



Research article

Does controlling for epicurean eating or the tendency to supersize food portions change the relationship between mindful eating and grazing?

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ABSTRACT

The study examines the potential for Epicurean eating to offer fresh perspectives on the predictive value of mindful eating. This research seeks to ascertain whether accounting for Epicurean eating (or its antithesis, supersizing), could influence the previously identified negative relationship between mindful eating and grazing habits. In a cross-sectional study, 419 participants completed questionnaires on epicurean eating, grazing, and mindful eating. The findings suggested mindful eating and epicurean eating were significantly associated with grazing, with both variables accounting for a significant amount of variance in grazing. Further analysis of the mindful eating subscales showed that eating without distraction, eating with awareness, and hunger and satiety cues accounted for this association with grazing when epicurean eating was included. Finally, whilst eating without distraction, eating with awareness, and hunger and satiety cues were associated with grazing, preference for supersizing did not account for a significant amount of variance in the relationship with grazing. The complex interplay between grazing and mindful eating becomes more apparent when considering the influence of epicurean eating. Exploring cross-cultural factors through additional research could provide valuable insights into the dynamics of epicurean eating and grazing. Simultaneously, incorporating alternative mindful eating scales may yield a more nuanced interpretation of mindful eating. Collectively, these avenues of inquiry warrant further investigation. Limitations and future directions are discussed.

1. Introduction

Epicurean eating – that is, “the enduring pleasure derived from the aesthetic appreciation of the sensory and symbolic value of the food” [1] – is a behaviour that is different from conventional self-regulatory models of healthy eating and behavioural change, but still proposes moderation in food consumption. Cornil and Chandon [1] proposed how epicurean eating is associated with moderation, smaller portion sizes, and quality over quantity; all of which have been observed in other research areas. For example, mindful eating is a behavioural adaptation that has the potential to increase pleasure in eating [2], and moderate the amounts that are eaten in one

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sitting [3,4], potentially drawing a close association with epicurean eating. Another association with mindful eating, however, is the negative association with grazing [5]. This refers to uncontrolled and repetitive consumption of small amounts of food [6], which has been linked to overconsumption and obesity [7–10]. In essence, smaller portions can have an equally negative impact on weight regulation when viewed in conjunction with grazing behaviour, as opposed to within the context of epicurean eating. Building upon previous research findings, which have established a robust negative association between mindful eating and grazing [5], this study investigates the potential association to epicurean eating, and the potential role of to enhance the relationship between mindful eating and grazing within an alternative framework, diverging from the conventional self-regulation approach.

Within eating literature, grazing stands out as a distinctive concept. Grazing is characterized by the uncontrolled and repetitive consumption of small quantities of food, and in some populations, has been linked to elevated weight (e.g., bariatric surgery patients; e.g. Ref. [11]). The unique behaviour of consistently consuming modest portions of food has been well-documented as a significant eating pattern in contemporary studies examining overconsumption and irregularities in eating behaviours [6,10]. Grazing is closely aligned with other patterns of problematic eating behaviours such as binge eating [12,13] and snacking in-between meals [14], collectively contributing to the aetiology of obesity.

Non-clinical research on grazing behaviour is relatively limited, with only two studies reporting data on a community sample and a student population [5,15]. Similarly, a recent systematic review [16] identified only seven studies reporting grazing as an outcome variable, indicating the limited research and clinical practice into interventions that address weight regulation through grazing behaviour change. Regarding the potential for interventions, only one study proposed that mindful eating has the capacity to serve as a moderating factor for grazing behaviour [5].

Mindful eating involves the application of mindfulness principles to one's approach to food and eating experiences. It is generally defined as the deliberate and non-judgmental focus on the current meal or eating moment, but it is worth noting that historical literature on mindful eating may exhibit substantial and potentially inaccurate variations in its definitions, interpretations and practices [17]. When viewed as an eating behaviour, mindful eating is defined as "the sustained attention to a sensory element of the eating experience (e.g., the taste), and a non-judgmental (or non-evaluative) awareness of thoughts and feelings that are incongruent to the sensory elements of the present eating experience" [17]. This definition suggests a notable overlap between mindful and epicurean eating, as both approaches emphasize sensory experiences as central components of self-regulation in the context of eating behaviours. Research has indicated that mindful eating relates to healthier eating [18], and assists in the treatment of problematic eating, such as binge eating disorder [19] and bulimia nervosa [20]. Further inquiries identified that mindfulness practices for binge eating assist in the reduction of binge eating episodes and further literature identified the enhancement of regulating overeating and consumption [19,21–23]. Furthermore, research has identified the promotion of regulated [21–25] and healthier eating, such as an increased intake of fruit and vegetables [18,26], and a reduction in the consumption of high sugar and energy-dense foods [4,27]. Cross-sectional research has indicated a negative correlation between mindful eating and the consumption of fat and sugar [28], as well as motivations to consume palatable foods [29,30]. Meanwhile, these variables are known to be linked to grazing behaviours and problematic for weight regulation [5]. Egan and colleagues [31] drew further associations where mindful eating-related negatively to emotional eating (see also [32]), whilst other research highlighted the negative association with weight gain [33], and some evidence proposed improvements in portion size regulation [34,35]. All considered, mindful eating proposes a variable and model that can aid weight regulation, and one of the primary elements relates to attention to sensory experiences while eating [17], which is a primary aspect of epicurean eating.

Epicurean eating, in the early and limited research that does exist, proposes a polar opposite to the larger portion sizes and supersizing that exist in most Western environments [1]. This research suggests that the potential overlap in characteristics that describe both epicurean and mindful eating constructs, particularly in terms of focusing on sensory experiences, could shed light on how and why mindful eating may promote healthy eating habits. In contrast, the negative relationship between grazing and mindful eating, and the mixed directionality observed in previous findings in the areas of pleasure, portion size, health, convenience energy-dense foods, and Body Mass Index [36–41] propose an inconsistent pattern of findings that highlights the necessity for additional investigations into the relationships between these variables.

In summary, previous literature lays the foundation by introducing epicurean eating as a departure from traditional self-regulatory models, emphasising its association with moderation, smaller portions, and quality. Drawing parallels with mindful eating, the sensory overlap between mindful and epicurean eating prompts the investigation into their combined impact on healthy eating habits. Knowing mindful eating for its positive impact on eating behaviours, and the negative association between mindful eating and grazing, the study aims to explore epicurean eating and its role in explaining the relationship between mindful eating and grazing. The research objectives, therefore, centre on understanding these concepts and their relationship, contributing to the limited knowledge of epicurean eating. The hypotheses predict significant positive associations between mindful and epicurean eating, both significantly negatively associated with grazing (H1), and an alteration in the relationship between mindful eating and grazing when controlling for epicurean eating (or supersizing) (H2).

2. Methods

2.1. Materials

Demographics. Participants were requested to report their age, sex, ethnicity, diet, exercise and smoking habits, and any history of a clinically diagnosed eating disorder. To assess BMI, participants also reported their height and weight, with the following formula being used to calculate BMI: weight in kg/height².

Mindful Eating Behaviour Scale (MEBS) [42]. The MEBS was used to measure mindful eating. This consists of 20 items and four domains: Focused Eating (e.g. 'I notice how my food looks'); Eating with Awareness ('I eat something without being really aware of it', reversed item); Eating in response to Hunger and Satiety Cues (e.g. 'I trust my body to tell me when to eat'); and Eating without Distraction ('I multi-task when I am eating'). Answer options ranged from 1 'never' to 5 'very often'. Higher scores indicate a higher level of mindful eating. In the present study, Cronbach's alpha of the overall score for MEBS was $\alpha = 0.83$, demonstrating internal consistency reliability.

Epicurean Eating Scale (EPI) [1]. The epicurean Eating Scale was used to measure the individual tendency to value epicurean eating pleasures focusing upon the aesthetic appreciation of the sensory and symbolic value of the food. The scale focuses on both epicurean eating tendencies (7 items 'If I try, I can clearly and easily imagine the taste of many dishes), and preference for supersizing (6 items, e.g. 'I often wish I had the option to choose smaller portions in restaurants, reversed item). Answer options ranged from 1 'totally disagree' to 7 'totally agree'. In the present study, Cronbach's alpha for epicurean eating tendencies was $\alpha = 0.83$ and for preference for supersizing was $\alpha = 0.65$, showing internal consistency reliability.

Grazing Scale (GS) [6]. The Grazing Scale was used to investigate the repetitive eating of small amounts of food. The scale contains 8 items e.g. 'Have you ever felt compelled or driven to eat, even when not hungry?', with answer options ranging from 1 'rarely' to 5 'all of the time'. Higher scores indicate higher levels of grazing. Cronbach's alpha of the Grazing Scale in the present study was $\alpha = 0.86$ demonstrating internal consistency reliability.

2.2. Procedure and design

Potential participants responded to online invitations to take part in the present study. They were provided with a link, which directed them to a participant information sheet containing all study information, along with the researchers' contact details. Those who wished to participate were then directed to a consent form. Upon providing written informed consent, participants were presented with the demographic form and the questionnaires. Once the study was complete, participants were presented with a debriefing sheet, providing them with further information about the study, and again provided participants with the contact details of the researchers if they wanted to withdraw, or wished to find out the results of the study at a later date. Ethical approval was granted by the University Research Ethics Committee, with the study conforming to the ethical guidelines set by the British Psychological Society [43].

2.3. Data analysis

Data were analysed using bivariate correlations and multiple linear hierarchical regressions to identify if mindful eating and the association with grazing is affected by controlling for the impact of epicurean eating and/or supersizing. SPSS 25.0 for Windows was utilised to perform the analyses.

3. Results

Participants ($n = 461$) were recruited through various online invitations, such as social media and a University Research Participation Scheme to take part in a study investigating eating behaviours using a volunteer sampling technique. Those who participated via the Research Participant Scheme were rewarded with course credits, a process that is part of the educational programme of the institution, and those who participated via social media were not compensated for their participation. Sample size calculations indicated a sample of 481 participants for a small effect size, a significance set at 0.05, and a Power of .80 (see <https://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower>). Exclusion criteria were participants under the age of 18, and a diagnosis of an eating disorder. Participants were excluded from the final analysis if they had been diagnosed with an eating disorder in the past 12 months ($n = 30$) or if participants did not complete the questionnaires by the end of the study ($n = 24$). After exclusions, the final sample included 34 males and 355 females ($n = 389$), estimating a small-to-medium effect size. Participants reported a mean age of $M = 21.72$ ($SD = 5.37$), and a mean BMI of $M = 24.89$ ($SD = 5.09$). Percentages for ethnicity and

Table 1
Participant demographic characteristics ($n = 389$).

Characteristic	%	<i>M (SD)</i>
Age		21.72 (5.37)
Body Mass Index (kg/m ²)		24.89 (5.09)
Gender		
Female	92.8	
Male	7.2	
Ethnicity		
White	46.4	
Asian	28.9	
Black	70.0	
Mixed/multiple ethnicities	3.6	
Arab	10.0	
Other ethnicity	13.1	

gender, with about half of the sample being white and the majority female participants, as well as means and standard deviations for age and BMI, are presented in Table 1.

3.1. Correlation analyses

The mean total scores of continuous variables are presented in Table 2. Pearson’s correlations were conducted to explore the relationships between measured variables (see Table 2 for correlation matrix). Grazing was positively associated with epicurean eating ($r = 0.179, p < 0.001$) and preference for supersizing ($r = 0.145, p = 0.002$), whilst negatively associated with mindful eating ($r = -0.413, p < 0.001$). Grazing was negatively associated with eating without distraction ($r = 0.582, p < 0.001$), eating with awareness ($r = 0.637, p < 0.001$), and hunger and satiety cues ($r = 0.631, p < 0.001$); it was not significantly associated with focused eating.

3.1.1. Hierarchical regression analyses

Before conducting hierarchical regression analyses, preliminary analyses ensured no violation of the assumptions of normality, linearity, and homoscedasticity. Correlations between predictor variables did not exceed the limit indicating multicollinearity ($r > 0.8$) [44]. Autocorrelation of adjacent residuals was tested with Durbin-Watson, which for each model was within the acceptable range of 1–3 [45].

3.2. Epicurean eating

In the first two-step hierarchical regression, epicurean eating was entered at Step 1 and accounted for significant variance in grazing, $F(1, 387) = 12.818, p < 0.001, R^2\Delta = 0.032$. Mindful eating was entered at Step 2 and led to a significant increase in the explained variance in grazing, $F\Delta(1, 386) = 99.769, p < 0.001, R^2\Delta = 0.199$. In the final model, epicurean eating and mindful eating were both significantly associated with grazing, with mindful eating recording a higher beta value ($\beta = -0.451, p < 0.001$) than epicurean eating ($\beta = 0.248, p < 0.001$). The explained variance of the total model was adjusted $R^2 = 0.227$.

To further explore the roles of mindful eating subscales, a second hierarchical regression was conducted. Epicurean eating remained the only predictor entered at Step 1. The four subscales of mindful eating were entered at Step 2 and led to a significant increase in the explained variance of grazing, $F\Delta(4, 383) = 36.970, p < 0.001, R^2\Delta = 0.369$. In the final model, epicurean eating ($\beta = 0.129, p = 0.009$) remained significantly associated with grazing. Eating without distraction ($\beta = -0.142, p = 0.004$), eating with awareness ($\beta = -0.387, p < 0.001$) and hunger and satiety cues ($\beta = -0.201, p < 0.001$) were significantly associated with grazing, whilst focused eating was not. The explained variance of the total model was adjusted $R^2 = 0.292$. Table 3 shows the results of the two hierarchical regression analyses.

3.2.1. Preference for supersizing

In the first two-step hierarchical regression, preference for supersizing was entered at Step 1 and accounted for significant variance in grazing, $F(1, 387) = 8.356, p = 0.004, R^2\Delta = 0.021$. Mindful eating was entered at Step 2 and led to a significant increase in the explained variance of grazing, $F\Delta(1, 386) = 76.895, p < 0.001, R^2\Delta = 0.163$. In the final model, preference for supersizing and mindful eating were significantly associated with grazing, with mindful eating recording a higher beta ($\beta = -0.405, p < 0.001$) than preference for supersizing ($\beta = 0.113, p = 0.014$). The explained variance of the total model was adjusted $R^2 = 0.180$.

A second hierarchical regression explored the roles of the mindful eating subscales. Preference for supersizing remained the only predictor entered in Step 1. The four subscales of mindful eating were entered at Step 2 and led to a significant increase in the explained variance of grazing, $F\Delta(4, 383) = 36.366, p < 0.001, R^2\Delta = 0.269$. In the final model, preference for supersizing was no longer associated with grazing. Eating without distraction ($\beta = -0.152, p = 0.002$), eating with awareness ($\beta = -0.401, p < 0.001$) and hunger and satiety cues ($\beta = -0.185, p < 0.001$) were significant, whilst focused eating was not. The explained variance of the total model was adjusted $R^2 = 0.281$. Table 4 shows the results of the two hierarchical regression analyses.

Table 2

Means, standard deviations, and bivariate correlations between mindful eating total and subscale scores, epicurean eating, preference for supersizing, grazing and BMI. ($n = 389$).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	M	SD
1. MEBS	–									58.34	8.98
2. DIS	0.582***	–								12.18	3.31
3. AWA	0.637***	0.485***	–							110.00	2.95
4. HSC	0.651***	0.066	0.095*	–						16.52	4.36
5. FOC	0.631***	0.056	0.205***	0.267***	–					18.64	3.71
6. EPI	0.152**	-0.175***	-0.094*	0.145**	0.427***	–				33.82	11.65
7. SUP	-0.079	-0.174***	-0.066	-0.145**	0.186***	0.298***	–			28.92	60.01
8. GS	-0.413***	-0.363***	-0.478***	-0.217***	-0.043	0.179***	0.145**	–		190.09	5.88
9. BMI	-0.005	0.044	-0.033	-0.090*	0.081	0.063	0.121**	0.068	–	24.89	50.09

Note: MEBS = Mindful Eating Behavior Scale total score; DIS = Eating without distraction; AWA = Eating with awareness, HSC = Hunger and satiety cues; FOC = Focused eating; EPI = Epicurean eating tendency; SUP = Preference for supersizing; GS = Grazing Scale; BMI = Body Mass Index.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3
Hierarchical regression analyses for epicurean eating and mindful eating as predictors of grazing ($n = 389$).

Variable	Model 1			Model 2			-	Model 1			Model 2		
	B	SE	β	B	SE	β		B	SE	β	B	SE	β
EPI	0.090***	0.025	0.179	0.125***	0.023	0.248		0.090***	0.025	0.179	0.065**	0.025	0.129
MEBS				-0.295***	0.030	-0.451							
DIS											-0.252**	0.088	-0.142
AWA											-0.772***	0.100	-0.387
HSC											-0.271***	0.060	-0.201
FOC											0.068	0.080	0.043
Adjusted R^2		0.030			0.227				0.030			0.292	
$R^2\Delta$		0.032			0.199				0.032			0.269	
Durbin-Watson					1.870							1.910	

Note: EPI = epicurean eating tendency; MEBS = Mindful Eating Behavior Scale total score; DIS = Eating without distraction; AWA = Eating with awareness, HSC = Hunger and satiety cues; FOC = Focused eating. $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4Hierarchical regression analyses for preference for supersizing and mindful eating as predictors of grazing. ($n = 389$).

Variable	Model 1			Model 2			-	Model 1			Model 2		
	B	SE	β	B	SE	β		B	SE	β	B	SE	β
SUP	0.142**	0.049	0.145	0.111*	0.045	0.113		0.142**	0.049	0.145	0.048	0.045	0.049
MEBS				-0.265***	0.030	-0.405							
DIS											-0.271**	0.089	-0.152
AWA											-0.801***	0.100	-0.401
HSC											-0.250***	0.062	-0.185
FOC											0.139	0.074	0.088
Adjusted R^2		0.019			0.180				0.019			0.281	
$R^2\Delta$		0.021			0.163				0.021			0.269	
Durbin-Watson					1.878							1.915	

Note: SUP = Preference for supersizing; MEBS = Mindful Eating Behavior Scale total score; DIS = Eating without distraction; AWA = Eating with awareness, HSC = Hunger and satiety cues; FOC = Focused eating. $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

After incorporating additional covariates such as dieting habits, exercise, and BMI in a supplementary regression analysis at a third step, the results of the hierarchical models remained unchanged. This suggests that the initially observed relationships in the hierarchical model persist even after accounting for these additional factors, reinforcing the robustness and stability of the identified associations.

4. Discussion

The present research aimed to identify whether controlling for epicurean eating (or supersizing) indicated a change in the relationship between mindful eating and grazing. The findings proposed that both mindful eating and epicurean eating were significantly associated with grazing, suggesting both variables accounted for a significant amount of variance in grazing. Further analysis showed that out of the four mindfulness sub-scales, three accounted for this association (eating without distraction, eating with awareness, and hunger and satiety cues) with grazing when epicurean eating was included. In the fourth regression model, although three of the mindful eating sub-scales were associated with grazing, preference for supersizing did not account for a significant amount of variance in the relationship with grazing. The results indicate that in the context of the relationship with grazing, epicurean eating significantly explains variation in certain aspects of mindful eating. However, it's noteworthy that the preference for supersizing did not bring about a significant alteration in the relationship between mindful eating and grazing. This observation might be attributed to the relatively low internal consistency of the supersizing subscale. The present findings correspond to previous research where a negative relationship was identified between mindful eating and grazing [5], and offer further insight into relationships between epicurean eating and supersizing.

Overall, the present research highlights two key findings that require further attention. First, the differential relationship between *focused eating* to grazing, epicurean eating and supersizing when compared to the rest of the subscales of mindful eating proposes implications for interventions, and potential limitations of mindful eating and the way it is taught in healthcare settings. Traditionally, healthcare has primarily centered around improving hunger and satiety cues [46]. However, it has been argued that these cues may not fully align with the principles and practices of mindful eating [47]. When suggesting a construct that fails to measure mindful eating as a unidimensional concept, and exhibits varying associations with health outcomes, the guidance provided to healthcare practitioners appears to be lacking in specificity and is somewhat immaterial. Future research should prioritize the exploration of recently developed mindful eating scales that align more closely with both the theory and practical aspects of mindful eating. These scales refrain from incorporating hunger and satiety cues as measurement components, and instead aim to provide a unidimensional psychometric tool for assessing mindful eating, with subscales that interrelate effectively [47]. For the first time since the conception of mindful eating, there is an opportunity to thoroughly investigate mindful eating, elucidating its dynamics and establishing a comprehensive understanding of its relationships, predictive capabilities, and moderating influences on other well-known problematic associations. Second, epicurean eating may propose a disparity when investigating overeating and obesity outside the cultural norms in which the scale was conceived. In short, the examination of epicurean eating within a British population and its association with grazing behaviours might yield distinct results when compared to cross-cultural investigations involving populations from Mediterranean countries. In Mediterranean cultures, where smaller portions, joyful dining experiences, and extended meals are integral to their cultural identity, such practices are often associated with improved health behaviours and overall well-being [48], which may not be the case for British populations and corresponding cultural norms. Then again, the British are accustomed to international cuisines and are as a nation, multi-cultural, making this discussion only speculative, and in need of further research.

We identified five limitations that need to be considered when interpreting the results. Firstly, due to the use of a cross-sectional study, a causal relationship could not be established as the research provides information at only one point in time. Future research could potentially look into experimental research to establish cause and effect. Second, approximately 93 % of participants in the study were women; the literature proposes that compared with men, women have reported more problematic attitudes and behaviours toward food [49,50], and similar findings exist for men, explaining how the generalisability is limited to women. The third limitation is that all participants were students, who display high levels of stress and anxiety [51], and are more likely to use snacking, or "grazing" to cope with stress [52]. It is important to consider the potential implications of generalizing the findings to the broader population, and crucial to follow up on these research results with further studies involving larger and more diverse samples from the community. Fourth, and closely associated, the number of participants the research aimed to achieve for a small effect size was not satisfied. Future research should aim to explore not just more diverse, but also larger samples. Last, in addition to examining the relationship between mindful eating, epicurean eating, and grazing, the study acknowledges the importance of considering potential confounding factors related to eating behaviour. These factors may include physical activity levels, dieting preferences, and other factors that may change the relationship between the variables.

5. Conclusion

Considering the limitations, exploring the potential of epicurean eating in influencing mindful eating appears to be more complex than initially conceived. Epicurean eating may form the basis of understanding how and for whom it is fitting, with an emphasis on cross-cultural and individual differences, to allow us to reflect and investigate the potential implications of mindful eating and accompanying practices. For the first time in the history of studying mindful eating, a scale has been developed that effectively measures its intended constructs [47], and aligns to the shared variance and characteristic of being attentive to sensory experiences. This scale may open new avenues for the development of mindful eating practices that align with the principles of epicurean engagement and consumption of food.

Ethics approval

The study was approved by the ethical review board of the Birmingham City University Psychology Department Research Ethics Committee and was under the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments. Ethical approval number: Mantzios/4985/Am/2020/Jul/BLSS FAEC. This article does not contain any studies with animals.

Statement of informed consent and consent to participate

Informed consent was obtained from all individual participants included in the study.

Data availability

The dataset for the current study is available from the corresponding author upon reasonable request.

Additional information

No additional information is available for this paper.

CRedit authorship contribution statement

Michael Mantzios: Writing – review & editing, Writing – original draft, Supervision, Conceptualization. **Katherine McAtamney:** Data curation. **Harvey Regan:** Data curation. **Karolina Kokocinska:** Writing – review & editing. **Sophia Kauser:** Data curation. **Eliza Kalika:** Writing – review & editing. **Misba Hussain:** Methodology. **Rebecca Keyte:** Methodology. **Jeffrey Wood:** Formal analysis, Data curation. **Deborah Wallis:** Writing – review & editing. **Helen Egan:** Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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