



## Short Communication

## The (non)-effect of induced emotion on desire for different types of foods

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## ABSTRACT

Extensive prior research has demonstrated the interplay between emotion and eating, but there has not been an empirical examination of the effects of experimentally induced basic emotions on people's desire for foods that vary in caloric density and taste quality. To address this issue, we used validated emotion induction manipulations to elicit feelings of anger, sadness, and happiness in 192 American college students, and then had them rate their desire to consume 16 food items that were either low or high in calories and sweet or savory. Participants desired both low and high calorie sweet foods and high-calorie savory foods over low-calorie savory foods. Some effects on overall desire to eat were also found, but induced emotion had no impact on the type of food desired, even when participants were strongly experiencing the emotion of interest. Our findings disentangle how emotions may influence overall motivation to eat versus desire for particular food types, and highlight the importance of research supporting the null hypothesis.

## 1. Introduction

Eating and emotion are clearly linked, but the exact nature of that link is not known (see Macht's, 2008, review). Motivation to consume food in general is related to emotion. For example, high arousal emotions such as anger and joy have been shown to increase desire to eat (Macht, 1996; Macht, Roth, & Ellgring, 2002), whereas low arousal, negative emotions (e.g., sadness) have been shown to decrease appetite and consumption (Macht et al., 2002). However, there are also inconsistencies in the literature, as negative valence, low arousal emotions have been shown to increase craving and intake of high calorie palatable foods (Goldschmidt, Tanofsky-Kraff, & Wilfley, 2011). Importantly, the types of foods, in terms of their caloric and taste properties, that are desired to be consumed as a function of the specific emotions that are experienced has not been investigated, though it is commonly believed that different emotions will elicit desires for different food types. For example, Lyman (1982) found that college students assumed that they would prefer to eat junk food when feeling various negative emotions and healthful foods when experiencing positive emotions.

The purpose of the present research was to address this gap in the literature by empirically testing whether experiencing different basic emotions would alter the desire to eat particular types of food. Specifically, we induced the emotions of anger, sadness and happiness, and examined whether the emotion changed the desire to eat foods that differed in their caloric density (high, low) and taste qualities (sweet,

savory). We chose the emotions of anger, sadness and happiness because they vary in arousal and valence in ways that may impact food choice.

## 2. Method

## 2.1. Participants and design

One hundred and ninety-two male and female undergraduate students (3 between-subjects emotion conditions  $\times$  64 participants per group) recruited through Boston College's SONA system, completed one of three surveys (depending on their respective emotion condition) and received one research credit for participating. Participants in each emotion condition reported similar demographics and general eating behaviors. See Table 1. We asked participants to refrain from eating before the experiment so that they would be motivated for food. In all conditions, participants reported that they had eaten approximately 1.5–3 h before.

## 2.2. Materials

Three computer-based surveys were developed, one per emotion condition (angry, sad, happy). Each survey included a two-part emotion induction validated by past research (Gerrards-Hesse, Spies, & Hesse, 1994), as well as rating scales and food images (details below).

The first part of the emotion induction manipulation consisted of

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**Table 1**  
Participant demographics by emotion condition.

	Condition		
	Angry	Sad	Happy
N	64 (32 males)	64 (32 males)	64 (32 males)
Age			
<i>M</i>	19	19	19
<i>SD</i>	1.20	1.20	1.20
Ethnicity			
African American	4	3	0
Asian	11	8	11
Caucasian	38	46	49
Hispanic	5	4	2
Other	6	3	2
Eating behavior			
Diagnosed eating disorder	1	3	0
Diagnosed food allergy	7	8	2
Vegetarian	2	2	1
Omnivore	62	62	63
Follow special/restricted diet	3	5	7

three short vignettes written in the second person, thus making the reader the story's protagonist, presented above an image depicting the narrative. Participants were instructed to "Please read the following stories and think about times when you experienced similar situations." For the Anger condition, the vignettes were: i) your internet malfunctions and technical support is unhelpful, with an accompanying image of a person yelling into the receiver of a telephone, ii) you are late for an important meeting and stuck behind a slow driver, with an accompanying image of a driver yelling and offensively gesturing at another driver, and iii) you are given the wrong meal at a drive-through but only discover the mistake once you arrive home, with an accompanying image of a person yelling, fork and knife in hand over an empty plate. For the sad condition, the vignettes were: (i) you make the difficult decision to euthanize your sick dog, with an accompanying image of a woman holding her unconscious pet, (ii) circumstances force you to break-up with the love of your life, with an accompanying image of a man walking away from a woman whose head and gaze are focused downward, and (iii) you learn that your grandmother has been diagnosed with terminal cancer and that she has only a short time to live, with an accompanying image of an elderly woman in a hospital bed tenderly holding hands with a younger person seated next to her. For the happy condition, vignettes were: (i) you earn a perfect score on an important class assignment and receive a special academic award as a result, with an accompanying image of someone marking a paper in red with an 'A+', (ii) you successfully complete an important project at work and earn a promotion, with an accompanying image of two people in business suits shaking hands, and (iii) your long-term crush reciprocates your feelings for him/her, with an accompanying image of two people holding hands walking towards a sunset. Pilot testing confirmed that all of the vignettes evoked the designated emotions.

The second part of the emotion induction manipulation consisted of a personal reflection exercise in which participants in the anger condition were instructed to "Close your eyes, and think back to a situation that made you feel REALLY REALLY ANGRY! Relive that situation now. Once you feel like you are back in that moment, in at least three sentences, describe the situation as vividly as possible (where were you?

when was this? who was involved? why did you get so angry?)." The term *angry* was replaced by *sad* or *happy* according to the condition.

### 2.3. Food stimuli

Participants were presented with images of 16 foods, each against a white background. Images were acquired from the internet. The food pictures were chosen based on a pilot test ( $N = 32$ ) that confirmed that each food image corresponded to our four categories of interest: high or low calorie, sweet or savory. The high-calorie sweet items were: chocolate cake, chocolate candies, chocolate chip cookies, vanilla ice cream. The low-calorie sweet items were: banana, fruit salad, oranges, strawberries. The high-calorie savory items were: cheeseburger, French fries, nachos, pizza. The low-calorie savory items were: chicken soup, grilled vegetables, grilled salmon, hummus. See Fig. 1 for sample images. Additional pilot testing confirmed that each image clearly depicted the food item, and that all of the foods were familiar to our participant sample.

### 2.4. Procedure

At the start of the study, participants answered two questions to assess hunger: 1. "How long ago did you have something to eat (not including gum and mints)?," response options included 'within the last 15 minutes' (= 1), 'within the last 30 minutes' (= 2), 'within the last hour' (= 3), 'within the last 1.5–3 hours' (= 4) and 'more than 3 h ago' (= 5); and 2. "How hungry do you feel right now?," with response options ranging from 'not at all hungry' (= 1) to 'extremely hungry' (= 9). The emotion induction manipulations followed.

According to their randomly assigned emotion condition, participants were first instructed to "Please read the following stories and think about times when you experienced similar situations." Participants were then presented with the second emotion induction, following which they rated how intensely they had experienced that emotion at the time of its occurrence by responding to the scale item "rate the intensity of how [angry/sad/happy] you felt *at the time of the event*." Participants also indicated how intensely they were experiencing their condition's emotion *now* (at the present time) by responding to the scale item "rate the intensity of how [angry/sad/happy] you feel now." Emotion ratings were made on 5-point scales ranging from 1 = 'very slightly or not at all' to 5 = 'extremely.'

Next, participants were shown 16 food images. Different random orders of images were generated for each participant. For each image, participants were instructed to "Please look at this picture and then answer the questions that follow." Three questions appeared under each image: 1. "How much do you want to eat a piece/take a bite of this food right now?" 2. "Do you consider this to be a high or low calorie food?" 3. "How healthy do you consider this food to be?" Each question was answered with a 9-point rating scale, where 1 was the lowest and 9 the highest score. Questions 2 and 3 served as a manipulation check.

After the food image procedure, all participants again rated their feelings of anger, sadness, and happiness, using a 5-point scale from 1 = 'very slightly or not at all' to 5 = 'extremely', and then answered a series of general eating behavior questions, and routine demographic questions from which the participant data shown in Table 1 were tabulated.



Fig. 1. Example images of food items in each food category.

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