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3 **“The thought is gonna come and the thought is gonna go”**: A qualitative study on how4 **non-meditators learn and apply brief mindfulness-based instructions for food cravings**

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23

Abstract

24 While brief mindfulness-based interventions have emerged as tools to modulate automatic
25 responding in various domains of health and wellbeing, findings are primarily based on
26 quantitative experimental research. However, these group-level findings do not capture the
27 rich subjective experiences of individuals learning mindfulness. In the following qualitative
28 study, we explored how non-meditators learn and apply brief mindfulness instructions in the
29 domain of food cravings. Ten non-meditators listened to ‘normal viewing’ instructions,
30 which asked them to view foods in the way that they normally would. They then viewed a
31 video of attractive foods, and were interviewed about their experiences of learning and
32 applying the instructions. Next, participants listened to a five-minute recording of
33 mindfulness instructions, viewed another food video while applying the mindfulness
34 instructions, and were interviewed again. The data were analysed using thematic analysis.
35 When participants applied brief mindfulness, their relationship to the food stimuli changed
36 such that they started perceiving their experiences as transient. Certain factors (e.g., use of
37 visual metaphors) and processes (e.g., listening to the ‘normal viewing’ instructions first)
38 facilitated this change. The ease of applying the instructions fluctuated with food preferences
39 and perceived strength of cravings. Participants reported that they would apply the
40 instructions in daily life if they felt a need for this, including in domains other than food.
41 However, they anticipated challenges such as remembering and finding time to apply. Our
42 findings highlight the specific aspects that influence how brief mindfulness instructions are
43 learned and applied. These insights may change how brief mindfulness is studied empirically,
44 and may inform the development of simple and empowering techniques that can promote
45 wellbeing in daily life.

46 *Keywords:* mindfulness, decentering, food cravings, qualitative research, thematic
47 analysis

48

1. Introduction

49 Mindfulness-based instructions have gained both scientific and popular interest in the
50 last few years, including brief interventions and those in the domain of food cravings
51 (Howarth et al., 2019; Van Dam et al., 2018). This interest may relate to a need for simple
52 and effective techniques that improve health and wellbeing. Further, compared to longer term
53 mindfulness-based interventions that entail an extended daily practice (e.g., the 8-week
54 Mindfulness-Based Stress Reduction (MBSR) course; Kabat-Zinn, 1982), brief mindfulness
55 may be more compatible with fast-paced daily lives, especially for non-meditators who are
56 starting to practice mindfulness for the first time. Although ‘brief mindfulness’ does not have
57 a standard definition in the literature, its brevity has been loosely conceptualised as “a
58 duration of 30 minutes or less on any one occasion” (Howarth et al., 2019). Recent research
59 suggests that even 3-12 minute decentering mindfulness instructions can positively affect
60 cognition and behaviour in domains such as food cravings, cigarette smoking, stressful
61 events, and emotional responding (e.g., Bowen & Marlatt, 2009; Erisman & Roemer, 2010;
62 Keesman et al., 2017, 2019; Lebois et al., 2015). In a systematic review of brief mindfulness-
63 based interventions, 93% of studies reported positive effects of these interventions on health-
64 related outcomes such as stress, negative affect, emotion regulation and memory (Howarth et
65 al., 2019). These outcomes were observed in a wide range of mindfulness-based techniques
66 such as breathing exercises and acceptance practices, with instructions as short as five
67 minutes.

68 However, so far, brief mindfulness has primarily been studied through quantitative
69 experimental research (for an overview, see Howarth et al., 2019; Jiménez et al., 2020).
70 Although these findings are highly informative and necessary, they lack rich accounts of how
71 participants experience these techniques. As a result, it is not known whether mindfulness
72 instructions are effective for every participant when a study demonstrates their group level

73 effectiveness. Equally, when the instructions are not effective at the group level, the
74 underlying processes that take place at the individual level are unknown. Here, in a
75 qualitative study, we explored how non-meditators learn and apply brief decentering
76 mindfulness instructions in the domain of food cravings.

77 In the Western secular context, mindfulness has been defined as the awareness that
78 develops from paying intentional and non-judgmental attention to experiences, moment-by-
79 moment (Kabat- Zinn, 1994). Beyond this definition, however, mindfulness as a construct
80 may carry different but related meanings within the modern literature, such as a dispositional
81 quality (trait), a state of being, a practice, strategy, or intervention (Chiesa & Malinowski,
82 2011; Vago & Silbersweig, 2012). In the present study, we refer to mindfulness primarily as
83 a strategy that can be used in the context of an intervention. Accumulating evidence
84 demonstrates the effectiveness of mindfulness-based interventions across various domains of
85 health and wellbeing such as reactivity to food cues, alcohol cravings, nicotine dependence,
86 anxiety, and mood problems (e.g., Baquedano et al., 2017; Ostafin et al., 2012; for meta-
87 analyses, see Goyal et al., 2014; Howarth et al., 2019).

88 Decentering is a component of mindfulness (also referred to as de-reification, mindful
89 attention, cognitive defusion, and urge surfing; e.g., Bowen & Marlatt, 2009; Lutz et al.,
90 2015; Papiés et al., 2012). The term ‘decentering’ has been coined by Safran and Segal
91 (1990). It refers to the metacognitive insight that one’s thoughts, feelings and experiences are
92 transient mental events, rather than accurate reflections of an objective reality (Bishop et al.,
93 2004). If one adopts a decentred perspective, one experiences thoughts and feelings as less
94 subjectively real, and as mental events that come up and go away on their own. Critically,
95 this decentred stance is not the same as dissociation. Whereas dissociation is an unconscious
96 avoidance mechanism, decentering can be better described as a conscious coping strategy
97 (Corrigan, 2002; Zerubavel & Messman-Moore, 2015), which involves deliberately accepting

98 thoughts and feelings for what they are – transient mental events – without elaborating or
99 ruminating on them (Fresco et al., 2007; Williams, 2010). For example, when one imagines
100 their favourite attractive, yet unhealthy food, one may have the thought: “I need to eat it right
101 now”. Adopting a decentred perspective may transform one’s perception of this thought from
102 an objective truth that needs to be acted upon into a transient mental event (i.e. “I am having
103 the thought that I need to eat it right now, and this thought will pass”).

104 Many quantitative studies suggest that decentering may be effective in regulating
105 problematic cognitive patterns and behaviours (for an overview, see Bernstein et al., 2015).
106 For instance, in the context of negative affect, decentering has been shown to reduce
107 symptoms of anxiety and depression (e.g., Fresco et al., 2007; Lau et al., 2006; Teasdale et
108 al., 2002). In the context of the reward-related process of food cravings, decentering has been
109 shown to reduce cravings, reactivity to food cues, preferences for unhealthy foods, and the
110 actual consumption of attractive, high-calorie foods (e.g., Arch et al., 2016; Jenkins &
111 Tapper, 2014; Lacaille et al., 2014; Papies et al., 2015). In five-minute audio recordings, for
112 example, Lacaille et al. (2014) instructed participants to adopt a decentred or a control
113 perspective toward their food-related thoughts. When participants were then given one
114 minute to look at and interact with their preferred piece of chocolate, the decentering
115 participants reported reduced cravings. Again with brief cognitive defusion instructions,
116 Jenkins and Tapper (2014) demonstrated that chocolate consumption was reduced over a
117 five-day period. Similarly, Papies et al. (2015) instructed non-meditators to adopt a decentred
118 perspective toward attractive but unhealthy, and healthy food images. Compared to a control
119 group, participants in the decentering condition showed lower preferences for unhealthy
120 foods in both laboratory and cafeteria settings (Papies et al., 2015).

121 One possible mechanism is that decentering reduces reactivity to appetitive stimuli by
122 targeting consumption and reward simulations that lead to desire (Keesman et al., 2017;

123 Papies et al., 2015). According to the Grounded Cognition Theory of Desire and Motivated
124 Behaviour (Papies et al., 2020; Papies & Barsalou, 2015), appetitive stimuli trigger
125 spontaneous, often non-conscious re-experiences of eating and enjoying foods. These re-
126 experiences, or “consumption and reward simulations,” can be so compelling that they lead to
127 the conscious experience of desire and cravings (Papies et al., 2020). Here, desire refers to an
128 “affectively charged cognitive event” (Kavanagh et al., 2005) that is focused around a
129 stimulus or experience associated with reward (Papies & Barsalou, 2015). In simpler terms, a
130 desire is an urge or a wish to gain pleasure or relieve discomfort. Although desires do not
131 always conflict with a person’s goals and values (Hofmann et al., 2012), in the context of the
132 present work, we are particularly interested in desires that favour short-term hedonic goals
133 over longer-term health and wellbeing goals. This is because some of these desires, such as
134 those toward attractive yet unhealthy or unsustainable foods, may have negative health or
135 environmental consequences (e.g., weight gain, climate change; Boswell & Kober, 2016;
136 Bryant, 2019).

137 The Grounded Cognition approach that we have briefly described here is our main
138 theoretical framework of interest, as it seems particularly useful for understanding how
139 decentering can change individuals’ responses to appetitive stimuli. Within this framework,
140 assuming that consumption and reward simulations lead to desire (Papies et al., 2020),
141 decentering directly targets these simulations by helping participants to view them and their
142 associated urges as mental events. As such, these experiences are viewed as transient, rather
143 than an objective reality that requires obtaining and consuming the food. Indeed, Keesman et
144 al. (2017) have shown that even when participants experience simulations, decentering
145 instructions reduce subjective cravings, and physiological responses to food such as
146 salivation. Studies in other domains of health and wellbeing also demonstrate that
147 decentering decouples the relationship between motivation and behaviour (e.g., cigarette

148 smoking; Bowen & Marlatt, 2009). In other words, according to quantitative research
149 findings, decentering can change the way in which one relates to one's mental experiences.
150 However, from a deeper personal experience perspective, what happens during this
151 decoupling process is unclear.

152 Further, quantitative studies of brief mindfulness-based instructions have limitations.
153 Many of these limitations are common to mindfulness-based interventions more generally,
154 such as the lack of a shared conceptual understanding and operational definition of
155 mindfulness (Bergomi et al., 2013; Hanley et al., 2016), and the varying rigour of research
156 designs (Goyal et al., 2014; Howarth et al., 2019; see also, Davidson & Kaszniak, 2015;
157 Goldberg et al., 2017; Jiménez et al., 2020; Rosenkranz et al., 2019; Van Dam et al., 2018).
158 Most importantly for the present work, these studies are based on the underlying assumption
159 that participants apply the specific instructions assessed in the study in the way that the
160 researchers have intended them to. Although some studies call for participants to verbally
161 summarise instructions before applying them (e.g., Lebois et al., 2015), this brief summary
162 runs the risk of being a verbatim recall. This would not gauge the actual semantic or deeper,
163 personal understanding of the instructions. Therefore, without asking participants for a
164 detailed account of their understanding, it is unclear *what* exactly works in studies to cause
165 the effects of brief mindfulness. While the active component could indeed be mindfulness, it
166 could equally be something else. In the same vein, it is unclear what exactly does not work in
167 studies that do *not* support the effectiveness of brief mindfulness. While the mindfulness
168 strategy could indeed be ineffective, the results could equally be due to participants' lack or
169 incomplete understanding of the instructions.

170 Another major limitation of quantitative experiments on brief mindfulness is the control
171 conditions used (Van Dam et al., 2018). If the control condition resembles the mindfulness
172 condition too closely and participants perceive the control instructions as mindfulness,

173 demand effects may occur. This perceived or real resemblance of the control and mindfulness
174 conditions may account for the lack of effectiveness suggested by these studies. Conversely,
175 in studies that *do* show an effect of brief mindfulness, the control condition might not control
176 for factors such as working memory load and relaxation effects. The control instructions may
177 even contribute to the process that deems the mindfulness instructions effective. Therefore, it
178 is important to get a sense of participant experiences and perceptions beyond what
179 quantitative methodologies and measures can offer.

180 The qualitative studies conducted so far indeed highlight the importance of gaining a
181 deeper understanding of mindfulness-based instructions based on personal experience (e.g.,
182 Howarth et al., 2016; Strauss et al., 2014). Previous qualitative research has been conducted
183 mainly on manualised interventions. For instance, Strauss et al. (2014) interviewed
184 participants who were experiencing major depression and receiving Person-Based Cognitive
185 Therapy (PBCT). They identified themes such as participants' altered relationship to their
186 depressive symptoms after the intervention, characterised by an increased awareness of
187 negative thoughts and rumination. Although rare, qualitative research has also examined brief
188 mindfulness interventions. Howarth et al. (2016), for example, conducted interviews and
189 focus groups with chronic illness patients who received brief body scan instructions. Patients
190 reported positive effects such as relaxation. They also reported feeling positively about the
191 contents of the instructions, but felt that the instructions were too short and rushed. These
192 important perceptions and concerns would not be typically identified through quantitative
193 research. Importantly, no previous research has studied brief decentering using qualitative
194 methodologies.

195 The current study was designed to assess how non-meditators learn and apply brief
196 decentering instructions in the domain of food cravings. To this end, we first instructed
197 participants to view highly attractive food images in the way that they normally would, as a

198 control condition, and then again while applying brief mindfulness-based instructions. We
199 conducted interviews after each viewing experience to explore how non-meditators learn and
200 apply brief mindfulness. For this study, we adopted a critical realist epistemological stance.
201 This perspective assumes that the world is “theory-laden” rather than “theory-determined”
202 (Fletcher, 2017). In other words, knowledge may be gained through theories, one of which is
203 the Grounded Cognition Theory of Desire and Motivated Behaviour (Papies et al., 2020).
204 Critically, some of this knowledge is closer to reality than other knowledge.

205 **2. Method**

206 The reporting of this study was informed by the Consolidated Criteria for Reporting
207 Qualitative Research (COREQ) 32-item checklist (Tong et al., 2007). The study was
208 approved by the University of Glasgow Ethics Committee, and pre-registered on the Open
209 Science Framework (OSF; <https://osf.io/9cb28/>). Also see the OSF for supplementary
210 materials (<https://osf.io/5yt2d/>). Although the debate on the usefulness and appropriateness of
211 pre-registration in qualitative research is new and ongoing (Haven & Van Grootel, 2019;
212 Kern & Gleditsch, 2017; Pratt et al., 2019), we pre-registered this study to document our
213 research process in a transparent way. We used Kern et al.’s (2017) pre-registration template
214 and clearly indicated when we deviated from this (e.g., added sections).

215 **2.1. Study Design**

216 We used an exploratory case study design. First, each participant viewed foods while
217 applying the ‘normal viewing’ control instructions. These instructions asked them to view the
218 foods as they normally would. Participants then viewed foods while applying the
219 ‘decentering’ instructions. These instructions explained the metacognitive concept of
220 decentering and asked participants to observe their responses to food as transient mental
221 events. See Materials for further details of the instructions.

222 We conducted semi-structured interviews, which are recommended for collecting rich
223 descriptive data (Hill & Lambert, 2004). The semi-structured interview provided structure to
224 study our research question through our theoretical framework of interest (i.e. Grounded
225 Cognition Theory of Desire and Motivated Behaviour; Papies et al., 2020), and flexibility to
226 explore and identify new themes.

227 **2.2. Participants**

228 We recruited 10 participants from the general population (8 female; age range: 22-35).
229 See Appendix A for further demographic information, and the Discussion section for a brief
230 account of gender imbalances in our sample.

231 Participants self-selected to take part based on the inclusion criteria that they currently
232 live in the UK, consume an omnivorous diet, are not on a weight loss or other restrictive diet
233 (e.g., gluten-free), have normal or corrected-to-normal vision, do not have any psychological,
234 psychiatric or neurological condition, or learning disabilities, and have no current eating
235 disorder or a history of eating disorders (without providing any further descriptions of these
236 criteria). Further, participants were screened based on the inclusion criteria that they do not
237 have a past and/or current formal meditation practice, and do not regularly use meditation
238 applications (i.e. at least once a week). If an individual indicated that they had or currently
239 have a meditation practice, they further described the type and nature of this practice in an
240 open textbox. The participants were screened on a case-by-case basis by all authors (e.g.,
241 those who practice yoga were eligible, whereas those who have attended an MBSR course
242 were not eligible).

243 To ensure that participants were not fully satiated, they were asked to refrain from
244 eating and drinking except water, black tea or coffee without sugar one hour prior to their

245 scheduled interview time. Participants were asked to verbally confirm that they had complied
246 with these instructions before beginning the interview.

247 Participants were recruited with convenience sampling, through the online social
248 networks of RP's personal social network and the University of Glasgow Psychology Subject
249 Pool. None of the researchers knew the participants prior to the study. Interviews were
250 scheduled through email communication. Participants did not know about the researchers'
251 reasons or personal goals for doing this research at the time of participation. They received a
252 gift voucher worth £6 as compensation for their participation.

253 **2.3. Interview Schedule**

254 We developed the interview questions by reviewing the specific literature on brief
255 decentering instructions, as well as wider literature on brief mindfulness instructions, and
256 interventions that feature decentering as a component such as Acceptance and Commitment
257 Therapy (for example, Bacon et al., 2014; Chittaro & Vianello, 2016; Howarth et al., 2016;
258 Strauss et al., 2014). First, BT (female, PhD student and trainee counsellor) and RP (female,
259 third year undergraduate student) generated and discussed a list of questions that may be
260 relevant to assessing experiences of learning and applying decentering to food cravings. This
261 process was also guided by the Grounded-Cognition Theory of Desire and Motivated
262 Behaviour (Papies et al., 2020; Papies & Barsalou, 2015). EKP reviewed and provided initial
263 feedback on the questions. BT and RP then created an initial interview schedule, shared it
264 with other colleagues for feedback (one masters student, three PhD students, one postdoctoral
265 research assistant, one professor/principal investigator), and refined the interview schedule
266 based on feedback. We pilot-tested the interview on one participant.

267 The final interview schedule contained a list of pre-determined, open-ended question
268 that all participants were asked, and optional, more closed probing questions that were asked

269 if the interviewer judged them as relevant and potentially informative. The interviewer also
270 asked follow-up questions that were not pre-determined probes, but based on the responses
271 that participants gave to previous interview questions.

272 After both the normal viewing and decentering instructions, we asked participants to
273 describe their experiences of (1) viewing the foods, (2) listening to and learning the
274 instructions, and (3) applying the instruction to the foods. In addition, after the decentering
275 instructions, we asked participants to verbally rate their experiences using the Food Thoughts
276 Overlap Measure (see Materials), and to explain their choice. Then, we asked participants to
277 give a name or title to the decentering instructions, and explored participants' potential future
278 daily use of these instructions. Finally, we asked participants about their previous knowledge
279 and experience of mindfulness and/or meditation. See Supplementary Material 1 for the full
280 interview schedule.

281 **2.4. Materials**

282 **2.4.1. Food Images**

283 Participants viewed two videos, one with normal viewing and one with decentering
284 instructions. Each video contained five highly attractive food images (e.g., brownie, burger).
285 The images were selected from a pilot study where participants had rated the attractiveness of
286 various food images (video 1 attractiveness $M= 67.34$, $SD= 3.19$; video 2 attractiveness $M=$
287 67.46 , $SD= 3.60$; on a 100-point Visual Analogue Scale). The videos were in a slideshow
288 format, containing an introductory slide, food images shown for 10 seconds each, and a three-
289 second transition between each image. The image sets were matched in sweetness and
290 savouriness.

291 **2.4.2. Control and Decentering Instructions**

292 The normal viewing (control) and decentering instructions were similar in structure and
293 approximately three and five minutes in duration, respectively. The instructions were narrated
294 by BT and presented to participants as audio recordings. To prevent demand effects, the
295 terms “mindfulness” and “meditation” were not used. To check comprehension, participants
296 were asked to summarise what they understood from the instructions. The interviewer then
297 repeated any key details of the instructions that were missing from the summary, corrected
298 mistakes in understanding, and addressed any further questions.

299 The normal viewing control instructions were based on instructions by Tatar et al. (in
300 preparation). Participants were asked to view foods in the way that they normally would, and
301 to follow up on any thoughts, feelings or physical sensations that may come up. The
302 metaphor of a river was used, where the participants were asked to let their “mind flow freely
303 as a river, full of clear, flowing water”.

304 The decentering instructions were based on instructions by Tatar et al. (in preparation).
305 Participants were asked to observe their thoughts, feelings and physical experiences in
306 response to food as transient mental events that come up and go away on their own. The
307 metaphor of a waterfall was used to further explain this concept, where the constant stream of
308 water was likened to one’s stream of thoughts. Participants were asked to “step behind the
309 waterfall”, rather than getting carried away in the water, trying to resist the stream, or
310 pretending that it does not exist.

311 See Supplementary Material 2 for the full instruction scripts.

312 **2.4.3. Food Thoughts Overlap Measure (FTOM)**

313 We adapted the Inclusion of Other in the Self Scale (IOS; Aron et al., 1992) (see Figure
314 1; see also, Schubert & Otten (2002)). We assumed that lower levels of decentering would be

315 reflected in a higher perceived overlap of food thoughts with the self. The FTOM served as a
 316 qualitative tool in the current study to further explore participants' experiences.

317 The interviewer explained to the participants that the pictures represent the distance
 318 between them and their food thoughts. They were asked to pick the picture that best
 319 represents how they related to their food thoughts during each of the food videos from 1
 320 (complete overlap of circles) to 7 (maximum distance between circles), and to state the
 321 number next to the image that they have picked. The interviewer then probed the participants
 322 to explore their reasons for choosing this picture.

323

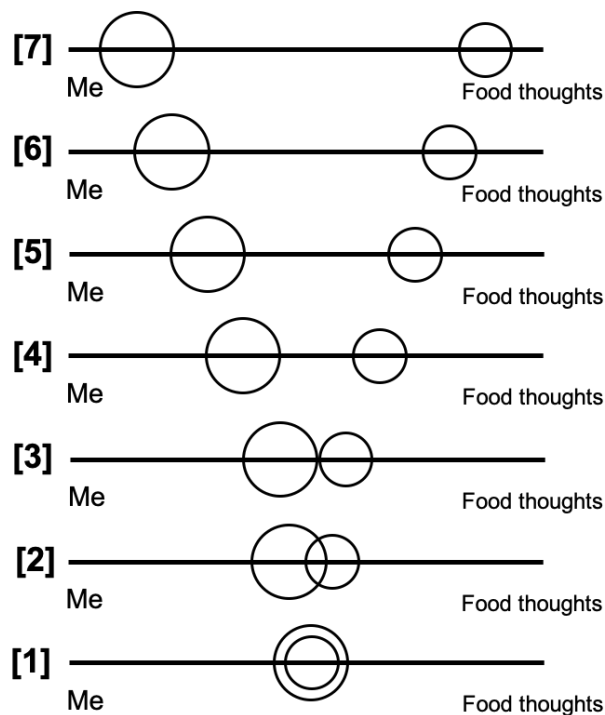


Fig. 1 Food Thoughts Overlap Measure (FTOM)

324

325 **2.5. Procedure**

326 All study sessions were conducted by RP (female, age: 22 years, referred to as the
 327 “interviewer”) between June and July, 2020. They were done online using Zoom video
 328 communications software, audio-recorded using the interviewer’s mobile device with

329 participants' consent, and deleted after transcription. Both parties were in a quiet, private
330 space, unless (minor) disruptions occurred. All sessions with interruptions (e.g., connectivity,
331 doorbell) were resumed and completed. Both the interviewer and participants were at a
332 personal residential setting during the interview. The sessions ranged from 36 to 71 minutes
333 in duration ($M= 51$ minutes).

334 For an overview of the study procedure, see Figure 2. Participants were invited to take
335 part in a study entitled, "Exploring experiences with food", between 12 noon and 7 pm.
336 Qualtrics software (Qualtrics, Provo, UT) was used to deliver the information, consent and
337 debriefing forms, to ask demographical questions, and to present audio instructions and food
338 videos.

339 First, participants viewed the study information form to confirm again that they meet
340 the inclusion criteria. Eligible participants read and signed the consent form. The interviewer
341 emphasised that participants may leave the study or choose to omit any questions that they do
342 not feel comfortable answering. The audio recording of the study session started once
343 participants completed these forms. They were notified before starting to record.

344 Next, participants described their current levels of hunger and confirmed compliance
345 with the fasting instructions. They listened to the normal viewing instructions. Then,
346 participants were shown the first food video and asked to apply the instructions that they
347 received while viewing the foods. Participants were interviewed about their experiences.

348 Next, participants listened to the decentering instructions. Participants viewed the
349 second food video while applying the instructions. They were interviewed again and asked if
350 there was anything else they wanted to share. They then provided demographic information
351 (age, allergies for foods shown in the study), and were debriefed and thanked for their

352 participation. The audio recording of the session stopped after the demographic questions, but
 353 before debriefing. Participants were notified when the recording had stopped.

354 The interviewer documented study experiences and reflexive thoughts as soon as
 355 possible after each session, and regularly discussed these with BT (see Supplementary
 356 Material 3; Langdridge, 2007; Lazard & McAvoy, 2020). The recordings were transcribed
 357 verbatim by RP (participants 1, 2, 3, 4, 7, 8, 10) and BT (participants 5, 6, 9), using
 358 pseudonyms assigned by RP (see Supplementary Material 4 for the transcripts). RP and BT
 359 cross-checked transcripts for participants 1-4 for quality assurance. Any discrepancies in
 360 transcription were discussed and resolved.

361 Since no personally identifying information was shared in any of the interviews, we did
 362 not redact information.

363
 364

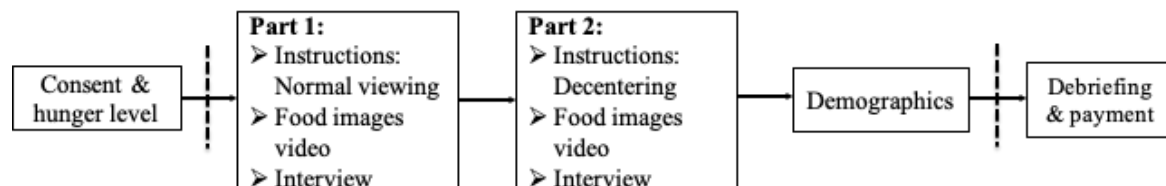


Fig. 2 Overview of study procedure. Dashed lines denote when the audio recording will start and end

365
 366
 367
 368

2.6. Analysis

369 Reflexive thematic analysis (TA) was used (Braun & Clarke, 2006, 2014, 2019; Clarke
 370 et al., 2016; Clarke & Braun, 2017). The data were analysed and managed using NVivo
 371 software (Mac version 12). Reflexive TA involves six phases: data familiarisation, initial
 372 code generation, theme search, theme review, theme definition and naming, and report
 373 writing (see, for example, Braun & Clarke, 2006). This analytic method is not restricted to a

374 specific theory or epistemology (Braun & Clarke, 2006). Further, it is compatible with our
375 critical realist approach. Critical realists explore tendencies in data, termed “demi-
376 regularities” (Danermark et al., 2002; Fletcher, 2017). Here, these demi-regularities are
377 identified as themes.

378 BT and RP individually performed phases one and two (i.e. code generation) of
379 reflexive TA for four transcripts (participants 1-4). They then discussed the initial codes,
380 resolving any discrepancies and duplicates (i.e. different code names for the same
381 interpretation). Following initial coding, BT and RP completed coding and theme search
382 individually for all transcripts. They collaboratively identified a thematic framework (phases
383 three to five). All others discussed and modified this framework to reach its final version (see
384 Findings). See Supplementary Material 5 for a description of how we established
385 trustworthiness.

386 **3. Findings**

387 We identified three themes from the data. Theme 1 captures the experiences of learning
388 and the immediate application of the decentering instructions. Theme 2 captures the potential
389 future daily application of these instructions. Theme 3 captures consumption and reward
390 simulations associated with the food images shown to participants. For further descriptions of
391 the themes and sub-themes, see Table 1.

392

393

Table 1*Overview of themes and sub-themes*

Theme	Sub-theme	Essence of the sub-theme	Participants
1. Learning and applying decentering instructions	1.1 Specific factors and processes facilitate learning of instructions.	Factors (e.g., instructions that are appropriately challenging) and processes (e.g., discussing the instruction with the interviewer) facilitate the learning process.	All participants
	1.2 Instructions change the experience of viewing the foods.	Food stimuli are viewed differently (e.g., as less tempting) when applying the instructions.	All participants
	1.3 The application of instruction fluctuates.	Applying instructions was effortful and successful to varying degrees for different food stimuli.	2, 5, 7, 8
	1.4 Normal viewing instructions increase awareness, which may be experienced as mindfulness.	The process of learning decentering may start with normal viewing, through an increased awareness of one's experiences.	2, 3, 4, 6, 7, 9, 10
2. Potential daily application of decentering instructions	2.1 Instructions would be used based on need.	If there is a perceived need to achieve a goal (e.g., losing or maintaining weight), decentering may be used.	5, 6, 8, 9
	2.2 Challenges are anticipated.	It may be challenging to apply the instructions in daily life (e.g., finding time).	1, 4, 5, 6, 7, 8, 9, 10
	2.3 Instructions may be applied across domains.	The instructions may be relevant and useful beyond the domain of food (e.g., in stressful situations).	2, 3, 4, 5, 8, 10
3. Consumption and reward simulations	3.1 Simulations arise spontaneously.	The re-experiences of eating and enjoying foods arise automatically.	All participants

3.2 Simulations vary in intensity.	The intensity of simulations varies based on contextual factors (e.g., current levels of hunger) and personal factors (food preferences).	1, 2, 4, 5, 6, 7, 9, 10
3.3 The online study environment may become a barrier against experiencing simulations.	Since they cannot be accessed and eaten, the food images may be perceived as unreal, therefore not evoking simulations.	3, 6, 7, 9, 10

394

395 In the following section, we further illustrate each theme with supporting quotes.

396 Where quotes are shortened, it was done so without changing the context and meaning.

397 **3.1. Theme 1: Learning and Applying Decentering Instructions**

398 ***3.1.1. Specific Factors Facilitate Learning of Instructions***

399 We identified several factors that facilitate the process of learning the decentering
 400 instructions. Compared to the normal viewing instructions, most participants found the
 401 decentering instructions appropriately structured and challenging, which were perceived as
 402 facilitative:

403

404 “I was definitely more focused the second time around because the first time, instructions felt
 405 this sounded very easy. Whereas the second time because I wanted that extra explanation, I
 406 was... I was a bit more focused than the first time around.” – Tatiana (lines 440-442)

407

408 “I felt like... now... ehm I was asked to do something more specific rather than just look at
 409 them as you'd normally look at them, you know, and then I have to ask myself, ‘How do I
 410 look at food?’ and I, I didn't really know what to do. But in this case, I was told to... to look
 411 at them, and let thoughts come and go and you know, ground myself, so it was a bit more
 412 specific, I think.” – Katie (lines 450-454)

413

414 Another facilitative process in learning the instruction was having clarifying
415 discussions with the interviewer:

416
417 “I, I think probably I've got about 66.6% of it and you had to fill in the extra [laugh]. Ehm,
418 because... yeah, I think, again, it was due to me, wondering about alternative modes of
419 delivery. Ehm, instead of listening, so... I would say, yeah... two thirds of the way there, and
420 you had to give me that extra third [laugh].” – Steve (lines 893-896)

421
422 Importantly, almost all participants grasped the rather abstract concept of decentering
423 through the more concrete visual metaphor of the waterfall:

424
425 “I think the using the metaphor as a comparison really helps.” – Tatiana (line 390)

426
427 “It was nice. Uh, the, the imagery was a bit more deep. So, I could, I could... more see like
428 the waterfall in like a forest in front of me and uhm, as, as I described how you let yourself
429 carry like, you can get carried away by the stream or step behind the waterfall like I could
430 see, like, like in a movie sort of that happening.” – Christina (lines 556-559)

431

432 ***3.1.2. Instructions Change the Experience of Viewing the Foods***

433 Compared to experiences of normal viewing, applying decentering to the food stimuli
434 changed participants' experiences of relating to the foods. The experiences ranged from
435 feeling more in control and empowered to feeling less involved and letting go:

436

437 “Uhm... I felt like it was... I felt I had more control. I felt like I was looking at the food and I
438 might want the food. I might not want the food, but I felt like I had more control as to
439 whether I wanted it or not. I didn't feel as... uhm like unempowered to make a choice about

440 the food. And the thought would come up, and I could let the thought pass and it felt like I
441 had more of a choice in that.” – Patricia (lines 439-443)

442
443 “I felt like I had a choice to think about, ‘Okay uhm, if it it's coming up, that it feels
444 delicious, but that thought is gonna come, that thought is gonna go’. So I didn't need to act on
445 what think about the food because the thought is gonna come and the thought is gonna go.” –
446 Patricia (lines 449-452)

447
448 “So I'd usually say, ‘Ooh, this is a burger’. And then I'd say, ‘It's just a burger. It's just a
449 picture of a burger. It's okay. It's just a burger’. You know not - instead of just - you know,
450 ‘It's a burger, oh it looks good, oh I could eat that, oh... what would I put on it if I had a
451 burger?’, or, you know. The first time around, I did think about these things. And now I was
452 just thinking, ‘Okay, that's a picture’.” – Katie (lines 342-346)

453
454 “I was less... involved? / Uhm... I still felt, so for example that burger appeared and I'm like,
455 ‘Yeah, I'm hungry’ [laugh]. ‘I wanna, I want to, I want to eat something’. But, ... uhm like
456 there was this, like I had to step back where because I was asked to notice that, as opposed
457 to... uhm... limit, I don't know.” – Eleanor (lines 409; 415-418)

458

459 ***3.1.3. The Application of Instructions Fluctuates***

460 The quality of experience when applying the decentering instructions fluctuated. This
461 was primarily based on the aspect of the food experience that was most salient for the
462 participants at a given time (i.e. thoughts such as food preferences, feelings or physical
463 sensations). In other words, *which facet of their experience* participants applied decentering
464 to continually changed, which then led to fluctuations in the quality of experience when
465 applying decentering.

466
467 “Uhm... well, at first when I saw that first picture, I thought because I have so many thoughts,
468 I felt a bit like, uff, so many I... thoughts rushing through. And then when I was slowing
469 down I was... I gue-, I guess it was... at the very end there was a bit more emotion rather than

470 a thought because I thought... when, when seeing the brownie, I thought, ‘Oh my god, that
471 must be like a 1000 calories in that one’. / And then when I saw burger, I thought ‘Oh, I
472 actually like other toppings on my burger’.” – Tatiana (lines 309-313; 314-315)

473

474 *3.1.4. Normal Viewing Instructions Increase Awareness, Which May Be Experienced as* 475 *Mindfulness*

476 Although the normal viewing instructions were intended as a control condition, they
477 increased most participants’ awareness of their current mental and physical state. Through
478 heightened awareness, normal viewing might have played an active, metacognitive role in the
479 process of applying decentering. In other words, since normal viewing was always presented
480 first and decentering was always presented second, normal viewing might have brought food-
481 related experiences to participants’ attention, and participants might have applied decentering
482 to these previously identified experiences.

483

484 “[normal viewing] made me more aware of my senses.” – Eleanor (line 171)

485

486 “Uhm... so, since the [normal viewing] instructions... said to like look at the food nat.. like,
487 like I naturally would... ehm... so, I tried to be like well, nat.. like how does that ‘naturally’
488 mean? Ehm, [pause] and... but I don't know if I still... paid more attention to the food... than if
489 I would actually, like how I would naturally pay attention to food.” – Elizabeth (lines 313-

490

316)

491

492 For some participants, the experiences of normal viewing resembled their preconceived
493 notions of mindfulness, especially around the cultivation of awareness. If normal viewing
494 was indeed perceived as mindfulness, this may indeed suggest that the normal viewing
495 instructions played an active role in the decentering process:

496

497 “And uh... it [normal viewing] did remind me a bit of, of meditation apps. It’s... I had to
498 close my eyes and then it was almost like the story and it was inviting me to, encouraging me
499 to... to, to look at these foods. It made me excited. It made me... look forward to seeing the
500 pictures of the foods and looking at them.” – Katie (lines 116-119)

501
502 “I think mindfulness is... in a way it’s awareness, trying to be aware of the surroundings.” –
503 Katie (lines 640-641)

504

505 **3.2. Theme 2: Potential Daily Application of Decentering Instructions**

506 ***3.2.1. Instructions Would Be Used Based on Need***

507 Participants were confident that they would use the decentering instructions in their
508 daily lives if they felt the need for it.

509
510 “Uhm... if I were, if I were trying to watch my food intake, yes.” – Katie (line 602)

511
512 “I don’t think I would just blanket sort of apply it to anything. But if I thought there was
513 something that I personally didn’t feel like I had control of or had control of me, I think I
514 would remember this and be like, ‘Well, actually, I can use this technique. And I can apply
515 this if I want to’.” – Patricia (lines 763-766)

516

517 ***3.2.2. Challenges Are Anticipated***

518 Most participants expected challenges if they were to apply the decentering instructions
519 in their daily lives. Specifically, remembering to apply the instructions was a common
520 barrier:

521

522 “I think that just you need to... train yourself to... remember to think like that. So, whenever
523 you see something, food, which has been presented to you, train yourself just to think of it in
524 a different way. / I think it’s just training, I think it’s training. I don’t think there’s something

525 you can do or, or something maybe a cue word which you can use, which will then trigger eh,
526 something else.” – George (lines 715-717; 723-724)

527

528

529 “I think when you're stressed, you're not very relaxed, very relaxed, relaxed enough in your
530 stress. I'd have to do something that made me calm down first. Then to, to even remember, to
531 remind me that I've done this and I know this, and then I'd have to apply it.” – Patricia (lines
532 790-793)

533

534

535 Other challenges were the effort required to apply the instructions, finding the time, and
536 being in the right broader stage of life to apply them:

537

538 “I just need to get started with it and you know, it's effort and it's time and yeah.” – Christina
539 (lines 875-876)

540

541 “Like, I would need the routine, the structure and the environment to make it stick. ... I like
542 the idea of it. But I also... I, I... I think I would need to also find the right person and the right
543 environment and the right kind of uh mantras and the right context. And that means the right
544 times of my life, as well.” – Patricia (lines 854-858)

545

546 ***3.2.3. Instructions May Be Applied Across Domains***

547 When asked about the potential daily application of the instructions, some participants
548 spontaneously brought up the possibility of applying them in domains other than food:

549

550 [in response to “Could you think of where or how you would apply it?”] “Ehm, Is it only
551 about food? / well definitely about food. / but I guess with any kind of sensation or like, kind
552 of... engaging with... like just... this idea of knowing how to like notice your thoughts and
553 letting them go. Like that can work with anything really.” – Elizabeth (lines 978; 984; 992-

554

555 “Just, I guess, (pause) just generally like (pause) could be applied to almost anything to uhm,
556 (pause) not only when it comes to like some stressful situations when you're thinking really
557 fast and you have to be like sharp like fast in your actions. You could maybe sometimes, you
558 know when people say, ‘You should think twice before you do something’.” – Tatiana (lines
559 634-637)

560

561 **3.3. Theme 3: Consumption and Reward Simulations**

562 This theme was identified and interpreted through our main theoretical framework of
563 the Grounded-Cognition Theory of Desire and Motivated Behaviour (Papies & Barsalou,
564 2015).

565 **3.3.1. Simulations Arise Spontaneously**

566 Simulations readily came up for most participants. The most salient features of these
567 simulations were the taste and texture of the foods, and the context in which they would
568 typically be consumed:

569

570 [normal viewing] “So, it was quite easy to imagine, you know, how the texture of eating
571 them, the taste, uhm ... and... like the context of eating these food is quite usually pleasant.
572 This is the kind of food that you would eat with friends, probably. So, I don't know, there's
573 like a nice feeling about it.” – Eleanor (lines 108-111)

574

575 [decentering] “so same, same I had, you know, like textures and tastes, like thoughts of what
576 it would taste like and feel like. Uhm... but I also had [pause] uhm [pause] yeah, and I had
577 you know, I had the image of like being eating a burger at a, a place and enjoying it.” –
578 Eleanor (lines 427-430)

579

580 [normal viewing] “Ehm, well the chicken made me think of one of the cafes that I have been
581 to in city centre and that serves a similar dish. So, it just made me associate that dish to that
582 specific bar I've been to. – Tatiana (lines 54-56)

583

584 3.3.2. *Simulations Vary in Intensity*

585 Although all participants experienced simulations, the intensity of simulation varied as
586 a function of participants' food preferences:

587

588 "I felt like the images of some of the food for me, the some of them the intensity was more
589 stronger in terms of what was presented. And also in terms of the food looking like it was
590 more uhm not inviting, but sort of the burger was more open, and there was the dessert had
591 the sauce pouring down." – Patricia (lines 478-481)

592

593 "I first thought the, the carrot cake was quite fluffy but maybe a bit too sweet for... to, to
594 have just now. And, and the chicken looked really good, the fried chicken. But then I thought,
595 'Maybe that's too much of a, of a meal or a big snack to have just now'. Then the waffles uh
596 seem a great idea for breakfast [laugh]. Eh, nachos weren't that exciting, and the brownie
597 looked really nice, but again, might be too sweet for now. That's what I thought." – Katie
598 (lines 98-102)

599

600 3.3.3. *The Online Study Environment May Become a Barrier to Experiencing Simulations*

601 Although most participants experienced simulations, the use of food images as stimuli
602 rather than actual food became a barrier for some of them:

603

604 "And during the video, I didn't feel any feeling in looking at the food, probably because it
605 was... an image and it wasn't real." – Olivia (lines 375-376)

606

607 "Well I think obviously, like I know it's just a visual. So it's not, you know, I know I'm not
608 going to feel it. I know I'm not going to taste it." – Eleanor (lines 324-325)

609

610 "So, like I said before, it's a different environment. It's a different medium, so you're not
611 smelling the food, you're not, you're not touching it. It's just it's one-dimensional." – Steve
612 (lines 378-379)

613 **3.4. Food Thoughts Overlap Measure (FTOM) as a Tool for Exploring Decentering**
614 **Effects**

615 The FTOM served as a self-awareness tool for participants to assess the distance
616 between themselves and their food thoughts. Asking participants to rate and explain their
617 perceived distance for both normal viewing and decentering sparked further discussion,
618 including a comparison of the experience of viewing the foods while applying each of the
619 instructions (e.g., subtheme 1.2). Some participants engaged in an elaborate thought process
620 while providing their FTOM ratings:

621

622 [normal viewing] “I'm looking down between one and three at the moment. So, somewhere
623 between there. And I'm gonna look more closely. So this is the first video, uhm... probably
624 two. / Because the 'me' and the 'food thoughts' are overlapping somewhat. So there's an area
625 of where there, the two elements are still independent, but there's overlap in the middle.” –
626 Patricia (lines 528-530; 536-537)

627

628 [decentering] “I'm looking between five and seven. And I'm just going to see, probably I'm
629 gonna choose a six. So... I felt that myself and the thoughts were quite separate. So there was
630 me and there was my thoughts and they were coming up and they were going. So they felt
631 quite independent of each other. And I did definitely felt some, some distance. So greater
632 than the four or five. And I'm gonna go with six.” – Patricia (lines 545-549)

633

4. Discussion

634 This study was designed to provide an in-depth analysis of the personal experiences of
635 learning to apply a decentering perspective to one's spontaneous response to attractive food
636 images. Through thematic analysis of qualitative interviews, we identified three themes that
637 describe how non-meditators learn and apply brief mindfulness instructions (Theme 1), how
638 these instructions may be used in daily life (Theme 2), and the characteristics of the vivid and

639 compelling consumption and reward simulations that participants apply decentering to
640 (Theme 3).

641 The process of comparing the decentering instructions to the normal viewing
642 instructions seemed key for participants' understanding, application, and evaluation of the
643 decentering instructions. Compared to normal viewing, participants benefitted from the
644 structure and challenging metacognitive contents of the decentering instructions. Also
645 compared to normal viewing, applying decentering changed the way in which participants
646 related to their experiences of food. This altered way of relating included feeling more in
647 control over these experiences, as well as feeling more empowered, and less involved. These
648 findings are supported by previous quantitative research that also show how decentering
649 alters one's relationship to one's urges by decoupling motivation and behaviour (e.g., Bowen
650 & Marlatt, 2009; Keesman et al., 2017).

651 The decoupling process implicated in decentering can prevent the automatic enacting of
652 impulses, and provide space for more deliberate responding based on more conscious
653 intentions. However, it is important to note that within Western contemporary settings, the
654 decoupling of motivation and behaviour is often conceptualised and taught in a way that does
655 not address ethics or "right mindfulness" (Monteiro et al., 2015; Purser & Milillo, 2015).
656 Given an ethically neutral context, decentering could potentially provide space for acting on
657 good as well as on bad intentions, with potentially harmful consequences (Monteiro et al.,
658 2015). The decentering instructions presented here are intended to introduce an aspect of
659 mindfulness to non-meditators, and to enable these individuals to manage unwanted food
660 cravings in the context of an overall healthy relationship with food.

661 Importantly, the active role of the normal viewing instructions in participants'
662 understanding and application of decentering was unexpected. Although normal viewing
663 instructions were intended as a control condition, they seemed to actively facilitate the

664 process of decentering, first by increasing participants' awareness of their current thoughts,
665 feelings and physical sensations, and then by serving as a baseline to which participants
666 compare the style, structure, and difficulty of the decentering instructions. This suggests that
667 normal viewing may already have been perceived as a component of mindfulness, raising the
668 question of whether normal viewing serves as an appropriate control condition for
669 experimental research, especially for within-participant designs. This is also in line with
670 findings suggesting that awareness ("attention monitoring") and acceptance skills are key
671 components of mindfulness that interact to improve various outcomes of health and
672 wellbeing (Lindsay & Creswell, 2017). Acceptance skills (i.e. changing one's relation to
673 one's experiences), closely relates to the concept of decentering.

674 Another factor that facilitated the learning and application of decentering was
675 discussing the instructions with the interviewer/researcher, to clarify the meaning and goals
676 of these instructions. The audio recording may have led to an initial understanding of the
677 instructions, and the interviewer may have further scaffolded this learning. This is similar to
678 qualitative research on the role of teachers in mindfulness courses, where participants
679 emphasised the important role of a supportive teacher in their learning and engagement (van
680 Aalderen et al., 2014). Specifically, they indicated that the teacher should be a compassionate
681 role model who motivates them (van Aalderen et al., 2014). Similarly, participants in the
682 Howarth et al. (2016) qualitative study indicated that the presence of someone knowledgeable
683 was important while listening to the mindfulness recording. Participants found this to be
684 reassuring and motivating. This may disadvantage online mindfulness studies or mindfulness
685 applications, if the interaction with a researcher or teacher is absent. In this context, the
686 model of Supportive Accountability may be relevant for providing human support during
687 online mindfulness research and training (Mohr et al., 2011). This model highlights
688 accountability (e.g., social presence, process focus) and legitimacy (e.g., expertise and

689 trustworthiness of teacher/coach) as factors that are essential for promoting adherence to
690 internet and eHealth interventions.

691 Finally, participants indicated that they found the visual metaphor of the waterfall
692 helpful, particularly when learning the instructions. We included this metaphor in the
693 instructions to better explain the abstract concept of decentering. This finding is in line with
694 research showing that metaphors enable individuals to draw on previous experiences from
695 concrete and familiar domains, while learning and making sense of abstract concepts
696 (Jamrozik et al., 2016).

697 Together, these factors suggest a potential multi-stage process of learning brief
698 mindfulness, much like manualised mindfulness-based interventions (e.g., Mindfulness-
699 Based Stress Reduction; Kabat-Zinn, 1982). Specifically, our findings suggest that one learns
700 brief decentering through the key stages of (1) increased awareness (i.e. effects of normal
701 viewing), (2) conceptual understanding of decentering, (3) receiving feedback from the
702 interviewer (similar to mindfulness teachers), (4) developing further understanding of
703 decentering, and (5) the use of metaphors to aid learning. All of these stages also feature in
704 traditional interventions.

705 Further, participants were confident that they would use the decentering instructions in
706 their daily lives, if they felt the need for it. This finding was directly linked to the
707 characteristics of our sample, who were generally healthy participants without a restrictive
708 diet and with no history of eating disorders. Most participants, however, expected to face
709 challenges if they were to apply decentering in their daily lives, especially challenges with
710 remembering to apply the instructions. This is different from Howarth et al.'s (2016)
711 findings, where most patients reported that they do not anticipate challenges, due to the
712 minimal time requirement of applying the instructions. Finally in the present study, when
713 asked about the situations in which they would apply decentering, some participants

714 spontaneously brought up domains other than food, such as stress. This may be related to the
715 cognitive psychological concept of transfer of learning, where previous learning of
716 mindfulness in one domain generalises to and facilitates its learning in a different domain
717 (Salomon & Perkins, 1989).

718 Generally, participants seemed to understand what we intended to convey through the
719 decentering instructions, and most of them benefited from it while viewing the video of
720 attractive foods. While most participants fully understood the instructions after listening to
721 the audio recording, some needed further guidance. Importantly, all participants correctly
722 understood the instructions once they discussed it with the interviewer. This highlights the
723 important role of the participant-researcher interaction in learning decentering, suggesting
724 that a lack of interaction may impede learning for some participants. Overall, these findings
725 elucidate key factors that contribute to learning and applying decentering. Some of these
726 factors are part of the decentering instructions themselves (e.g., visual metaphors), while
727 others relate to other aspects of the study (e.g., perceiving the control condition as
728 mindfulness). Thus, our findings confirm that factors other than brief mindfulness may drive
729 the effects or lack thereof shown in mindfulness studies. It would be important to critically
730 evaluate the potential impact of these factors on study outcomes, especially during the stages
731 of study conceptualisation and design.

732 In line with our theoretical framework of the Grounded Cognition Theory of Desire and
733 Motivated Behaviour, the thoughts, feelings and physical sensations that participants
734 experienced may be termed “consumption and reward simulations” (Papies et al., 2020). In
735 this study, these simulations came up spontaneously. The most salient features of these
736 simulations were the taste and texture of the foods, and the context in which they would
737 typically be consumed. This is in line with previous work showing that tempting foods
738 activate simulations, including simulations of an eating context (Papies, 2013).

739 One of the main limitations of this study was the online study environment. Although
740 most participants engaged with the food images and experienced vivid simulations of
741 consuming them, the use of online food images instead of actual food was a barrier for some.
742 Further, participants were presented with a generic selection of tempting foods, which might
743 not have catered to their unique food likes and dislikes. This means that the images might not
744 have elicited the full extent or intensity of simulations that would arise if participants were
745 presented with actual foods that were personalised to reflect their preferences. If so, it might
746 have been easier to apply decentering here, as the experiences would have been less intense.
747 A qualitative study that uses actual, personalised food stimuli would therefore be more
748 informative, and would address potential concerns with the ecological validity of this study.
749 At the same time, food cravings are often triggered by spontaneous, associative thoughts, in
750 the absence of actual foods (Kavanagh et al., 2005). Therefore, understanding how people
751 can apply mindfulness-based instructions in such situations has high ecological validity and
752 practical value.

753 Another limitation of this study was the control condition used. Although the normal
754 viewing instructions provided unexpected and provocative insights, they did not serve as an
755 adequate control condition. Normal viewing was initially selected to control for potential
756 expectancy effects, without resembling mindfulness too closely (Davidson & Kaszniak,
757 2015; Van Dam et al., 2018). However, normal viewing was perceived as if it was
758 mindfulness by some participants, as some of its features (e.g., the reference to thoughts,
759 feelings, and physical experiences; the river metaphor) matched participants' pre-existing
760 knowledge and assumptions around mindfulness. In the future, a different control condition
761 might be used, although a control condition might be unnecessary and omitted altogether in
762 studies like the present work. Regardless of the decision to include a control condition or not,

763 it is important to recognise the difficulty of implementing adequate active control conditions,
764 both in this study, and in general (Davidson & Kaszniak, 2015; Van Dam et al., 2018).

765 A final limitation was the gender imbalance in our sample. We recruited eight female
766 and two male participants based on participants' interest in our study and their eligibility.
767 However, the imbalance both in the level of interest and the final sample composition may
768 suggest a self-selection bias. Indeed, preliminary findings suggest that women may be more
769 interested in mindfulness-based interventions than men (Katz & Toner, 2013). While gender
770 differences were not a main focus of this study, it is important to note that male participants
771 have been under-represented in mindfulness research more generally (Bodenlos et al., 2017),
772 and inattention toward gender as a variable is a wider issue within the mindfulness and
773 meditation literature (Hickey, 2010). Since there are mixed findings on gender differences in
774 the effectiveness of mindfulness-based interventions (e.g., Katz & Toner, 2013; Rojiani et al.,
775 2017), future research should be conducted with a gender-balanced sample. This may lead to
776 meaningful between-gender qualitative comparisons of mindfulness experiences.

777 Future research should also explore how clinical or sub-clinical samples of emotional
778 eaters and those with eating disorders learn and apply brief mindfulness. These samples may
779 differ from a sample of healthy eaters, as they may have a more immediate and real need for
780 improving their eating behaviours. Further, since most participants expected to face
781 challenges when applying decentering in daily life, future research should investigate how
782 different groups of individuals can most easily learn brief mindfulness, and apply it in their
783 daily lives to spontaneously arising food cravings.

784 In conclusion, this study presents an initial qualitative account of the unique processes
785 that are implicated in learning and applying brief decentering instructions for food cravings.
786 These insights may influence how future experimental studies are designed by emphasizing
787 the value of allowing researcher interaction, of providing metaphors to aid learning, and of

788 providing tools to increase awareness of one's experiences before applying decentering. It
789 may also inform the development of simple, accessible, and effective mindfulness
790 techniques, which may be suitable for integration into daily life, as well as clinical practice.

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807

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1038

Appendix A1039 **Table A1**1040 *Participant demographic information*

Participant number / Pseudonym	Age	Sex	Current student status
1 / Sophie	24	Female	Non-student
2 / Tatiana	30	Female	Non-student
3 / Steve	27	Male	Non-student
4 / Elizabeth	31	Female	Student
5 / Patricia	35	Female	Non-student
6 / Katie	22	Female	Student
7 / Olivia	25	Female	Student
8 / George	33	Male	Non-student
9 / Eleanor	35	Female	Non-student
10 / Christina	25	Female	Student

1041