



Enjoying food without caloric cost: The impact of brief mindfulness on laboratory eating outcomes



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ABSTRACT

Objective: Mindfulness-based interventions have been increasingly applied to treat eating-related problems ranging from obesity to eating disorders. Yet few studies have empirically examined the mechanisms of a mindful approach to eating. The current studies examine the potential of brief mindfulness instructions to enhance the psychological and behavioral dimensions of eating.

Methods: In three experiments (total $N = 319$ undergraduates), we examined whether brief mindfulness instructions would enhance the positive sensory experience involved in tasting food as well as healthy eating behaviors.

Results: Relative to distraction control instructions, the first two studies demonstrated that brief mindfulness instructions increased the enjoyment of a commonly pleasurable food (chocolate; Study 1), and a food with generally more mixed associations (raisins; Study 2). The third study replicated and extended these findings to show that brief mindfulness instructions also led to lower calorie consumption of unhealthy food relative to distracted or no-instruction control conditions, an effect mediated by greater eating enjoyment.

Conclusions: Findings demonstrated the power of brief mindfulness instructions to positively impact both health-relevant behavior and sensory experience associated with eating food. Implications for both theory and clinical applications of mindfulness are discussed.

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Mindfulness-based interventions have been increasingly employed to address eating-related problems ranging from eating disorders to obesity, and show initial promise across multiple of these areas (O'Reilly, Cook, Spruijt-Metz, & Black, 2014; Wanden-Berghe, Sanz-Valero, & Wanden-Berghe, 2010). Yet comparatively little work has examined the more fundamental mechanisms of mindfulness-based approaches to eating. Investigating potential mechanisms has the potential to elucidate the pathways by which mindfulness-based approaches influence how people enjoy and consume food and counter clinical problems related to eating. The current set of studies were undertaken to address this important gap.

In addition, theory and considerable research indicate that mindfulness promotes well-being (see Brown, Ryan, & Creswell, 2007) but much of this work has been directed towards investigating whether mindfulness ameliorates negative or maladaptive psychological experiences (e.g., Frewen, Evans, Maraj, Dozois, & Partridge, 2008; Hofmann, Sawyer, Witt, & Oh, 2010), rather than whether mindfulness promotes positive experiences (see Arch & Landy, 2015). The present studies thus were specifically designed to examine whether mindfulness fosters positive psychological experience of eating - an activity that is often poorly attended to, yet offers rich potential for daily enjoyment.

Researchers (Brown & Ryan, 2003; Kiken & Shook, 2011) have proposed that mindfulness may promote higher quality moment-to-moment experiences for several reasons. For example, the receptive attention that characterizes mindfulness may promote more openness to explore experiences, including pleasant features that might otherwise go unnoticed, and to enhance awareness of

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sensory perceptions (Brown et al., 2007). Moreover, the emotional benefits of mindfulness, including the containment and down-regulation of negative emotional responses (Arch & Craske, 2006; see Arch & Landy, 2015), and less negative affect in general (Brown & Ryan, 2003), may create more opportunities for experiencing positive states of mind.

Outside the context of eating, limited evidence supports the link between mindfulness and positive experiences. Experience sampling research (Brown & Ryan, 2003) has shown that state, or momentary mindfulness is associated with more intense and frequent pleasant affect. Experimental research (Erisman & Roemer, 2010) demonstrated that a very brief mindfulness training, or induction, enhanced positive affect in response to a positive film clip, relative to a neutral control condition. Kiken and Shook (2011) found that participants induced into mindful states identified the valence of positive stimuli more accurately than controls. Further, Garland, Gaylord, and Fredrickson (2011) found that increases in trait mindfulness over the course of a mindfulness-based intervention were related to increases in self-reported positive reappraisals (i.e., reframing events as meaningful or beneficial). Attending to present-moment experience is also central to savoring – enjoying and increasing one's positive emotional experiences (Bryant, 1989) – which in turn has been related to higher positive affect (Bryant, 2003; Quoidbach, Berry, Hansenne, & Mikolajczak, 2010). These studies provide initial evidence that mindfulness promotes positive emotional experiences. Studies on this topic are few, however, particularly investigating the potential for mindfulness to enhance mundane sensory experiences such as tasting food.

Thus, the current studies were designed first to test whether brief mindfulness instructions¹ enhanced the sensory experience of eating food, among university students. In the first two experiments reported here, we explored the effect of mindfully tasting foods with generally positive associations (chocolate; Study 1) and more neutral or mixed associations (raisins; Study 2). To distinguish mindful eating from the distracted approach to eating that is common in modern societies (see Robinson et al., 2013; Wansink, 2004), we compared the effects of eating mindfully with those of eating distractedly. In that eating in a distracted manner represents how many people often eat – for example, while talking with others, watching television, reading, texting, and so on – we conceptualized it as the control condition. Based on mindfulness theory (Brown & Ryan, 2003; Kristeller & Wolever, 2010) and the preliminary evidence reviewed here, we predicted that induced mindfulness would enhance the positivity of the ordinary sensory experience of eating, measured both in terms of greater enjoyment (hypothesis 1) and in a greater desire to continue the sensory experience of eating (hypothesis 2). Based upon previous findings on both mindfulness and savoring, we also predicted that mindfulness would result in greater positive and lower negative affect following food consumption (hypothesis 3).

If mindfulness enhances eating enjoyment and a desire to continue eating, as we predict, then it may lead to eating more – a potentially undesirable consequence, particularly if the foods eaten are calorie-rich or have poor nutritional value (e.g., snacks with high fat, salt, or sugar content). Yet it has been suggested that mindfulness enhances awareness of and responsiveness to satiety cues, and therefore, functions adaptively to reduce calorie consumption (Kristeller & Wolever, 2010). Consistent with this calorie consumption hypothesis, Jordan, Wang, Donatoni, and Meier (2014) found that trait and state (induced) mindfulness predicted

lower calorie intake; however the results were not differentiated by the healthfulness of the available foods (candy, pretzels, and almonds). Self-reported trait mindfulness was related to more healthy food choices (selecting fruit over sweets as a “thank-you” gift at the end of the study), a relation mediated by self-reported preferences for healthy over unhealthy foods.

Building upon this preliminary evidence, the third experiment (Study 3) examined whether briefly instructed (induced) mindfulness leads to lower calorie consumption of unhealthy (high sugar, salt or saturated fat) snack foods, in addition to increased enjoyment of, and desire to continue tasting food. Based on mindful eating theory (Kristeller & Wolever, 2010) and initial evidence reported here, we hypothesized that mindfulness, relative to distraction and to no-instruction control conditions, would lead to lower food consumption, particularly of the unhealthy sort (hypothesis 4). We also examined whether the enjoyment of tasting experiences helped to mediate the predicted relationship between (briefly) induced mindfulness and calorie consumption (hypothesis 5). As a whole, these studies examined in a laboratory context whether brief mindfulness offers both psychological and physical benefits by enhancing the positive experience of eating while simultaneously decreasing caloric consumption.

1. Study-1

An initial experiment was conducted using chocolate to test the first three hypotheses: that relative to distracted attention, mindful attention would enhance food enjoyment (hypothesis 1) and the desire to continue eating (hypothesis 2), and would result in greater positive affect and less negative affect following tasting (hypothesis 3).

2. Method

2.1. Participants

Participants were recruited from the undergraduate psychology research pool of a large Mid-Atlantic U.S. university and earned course credit for participation. Inclusion criteria included age (18 years or older) and fluency in English. Exclusion criteria included an allergy to, strong dislike of, or diet that excluded eating chocolate, a history of diabetes, a current illness that affected taste, or cigarette smoking, which can blunt the sense of taste. Criteria were assessed upon arrival to the laboratory with a screening questionnaire.²

Eighty-one participants (59.3% female) met the inclusion criteria and completed the study. Participants were on average 19.49 years old ($SD = 1.80$, range 18–26). Participants were White/Caucasian (56.8%), African-American (23.5%), Asian-American (12.3%), Hispanic/Latino(a) (4.9%), and Native American (2.5%).

2.2. Procedure

The study was titled “Concentration and Food Tasting Study” that would “examine the effect of tasting on mental concentration.” Participants completed a single experimental session in a group computer laboratory with 8 individual cubicles. A sole male experimenter administered all sessions. The experimenter left the room after training to reduce experimental demands on the participants.

After giving informed consent, participants completed the

¹ Thus, we assessed the effects of briefly instructing or training participants to eat food mindfully, as opposed to training them in formal mindfulness meditation.

² The chocolate-related questions were embedded in questions about a variety of foods so that participants would not know beforehand what they would taste.

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