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# Trait self-compassion, daily stress and eating behaviours: a daily diary study

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## ABSTRACT

Self-compassion is associated with reduced stress and health-promoting behaviours through enabling a positive attitude towards the self in times of difficulty. However, limited research has investigated the role of self-compassion in understanding the relationship between daily stress and eating styles. This study examined whether trait self-compassion was associated with daily eating behaviours and eating styles. It also tested moderation and mediation models that linked trait self-compassion, daily stress and daily eating. A sample of 146 individuals completed a measure of trait self-compassion at baseline and then a 7-day daily diary. At baseline, self-compassion was found to be associated with uncontrolled, restrained, emotional, and intuitive eating styles. Multilevel modelling found that daily hassles were positively associated with total snacking (unhealthy and healthy) behaviours. Trait self-compassion was associated with less daily hassles. However, self-compassion was not associated with between-meal snack consumption and did not moderate daily stress-snacking relationships. Multilevel mediation analyses revealed no indirect effects of self-compassion on between-meal snacking, daily hassles or uplifts. Future research ought to replicate the current findings and explore fluctuations in self-compassion at a daily level. Greater understanding of a state-trait approach to self-compassion is warranted for the associations with daily stress and eating behaviours.

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## KEYWORDS

Daily hassles; daily uplifts; snacking; mindfulness; eating styles

## 1. Introduction

Self-compassion is a positive attitude towards the self that can be applied to support health. This construct, defined as treating oneself during challenges and failures with kindness, care and acceptance (Neff, 2003), shows benefits with a wide range of positive psychological outcomes (MacBeth & Gumley, 2012). According to Neff (2003), self-compassion consists of three components: a) *self-kindness*: treating oneself with kindness and understanding in times of difficulty, rather than harsh judging and criticising the self; b) *common humanity*: seeing one's struggles as part of human life and all people lead imperfect lives;

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and c) *mindfulness*: holding a balanced awareness of present affect and painful thoughts, instead of over-identifying or exaggerating them.

A large number of studies have documented that self-compassion is associated with many and varied health-related outcomes including lower levels of perceived stress (Allen & Leary, 2010; Sirois et al., 2015), adaptive coping with stress (Bui et al., 2021; Ewert et al., 2021), better physical health (Dunne et al., 2018; Homan & Sirois, 2017), promotion of healthy eating habits (Rahimi-Ardabili et al., 2018), and greater engagement in health-promoting behaviours (Phillips & Hine, 2021; Sirois et al., 2019). However, the evidence claiming the benefits of self-compassion for health is outpacing research into the pathways and mechanisms that could explain the associations. For example, less research has explored whether the links between self-compassion and health is explained by greater engagement in health behaviours and the experience of lower stress levels. Self-compassion predicts healthy behaviours through ameliorating stress (Hu et al., 2018; Sirois et al., 2015; Sirois & Hirsch, 2019). With regards to the consistent links between stress and poor health behaviours (Cohen et al., 1983; Sirois, 2007), between self-compassion and health-related outcomes (Allen & Leary, 2010; Terry & Leary, 2011), it is plausible that stress is involved in the pathway connecting self-compassion to health behaviours and health. The purpose of this study is to investigate these possibilities further.

### **1.1. Self-compassion, health behaviours and health**

Trait self-compassion has been found to be associated with a range of positive health behaviours. Most existing literature has examined self-compassion at trait level as it represents individuals' general tendency to respond to health-related behaviours (Neff, 2016). A body of research has noted that its relation to self-care motivation in exercise (Wong et al., 2021), reduced smoking in people with low readiness to change (Kelly et al., 2010), improved sleep quality with decreased ruminative thoughts (Butz & Stahlberg, 2018), and with the practice of multiple health-promoting behaviours *via* higher positive affect (Sirois, 2015). The association between self-compassion and health behaviours could be explained in terms of its link to self-regulation of emotions (Sirois, 2015; Terry & Leary, 2011). Self-compassionate people tend to experience setbacks and failures in a more acceptable and mindful way (Neff, 2003), rather than being immersed in negative emotions or stressing out situations (Leary et al. 2007). As a result, they are more willing to take actions to engage in health behaviours in order to maintain health.

#### **1.1.1. Self-compassion and eating styles**

Eating is considered one of the major health behaviours with a strong influence on health outcomes (Jepson et al., 2010). Recently, researchers have been paying more attention to the relationship between self-compassion on eating behaviours. Self-compassion benefits are linked to reduced disordered eating (Breines et al., 2014), better weight management outcomes and enhanced positive body image (Brenton-Peters et al., 2021). It is generally accepted that a self-compassionate frame of mind encourages a non-judgemental and balanced view regarding internal and external suffering (Neff, 2003), helping people

manage emotional stress without turning to harmful coping behaviours (Albertson et al., 2015). In fact, research has shown that self-compassion may influence several specific eating styles, both adaptive and maladaptive. Lower levels of self-compassion were associated with more emotional eating and uncontrolled binge eating in response to emotional triggers which can lead to poor psychological and physical health outcomes (Gouveia et al., 2019; Webb & Forman, 2013). Whilst higher levels of self-compassion were linked with decreased rigid cognitive restraint of food intake to regulate body weight (Bourke & Pila, 2023) for the sake of body image, they were also associated with increased intuitive eating characterised by greater self-acceptance and responsiveness to internal hunger and satiety cues (Schoenefeld & Webb, 2013). Further, self-compassion has also been linked to healthier eating behaviours more broadly, such as choosing more nutritious foods (Rahimi-Ardabili et al., 2018), and engaging in mindful eating involving greater consumption of fruits and vegetables rather than high-fat or high-sugar foods (Brenton-Peters et al., 2021; Mantzios et al., 2018). More recently, studies demonstrating the associations between self-compassion and daily eating behaviours showed that high self-compassion predicted lower levels of daily emotional eating (Schnepper et al., 2020), and better daily dietary choices (Li et al., 2020). Although previous studies have shown that self-compassion influences eating, research focused on self-compassion in relation to a comprehensive range of eating styles is limited. Therefore, the first goal of the current study was to expand this avenue of research and investigate the associations between self-compassion and a series of eating styles including emotional, uncontrolled, cognitive restraint, intuitive eating.

### **1.2. Self-compassion, stress, and eating behaviours**

Stress can negatively affect health through changes in eating behaviours (O'Connor, Thayer & Vedhara, 2021). Stress-eating relationships are well documented based on the facts that stress can evoke emotional arousal and stress hormones (i.e. cortisol), which alters peoples' appetite to eat more comfort food or increased energy consumption regardless of nutrition need (Araiza & Lobel, 2018; Cartwright et al., 2003; Cummings & Tomiyama, 2019). For example, emotional eating triggered by stress is high in emotional eaters because they eat as a way to cope with anxious feelings (O'Connor & Conner, 2011). Other research in samples of women (Epel et al., 2001) and children (Moss et al., 2020), respectively, have similarly found that when stressed, individuals with higher cortisol reactivity consumed more snacks than those with low cortisol response to a laboratory stressor. However, laboratory studies may not accurately represent stress-eating relationships because people might exhibit different eating tendencies or preferences outside of a laboratory (Hsu & Raposa, 2021). Studies examining stress and eating style variables on daily basis in natural settings are more generalisable to the real-world (Segerstrom & O'Connor, 2012).

In fact, approaches using daily diary assessment have also supported the impact of daily stressors on eating. Evidence shows that daily hassles are related to an increase in snack consumption (Newman et al., 2007), and binge eating (Crowther et al., 2001). More importantly, daily uplifts perceived as joyful positive daily experiences also play a key role in eating. Positive emotions following the experience of daily uplifts have been shown to trigger increased high fat/sugar between-meal snacks, decreased

vegetables and main meal consumption (Moss et al., 2021). A likely explanation is that daily hassles seem to trigger stress-eating patterns, whilst uplifts may influence eating through mood-enhancing pathways that differ from stress-based coping (Fredrickson, 2001). Including both hassles and uplifts allows for a more comprehensive understanding of how daily affective experiences can shape eating patterns. Therefore, the current study employed daily diary methods to explore how both daily hassles and daily uplifts influence eating behaviour on a day-to-day level, and to provide greater insights into the fluctuations in within-person stress-eating outcomes.

Based on the findings above, it is well established that stress has a major influence on eating behaviours, especially when individuals lack the emotional or cognitive resources to regulate their responses. One such potential resource is self-compassion, which may buffer the effects of stress on eating behaviour through its impact on self-regulation and emotional resilience. It has been argued that self-compassion is associated with eating behaviours because it highlights the perception of unconditional acceptance of the self. If a self-compassionate attitude may help foster kindness and understanding against critical perfectionism of oneself and one's body that would also promote greater engagement in adaptive eating styles, such as reduced emotional eating and cognitive restraint (Bergunde & Dritschel, 2020; Braun et al., 2016). Simultaneously, it has been argued that self-compassion has the capacity to lower stress (Allen & Leary, 2010) because it helps self-regulate and reframe a stressful situation in a more positive manner. If self-compassion orientation could enhance tolerance of the internal negative emotions, then that could also facilitate emotional capacity to remain emotionally grounded in the face of the perceived intensity from stress (Finlay-Jones et al., 2015; Homan & Sirois, 2017; Soysa & Wilcomb, 2015). Together, people need such self-regulation ability to manage undesired emotions resulted from failures and unexpected situations. Self-compassion thus provides a more mindful and self-supportive approach into the coping process between stress and eating response (Terry & Leary, 2011), through which people may resist stress-related eating tendencies.

In addition to the direct influence on stress and eating, self-compassion may influence eating indirectly through its effects on stress. Empirical evidence has supported the potential mediating role played by stress. Research using mediation analysis has found increased engagement of health-promoting behaviours (e.g. healthful eating habits) occur when people respond to perceived stress with a more self-compassionate attitude (Homan & Sirois, 2017). More recently, the positive effects of self-compassion on eating behaviours were found to be mediated by perceived stress (Li et al., 2020). However, it is notable that of the existing research, there has been an over reliance on one-off assessments (e.g. Perceived Stress Scale) to investigate the underlying processes behind the impacts of self-compassion on stress and eating responses. Single assessments of stress may not capture the variability and nuance of daily stress experiences that influence eating in real time (Hill et al., 2023), or improve understanding of how self-compassion interacts with daily stress-eating process. Moreover, few studies have examined the role of self-compassion in relation to daily uplifts, which may also contribute to eating through emotional and motivational mechanisms. To date, little research has explored self-compassion, daily stressors, and multiple eating behaviours, simultaneously within a daily diary research framework.

### 1.3. This study

Therefore, taken together, using a 7 day daily diary design, the current study aimed to investigate the following research questions: 1) whether there are the associations between trait self-compassion (assessed once at baseline) and a range of eating style variables (e.g. emotional eating, intuitive eating); 2), whether trait self-compassion was associated with daily eating, hassles and uplifts; 3) whether trait self-compassion moderated daily hassles-eating and daily uplifts-eating relationships and 4) whether trait self-compassion had indirect effects on daily eating behaviours through daily stress and daily uplifts. The main study research questions were preregistered on AsPredicted (AsPredicted#129191). The research questions concerning eating styles, daily uplifts and uplift-eating associations were not pre-registered and were therefore examined as additional exploratory analyses.

## 2. Method

### 2.1. Design and participants

Participants were adults in UK aged  $\geq 18$  years and fluent in English language who completed online baseline questionnaires and a 7-day daily diary. Participants were recruited *via* School of Psychology's participant pool scheme, postings on social media, university library and participant mailing list. Participants were either reimbursed with course credits or entered into a prize draw for gift vouchers for their participation. We aim to recruit around 150 participants to this study. This was informed by prior daily diary research in the field of stress and eating. Sample sizes in such studies have ranged from under 50 to nearly 500 participants, with the majority clustering between 100–200 (e.g. Dalton & Hammen, 2018; Debeuf et al., 2018). Before proceeding to baseline survey, interested participants were directed to provide informed consent. All participants were sent text messages as notifications to complete their diary surveys twice a day at 12 pm and before they went to bed (though the second text message was sent at 8 pm).

A total of 159 participants completed at least two days of daily diaries. 13 of them did not complete the baseline. They were therefore excluded from the final data analyses. The final sample consisted of 146 participants (87.7% female) with an average age of 21.16 years ( $SD=6.99$ ). Among them, 92.5% self-reported that they were not on diet, 95.2% were single, and 79.5% were undergraduate students. All procedures were approved by the University of Leeds School of Psychology Research Ethics Committee (reference number: PSYC-905).

### 2.2. Measures

#### 2.2.1. Demographics

Data was collected on participants' age, sex, dietary restrictions, education level, employment, and marital status. Participants also self-reported their height and weight which were converted into body mass index scores (BMI).

### 2.2.2. Self-compassion

The 26-item Self-Compassion Scale (SCS, Neff, 2003) was utilised to measure trait self-compassion. The SCS assesses the three main components of self-compassion. Items measured self-kindness (e.g. "I try to be loving towards myself when I'm feeling emotional pain"), common humanity (e.g. "When things are going badly for me, I see the difficulties as part of life that everyone goes through"), and mindfulness (e.g. "When something upsets me, I try to keep my emotions in balance"). All items indicate how a respondent act towards the self on a scale ranging from 1 (almost never) to 5 (almost always). A total self-compassion score is calculated by averaging the mean subscale scores after reverse coding the negative items. Cronbach's alpha for scale in this study was .929.

### 2.2.3. Eating styles

*Three Factor Eating Questionnaire-R18* (TFEQ-R18, Anglé et al., 2009) assesses eating styles of cognitive restraint (e.g. "I deliberately take small helpings as a means of controlling my weight"), uncontrolled eating (e.g. "Sometimes when I start eating, I just can't seem to stop"), and emotional eating (e.g. "When I feel anxious, I find myself eating"), with 18 items on a 4-point Likert scale (1 = definitely true, 2 = mostly true, 3 = mostly false, 4 = definitely false). Higher scores in the respective scales are indicative of greater cognitive restraint, uncontrolled, and emotional eating. Cronbach's alpha for each subscale in this study was .801 (uncontrolled eating), .838 (cognitive restraint), .848 (emotional eating).

*Salzburg Emotional Eating Questionnaire* (SEES, Meule, Reichenberger & Blechert, 2018) evaluates emotional eating with 20 items by distinguishing between various emotions (e.g. happy, anger), and changes in food consumption. Response options range from 1 (I eat much less than usual) to 5 (I eat much more than usual). Higher scores show that respondents eat more when stressed, whereas lower scores show less emotional eating behaviours. Cronbach's alpha for scale in this study was .836.

*Intuitive Eating Scale-2 questionnaire* (IES-2, Tylka & Kroon Van Diest, 2013) measures individuals' tendency to follow their physical hunger and satiety cues when determining when, what, and how much to eat. Response options for the IES-2 were on a 5-point Likert scale arranging from 1 (strongly disagree) and 5 (strongly agree). The total score for the IES-2 was calculated by averaging the score for all 23 items with higher scores reflecting more intuitive eating. Cronbach's alpha for scale in this study was .862.

### 2.2.4. Daily diary measures

Online daily diaries were completed twice a day for 7 consecutive days in which participants recorded daily hassles, daily uplifts, and between-meal snacks. At the beginning, participants were instructed on what the diaries included, how they received daily access (i.e. a link was provided in each text reminder that was sent at 12pm and again at 8pm in the evening), and how to complete questions through providing definitions and examples.

**2.2.4.1. Daily hassles and uplifts.** In each entry of the daily diary, participants were given open-ended questions (e.g. "How many hassles have you experienced today") to self-report up to 10 negative and 10 positive experiences that occurred

in free-response boxes. Subsequently they were requested to rate its intensity on a scale ranging from 1 (not at all intense) to 5 (very intense). Keeping with previous methodology based on similar diary studies (Moss et al., 2025; O'Connor et al., 2009), the results of a total number of hassles, uplifts and intensity levels were reported by actual number (0–10). Daily hassles were defined as *events, thoughts, or situations which, when they occur, produce negative feelings such as annoyance, irritation, worry or frustration, and/or make you subjectively aware that your goals and plans will be more difficult or impossible to achieve* (O'Connor et al., 2008). Daily uplifts were defined as *a positive experience such as the joy derived from manifestations of love, relief at hearing good news, the pleasure of a good night's rest and so on* (DeLongis et al., 1982; Moss et al., 2025). Examples of hassles and uplifts were provided for participants alongside the definitions.

**2.2.4.2. Between-meal snacking.** The second section of the daily diary requested participants to report any between-meal snack that they consumed in each entry using free-response boxes. They were asked to record up to 10 snack items (foods or drinks between the meal) including the time, the brand/type, and the size/quantity. Each reported item was independently coded by the primary researcher in terms of whether it was healthy snack/drink or unhealthy snack/drink. The categorizations were based on literature that has documented levels of sugar and/or fat composition (McCance & Widdowson, 2014; Moss et al., 2021). If a snack contained more than 22.5g of sugar per 100g or 17.5g of fat per 100g, it was categorised as unhealthy snack. This included high sugar/calorie drinks (e.g. fizzy drinks, energy drinks). Each snack item could potentially have been classified into more than one category due to several participants recording multiple unrelated snacks in one single response box (e.g. 'peanut butter bar with orange juice' was respectively coded as a snack and a drink). The measure of between-meal snack consumption is well-established in previous research studies (e.g. Moss et al., 2025; O'Connor et al., 2008, 2009). Three scores were computed: total number of overall snacks consumed, total number of healthy snacks and total number of unhealthy snacks consumed per day.

### 2.3. Data analysis

Participants who had missing data for the self-compassion measure at baseline or who only completed 2 days' diaries were excluded. A total of 1758 diaries over a 7-day period spread across 146 individuals were used in the final analysis (after 13 participants were removed). The analysis was conducted in three blocks. First, the associations between self-compassion and the eating style variables were explored using Pearson's Product Moment Correlations. Second, multilevel modelling was conducted using Hierarchical Linear Modelling 7 (HLM7, Raudenbush et al., 2011). This analysis enables both within-person and between-person level variables to be compared simultaneously in the same model. The data was considered to have a two-level hierarchical structure. Level 1 (e.g. daily hassles, and between-meal snacks) contained within-person variables that varied from day to day. Level 2 (e.g. trait self-compassion, and demographics) included between-person

variables. Cross-level effects were examined to test: (1) the associations between self-compassion and daily hassles, daily uplifts as well as daily snacking, and (2) the moderation role of self-compassion on daily stress-eating relationships. Variables were entered as predictors based the hypotheses: at step 1 snacks, hassles and uplifts were regressed on self-compassion. Step 2 added and regressed hassle-snack and uplift-snack interactions on self-compassion. Simple slopes analyses were utilised to examine any significant interaction through the unstandardised regression slope for hassle-snacking, uplift-snacking, and the moderator of self-compassion. BMI, age and gender were preliminarily entered into the hierarchical models; however, the results were substantively the same. Therefore, they were not entered in the final analyses. Third, multilevel mediation was conducted using the MLmed computational macro in SPSS to investigate whether there were indirect effects of trait self-compassion on daily snacking behaviours *via* daily hassles and daily uplifts. The effects were tested through 2-1-1 mediation model with self-compassion as the level 2 predictor, hassles and uplifts as potential mediating variables and between-meal snacks assessed as level 1 outcome variables.

### 3. Results

#### 3.1. Descriptive statistics

Table A1 (see Appendices) shows that participants reported 0.73 daily hassles and 0.85 daily uplifts on average per day. The mean total number of between-meal snacks consumed each day was 1.04, and 0.66 for unhealthy snack intake 0.39 for healthy snack intake. The mean value for self-compassion (mean=2.79) was comparable with other published studies (Neff, 2016; Neff et al., 2019) with a moderate level of self-compassion. Mean scores for the eating styles, age, gender, and BMI were also reported. According to National Health Service (NHS), results showed that the BMI range for adult participants in the current study was described as being healthy weight.

#### 3.2. Self-compassion and eating styles

Table A2 (see Appendices) displays the Pearson's correlations between self-compassion and the level 2 variables. Self-compassion was negatively associated with eating behaviours of uncontrolled, cognitive restraint and emotional eating, but positively associated intuitive eating. This indicates that lower levels of self-compassion were related to higher levels of uncontrolled eating, emotional eating, and cognitive restraint, and lower levels of intuitive eating style. BMI was also positively related to cognitive restraint and emotional eating, however, negatively associated with intuitive eating. Meanwhile, significant correlations were found between age and self-compassion, with participants who were older reporting greater self-compassion.

#### 3.3. Effects of self-compassion on daily eating, hassles, and uplifts

HLM was utilised to examine the associations between self-compassion and the level 1 within-person variables (Table A3, see Appendices). The beta weights showed that total snacks including unhealthy and healthy snacks were not significantly associated

with self-compassion such that the levels of self-compassion were not related with daily eating. Furthermore, self-compassion was negatively associated with daily hassles ( $B = -0.152$ ,  $SE = .072$ ,  $p = .038$ ), however, it was not related with daily uplifts ( $B = -0.022$ ,  $SE = .060$ ,  $p = .705$ ). As such, only higher self-compassion was associated with lower daily stress.

### 3.4. Self-compassion and daily stress-eating relationships

#### 3.4.1. Effects of self-compassion on hassle-snacking and uplift-snacking relationships

Table A4 (see Appendices) investigated whether self-compassion moderated the daily hassle-eating and daily uplift-eating relationships. As shown below, daily hassles were significantly associated with total snacks, unhealthy and healthy snacks. However, cross-level analysis showed that self-compassion did not moderate any of the daily hassle-eating relationships ( $B = -0.007$ ,  $SE = .044$ ,  $p = .862$ ). Furthermore, daily uplifts were also significantly related with total snacks, unhealthy and healthy snacks. Yet self-compassion did not moderate any of the daily uplift-eating relationships ( $B = .004$ ,  $SE = .057$ ,  $p = .939$ ).

#### 3.4.2. Indirect effects of self-compassion on snacking via hassles and uplifts

Additionally, we tested whether the effects of self-compassion on daily snacking behaviours were mediated *via* daily hassles and daily uplifts. The results (Table A5, see Appendices) showed that self-had no indirect effects on total snacks, unhealthy snacks, and healthy snacks through daily uplifts.

## 4. Discussion

Our study focused on how trait self-compassion linked to a range of eating behaviours, and how it was related to within-person levels of daily stress and daily eating behaviours. Our analyses showed that trait self-compassion was associated with four important eating styles: uncontrolled eating, emotional eating, cognitive restraint, and intuitive eating. Daily hassles and uplifts were found to be positively related to total daily snacking, healthy and unhealthy snacking behaviours and trait self-compassion was associated with less daily hassles. However, trait self-compassion did not moderate daily stress-snacking relationships or the daily uplifts-snacking relationships. Finally, we found no evidence of indirect effects of self-compassion on eating behaviours through daily hassles or uplifts.

Theoretically, self-compassion is beneficial for various health and eating behaviours *via* self-regulatory resources that can reduce negative emotions such as anxiety and stress (Terry & Leary, 2011). Our study collaborates the theory and extends pre-registered hypothesis through broadly measuring a range of eating behaviours at a time which is not only limited to daily eating behaviours. In the current study, trait self-compassion was negatively related to uncontrolled eating and emotional eating. It is generally explained that individuals with higher self-compassion are likely to have a non-judgemental and mindful approach in response to external influences. Such approach can foster a more flexible and adaptive mindset towards their changes in

emotions, thoughts and needs rather than an impulsive way (Braun et al., 2016; Gouveia et al., 2019). Moreover, trait self-compassion was found to be positively connected to intuitive eating but negatively to cognitive restrained eating. Our findings are in line with large literature particularly targeting the relationship between eating and body image. Intuitive eating is not compatible with restrictive eating (Linardon, 2021). People who are kind and compassionate to themselves seem to be less self-critical in relation to their body image (Kelly et al., 2014). Instead, they follow the hunger and satiety cues to eat what they enjoy while still ensuring the body nurtured (Tylka, 2006). Our results indeed were aligned with our hypothesis and further supported previous research: people who treated themselves more self-compassionately, they reported more positive eating styles.

In contrast, the association between self-compassion and daily positive eating behaviours (i.e. fewer daily snacking behaviours) remained absent in the current study. Trait self-compassion was not related to between-meal snack consumption. Snacking perceived as a health behaviour (Verhoeven et al., 2012; Weijzen et al., 2009) might be used by people to cope with daily stressful experiences. Earlier work of O'Connor et al. (2021) demonstrated that unhealthy snack consumption (e.g. high fat or energy dense snacks) is highly associated with individual negative or positive emotions in response to daily hassles or daily uplifts. As a result of daily diary assessment, our findings were consistent with former daily diary investigation that higher levels of daily hassles and uplifts were related with increased total between-meal snacks and unhealthy snacks. In addition, results of multilevel modelling revealed positive associations between daily hassles, daily uplifts, and healthy snacks. These findings confirmed the stress-induced role on habitual eating behaviours on daily basis. That is, general emotional arousal triggers eating behaviours to cope with daily stressors regardless of the extent to which category of emotions, and to which category of food consumption (Evers et al., 2013; Wallis & Hetherington, 2009).

However, inconsistent with expectations, trait self-compassion did not moderate with daily hassle-snacking and uplift-snacking relationships. In the previous research, higher levels of trait self-compassion have been found to be associated with less stress and more health-promoting behaviours (Homan & Sirois, 2017). To our best knowledge, this is the first study to investigate the associations between trait self-compassion and daily stress-snacking behaviours. It suggests that the associations remain understudied, such that more research is warranted in larger samples using more detailed measures of eating to confirm definitively whether or not self-compassion can influence the daily stress-eating relationship. Moreover, it is important to note that self-compassion was assessed as a baseline, trait-like measure in the current study. Therefore, it is important for future research to explore the extent to which daily fluctuations in self-compassion may influence the daily stress and eating process. In addition, other positive psychological constructs such as optimism or positive affect (Allen & Leary, 2010; Sirois, 2015), which are often associated with self-compassion and may function through cognitive reconstruct and behavioural responses, might cumulatively help buffer the impact of daily stress on health behaviours. Future research ought to explore how these constructs interact or function alongside self-compassion to support adaptive coping in stress-eating behaviours.

The current study did find that trait self-compassion was negatively associated with daily hassles. This is an important finding as it suggests that self-compassion can influence the experience of daily hassles and may extend it to the state level. As it has been explained on the trait level, self-compassion is perceived as an adaptive emotional regulation strategy in response to stress reactivity (Neff et al., 2007; Svendsen et al., 2016). Our result corresponds to the buffering role of self-compassion on the negative affect of daily hassles when individuals are more self-compassionate as a person (Mey et al., 2023; Wahyuni et al., 2022). On the other hand, relating oneself with compassion and care in daily stressful events could protect people to cope with day-to-day stress due to daily hassles. Further, this may imply a daily stress coping pathway through which self-compassion helps protect health.

## 5. Limitations

There are a number of limitations of the current study that ought to be acknowledged. First, our sample was rather homogeneous mostly involving a young, student and female population. Due to the gender differences in self-compassion, the associations between self-compassion, stress processing and eating response might vary between males and females. Compared with men, women tend to have lower self-compassion, and they are more likely to turn to eating behaviours to dampen negative stress feelings (Mikolajczyk et al., 2009; Sims et al., 2008; Yarnell et al., 2019). Therefore, future research needs to replicate the results with more diverse samples to shed light on the generalisability of the findings. Second, like many other daily diary investigations, the current study relied heavily on self-report and online measures that could potentially introduce reporting biases. Participants might overstate the healthy eating and understate the unhealthy eating due to demand characteristics (e.g. embarrassment). Future studies should promote clear guidelines and be strict to the access of the daily diary survey. Furthermore, although our twice-daily measurement is consistent with the practices in prior daily diary studies (cf., Segerstrom & O'Connor, 2012), we acknowledge that other even more intensive momentary assessments might provide a more detailed picture for future studies to further improve the timing and accuracy of reporting daily stress-eating behaviours. Finally, we note that the research questions exploring the links between self-compassion and the eating styles variables were not preregistered, therefore, these results should be considered exploratory until confirmed in future studies.

## 6. Conclusions

The current study found that trait self-compassion was associated with four important eating styles: uncontrolled eating, emotional eating, cognitive restraint, and intuitive eating. Daily hassles and uplifts were found to be positively related to total daily snacking, unhealthy and healthy snacking behaviours and trait self-compassion was associated with less daily hassles. However, trait self-compassion did not moderate daily stress-snacking relationships or the daily uplifts-snacking relationships. Future research ought to replicate these findings in a larger, more diverse sample and incorporate daily assessments of self-compassion.

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## Data availability statement

Data available upon reasonable request.

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## Appendices

**Table A1.** Descriptive statistics for level 1 (within-subjects) and level 2 (between-subjects) variables.

|                                  | Mean  | SD    | Min   | Max    |
|----------------------------------|-------|-------|-------|--------|
| <b>Level 1 variables</b>         |       |       |       |        |
| Total number of hassles          | 0.73  | 0.96  | 0.00  | 7.00   |
| Total number of uplifts          | 0.85  | 0.90  | 0.00  | 7.00   |
| Total number of snacks           | 1.04  | 1.20  | 0.00  | 7.00   |
| Total number of healthy snacks   | 0.39  | 0.78  | 0.00  | 12.00  |
| Total number of unhealthy snacks | 0.66  | 0.89  | 0.00  | 5.00   |
| <b>Level 2 variables</b>         |       |       |       |        |
| Age                              | 21.16 | 7.00  | 18.00 | 61.00  |
| Gender                           | 1.12  | 0.33  | 1.00  | 2.00   |
| BMI                              | 22.52 | 4.29  | 16.40 | 43.40  |
| Self-compassion                  | 2.79  | 0.60  | 1.38  | 4.31   |
| TFEQ-Uncontrolled eating         | 19.99 | 4.98  | 9.00  | 35.00  |
| TFEQ-Cognitive restraint         | 13.14 | 4.20  | 6.00  | 24.00  |
| TFEQ-Emotional eating            | 6.68  | 2.60  | 3.00  | 12.00  |
| SEE                              | 65.51 | 16.91 | 30.00 | 162.00 |
| IE                               | 3.38  | 0.56  | 1.70  | 4.70   |

Note. TFEQ=Three factor eating; SEE=Salzburg emotional eating; IE=Intuitive eating.

**Table A2.** Correlations between self-compassion and eating styles.

|                              | 1        | 2        | 3        | 4        | 5        | 6        | 7       | 8      | 9      |
|------------------------------|----------|----------|----------|----------|----------|----------|---------|--------|--------|
| 1. Self-compassion           | --       | −0.208*  | −0.266** | −0.178*  | −0.006   | .444**   | −0.079  | .137   | .247** |
| 2. Uncontrolled eating       | −0.208*  | --       | .086     | .634**   | .543**   | .465**   | .107    | .077   | −0.144 |
| 3. Cognitive restraint       | −0.266** | .086     | --       | .018     | −0.113   | −0.443** | .249**  | −0.152 | −0.097 |
| 4. Emotional eating          | −0.178*  | .634***  | .018     | --       | .683**   | −0.620** | .211*   | −0.059 | −0.080 |
| 5. Salzburg emotional eating | −0.006   | .543**   | −0.113   | .683**   | --       | −0.398** | .144    | .076   | −0.056 |
| 6. Intuitive eating          | .444**   | −0.465** | −0.443** | −0.620** | −0.398** | --       | −.232** | .146   | .153   |
| 7. BMI                       | −0.079   | .107     | .249**   | .211*    | .144     | −0.232** | --      | .178*  | .207*  |
| 8. Gender                    | .137     | .077     | −0.152   | −0.059   | .076     | .146     | .178*   | --     | .198*  |
| 9. Age                       | .247**   | −0.144   | −0.097   | −0.080   | −0.056   | .153     | .207*   | .198*  | --     |

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Table A3.** Effects of self-compassion on daily eating, hassles, and uplifts.

|                     | $\beta$      | Coefficient | SE    | P     |
|---------------------|--------------|-------------|-------|-------|
| Intercept           | $\beta_{00}$ | 1.035       | 0.052 | <.001 |
| SC-Snacks           | $\beta_{01}$ | −0.050      | 0.089 | 0.570 |
| Intercept           | $\beta_{00}$ | 0.657       | 0.030 | <.001 |
| SC-Unhealthy snacks | $\beta_{01}$ | −0.034      | 0.051 | 0.502 |
| Intercept           | $\beta_{00}$ | 0.385       | 0.036 | <.001 |
| SC-Healthy snacks   | $\beta_{01}$ | −0.020      | 0.063 | 0.753 |
| Intercept           | $\beta_{00}$ | 0.733       | 0.042 | <.001 |
| SC-Hassles          | $\beta_{01}$ | −0.152      | 0.072 | 0.038 |
| Intercept           | $\beta_{00}$ | 0.844       | 0.041 | <.001 |
| SC-Uplifts          | $\beta_{01}$ | −0.022      | 0.060 | 0.705 |

Note. SC = Self-compassion.

**Table A4.** Moderating effects of self-compassion on daily hassle-eating relationship (upper panel), and moderating effects of self-compassion on daily uplift-eating relationship (lower panel).

| Model and variables              | $\beta$      | Coefficient | SE    | P     |
|----------------------------------|--------------|-------------|-------|-------|
| Intercept                        | $\beta_{00}$ | 1.036       | 0.052 | <.001 |
| SC-Total snacks                  | $\beta_{01}$ | -0.050      | 0.089 | 0.566 |
| Slope: Hassles- snacks           | $\beta_{10}$ | 0.336       | 0.034 | <.001 |
| SC x hassles- snacks             | $\beta_{11}$ | -0.007      | 0.044 | 0.862 |
| Intercept                        | $\beta_{00}$ | 0.658       | 0.030 | <.001 |
| SC-Unhealthy snacks              | $\beta_{01}$ | -0.034      | 0.052 | 0.505 |
| Slope: Hassles- unhealthy snacks | $\beta_{10}$ | 0.213       | 0.026 | <.001 |
| SC x Hassles- unhealthy snacks   | $\beta_{11}$ | -0.001      | 0.034 | 0.959 |
| Intercept                        | $\beta_{00}$ | 0.385       | 0.036 | <.001 |
| SC-Healthy snacks                | $\beta_{01}$ | -0.020      | 0.063 | 0.745 |
| Slope: Hassles- Healthy snacks   | $\beta_{10}$ | 0.117       | 0.021 | <.001 |
| SC x Hassles- healthy snacks     | $\beta_{11}$ | -0.017      | 0.034 | 0.610 |

| Model and variables              | $\beta$      | Coefficient | SE    | P     |
|----------------------------------|--------------|-------------|-------|-------|
| Intercept                        | $\beta_{00}$ | 1.035       | 0.052 | <.001 |
| SC-Total snacks                  | $\beta_{01}$ | -0.053      | 0.088 | 0.549 |
| Slope: Uplifts- snacks           | $\beta_{10}$ | 0.330       | 0.037 | <.001 |
| SC x Uplifts- snacks             | $\beta_{11}$ | 0.004       | 0.057 | 0.939 |
| Intercept                        | $\beta_{00}$ | 0.657       | 0.030 | <.001 |
| SC-Unhealthy snacks              | $\beta_{01}$ | -0.037      | 0.051 | 0.471 |
| Slope: Uplifts- unhealthy snacks | $\beta_{10}$ | 0.200       | 0.030 | <.001 |
| SC x Uplifts- unhealthy snacks   | $\beta_{11}$ | 0.012       | 0.050 | 0.800 |
| Intercept                        | $\beta_{00}$ | 0.385       | 0.036 | <.001 |
| SC-Healthy snacks                | $\beta_{01}$ | -0.020      | 0.063 | 0.747 |
| Slope: Uplifts- Healthy snacks   | $\beta_{10}$ | 0.121       | 0.024 | <.001 |
| SC x Uplifts- healthy snacks     | $\beta_{11}$ | -0.011      | 0.035 | 0.745 |

Note. SC = Self-compassion.

**Table A5.** Indirect effects of self-compassion on daily snacking through daily hassles (mediator), and daily uplifts (mediator).

|                           | Effect | SE    | t/Z    | P     | 95%CI          |
|---------------------------|--------|-------|--------|-------|----------------|
| Self-compassion           |        |       |        |       |                |
| Hassles- Total snacks     |        |       |        |       |                |
| Direct effect             | 0.003  | 0.085 | 0.044  | 0.964 | -0.165, 0.173  |
| Indirect effect           | -0.052 | 0.029 | -1.747 | 0.080 | -0.119, -0.002 |
| Hassles- Unhealthy snacks |        |       |        |       |                |
| Direct effect             | -0.034 | 0.070 | -0.488 | 0.625 | -0.173, 0.104  |
| Indirect effect           | -0.015 | 0.015 | -0.986 | 0.323 | -0.052, 0.009  |
| Hassles- Healthy snacks   |        |       |        |       |                |
| Direct effect             | 0.001  | 0.075 | 0.024  | 0.980 | -0.146, 0.150  |
| Indirect effect           | -0.029 | 0.020 | -1.441 | 0.149 | -0.077, 0.000  |
| Self-compassion           |        |       |        |       |                |
| Uplifts- Total snacks     |        |       |        |       |                |
| Direct effect             | -0.043 | 0.086 | -0.501 | 0.616 | -0.214, 0.127  |
| Indirect effect           | -0.005 | 0.019 | -0.296 | 0.766 | -0.048, 0.031  |
| Uplifts- Unhealthy snacks |        |       |        |       |                |
| Direct effect             | -0.049 | 0.068 | -0.732 | 0.465 | -0.184, 0.084  |
| Indirect effect           | -0.002 | 0.009 | -0.242 | 0.808 | -0.024, 0.015  |
| Uplifts- Healthy snacks   |        |       |        |       |                |
| Direct effect             | -0.027 | 0.075 | -0.371 | 0.710 | -0.176, 0.120  |
| Indirect effect           | -0.001 | 0.008 | -0.193 | 0.846 | -0.021, 0.014  |