al., 2023). Amongst populations with clinically diagnosed eating disorders, incorporation of compassion-focused therapies alongside usual interventions have been found to significantly improve both disorder symptomology and psychological distress (Gale et al., 2014). Similar findings have been noted amongst those without an eating disorder diagnosis, whereby individuals with bodily concerns randomised to a compassion-focused intervention significantly improved on measures of self-compassion and body satisfaction (Albertson et al., 2015). Therefore, clinicians may seek to introduce or incorporate compassion-focused therapy into interventions for disordered eating.

The research also further highlighted the impact that daily perceived stress can have on daily worries over eating, food, and weight gain, and a fear of losing control when eating. Additionally, the finding that individuals in the present study were not more likely to eat more in response to difficult emotions and in the context of increased daily stress may highlight the role of health promotion via other methods of coping with stress, such as exercise to increase positive affect (as per Thome & Espelage, 2004).

Finally, the current findings continue to highlight the importance of examination of non-clinical eating attitudes and behaviours, and subsequent targeted interventions to identify those who may be at risk of later developing more pathological eating outcomes or reach levels of clinical diagnosis (Scarano & Kalodner-Martin, 1994). As well as specific implications for healthcare professionals, including Clinical Psychologists, as focused on earlier in this section, there are also wider prevention efforts with a focus on disordered eating (Neumark-Sztainer et al., 2006). This includes the potential for collaboration with policy-makers, schools, healthcare services and beyond in order to provide psychoeducation on the continuum of eating behaviours and associated health impacts at the wider, environmental level (Neumark-Sztainer et al., 2006).

Conclusion

This thesis highlighted the role of childhood trauma on daily disordered eating outcomes, finding links between higher levels of trauma in childhood and increased daily disordered relationship with food, concerns over food and weight gain, and greater restrictive and compensatory practices. Furthermore, an increase in daily stress was significantly associated with an increase in concerns over food and weight gain, and a greater disordered relationship with food. Such findings continue to highlight the importance of research into the long-lasting health impacts of childhood trauma, specifically concerning those related to disordered or non-clinical eating attitudes and behaviours.

Contrary to the expected hypotheses, childhood trauma was not found to moderate the daily stress-eating, or daily perfectionistic cognition-eating relationships, aside from one significant moderation effect regarding childhood trauma, stress, and restrictive and compensatory practices. Furthermore, examination of perfectionistic thinking at the daily level showed little impact on subsequent eating outcomes and behaviours, which was somewhat unexpected given the previous literature on trait perfectionism. Nonetheless, the findings have important implications for how health professionals may formulate difficulties relating to disordered eating behaviours, and to emphasise the importance of consideration of childhood trauma experiences when formulating eating-related difficulties.

References

Alfalahi, M., Mahedevan, S., al Balushi, R., Chan, M. F., Saadon, M. A., Al-Adawi, S. & Qoronfleh, M. W. (2022). Prevalence of eating disorders and disordered eating in Western Asia: a systematic review and meta-analysis. *Eating Disorders, 30*(5), 556-585. Prevalence of eating disorders and disordered eating in Western Asia: a systematic review and meta-analysis. DOI: 10.1080/10640266.2021.1969495.

Albertson, E. R., Neff, K. D. & Dill-Shackleford, K. E. (2014). Self-compassion and body dissatisfaction: a randomized controlled trial of a brief meditation intervention. *Mindfulnes, 6*(3), 444-454. DOI: 10.1007/s12671-014-0277-3

Alvarenga, M. S., Pereira, R. F., Scagliuisi, F. B., Philippi, S. T., Estima, C. C. P. & Croll, J. (2010a). Psychometric evaluation of the disordered eating attitude scale (DEAS): English version. *Appetite, 55*(2), 374-376. DOI: 10.1016/j.appet.2010.07.003

Alvarenga, M. S., Scagliuisi, F. B. & Philippi, S. T. (2010b). Development and validity of the disordered eating attitude scale (DEAS). *Perceptual and Motor Skills, 110*(2), 379-395. DOI: 10.2466/PMS.110.2.379-395

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders: DSM-5* (5th ed). APA. DOI: 10.1176/appi.books.9780890425596

Angelakis, I., Gillespie, E. L. & Panagioti, M. (2019). Childhood maltreatment and adult suicidality: a comprehensive systematic review with meta-analysis. *Psychological Medicine, 49*(7), 1057-1078. DOI: 10.1017/S0033291718003823

Araiza, A. M. & Lobel, M. (2018). Stress and eating: definitions, findings, explanations, and implications. *Social and Personality Psychology Compass, 12*(4), e12378. DOI: 10.1111/spc3.12378

Bardon-Cone, A. M., Wonderlich, S. A., Frost, R. O., Bulik, C. M., Mitchell, J. E., Uppala, S. & Simonich, H. (2007). Perfectionism and eating disorders: current status and future directions. *Clinical Psychology Review, 27*(3), 384-405. DOI: 10.1016/j.cpr.2006.12.005

Bartlett, J. D. & Sacks, V. H. (2019, July 25). *Adverse childhood experiences are different than child trauma, and it's critical to understand why.* Child Trends. DOI:10.13140/RG.2.2.18206.89921

Bédard, A., Lamarche, P., Grégoire, L., Trudel-Guy, C., Provencher, V., Desroches, S. & Lemieux, S. (2020). Can eating pleasure be a lever for healthy eating? A systematic scoping review of eating pleasure and its links with dietary behaviors and health. *PLoS ONE, 15*(12), e0244292. DOI: 10.1371/journal.pone.0244292

Beilharz, J. E., Paterson, M., Fatt, S., Wilson, C., Burton, A., Cvejic, E., Lloyd, A. & Vollmer-Conna, U. (2020). The impact of childhood trauma on psychosocial functioning and

physical health in a non-clinical community sample of young adults. *Australian & New Zealand Journal of Psychiatry, 54*(2), 185-194. DOI: 10.1177/0004867419881206

Bellis, M. A., Hughes, K., Ford, K., Rodriguez, G. R., Sethi, D. & Passmore, J. (2019). Life course health consequences and associated annual costs of adverse childhood experiences across Europe and North America: a systematic review and meta-analysis. *The Lancet, 4*(10), 517-528. DOI:10.1016/S2468-2667(19)30145-8

Bento, C., Pereira, A. T., Marques, M., Soares, M. J., Bos, S., Valente, J., Gomes, A., Azevedo, M. H. P. & Macedo, A. (2010). Perfectionism and eating behaviour in Portuguese adolescents. *European Eating Disorders Review, 18*(4), 328-337. DOI: 10.1002/erv.981

Bernstein, D. P., Fink, L., Handelsman, L., Foote, J., Lovejoy, M., Wenzel, K., Sapareto, E. & Ruggiero, J. (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *American Journal of Psychiatry, 151*(8), 1132-1136. DOI: 10.1176/ajp.151.8.1132

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvia, T., Stokes, J., Handelsman, L., Medrano, M., Desmond, D. & Zule, W. (2003). Development and validation of a brief screening version of the childhood trauma questionnaire. *Child Abuse & Neglect, 27*(2), 169-190. DOI: 10.1016/s0145-2134(02)00541-0

Betz, L. T., Penzel, N., Rosen, M. & Kambeitz, J. (2020). Relationships between childhood trauma and perceived stress in the general population: a network perspective. *Psychological Medicine, 51*(5), 2696-2706. DOI: 10.1017/S003329172000135X

Bloomfield, M. A. P. (2019). Trauma and post-traumatic disorder: children should be seen and heard. *The Lancet, 6*(3), 193-194. DOI: 10.1016/S2215-0366(19)30037-9

Bödicker, C., Reinckens, J., Höfler, M. & Hoyer, J. (2022). Is childhood maltreatment associated with body image disturbances in adulthood? A systematic review and meta-analysis. *Journal of Child & Adolescent Trauma, 15*(3), 523-538. DOI: 10.1007/s40653-021-00379-5

Boone, L., Soenens, B., Mouratidis, A., Vansteenkiste, M., Verstuyf, J. & Braet, C. (2012). Daily fluctuations in perfectionism dimensions and their relation to eating disorder symptoms. *Journal of Research in Personality, 46*(6), 678-687. DOI: 10.1016/j.jrp.2012.08.001

Boullier, M. & Blair, M. (2018). Adverse childhood experiences. *Paediatrics and Child Health, 28*(3), 132-137. DOI: 10.1016/J.PAED.2017.12.008

Branley-Bell, D., Talbot, C. V., Downs, J., Figueras, C., Green, J., McGilley, B. & Murphy-Morgan, C. (2023). It's not all about control: challenging mainstream framing of eating disorders. *Journal of Eating Disorders, 11,* 25. DOI: 10.1186/s40337-023-00752-9

Brown, D. W., Anda, R. F., Timeier, H., Felliti, V. J., Edwards, V. J., Croft, J. B. & Giles, W. H. (2009). Adverse childhood experiences and the risk of premature mortality. *American Journal of Preventative Medicine, 37*(5), 389-396. DOI: 10.1016/j.amepre.2009.06.021

Buchanan, G., Gewirtz, A. H., Lucke, C. & Wambach, M. R. (2020). The concept of childhood trauma in psychopathology: definitions and historical perspectives. In G. Spalletta, D. Janiri, F. Piras & G. Sani (Eds.). *Childhood trauma in mental disorders: A comprehensive approach.* (pp. 9-29). Springer. DOI: 10.1007/978-3-030-49414-8_2

Butchart, A., Kahane, T., Harvey, A. P., Mian, M. & Furniss, T. (2006). *Preventing child maltreatment: A guide to taking action and generating evidence.* World Health Organization.

Bryant, E., Spielman, K., Le, A., Marks, P., National Eating Disorder Research Consortium, Touyz, S. & Maguire, S. (2022). *Journal of Eating Disorders*, *10*(1), 1-16. DOI: 10.1186/s40337-022-00597-8

Caslini, M., Bartoli, F., Crocamo, C., Dakanalis, A., Clerici, M. & Carrà, G. (2016). Disentangling the association between child abuse and eating disorders: a systematic review and meta-analysis. *Psychosomatic Medicine, 78*(1), 79-90. DOI: 10.1097/PSY.0000000000000233

Chen, C., Hewitt, P. L. & Flett, G. L. (2019). Adverse childhood experiences and multidimensional perfectionism in young adults. *Personality and Individual Differences, 146*, 53-57. DOI: 10.1016/j.paid.2019.03.042

Conner, T. S. & Lehman, B. J. (2012). Getting started: launching a study in daily life. In M. R. Mehl & T. S. Conner (Eds). *Handbook of research methods for studying daily life* (pp. 89-107). New York, New York: Guildford Press.

Costarelli, V. & Patsai, A. (2012). Academic examination stress increases disordered eating symptomatology in female university students. *Eating and Weight Disorders, 17*(3), 164-169. DOI: 10.1007/BF03325343

da Luz, F.Q., Sainsbury, A., Mannan, H., Touyz, S., Mitchison, D., Girosi, F. & Hay, P. (2018). An investigation between disordered eating behaviors, weight/shape overevaluation and mood in the general population. *Appetite, 129*, 19-24. DOI: 10.1016/j.appet.2018.06.029

Dazzi, T., Gribble, R., Wessely, S. & Fear, N. T. (2014). Does asking about suicide and related behaviours induce suicidal ideation? What is the evidence? *Psychological Medicine, 44*(16), 3361-3363. DOI: 10.1017/S0033291714001299

Debeuf, T., Verbeken, S., Van Beveren, M., Michels, N. & Braet, C. (2018). Stress and eating behavior: a daily diary study in youngsters. *Frontiers in Psychology, 9*, 2657. DOI: 10.3389/fpsyg.2018.02657

Dobos, B., Piko, B. F. & Mellor, D. (2021). What makes university students perfectionists? The role of childhood trauma, emotional dysregulation, academic anxiety and social support. *Scandinavian Journal of Psychology, 62*(3), 443-447. DOI: 10.1111/sjop.12718

Downey, C. A., Reinking, K. R., Gibson, J. M., Cloud, J. A. & Chang, E. C. (2014). Perfectionistic cognitions and eating disturbance: distinct mediational models for males and females. *Eating Behaviors, 15*(3), 419-426. DOI: 10.1016/j.eatbeh.2014.04.020

Emery, R. L., Yoon, C., Mason, S. M. & Neumark-Sztainer, D. (2021). Childhood maltreatment and disordered eating attitudes and behaviors in adult men and women: findings from project EAT. *Appetite, 163*, 105224. DOI: 10.1016/j.appet.2021.105224

Enns, M. W., Cox, B. J. & Clara, I. (2002). Adaptive and maladaptive perfectionism: developmental origins and association with depression proneness. *Personality and Individual Differences, 33*(6), 921-935. DOI: 10.1016/S0191-8869(01)00202-1

Fairburn, C. G. & Beglin, S. J. (1993). Assessment of eating disorders: interview or self-report questionnaire? *International Journal of Eating Disorders, 16*(4), 363-370. DOI: 10.1002/1098-108X(199412)16:4%3C363::AID-EAT2260160405%3E3.0.CO;2-#

Fairburn, C. G. & Harrison, P. J. (2003). Eating disorders. *The Lancet, 361*(9355), 407-416. DOI: 10.1016/S0140-6736(03)12378-1

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P. & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: the adverse childhood experiences (ACE) study. *American Journal of Preventative Medicine, 14*(4), 245-258. DOI: 10.1016/s0749-3797(98)00017-8

Fink, G. (2010). Stress: definition and history. In G. Fink (*Ed.), Stress Science: Neuroendocrinology*, pp. 3-10. Academic Press. DOI: 10.1016/B978-008045046-9.00076-0

Flett, G. L. & Hewitt, P. L. (Eds). (2002). *Perfectionism: theory, research, and treatment*. American Psychological Association. https://psycnet.apa.org/doi/10.1037/10458-000

Flett, G. L., Hewitt, P. L., Blankstein, K. R. & Gray, L. (1998). Psychological distress and the frequency of perfectionist thinking. Journal of Personality and Social Psychology, *75*(5), 1363-1381. DOI: 10.1037/0022-3514.75.5.1363

Flett, G. L., Hewitt, P. L. & Singer, A. (1995). Perfectionism and parental authority styles. *Individual Psychology, 51*(1), 50-59. https://psycnet.apa.org/record/1995-36727-001

Flett, G. L., Newby, J., Hewitt, P. L. & Persaud, C. (2011). Perfectionistic automatic thoughts, trait perfectionism, and bulimic automatic thoughts in young women. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 29*(3), 192-206. DOI: 10.1007/s10942-011-0135-3

Forbush, K., Heatherton, T. F. & Keel, P. K. (2007). Relationships between perfectionism and specific disordered eating behaviors. *International Journal of Eating Disorders, 40*(1), 37-41. DOI: 10.1002/eat.20310

Frost, R. O., Marten, P., Lahart, C. & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*(5), 449-468. https://psycnet.apa.org/doi/10.1007/BF01172967

Fuemmeler, B. F., Dedert, E., McClernon, F. J. & Beckham, J. C. (2009). Adverse childhood events are associated with obesity and disordered eating: results from a U.S. population-based survey of young adults. *Journal of Traumatic Stress, 22*(4), 329-333. DOI:10.1002/jts.20421.

Gale, C., Gilbert, P., Read, N. & Goss, K. (2014). An evaluation of the impact of introducing compassion focused therapy to a standard treatment programme for people with eating disorders. *Clinical Psychology & Psychotherapy, 21*(1), 1-12. DOI: 10.1002/cpp.1806

Garner, D. M., Olmstead, M. P., Bohr, Y. & Garfinkel, P. E. (1982). The eating attitudes test: psychometric features and clinical correlates. *Psychological Medicine, 12*(4), 871-878. DOI: 10.1017/s0033291700049163

Garner, D. M., Olmstead, M. P. & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders, 2*(2), 15-34. DOI: 10.1002/1098-108X(198321)2:23.0.CO;2-6

Gilbert, L. K., Breiding, M. J., Merrick, M. T., Thompson, W. W., Dhingra, S. S. & Parks, S. E. (2015). Childhood adversity and adult chronic disease: an update from ten states and the district of Columbia, 2010. *American Journal of Preventative Medicine, 48*(3), 345-359. DOI: 10.1016/j.amepre.2014.09.006

Gilbert, S. C. & Thompson, J. K. (2002). Body shame in childhood and adolescence: relations to general psychological functioning and eating disorders. In P. Gilbert & J. Miles (Eds). *Body Shame: conceptualisation, research and treatment* (pp. 55-74). Brunner-Routledge. DOI: 10.4324/9781315820255

Gois, A. C., Ferreira, C. & Mendes, A. L. (2018). Steps toward understanding the impact of early emotional experiences on disordered eating: the role of self-criticism, shame, and body image shame. *Appetite, 125,* 10-17. DOI: 10.1016/j.appet.2018.01.025

Goldner, E. M., Cockell, S. J. & Srikameswaran, S. (2002). Perfectionism and eating disorders. In G. L. Flett & P. L. Hewitt (Eds). *Perfectionism: theory, research and treatment* (pp. 319-340). American Psychological Association. DOI: 10.1037/10458-013

Goss, K. & Allan, S. (2009). Shame, pride and eating disorders. *Clinical Psychology & Psychotherapy, 16*(4), 303-316. DOI: 10.1002/cpp.627

Guillaume, S., Jaussent, I., Maimoun, L., Ryst, A., Seneque, M., Villain, L., Hamroun, D., Lefebvre, P., Renard, E. & Courtet, P. (2016). Associations between adverse childhood experiences and clinical characteristics of eating disorders. *Scientific Reports, 6*(1), 35761. doi:10.1038/srep35761

Gunthert, K. C. & Wenze, S. J. (2011). Daily Diary Methods. In M. R. Mehl & T. S. Conner (Eds). *Handbook of research methods for studying daily life* (pp. 144-159). Guildford Press.

Gutin, I. (2018). In BMI we trust: reframing the body mass index as a measure of health. *Social Theory & Health, 16*(3), 256-271. DOI: 10.1057/s41285-017-0055-0

Groesz, L., McCoy, S., Carl, J., Saslow, L., Stewart, J., Adler, N., Laraia, B. & Epel, E. (2012). What is eating you? Stress and the drive to eat. *Appetite, 58*(2), 717-721. doi: 10.1016/j.appet.2011.11.028

Hardt, J. & Rutter, M. (2004). Validity of adult retrospective reports of adverse childhood experiences: a review of the evidence. The Journal of Child Psychology and Psychiatry, 45(2), 260-273. DOI: 10.1111/j.1469-7610.2004.00218.x

Hasselle, A. J., Howell, K. H., Dormois, M. & Miller-Graff, L. E. (2017). The influence of childhood polyvictimization on disordered eating symptoms in emerging adulthood. *Child Abuse & Neglect, 68*, 55-64. DOI: 10.1016/j.chiabu.2017.04.003

Hewitt, P. L. & Flett, G. L. (1991). Perfectionism in the self and social contexts: conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology, 60*(3), 456-470. DOI: 10.1037//0022-3514.60.3.456

Hewitt, P. L., Flett, G. L. & Mikail, S. F. (2017). *Perfectionism: a relational approach to conceptualization, assessment and treatment.* The Guildford Press.

Hill, D., Conner, M., Clancy, F., Moss, R., Wilding, S., Bristow, M. & O'Connor, D. (2021). Stress and eating behaviours in healthy adults: a systematic review and meta-analysis. *Health Psychology Review, 16*(2), 280-304. DOI: 10.1080/17437199.2021.1923406

Hill, D. C., Moss, R. H., Sykes-Musket, B., Conner, M. & O'Connor, D. B. (2018). Stress and eating behaviors in children and adolescents: systematic review and meta-analysis. *Appetite, 123,* 14-22. DOI: 10.1016/j.appet.2017.11.109

Hovens, J. G. F. M., Giltay, E. J., Spinhoven, P., van Hemert, A. M. & Penninx, B. W. J. H. (2015). Impact of childhood life events and childhood trauma on the onset and recurrence of depressive and anxiety disorders. *The Journal of Clinical Psychiatry, 76*(7), 931-938. DOI: 10.4088/JCP.14m09135

Hsu, T. & Raposa, E. B. (2020). Effects of stress on eating behaviours in adolescents: a daily diary investigation. *Psychology & Health, 36*(2), 236-251. DOI: 10.1080/08870446.2020.1766041

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., Jones, L. & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *The Lancet, 2*(8), 356-366. DOI: 10.1016/S2468-2667(17)30118-4

King, K. A. (2009). Disordered eating and job stress among nurses. *Journal of Nursing Management, 17*(7), 861-869. DOI: 10.1111/j.1365-2834.2009.00969.x

Ko, A., Hewitt, P. L., Cox, D., Flett, G. L. & Chen, C. (2019). Adverse parenting and perfectionism: a test of the mediating effects of attachment anxiety, attachment avoidance, and perceived defectiveness. *Personality and Individual Differences, 150*, 109474. DOI: 10.1016/J.PAID.2019.06.017

Kong, S. & Bernstein, K. (2009). Childhood trauma as a predictor of eating psychopathology and its mediating variables in patients with eating disorders. *Journal of Clinical Nursing, 18*(13), 1897-1907. DOI: 10.1111/j.1365-2702.2008.02740.x

Lazarus, R. S. & Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer.

Lambert, H. K., Meza, R., Martin, P., Fearey, E. & McLaughin, K. A. (2017). Childhood trauma as a public health issue. In M. Landolt, M. Cloitre & U. Schnyder. (Eds). *Evidence-based treatments for trauma related disorders in children and adolescents* (pp. 49-66). Springer International Publishing. DOI: 10.1007/978-3-319-46138-0_3

Lewis, S. J., Arseneault, L., Caspi, A., Fisher, H. L., Matthews, T., Moffitt, T. E., Odgers, C. L., Stahl, D., Teng, J. Y. & Danese, A. (2019). The epidemiology of trauma and post-traumatic stress disorder in a representative cohort of young people in England and Wales. *The Lancet, 6*(3), 247-256. DOI: 10.1016/S2215-0366(19)30031-8

Li, M., D'Arcy, C. & Meng, X. (2016). Maltreatment in childhood substantially increases the risk of adult depression and anxiety in prospective cohort studies: systematic review, meta-analysis, and proportional attributable fractions. *Psychological Medicine, 46*(4), 717-730. DOI: 10.1017/S0033291715002743

Lo, A. & Abbott, M. (2013). Review of the theoretical, empirical, and clinical status of adaptive and maladaptive perfectionism. *Behaviour Change, 30*(2), 96-116. DOI:10.1017/bec.2013.9

Louch, G., O'Hara, J., Gardner, P. & O'Connor, D. B. (2017). A daily diary approach to the examination of chronic stress, daily hassles and safety perceptions in hospital nursing. *International Journal of Behavioral Medicine, 24*, 946-956. DOI: 10.1007/s12529-017-9655-2

Lovallo, W. R. (2013). Early life adversity reduces stress reactivity and enhances impulsive behavior: implications for health behaviors. *International Journal of Psychophysiology, 90*(1), 8-16. DOI: 10.1016/j.ijpsycho.2012.10.006

Macedo, A., Soares, M. J., Azvedo, M. H., Gomes, A., Pereira, A. T., Maia, B. & Pato, M. (2007). Perfectionism and eating attitudes in Portuguese university students. *European Eating Disorders Review, 15*(4), 296-304. DOI: 10.1002/erv.735

Manosso, L. M., Rasparini, C. R., Réus, G. Z. & Pavlovic, Z. M. (2022). Definitions and concepts of stress. In Z. M. Pavlovic (Ed.). *Glutamate and neuropsychiatric disorders: current and emerging treatments*, pp. 27-64. Springer.

Mason, S. M., MacLehose, R. F., Katz-Wise, S. L., Austin, S. B., Neumark-Sztainer, D., Harlow, B. L. & Rich-Edwards, J. W. (2015). Childhood abuse victimization, stress-related eating, and weight status in young women. *Annals of Epidemiology, 25*(10), 760-766. DOI: 10.1016/j.annepidem.2015.06.081

McCance, R. A. & Widdowson, E. M. (2014). *The Composition of Foods: Seventh Summary Edition (vol 7).* Royal Society of Chemistry. DOI: 10.1039/9781849737562

McKay, M. T., Cannon, M., Chambers, D., Conroy, R. M., Coughlan, H., Dodd, P., Healy, C., O'Donnell, L. & Clarke, M. C. (2021). Childhood trauma and adult mental disorder: a systematic review and meta-analysis of longitudinal cohort studies. *Acta Psychiatrica Scandinavica, 143*(3), 189-205. DOI: 10.1111/acps.13268

Merrick, M. T., Ford, D. C., Ports, K. A., Guinn, A. S., Chen, J., Klevens, J., Metzler, M., Jones, C. M., Simon, T. R., Daniel, V. M., Ottley, P. & Mercy, J. A. (2019). Vital signs: estimated proportion of adult health problems attributable to adverse childhood experiences and implications for prevention – 25 states, 2015-2017. *Morbidity and Mortality Weekly Report, 68*(44), 999-1005. DOI: 10.15585/mmwr.mm6844e1

Mishra, K. & Harrop, E. (2023). *AMA Journal of Ethics, 25*(7), e507-513. DOI: 10.1001/amajethics.2023.507.

Molendijk, M. L., Hoek, H. W., Brewerton, T. D. & Elzinga, B. M. (2017). Childhood maltreatment and eating disorder pathology: a systematic review and dose-response meta-analysis. *Psychological Medicine, 47*(8), 1402-1416. DOI: 10.1017/S0033291716003561

Monteleone, A. M., Marciello, F., Cascino, G., Cimino, M., Ruzzi, V., Pellegrino, F., Giorno, C. D. & Monteleone, P. (2020). Early traumatic experiences impair the functioning of both components of the endogenous stress response system in adult people with eating disorders. *Psychoneuroendocrinology, 115*, 104644. DOI: 10.1016/j.psyneuen.2020.104644

Morgan, J. F., Reid, F., & Lacey, J. H. (1999). The SCOFF questionnaire: assessment of a new screening tool for eating disorders. *BMJ, 319*, 1467-1468. DOI: 10.1136/bmj.319.7223.1467

Moss, R. H., Conner, M. & O'Connor, D. B. (2021). Exploring the effects of daily hassles and uplifts on eating behaviour in young adults: the role of daily cortisol levels. *Psychoneuroendocrinology, 129*, e105231. DOI: 10.1016/j.psyneuen.2021.105231

Moss, R. H., Conner, M. & O'Connor, D. B. (2023). Daily hassles and eating behaviours in adults: exploring the buffering effects of daily uplifts. *Psychological Reports,* pre-print. DOI: 10.1177/00332941231161794

Moulton, S. J., Newman, E., Power, K., Swanson, V. & Day, K. (2015). Childhood trauma and eating psychopathology: a mediating role for dissociation and emotion dysregulation? *Child Abuse & Neglect, 39,* 167-174. DOI: 10.1016/j.chiabu.2014.07.003

National Institute for Health and Care Excellence (2020). Eating disorders: recognition and treatment. https://www.nice.org.uk/guidance/ng69/chapter/Context

Neumark-Stztainer, D., Levine, M. P., Paxton, S. J., Smolak, L., Piran, N. & Wertheim, E. H. (2006). Prevention of body dissatisfaction and disordered eating: what next? *Eating Disorders, 14*(4), 265-285. DOI: 10.1080/10640260600796184

Nezlek, J. B. (2001). Multilevel random coefficient analyses of event- and interval-contingent data in social and personality psychology research. *Personality and Social Psychology Bulletin, 27*(7), 771-785. DOI: 10.1177/0146167201277001

O'Connor, D. B. (2021). Effects of childhood trauma on health and wellbeing: many questions remain unanswered. *The European Health Psychology, 22*(3), 790-795. https://www.ehps.net/ehp/index.php/contents/article/view/3374/1255

O'Connor, D. B., Branley-Bell, D., Green, J., Ferguson, E., O'Carroll, R. & O'Connor, R. (2020a). Effects of childhood trauma, daily stress and emotions on daily cortisol levels in individuals vulnerable to suicide. *Journal of Abnormal Psychology, 129,* 92-107. DOI: 10.1037/abn0000482

O'Connor, D. B. & Conner, M. (2011). Effects of stress on eating behavior. In: R. J. Contrada & A. Baum (Eds.), *Handbook of Stress Science: Psychology, Biology and Health* (pp. 275-286). New York: Springer Publishing Company.

O'Connor, D. B. & Ferguson, E. (2008). Studying the natural history of behaviour. *The Psychologist,* 21, 1034-1036. https://www.bps.org.uk/psychologist/methods-studying-natural-history-behaviour

O'Connor, D. B., Green, J. A., Carroll, R. E., Branley-Bell, D., Ferguson, E. & O'Connor, R. C. (2020b). Effects of childhood trauma, daily stress, and emotions on daily cortisol levels in individuals vulnerable to suicide. *Journal of Abnormal Psychology, 129*(1), 92-107. DOI: 10.1037/abn0000482

O'Connor, D. B., Green, J. A., Ferguson, E., O'Carroll, R. E. & O'Connor, R. C. (2018). Effects of childhood trauma on cortisol levels in suicide attempters and ideators. *Psychoneuroendocrinology, 88,* 9-16. DOI: 10.1016/j.psyneuen.2017.11.004

O'Connor, D. B., Jones, F., Conner, M., McMillan, B. & Ferguson, E. (2008). Effects of daily hassles and eating style on eating behavior. *Health Psychology, 27*(1), 20-31. DOI: 10.1037/0278-6133.27.1.S20

O'Connor, D. B., Thayer, J. F. & Vedhara, K. (2021). Stress and health: a review of psychobiological processes. *Annual Review of Psychology, 72*, 663-688. DOI: 10.1146/annurev-psych-062520-122331

Office for National Statistics (ONS) (2020, January 14). *Child abuse, extent and nature, England and Wales: year ending March 2019.* https://www.ons.gov.uk/peoplepopulationandcommunity/crimeandjustice/articles/childabuseextentandnatureenglandandwales/yearendingmarch2019

Ortega-Luyando, M., Alvarez-Rayón, G., Garner, D. M., Amaya-Hernández, A., Bautista-Díaz, M. & Mancilla-Díaz, J. M. (2015). Systematic review of disordered eating behaviors: methodological considerations for epidemiological research. *Mexican Journal of Eating Disorders, 6*(1), 51-63. DOI: 10.1016/j.rmta.2015.06.001

Perry, B. D. & Pollard, R. (1998). Homeostatis, stress, trauma, and adaption: a neurodevelopmental view of childhood trauma. *Child and Adolescent Psychiatric Clinics of North America, 7*(1), 33-51. DOI: 10.1016/s1056-4993(18)30258-x

Petruccelli, K., Davis, J. & Berman, T. (2019). Adverse childhood experiences and associated health outcomes: a systematic review and meta-analysis. *Child Abuse & Neglect, 97,* 104127. DOI: 10.1016/j.chiabu.2019.104127

Pignatelli, A. M., Wampers, M., Loriedo, C., Biondi, M. & Vanderlinden, J. (2015). Childhood neglect in eating disorders: a systematic review and meta-analysis. *Journal of Trauma & Dissociation, 18*(1), 100-115. DOI: 10.1080/15299732.2016.1198951

Polivy, J. & Herman, C. P. (2002). Causes of eating disorders. *Annual Review of Psychology, 53,* 187-213. DOI: 10.1146/annurev.psych.53.100901.135103.

Preacher, K. J., Curran, P. J. & Bauer, D. J. (2006). Computational tools for probing interaction effects in multiple linear regression, multilevel modelling, and latent curve analysis. *Journal of Educational and Behavioral Statistics, 31,* 437-448.

Qian, J., Wu, Y., Liu, F., Zhu, Y., Jin, H., Zhang, H., Wan, Y., Li, C. & Yu, D. (2022). An update on the prevalence of eating disorders in the general population: a systematic review and meta-analysis. *Eating and Weight Disorders – Studies on Anorexia, Bulimia and Obesity, 27*(2), 415-428. DOI: 10.1007/s40519-021-01162-z

Rabito-Alcón, M., Baile, J. I. & Vanderlinden, J. (2021). Mediating factors between childhood traumatic experiences and eating disorders development: a systematic review. *Children, 8*(2), 114. DOI: 10.3390/children8020114

Reichenberger, J., Kuppens, P., Liedlgruber, M., Wilhelm, F. H., Tiefengrabner, M., Ginzinger, S. & Blechert, J. (2018). No haste, more taste: an EMA study of the effects of stress, negative and positive emotions on eating behavior. *Biological Psychology, 131*, 54-62. DOI: 10.1016/j.biopsycho.2016.09.002

Russell-Mayhew, S. (2007). Preventing a continuum of disordered eating: going beyond the individual. *The Prevention Researcher, 14*(3), 7-10. http://www.tpronline.org/article.cfm/Preventing_a_Continuum_of_Disordered_Eating

Russell, S. & Ryder, S. (2010). BRIDGE (Building the relationship between body image and disordered eating graph and explanation): a tool for parents and professionals. *Eating Disorders, 9*(1), 1-14. DOI: 10.1002/erv.399

Sara, G. & Lappin, J. (2017). Childhood trauma: psychiatry's greatest public health challenge? *The Lancet: Public Health, 2*(7), 300-301. DOI: 10.1016/S2468-2667(17)30104-4

Scarano, G. M. & Kalodner-Martin, C. R. (1994). A description of the continuum of eating disorders: implications for intervention and research. *Journal of Counseling & Development, 72*(4), 356-361. DOI:10.1002/j.1556-6676.1994.tb00949.x

Smolak, L. & Murnen, S. K. (2002). A meta-analytic examination of the relationship between child sexual abuse and eating disorders. *International Journal of Eating Disorders, 31*(2), 136-150. DOI: 10.1002/eat.10008

Smyth, J. M., Heron, K. E., Wonderlich, S. A., Crosby, R. D. & Thompson, K. M. (2008). The influence of reported trauma and adverse events on eating disturbance in young adults. *International Journal of Eating Disorders, 41*(3), 195-202. DOI: 10.1002/eat.20490

Stoltenberg, S. F., Anderson, C., Nag, P. & Anagnopoulos, C. (2012). Association between the serotonin transporter triallelic genotype and eating problems is moderated by the experience of childhood trauma in women. *International Journal of Eating Disorders, 45*(4), 492-500. DOI: 10.1002/eat.20976

Stone, A. A. & Brownell, K. D. (1993). The stress-eating paradox: multiple daily measurements in adult males and females. *Psychology & Health, 9*(6), 425-436. DOI:10.1080/08870449408407469

Strodl, E. & Wylie, L. (2020). Childhood trauma and disordered eating: exploring the role of alexithymia and beliefs about emotions. *Appetite, 154*, 104802. DOI: 10.1016/j.appet.2020.104802.

Taylor, S. E. (2010). Mechanisms linking early life stress to adult health outcomes. *Proceedings of the National Academy of Sciences, 107*(19), 8507-8512. DOI: 10.1073/pnas.1003890107

Teicher, M. H. & Samson, J. A. (2013). Childhood maltreatment and psychopathology: a case for ecophenotypic variants as clinically and neurobiologically distinct subtypes. *The American Journal of Psychiatry, 170*(10), 1114-1133. DOI: 10.1176/appi.ajp.2013.12070957

Thome, J. & Espelage, D. L. (2004). Relations among exercise, coping, disordered eating, and psychological health among college students. *Eating Behaviors, 5,* 337-351. DOI: 10.1016/j.eatbeh.2004.04.002

Torres, S. J. & Nowson, C. A. (2007). Relationship between stress, eating behavior, and obesity. *Nutrition, 23*(11-12), 887-894. DOI: 10.1016/j.nut.2007.08.008

Umberson, D., Liu, H. & Rezcek, C. (2008). Stress and health behaviour over the life course. *Advances in Life Course Research, 13*(2), 19-44. DOI: 10.1016/S1040-2608(08)00002-6

Vacca, M., Ballesio, A. & Lombardo, C. (2021). The relationship between perfectionism and eating-related symptoms in adults: a systematic review. *European Eating Disorders, 29*(1), 32-51. DOI: 10.1002/erv.2793

Vartanian, L. R., Hayward, L. E., Smyth, J. M., Paxton, S. J. & Touyz, S. W. (2018). Risk and resiliency factors related to body dissatisfaction and disordered eating: the identity disruption model. *International Journal of Eating Disorders, 51*(4), 322-330. DOI: 10.1002/eat.22835

Westerberg, D. & Waitz, M. (2013). Binge-eating disorder. *Osteopathic Family Physician, 5*(6), 230-233. DOI: 10.1016/j.osfp.2013.06.003

Yau, Y. H. C. & Potenza, M. N. (2013). Stress and eating behaviors. *Minerva Endocrinol, 38*(3), 255-267. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4214609/pdf/nihms-630893.pdf

Yoon, C. Y., Mason, S. M., Loth, K. & Jacobs Jr, D. R. (2022). Adverse childhood experiences and disordered eating among middle-aged adults: findings from the coronary artery risk development in young adults study. *Preventive Medicine, 162,* 107124. DOI: 10.1016/j.ypmed.2022.107124

Appendices

Appendix A: Research poster

Appendix B: Information Sheet

Childhood Experiences and Daily Behaviours - Background Questionnaire

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Participant Information

This research has received ethical approval from the University of Leeds School of Psychology Ethics Committee, PSYC-454 *(10/02/22)*.

Childhood Experiences and Daily Behaviours

We would like to invite you to take part in a research study on childhood experiences, daily stress and thoughts, and eating attitudes and behaviours. Before you decide whether to participate, it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Part 1 tells you the purpose of the study and gives a summary of what will happen if you take part.

Part 2 gives you more detailed information about the conduct of the study.

Part 1

What is the purpose of the project?

The current study aims to understand how past life events (childhood experiences) affect daily wellbeing and influence responses to eating attitudes and behaviours.

Individuals who have experienced adverse life events have been found to respond differently to stressful situations and display different attitudes and health behaviours, compared to those who have not experienced any adverse life events.

Using a daily diary approach, this study will aim to investigate how people respond to stressful events and thoughts that occur in daily life, and how these relate to eating attitudes and behaviours.

Why have I been chosen?

You are reading this information sheet because you responded to an advertisement for the research opportunity. If you are **aged 18 years old or over** and **fluent in English**, you will be eligible to take part in the study.

Do I have to take part?

Taking part in this research is entirely voluntary. It is up to you to decide whether or not you wish to take part.

You will be able to withdraw from the study at any point if you choose to and will not be required to give a reason.

What do I have to do/what will happen to me if I take part?

The entire study will be carried out online, by you in your home environment. It will involve you completing a background questionnaire about your early life experiences, personality and eating attitudes. Following this, you will complete a brief online diary once per day, at the end of each day (which will take approximately 5 minutes), for seven consecutive days.

What are the possible disadvantages and risks of taking part?

There is a small risk that due to the personal nature of some of the questions that parts of this study may be upsetting. You may experience some negative emotions when answering these questions. Though these emotions are normal, if you feel your mental health has worsened whilst taking part in this study, you should withdraw and seek support from one of the confidential services on the list of contacts that you can access by clicking here. In urgent scenarios you should contact your GP.

It is also important that you are aware you are free to stop at any time should you feel upset or distressed, and that you do not have to answer any questions you do not wish to.

If you do not feel comfortable answering any of the questions, please feel free to wtihdraw from the study.

It may also be inconvenient for you to give up your time and to follow the study guidelines by completing a 5-minute questionnaire once per day. Therefore, you should think carefully about how you will feel taking part and if you are able to commit to completing the consecutive seven days. However, it is important to remember that if you agree to take part you can withdraw at any point without having to explain your reasons.

What are the benefits of taking part?

Whilst there are no immediate benefits, the findings from the study will help contribute to our understanding of the factors associated with the health outcomes and behaviours of adults who have experienced adverse experiences in childhood. In addition, the findings might help develop important health interventions in the future.

There is the benefit of being entered into a prize draw to win one of several Amazon vouchers, should you complete the baseline questionnaire and all 7 daily-diary questionnaires.

What happens to the data collected and is it confidential?

Yes. All data collected is completely anonymous and confidential, and your responses cannot be linked to you.

Will I receive anything for taking part?

As a thank you for your time and participation for completing the entire study, you will be entered into a prize draw to win one of several Amazon vouchers (worth between £5 and £50).

If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decision.

Part 2

What will I have to do if I take part?

You will be asked to complete an initial 15-minute baseline questionnaire online. You will also be asked to complete a brief online diary, once per day at the end of the day, lasting 5 minutes, for the following 7 days to reflect on your stress, thoughts, and eating each day.

What happens to the data collected and is it confidential?

All the information collected during the course of the study will be kept strictly confidential. After completing a consent form, you will be assigned a unique study identity code and all data will be recorded using this code. All personal information, such as your email, will be held separately to your answers and cannot be linked to your responses. The data collected will only be used for research purposes, and individual participants will not be identifiable in any reports or publications.

What will happen if I don't want to continue?

If at any point during the study you no longer wish to continue, you are free to withdraw without having to give an explanation for your reasons. If you decide not to continue during the course of the study, we ask that you inform the researchers (via email). We may wish to use the data you provide up until the point you drop out, however you also have the right to withdraw all your data up to 2 weeks after you finish taking part in the study.

For more information on how your information is used for research within the University of Leeds, please see the following: http://dataprotection.leeds.ac.uk/wp-content/uploads/sites/48/2019/02/Research-Privacy-Notice.pdf

Who is organising and funding the research?

The research is being undertaken at the University of Leeds. There are no funding bodies included in this research.

Who has reviewed this study?

All research is reviewed and approved by the School of Psychology Ethics Committee to protect your interests and wellbeing.

Who can I contact for further information?

If you have any remaining questions regarding your participation, you can contact the researcher, Amy Willgoose using the following contact details:

Amy Willgoose - eatingstudy2022@gmail.com / umaw@leeds.ac.uk

Or you can contact the principal supervisor Professor Daryl O'Connor using the following contact details:

Daryl O'Connor – d.b.oconnor@leeds.ac.uk / 0113 3435727

If you have any questions or concerns regarding ethical procedures relating to this study, please contact the Chair of the Psychology Ethics Committee, by post at:

School of Psychology, University of Leeds, Leeds, LS2 9JT

Or telephone: +44 (0) 113 343 7247

Finally, thank you for taking the time to read this information. If you have any additional questions, please do not hesitate to ask.

Next >

Appendix C: Ethical Approval Email Confirmation

Your ethics application result - Approved

MA Microsoft Power Apps and Power Automate <microsoft@powerapps.com>
10/02/2022 13:28

To: Amy Willgoose

Dear Alscient Developer

Re your ethics application, Childhood trauma and eating outcomes: exploring the role of daily stressors and perfectionist thinking using a daily diary approach, ethics reference number: PSYC-454.

I am pleased to inform you that the above research application has been reviewed by the School of Psychology Research Ethics Committee and the desision is
Approved.

If the reviewers have left any comments they will appear below.

Primary reviewer comments (if applicable) : Approved after discussion with the applicant. Notes on file.

Secondary reviewer comments (if applicable) :

Please note that this approval only relates to the particular version of documentation supplied in this specific application (ethics ref no: PSYC-454).

If you wish to make any amendments to the approved documentation, please note that all changes require ethical approval prior to implementation.

Please note: You are expected to keep a record of all your approved documentation, as well as documents such as sample consent forms, and other documents relating to the study. This should be kept in your study file, which should be readily available for audit purposes.

You will be given a two week notice period if your project is to be audited. There is a checklist listing examples of documents to be kept which is available at http://ris.leeds.ac.uk/EthicsAudits.

Yours sincerely,

School of Psychology Research Ethics Committee

If you want to unsubscribe from these emails, please use this form.

Appendix D: Participant Debrief

Study Purpose

Thank you for taking the time to participate in this research study. The following information is now available to explain the purpose of the project.

At the beginning of the study, we measured different aspects of personality (such as perfectionistic thinking), childhood experiences, and eating behaviours and attitudes. The primary aim of this study was to investigate whether childhood experiences are related to eating behaviours and attitudes in adulthood, and additionally whether these are further influenced by experiences of stress and amount of perfectionist thinking.

Previous research has shown that individuals who have had negative childhood experiences are more likely to experience disrupted health outcomes in adulthood, *including* that of eating behaviours and attitudes. Additionally, it has been found that *stress* and *perfectionist thinking* are important in understanding the links between childhood trauma and eating outcomes. Therefore, in this study, we have been exploring whether childhood experiences are linked to eating attitudes and behaviours.

In our analyses, we will explore whether individuals who have experienced negative childhood experiences differ on their daily eating outcomes, and whether these are influenced by the daily incidence of perfectionistic thoughts or stress. We expect that negative childhood experiences will be linked to more disrupted eating outcomes, and that this will be related to increased stress and perfectionistic thinking.

If you would like further information on this study, please feel free to email Amy Willgoose (umaw@leeds.ac.uk/eatingstudy2022@gmail.com) or Professor Daryl O'Connor (d.b.oconnor@leeds.ac.uk).

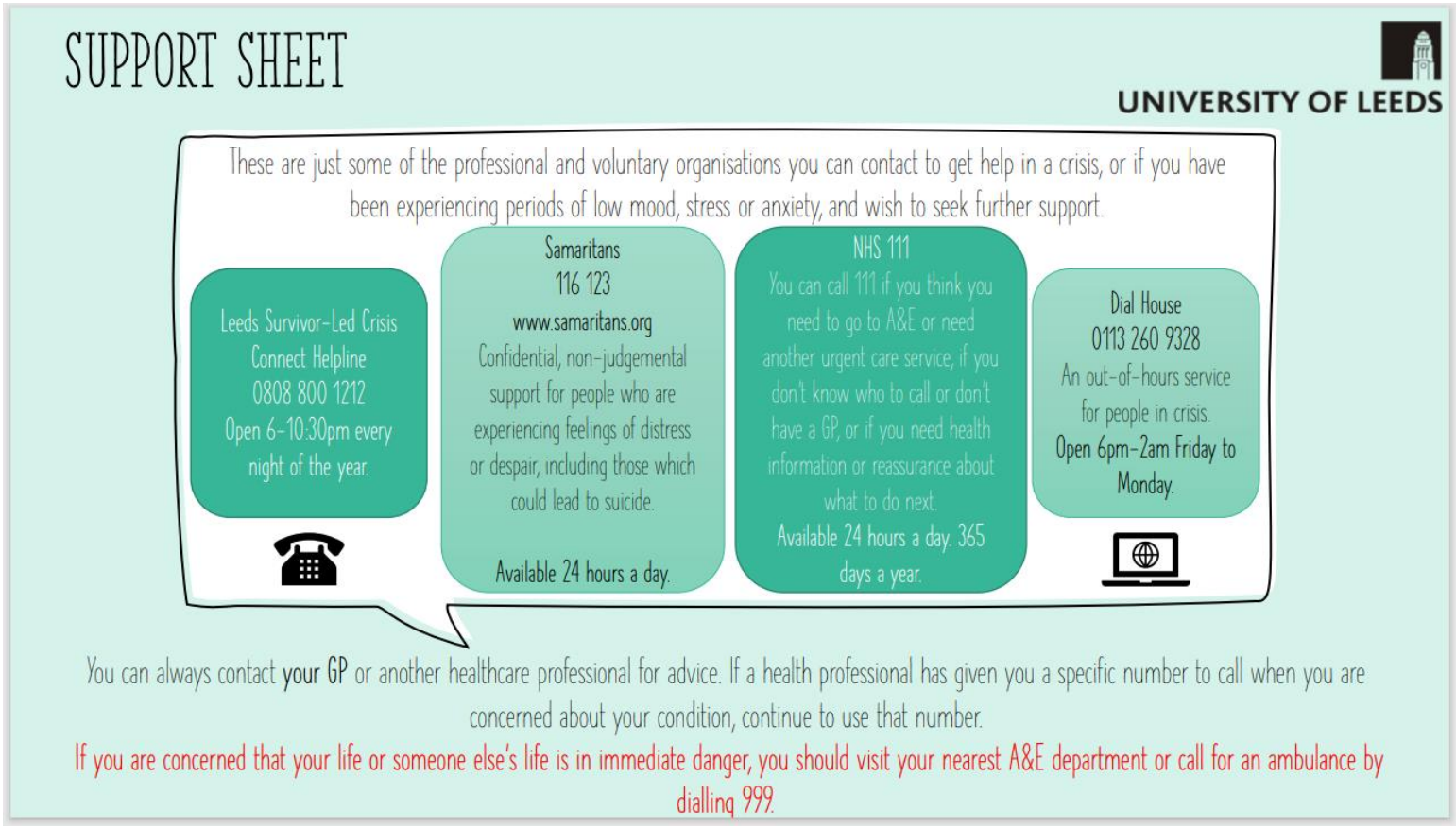
Thank you again for taking part in this study.

Entry into Prize Draw

As a thank you for taking part in this study and completing the background questionnaire and 7 daily diary questionnaires, we would like to offer you the opportunity to win one of several Amazon vouchers (worth between £5 and £50).

If you would like to be entered into the prize draw, please click here to send an email that will confirm your entry. This is the email you will be contacted on if you win.

Appendix E: Support Sheet



Appendix F: Demographic Questionnaire

This research has received ethical approval from the University of Leeds School of Psychology Ethics Committee, PSYC-454 *(10/02/22).*

The following questionnaire is designed to collect demographic information and information relating to your wellbeing. **There are 6 sections and it should take approximately 15 minutes to complete.**

You are not required to answer any question(s) you do not feel comfortable answering. However, we remind you that all your responses are confidential and no identifiable information is held with your responses, ensuring your anonymity.

Feel free to ask the researcher any questions you have as you work your way through the questionnaire.

Please enter your unique participant code. This code consists of the day of your birthday, the first letter of your mother's first name, and the last two numbers of your phone number. Your unique code is these numbers and characters written in order, with no spaces. E.g. if you were born on the 7th, your mother's name was Jane, and your phone number ended in 67, your code would be 07J67. *Required*

Your answer should be no more than 5 characters long.

Section 1

What is your age?

What is your date of birth?

(dd/mm/yyyy)

What is your gender?

- Male
- Female
- Non-binary
- Prefer not to answer
- Other

What is your height? (Please specify cm or ft/inches).

What is your weight? (Please specify kg or stones/pounds).

How would you describe your ethnic background?

What is your nationality? ***This refers to the country you are a citizen of, e.g. England, Japan, America, etc.***

Please enter a response that only contains letters.

What is the highest level of education that you have completed?

What is your postcode? *This will give us an idea of where respondents are located, to be used for demographic purposes only.*

Your answer should be no more than 7 characters long.

Section 2

1. Have you ever seriously thought of taking your life, but not actually attempted to do so?

- No
- Yes
- Would rather not say

2. Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?

- No
- Yes
- Would rather not say

3. Have any of your first-degree relatives attempted or completed suicide?

- No
- Yes
- Would rather not say

Appendix G: Background Questionnaires

Perceived Stress Scale (reference)

Please indicate how often you have felt or thought a certain way **during the last FOUR weeks. In the last four weeks, how often have you…**

Anchors: Never, Almost Never, Sometimes, Fairly Often, Very Often

1. Felt that you were unable to control the important things in your life?
2. Felt confident about your ability to handle your personal problems?
3. Felt that things were going your way?
4. Felt difficulties were piling up so high that you could not overcome them?

Multidimensional Perfectionism Scale (Hewitt & Flett, 1991)

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you **agree or disagree** and **to what extent.**

Anchors: Disagree (1) through to Agree (7)

1. When I am working on something, I cannot relax until it is perfect.
2. I am not likely to criticise someone for giving up too easily.
3. It is not important that people I am close to are successful.
4. I seldom criticise my friends for accepting second best.
5. I find it difficult to meet others' expectations of me.
6. One of my goals is to be perfect in everything I do.
7. Everything that others do must be of top-notch quality.
8. I never aim for perfection in my work.
9. Those around me readily accept that I can make mistakes too.
10. It doesn't matter when someone close to me does not do their absolute best.
11. The better I do, the better I am expected to do.
12. I seldom feel the need to be perfect.
13. Anything that I do that is less than excellent will be seen as poor work by those around me.
14. I strive to be as perfect as I can be.
15. It is very important that I am perfect in everything I attempt.
16. I have high expectations for the people who are important to me.
17. I strive to be the best at everything I do.
18. The people around me expect me to succeed at everything I do.
19. I do not have very high standards for those around me.
20. I demand nothing less than perfection of myself.
21. Others will like me even if I don't excel at everything.
22. I can't be bothered with people who won't strive to better themselves.
23. It makes me uneasy to see an error in my work.
24. I do not expect a lot from my friends.
25. Success means that I must work even harder to please others.
26. If I ask someone to do something, I expect it to be done flawlessly.
27. I cannot stand to see people close to me make mistakes.
28. I am perfectionistic in setting my goals.
29. The people who matter to me should never let me down.

30. Others think that I am okay, even when I do not succeed.
31. I feel that people are too demanding of me.
32. I must work to my full potential at all times.
33. Although they may not say it, other people get very upset with me when I slip up.
34. I do not have to be the best at whatever I am doing.
35. My family expects me to be perfect.
36. I do not have very high goals for myself.
37. My parent rarely expected me to excel in all aspects of my life.
38. I respect people who are average.
39. People expect nothing less than perfection from me.
40. I set very high standards for myself.
41. People expect more than me than I am capable of giving.
42. I must always be successful at school or work.
43. It does not matter to me when a close friend does not try their hardest.
44. People around me think that I am still competent even if I make a mistake.
45. I seldom expect others to excel at whatever they do.

Perfectionism Cognitions Inventory (Flett et al, 2007)

Listed below are a variety of thoughts about perfectionism that sometimes pop into people's heads. Please read each thought and indicate **how frequently, if at all, the thoughts occurred to you over the last week.** Please read each item carefully and circle the appropriate number below the response.

Anchors: Not at all, Sometimes, Moderately Often, Often, All of the Time.

1. Why can't I be perfect.
2. I need to do better.
3. I should be perfect.
4. I must never make the same mistake twice.
5. I've got to keep working on my goals.
6. I have to be the best.
7. I should be doing more.
8. I can't stand to make mistakes.
9. I have to work hard all the time.
10. No matter how much I do, it's never enough.
11. People expect me to be perfect.
12. I must be efficient at all times.
13. My goals are very high.
14. I can always do better, even if things are almost perfect.
15. I expect to be perfect.
16. Why can't things be perfect?
17. My work has to be superior.
18. It would be great if everything in my life was perfect.
19. My work should be flawless.
20. Things are seldom ideal.
21. How well am I doing?
22. I can't do this perfectly.
23. I certainly have high standards.
24. Maybe I should lower my goals.
25. I am too much of a perfectionist.

Disordered Eating Attitude Scale (Alvarenga et al, 2010b)

PART I

1. Mark with an X how healthy and necessary you consider consumption of each kind of food.

Anchors: Eating this food *often* is healthy and necessary; Eating this food *occasionally* is healthy and necessary; *Not* eating this food is healthy and necessary.

a) Sugar

French fries

Oil

b) Breads

Rice

Beans

Pasta

Red meat

Whole milk

Cheese

c) Vegetables

Fruits

White meat

Responses: Yes; No

2. Do you feel pleasure when you eat?
3. Does eating ever feel unnatural to you?
4. Have you ever spent one or more days without eating or having only liquids because you believed you could lose weight?
5. Do you count the calories of everything you eat?
6. Do you enjoy the feeling of an empty stomach?
7. Do you "skip" meals to avoid putting on weight?
8. Does eating make you feel "dirty"?
9. Do you have good memories related to food?
10. Would you like to not need to eat?
11. Do you believe that it is normal to eat sometimes just because you are sad, upset or bored?

12. When you eat more than usual, what is your behaviour afterwards? ***Please select one.***

Restart eating as usual.

Assume you have lost control and keep eating even more.

Decide to go on a diet to compensate.

Use some kind of compensation such as physical activity, vomiting, laxatives, and diuretics.

PART II

Anchors: Always, Usually, Often, Sometimes, Rarely/Never

1. I feel guilty when I eat something that I thought I should not eat for some reason.
2. I quit eating a kind of food if I find out it has more calories than I thought.
3. I worry all the time about what I am going to eat, how much to eat, how to prepare food and whether I should eat or not.
4. I worry about how much a certain kind of food or meal will make me gain weight.
5. I am angry when I feel hungry.
6. It is hard to choose what to eat, because I always think I should eat less or choose the option with fewer calories.
7. When I desire a specific kind of food, I know I won't stop eating until I have finished with it.
8. I would like to have my appetite and eating behaviour under total control.
9. I try eating less in front of others in order to overeat when I am alone.
10. I am afraid to start eating and not be able to stop.
11. I dream of a pill that would replace food.
12. I get nervous and/or lose my self-control at parties and buffets, due to the great amount of foods available.
13. My relationship with food messes up my life as a whole.

Childhood Trauma Questionnaire

These questions ask about some of your experiences growing up as a child and a teenager. Although these questions are of a personal nature, please try to answer as honestly as you can. For each question, circle the number under the response that best describes your experience.

Anchors: Never True, Rarely True, Sometimes True, Often True, Very Often True

When I was growing up…

1. I didn't have enough to eat.
2. I knew that there was someone to take care of me and protect me.
3. People in my family called me things like "stupid", "lazy", or "ugly".
4. My parents were too drunk or high to take care of the family.
5. There was someone in my family who helped me feel that I was important or special.
6. I had to wear dirty clothes.
7. I felt loved.
8. I thought that my parents wished I had never been born.
9. I got hit so hard by someone in my family that I had to see a doctor or go to hospital.
10. There was nothing I wanted to change about my family.
11. People in my family hit me so hard that it left me with bruises or marks.
12. I was punished with a belt, a board, a cord, or some other hard object.

13. People in my family looked out for each other.
14. People in my family said hurtful or insulting things to me.
15. I believe that I was physically abused.
16. I had the perfect childhood.
17. I got hit or beaten so badly that it was noticed by someone like a teacher, neighbour or doctor.
18. I felt that someone in my family hated me.
19. People in my family felt close to each other.
20. Someone tried to touch me in a sexual way, or tried to make me touch them.
21. Someone threatened to hurt me or tell lies about me unless I did something sexual with them.
22. I had the best family in the world.
23. Someone tried to make me do sexual things or watch sexual things.
24. Someone molested me.
25. I believe that I was emotionally abused.
26. There was someone to take me to the doctor if I needed it.
27. I believed that I was sexually abused.
28. My family was source of strength and support.

Appendix H: Daily Questionnaires

How stressed have you felt today?

Today, I felt…	Not at all stressed	Slightly stressed	Somewhat stressed	Moderately stressed	Extremely stressed

Please indicate how often you felt a certain way today.

Anchors: Never, Almost Never, Sometimes, Fairly Often, Very Often

How often did you…

1. Feel that you were unable to control the important things in your life?
2. Feel confident about your ability to handle your personal problems?
3. Feel that things were going your way?
4. Feel difficulties were piling up so high that you could not overcome them?

Please indicate how often you experienced the following thoughts today.

Anchors: Not at all, Sometimes, Moderately Often, Often, All of the time

1. I expected to be perfect.
2. I felt I should be perfect.
3. I couldn't stand to make mistakes.
4. I had to be efficient at all times.
5. I had to be the best.

Please list each food that you have consumed between meals on different occasions today and the time at which you ate them (or closest estimated time). E.g. chocolate, crisps, nuts and fruit - but do not include beverages.

For example, if you ate one bar of chocolate at 10am and another at 2pm, these would be entered as separate snacks.

If you are unsure whether an item is considered a snack, please include it anyway.

Space for 10 snacks.

Snack: *hh:mm*

In total, how many portions of FRUIT did you eat today?

In total, how many portions of VEGETABLES did you eat today?

NHS Choices defines 80g of fruit as one adult portion. Below is a guide to what one portion of fruit looks like:

- *2 or more small fruits (e.g. 2 plums or satsumas, 7 strawberries or 14 cherries)*
- *1 piece of medium fruit (e.g. 1 apple, banana, pear or nectarine)*
- *1 portion of large fruit (e.g. half a grapefuit, 1 slice of melon [5 cm slice] or 1 large slice of pineapple)*
- *Approximately 30g of dried fruit*

NHS Choices defines 80g of vegetables as one adult portion. Below is a guide to what one portion of vegetables looks like:

- *4 heaped tablespoons of green vegetables (e.g. cooked kale, spinach, spring greens, green beans) or 2 broccoli spears*
- *3 heaped tablespoons of cooked vegetables (e.g. carrots, peas, sweetcorn) or 7 cauliflower florets. Roughly the same for tinned/frozen.*
- *For salad vegetables, 1 portion counts as e.g. 3 celery sticks, 1 medium tomato, 3 cherry tomatoes.*
- *3 heaped tablespoons of pulses/beans (e.g. baked beans, kidney beans, chickpeas).*
- *Potatoes do not count as vegetables (this is the same for yams, cassava and plantain).*

Please rate the extent to which you feel you have done the following.
Anchors: 1 = Not at all, through to 7 = Very much

1. To what extent have you eaten HEALTHY SNACKS today? (e.g. apple, banana, dried fruit, carrot sticks, nuts)
2. To what extent have you eaten UNHEALTHY SNACKS today? (e.g. chocolate, crisps, cake)
3. To what extent do you feel that you consumed a HEALTHY DIET today?
4. To what extent do you feel that you consumed an UNHEALTHY DIET today?

Please indicate how often the following happened today.

Anchors: Always, Usually, Often, Sometimes, Rarely/Never

1. I tried to eat less in front of others, in order to overeat when I was alone.
2. I was afraid to start eating and not be able to stop.
3. I stopped eating a kind of food because I found out it had more calories than I thought.
4. I worried about how much a certain kind of food or meal would make me gain weight.
5. I didn’t eat or only had liquids because I believed I could lose weight.
6. I skipped a meal to avoid putting on weight.
7. Eating felt unnatural to me.
8. I felt pleasure when I ate.
9. I ate because I was sad, upset, or bored.
10. I didn’t stop eating a type of food until I had finished with it.

Appendix I: AsPredicted Pre-Registration

Created: 07/29/2022 02:47 AM (PT)

Author(s)
Amy Willgoose (University of Leeds) - umaw@leeds.ac.uk
Daryl O'Connor (University of Leeds) - d.b.oconnor@leeds.ac.uk

1) Have any data been collected for this study already?
It's complicated. We have already collected some data but explain in Question 8 why readers may consider this a valid pre-registration nevertheless.

2) What's the main question being asked or hypothesis being tested in this study?
The study aims to address the following research questions:
- Is there a main effect of childhood trauma on eating outcomes, whereby higher levels of childhood trauma will be associated with more maladaptive eating attitudes and behaviours?
- Are more maladaptive eating attitudes and behaviours evident on days with [a] more stressors, and [b] more perfectionistic thinking?
- Are the above relationships moderated by childhood trauma, such that the effects of perfectionistic thinking and stress on eating attitudes and behaviours are stronger in those who have experienced high levels of childhood trauma (compared to those with lower levels or no childhood trauma)?

3) Describe the key dependent variable(s) specifying how they will be measured.
Eating outcomes at daily level: includes number of fruit/vegetables consumed; self-rated perception of how healthy/unhealthy diet was that day; number and type of between-meal snacks; and attitudes/behaviours toward eating and food (how often they occurred today, 5-point Likert scale, daily adaptation of the Disordered Eating Attitude Scale).

4) How many and which conditions will participants be assigned to?
Participants will not be assigned to any conditions within the study.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
The data will be analysed using multilevel modelling (also referred to as Hierarchical Linear

Modelling). This analysis allows the effects of within and between-subject factors to be incorporated into the same analysis. The dataset will consist of two levels:
1. Level 1 – daily variation in stress, perfectionistic thinking, and eating attitudes and behaviours (within-subject variation)
2. Level 2 – between-person variation in background measures including age, gender, socioeconomic status, education level, body mass index, childhood trauma, trait perfectionism, and eating attitudes and behaviours

The main HLM analyses will test:
1) whether childhood trauma has cross-level (main) effects on daily maladaptive eating attitudes and behaviour
2) whether daily stressors and perfectionistic thinking are associated with daily maladaptive eating attitudes and behaviour
3) whether these daily relationships are moderated by childhood trauma

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Box plots will be used to identify potential outliers and any outliers will then be replaced with a score equal to three SDs from the mean.

Participants who complete less than 3 daily diaries will not be included in the analyses.

7) How many observations will be collected or what will determine sample size?
No need to justify decision, but be precise about <u>exactly</u> how the number will be determined.
A pilot study is being conducted to obtain preliminary data to inform power calculations to determine the number of participants to be recruited.

8) Anything else you would like to pre-register?
(e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
A pilot study is being conducted to obtain preliminary data to inform power calculations to determine the number of participants to be recruited.

Appendix J: Initial HLM Analyses (outliers retained)

Analyses were conducted on the full dataset, prior to outliers being replaced.

Main effect of CTQ on DEAS subscales

Fixed Effect For INTRCEPT, π_0 CTQ_TOTA, β_{01}	Coefficient	SE	*t*-ratio	*p*-value
DEAS_REL	0.035	0.005	7.21	<0.001
DEAS_CON	0.033	0.008	3.83	<0.001
DEAS_RES	0.038	0.008	4.65	<0.001
DEAS_FEE	0.011	0.006	1.76	0.081
DEAS_NOR	0.016	0.010	1.57	0.120

Significant main effects of childhood trauma were found for three of the DEAS subscales. There was a significant main effect of total CTQ score on the DEAS relationship with food subscale (β_{01} = 0.035, p = <0.001), indicating that higher levels of childhood trauma were associated with a higher daily disordered relationship with food. There was a significant main effect of total CTQ score on the DEAS concerns toward food and weight gain subscale (β_{01} = 0.033, p = <0.001), indicating that higher levels of childhood trauma were associated with a higher concern toward food and weight gain. Finally, there was a significant main effect of total CTQ score on the DEAS restrictive and compensatory practices subscale (β_{01} = 0.038, p = <0.001), indicating that higher levels of childhood trauma were associated with a greater incidence of restrictive and compensatory practices toward food.

Daily Stress – Eating Outcomes with CTQ Moderation

Model and Variables	β	**Coefficient**	**SE**	**p-value**
Relationship with Food				
Daily Stress – Relationship with Food	β_{10}	0.047	0.015	0.002
CTQ x Stress – Relationship with Food	β_{11}	0.002	0.001	0.049
Concerns about food and weight gain				
Daily Stress – Concerns	β_{10}	0.043	0.019	0.029
CTQ x Stress – Concerns	β_{11}	0.002	0.001	0.046
Restrictive/Compensatory Practices				
Daily Stress – Res/Con	β_{10}	0.017	0.017	0.330
CTQ x Stress – Res/Con	β_{11}	0.001	0.001	0.066
Feeling Toward Eating				
Daily Stress – Feeling	β_{10}	-0.039	0.023	0.092
CTQ x Stress – Feeling	β_{11}	-0.0001	0.001	0.924
Idea of Normal Eating				

Daily Stress – Normal Eating	β_{10}	0.057	0.029	0.055
CTQ x Stress – Normal Eating	β_{11}	-0.0009	0.001	0.496

Results showed that daily stress was significantly associated with the daily relationship with food subscale (β_{10} = 0.047, p = 0.002), and that this relationship was significantly moderated by the total childhood trauma score (β_{11} = 0.002, p = 0.049). Furthermore, daily stress was significantly associated with the daily concerns over eating subscale (β_{10} = 0.019, p = 0.029), and this relationship was significantly moderated by the total childhood trauma score (β_{11} = 0.002, p = 0.046). Daily stress was not significantly associated with the remaining three subscales (daily restrictive/compensatory practices, feeling toward eating, or idea of normal eating), and none of these non-significant relationships were moderated by childhood trauma.

Daily Perfectionistic Thinking – Eating Outcomes with CTQ Moderation

Model and Variables	***β***	**Coefficient**	**SE**	**p-value**
Relationship with Food				
Daily PCI – Relationship with Food	β_{10}	0.019	0.01	0.082
CTQ x PCI – Relationship with Food	β_{11}	0.0003	0.0009	0.729
Concerns about food and weight gain				
Daily PCI – Concerns	β_{10}	0.027	0.015	0.065
CTQ x PCI – Concerns	β_{11}	-0.0004	-0.383	0.702
Restrictive/Compensatory Practices				
Daily PCI – Res/Con	β_{10}	0.013	0.018	0.453
CTQ x PCI – Res/Con	β_{11}	0.0005	0.001	0.656
Feeling Toward Eating				
Daily PCI – Feeling	β_{10}	-0.019	0.017	0.265
CTQ x PCI – Feeling	β_{11}	-0.0009	0.0009	0.282
Idea of Normal Eating				
Daily PCI – Normal Eating	β_{10}	0.033	0.019	0.082
CTQ x PCI – Normal Eating	β_{11}	-0.0005	0.001	0.617

Results showed that daily perfectionistic thinking was not significantly associated with any of the daily disordered eating subscales. Furthermore, none of these non-significant relationships were moderated by the total childhood trauma score.