



## Using food to reduce stress: Effects of choosing meal components and preparing a meal



Katie E. Osdoba<sup>a,\*</sup>, Traci Mann<sup>b</sup>, Joseph P. Redden<sup>c</sup>, Zata Vickers<sup>a</sup>

<sup>a</sup> Department of Food Science and Nutrition, University of Minnesota, 1334 Eckles Ave., St. Paul, MN 55108, USA

<sup>b</sup> Department of Psychology, University of Minnesota, 75 East River Road, Minneapolis, MN 55455, USA

<sup>c</sup> Marketing Department, Carlson School of Management, University of Minnesota, 321 19th Ave S., Minneapolis, MN 55455, USA

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### ABSTRACT

Many people experience stress as a part of their daily lives. Chronic stress can have an impact on physical and mental health. Since food and eating are generally associated with positive moods, we explored how aspects of meal preparation can relieve stress and improve measures related to mood.

Our main objectives were to determine whether choosing meal components and/or preparing a meal would improve measures related to mood and reduce stress.

Participants came individually to our lab at dinner time. We measured stress (salivary cortisol, heart rate and blood pressure) and took measures related to mood on arrival. We then induced stress (Trier Social Stress Task) and took measures related to stress and mood again. Each participant was assigned to one of four experimental conditions. In the *prepare-choice* condition participants prepared a meal (pasta + sauce + inclusions) and had control over selection of meal components. In the *prepare-no-choice* condition participants prepared their meal, but had no control over the menu. In the *choice-no-prepare* condition participants had control over the menu, but the meal was prepared by someone else. In the *no-prepare-no-choice* condition participants were provided with a meal prepared by someone else. Food preference questionnaires conducted before the stress induction ensured that all participants received foods they liked.

Having no choice produced greater reductions in the mood-related measures of anxiety and anger compared with the choice condition. Systolic blood pressure was reduced more in the no choice than in the choice condition after the meal. Preparing versus not preparing had little effect on measures related to stress and mood.

People may find choosing to be a depleting task on their limited psychological resources; hence, choosing can add to their general stress. Not faced with choosing, one avoids this unnecessary stress. Consuming a meal without the burden of choosing has potential as a stress-reduction strategy.

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### Introduction

#### Importance of the food-mood relationship

Eating behaviors, stress, and negative mood<sup>1</sup> all affect physical and mental health, but their interactions are complex and not well defined. Similar to unhealthy eating behaviors, negative mood and

chronic stress can lead to anxiety, depression, diabetes, and cardiovascular disease (Dickerson & Kemeny, 2004; Kandiah, Yake, Jones, & Meyer, 2006). The process of choosing what food to eat can involve both physiological (i.e., hunger) and psychological (i.e., emotional) influences (Desmet & Schifferstein, 2008), and once eaten, those foods can affect our mood (King & Meiselman, 2010). If these relationships can be better understood, people may be able to make healthier food decisions that lead to a healthier physical and emotional state.

#### Effect of food on mood

Foods can elicit an emotional response when eaten, which is typically positive, but it is unclear why this response occurs. In recent years, the elicitation of emotions in response to food consumption

\* Corresponding author. Address: 225 Food Science and Nutrition, 1334 Eckles Ave, St. Paul, MN 55108, USA. Tel.: +1 507 382 8449.

E-mail addresses: [osdo0001@umn.edu](mailto:osdo0001@umn.edu) (K.E. Osdoba), [mamm@umn.edu](mailto:mamm@umn.edu) (T. Mann), [jredden@umn.edu](mailto:jredden@umn.edu) (J.P. Redden), [zvickers@umn.edu](mailto:zvickers@umn.edu) (Z. Vickers).

<sup>1</sup> Although there are clear distinctions in terms of psychological constructs, the words 'mood' and 'emotion' are often used synonymously in the literature. For the remainder of this paper, the words 'mood' and 'emotion' will be used interchangeably.

has been explored using several methods in many different contexts (Cardello et al., 2012; Desmet & Schifferstein, 2008; Gibson, 2006; King, Meiselman, & Carr, 2010). The majority of emotions found to be associated with foods are positive, including 25 out of 39 words in King & Meiselman (2010) EsSense™ Profile (three words are negative, and the remaining 11 are unclassified). Desmet and Schifferstein (2008) similarly found that positive emotions were experienced at a higher intensity than negative emotions in response to tasting both snack-type and meal-type foods.

Appetite levels could affect these emotional responses. People are typically alert and irritable when hungry, and calm and sleepy when full (Gibson, 2006). Intrinsic qualities of a food, such as the inherent pleasantness of a sweet product, may affect emotional responses (Steiner, 1974). Macht, Gerer, and Ellgring (2003) suggested that emotional responses could also be due to the psychological aspects of food and eating, such as guilt after eating high calorie foods. Other hypotheses support this psychologically-elicited view, including the role of cognitive expectations and prior associations, whereby memories and past experiences with foods can influence what our emotional response will be (Cardello et al., 2012; Mojet & Köster, 2002; Walsh & Kiviniemi, 2013; Wansink, Payne, & North, 2007).

#### *Effect of food on stress*

In addition to prompting a positive emotional response, the consumption of food may also alleviate both psychological and physiological stress. Martin et al. (2009) found that consumption of 40 g dark chocolate per day for two weeks decreased urinary cortisol (an indicator of physiological stress levels) in participants with chronic stress. In another study on chocolate, just three days of dark chocolate consumption resulted in decreased levels of psychological stress captured by self-reported anxiety and depression (Lua & Wong, 2011). Finally, Pecoraro, Reyes, Gomez, Bhargava, and Dallman (2004) saw a decrease in stress hormone levels after consumption (by rats) of palatable, calorie-dense food during periods of stress. Therefore, food consumption may impact stress both physically and psychologically.

#### *Choice*

Too many choices and/or too many options per choice may cause increased stress and negative mood. Schwartz (2004) calls this the 'Paradox of Choice' as adding explicit choice to a situation may unknowingly increase stress and negative mood. Repeated acts of choosing deplete the resources needed for self-control (Vohs et al., 2008), which could further increase stress and negative mood. Experiencing stress itself can also deplete resources (Baumeister, Bratslavsky, Muraven, & Tice, 1998), further enhancing feelings of stress and negative mood. Too many options may make choice unappealing because although it can be enjoyable, choice can also be overwhelmingly frustrating (Iyengar & Lepper, 2000; Schwartz et al., 2002). When there are too many options, the added burden of weighing all the possibilities and making the 'best' choice can increase dissatisfaction with the final result (Schwartz et al., 2002). In other words, there will always be the underlying thought of regret that the consumer failed in their quest to find the best option. Indeed, Iyengar and Lepper (2000) found that greater dissatisfaction is experienced when the same option is chosen from an extensive set (24–30 options) than from a set with limited options (six). The more choices available, the greater the chance the consumer chooses the 'wrong' one, magnifying feelings of stress and negative mood.

On the other hand, common consensus is that people enjoy freedom of choice. Liking and consumption tend to increase when people choose their food (Cardello et al., 2012). While this increase

in liking could presumably improve mood and stress, limited evidence suggests that this actually happens. When the participants of Garg and Lerner (2013) were given a choice of reward (chocolates vs. a ballpoint pen, with the idea that this would be an easy choice and most people would choose the chocolates) after induction of sad mood, sadness was reduced more than if the participants were just presented with chocolates as a gift. The work of Garg and Lerner (2013) and Iyengar and Lepper (2000) showed that simple choices, such as those with few options and/or trivial consequences, may result in less negative consequences for mood and stress. The detrimental effects of too many choices, however, especially when distressed, may outweigh the benefits of having the freedom to choose.

#### *Food preparation*

The alleviation of stress and improvement of mood are likely outcomes of food preparation, although limited evidence suggests that food preparation itself can be stressful. Benson, Beary, and Carol (1974) suggested that activities involving mindless, repetitive tasks elicit a relaxation response. Food preparation, which entails such tasks as chopping vegetables and repeated stirring, may fit well into this category. Food preparation may also result in improved mood when it is done out of a sense of duty (i.e., to feed the family) or to please others (Daniels, Glorieux, Minnen, & van Tienoven, 2012). Building on this, Costa (2013) found that people ascribe strong, positive feelings towards cooking hot meals at home, whereas they feel guilty (along with other negative emotions) when they do not cook at home. Food preparation allows for a certain amount of autonomy and control. Control in general is related to well-being and life satisfaction (Tangney, Baumeister, & Boone, 2004). Knowing the ingredients and processes that go into one's meal may be an easy way to exercise control and reap the psychological benefits. On the other hand, food preparation can be stressful, especially when hunger, distractions, and time constraints come into play (Daniels et al., 2012). In the case of mood improvement and stress relief, the advantages of preparing food may, under many circumstances, outweigh its detriments.

#### *Objectives and hypotheses*

The main objective of this study was to explore whether choice of meal ingredients (vs. no choice) and/or preparation of a meal (vs. someone else preparing) influence the stress-reducing and mood-lifting effects of food and eating.

Given the stressful consequences inherent to making choices, we expected choosing ingredients to have detrimental effects on mood and stress. We specifically hypothesized that if people did not choose their meal ingredients, they would show a greater improvement in measures related to mood and larger reduction in stress after eating than if they did choose their meal ingredients.

Given the positive consequences from preparing food, we expected preparing food to produce improvements in mood and stress. We specifically hypothesized that if people prepared the meal themselves, they would show a greater improvement in measures related to mood and larger reduction in stress after eating than if someone else prepared the meal for them.

## **Materials and methods**

### *Participants*

One hundred eighteen participants (36% male, mean age = 28, SD age = 11, range = 18–63) were recruited via email listserv and posted flyers. They were screened for availability and liking of meal

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