BLAIR KIDWELL, JONATHAN HASFORD, and DAVID M. HARDESTY*

Consumers are often mindless eaters. This research provides a framework for how consumers can become more mindful of their food choices. To do so, the authors develop an ability-based training program to strengthen people's ability to focus on goal-relevant emotional information. They demonstrate not only that emotional ability (EA) is trainable and that food choices can be enhanced (Study 1) but also that EA training improves food choices beyond a nutrition knowledge training program (Study 2). In Study 3, the authors test a conceptual model and find that EA training increases goal-relevant emotional thoughts and reduces reliance on the unhealthy = tasty intuition. Both factors mediate mindful eating effects. Last, Study 4 demonstrates the long-term benefits of EA training by showing that emotionally trained people lose more weight in a three-month period than a control group and a nutrition knowledge training group. Together, these findings suggest that consumers can gain control of their food choices through the enhancement of EA. The article concludes with a discussion of implications for policy officials, health care professionals, and marketers.

Keywords: emotional intelligence, mindful eating, training, nutrition knowledge, emotional ability

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Emotional Ability Training and Mindful Eating

As obesity rates continue to rise (Ogden et al. 2012), researchers have increasingly worked to understand poor food choices. To do so, research has largely focused on the pervasiveness of consumers' associations with food, often prompted by various marketing stimuli, such as advertisements, promotions, and container size (Keller and Block 1997). For example, many food providers now include healthier options to enhance the overall attractiveness of their menu and boost sales of unhealthy items (Wilcox et al. 2009). Furthermore, marketers often use consumption cues (e.g., sampling a tasty beverage) to influence consumer preferences for other emotionally satisfying products (e.g., chocolate; Wadhwa, Shiv, and Nowlis 2008). Marketers may even use multisensory advertisements to enhance the likelihood that consumers will choose a hedonically rewarding food item (Elder and Krishna 2010). Although these studies recognize that marketing efforts can often lead consumers to choose unhealthy but emotionally satisfying foods (Chandon and Wansink 2012), limited research has explored ways that consumers can combat this "mindless eating" (Wansink 2006). Therefore, it is imperative to develop new and more effective ways to improve the quality of consumer food choices.

In this research, we develop a means for consumers to regain control of their eating habits by becoming more mindful of their emotions and the marketing environment. We draw on the concept of *emotional ability* (EA; Kidwell, Hardesty, and Childers 2008) to help consumers develop emotional skills that will improve their decision making. Specifically, Kidwell, Hardesty, and Childers (2008) find a negative relationship between low levels of EA and healthy eating, while participants higher in EA made significantly better food choices. Low-EA people are at greater risk of unhealthy eating because they are less effective at thinking about how they feel and using emotions wisely. Thus, we extend this work by examining whether increasing a person's level of EA in a short single-session intervention can significantly improve consumer food choices. Moreover, although scholars have acknowledged the possibility, we

*Blair Kidwell is Assistant Professor of Marketing, Ohio State University (e-mail: kidwell.82@osu.edu). Jonathan Hasford is Assistant Professor of Marketing, Florida International University (e-mail: jhasford@fiu.edu). David M. Hardesty is Thomas C. Simons Endowed Professor of Marketing, University of Kentucky (e-mail: david.hardesty@uky.edu). The authors thank the *JMR* review team for their guidance. They also thank Bill Bearden, Terry Childers, Rebecca Walker Reczek, and Maura Scott for their helpful feedback on previous versions of the article. The authors contributed equally to this research. Vicki Morwitz served as associate editor for this article.

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empirically examine whether consumers can learn to use emotional information more effectively after EA training. In turn, we investigate whether enhanced EA improves food choices months after the conclusion of the training.

Many health programs and policy mandates currently focus solely on increasing nutrition knowledge. Evidence of the effectiveness of these programs is mixed. While some research indicates that the posting of nutrition facts and calorie content has not been effective in improving consumer food choice (Mohr, Lichtenstein, and Janiszewski 2012), other research indicates that these postings show a 6% reduction in calorie consumption (Bollinger, Leslie, and Sorensen 2011). We suggest, however, that eating decisions are more emotional in nature. People commonly exhibit powerful emotional responses to food, such as feeling joy when considering a dessert menu or feeling guilty after consuming an unhealthy meal. Other emotions can prompt food consumption, including sadness, boredom, anxiety, and nervousness (Garg, Wansink, and Inman 2007). In addition, eating behaviors may be planned around activities that are associated with various emotions, such as celebratory dinners and social gatherings. Emotions clearly have a powerful impact on when and how much people eat and on the quality and quantity of their food choices. Here, we offer preliminary evidence that a greater focus on goal-relevant emotional thoughts can subvert underlying tendencies to engage in unhealthy but hedonically rewarding decisions. We test this theory by examining whether increasing EA can significantly improve food choices beyond nutrition knowledge training. In doing so, we provide substantive implications for public policy officials and health care professionals interested in improving the quality of consumption-related behavior. We also present a detailed EA training program that can be easily implemented.

CONSUMER EMOTIONAL ABILITY

In general, previous research has viewed emotions as information that reflects a person's assessment of how he or she feels in a current situation (Pham 1998; Schwarz and Clore 1996). People often appraise their surroundings and reflect on how they feel about it. However, it is less clear what happens after this appraisal. Do they make good decisions when they appraise emotional information? The answer likely depends on what they do with the information provided by the specific emotion. For example, consumers who try to avoid, do not attend to, or do not understand the appropriate use of emotional information will likely experience undesirable consequences. Consumers are less likely to use emotional information when they lack trust in their feelings as a source of information, often leading to a reliance on feelings without considering their diagnosticity to the ultimate goal (Avnet, Pham, and Stephen 2012). This inability to use emotional information effectively when making decisions, even though it is readily available, is maladaptive (Damasio 1994). In contrast, people who can focus on and use goal-relevant emotional information should experience favorable outcomes. These people should be better able to judge whether emotional information is germane to the decision at hand.

Consumer EA (also known as "emotional intelligence") reflects the ability to skillfully use emotional information to achieve a desired consumption outcome (Kidwell, Hardesty, and Childers 2008). It represents the ability to process emotional information effectively and use that information to accomplish a goal (Mayer and Salovey 1997). Consumer EA consists of four dimensions that allow people to recognize the meanings of emotional information and to reason and solve problems on the basis of that information (Kidwell, Hardesty, and Childers 2008; Mayer and Salovey 1997). First, the perceiving dimension of EA refers to a person's ability to be aware of and recognize various emotions. Second, facilitating EA is a person's ability to know which emotions are relevant in various consumption settings. Third, understanding EA is a person's ability to know how emotions develop, blend, and progress over time. Fourth, managing EA is a person's ability to regulate his or her own and others' emotions.

Higher EA is associated with increased performance and often predicts outcomes beyond cognitive ability. For example, Kidwell, Hardesty, and Childers (2008) find that EA can predict healthy food choices beyond nutrition knowledge. Thus, EA provides an objective assessment of emotional knowledge and plays an important role in decision making.

Can EA Be Trained?

Many programs touted as EA training are advocated without systematic empirical support and, oftentimes, with little emotional content in the training (McEnrue, Groves, and Shen 2009). Our contention that EA can be trained is rooted in early research on EA (Mayer and Salovey 1997) and recent behavioral literature (McEnrue, Groves, and Shen 2009; Peter and Brinberg 2012). Mayer and Salovey (1997) suggest that each person has a unique level of EA that is learned in childhood and develops throughout his or her life. If EA is not learned in childhood, people may lack an understanding of emotions and be unable to effectively use them later in life. For example, if a parent tends to avoid expressing feelings but then exhibits intense unhealthy emotions such as hostility, a child may misunderstand when and how emotions should be expressed. To counteract this deficiency, EA training develops the emotional skills that are essential for effective decision making.

In an initial attempt to train EA, Peter and Brinberg (2012) were able to modestly increase the EA of participants in one of the four dimensions across a six-week training period. They also assessed how the training affected the decision quality ($N = 28$), finding that though calories were reduced, the difference was nonsignificant. They also found weight loss to be nonsignificant. This work provides some encouraging initial support that EA training can increase EA, but further research is necessary to develop and test a practical and effective method of training EA that leads to improved decision making and behavior. Furthermore, we present initial evidence for how and why our training works. We also include suggested discussion topics for conducting training sessions, recommendations for how consumers can use emotions more effectively, and techniques for controlling emotions in everyday situations.

One advantage of developing an ability-based training program is that it is grounded in a body of theoretical literature that delineates how EAs are developed from cognitive processes, allowing them to be more readily learned (Mayer, Salovey, and Caruso 2004). By teaching consumers how to become more aware of their emotions, think more about how they feel, and use those feelings effectively, we can increase EA. Thus, we predict the following:

> H_1: People who complete an ability-based training program will have higher levels of EA than those in a control condition.

Can EA Training Improve Decision Quality?

While developing a theoretically grounded EA training program should be of interest to researchers and practitioners (McEnrue, Groves, and Shen 2009), the value of a new intervention lies in its ability to improve decision making and transform consumer behavior. Recent research has shown that people with higher EA (through measurement) were better able to resist the temptation of unhealthy eating (Kidwell, Hardesty, and Childers 2008). We extend this research to show that people with low EA can learn to improve their use of emotions, and in doing so, their food choices can be improved.

When EA is enhanced, people may exhibit an increase in goal-relevant emotional thoughts. We define "goal-relevant emotional thoughts" as contemplative cognitions about one's experience of emotions, which emotions are beneficial for making quality choices, and how these emotions can be incorporated into decision making to improve well-being. Goal-relevant emotional thoughts are different from attitudes in that they are less of an evaluation of an object or person and more of a progression of thinking about one's emotions. A person's emotional thoughts may begin with "what am I feeling right now?" (perceiving) and then move to "how do those emotions make me feel?" (facilitating), "how will these emotions change and evolve?" (understanding), and "how do I control how I feel?" (managing).

These emotional thoughts are incorporated into people's decision making and provide additional information to help them make a high-quality choice. For example, when confronted with a dessert menu in a restaurant, consumers may appraise how they feel. They may quickly realize the emotions (e.g., disgust, regret) associated with consuming dessert. Consumers unskilled in EA might focus on less goal-relevant feelings, such as childhood memories about mom's cookies or how a dessert is a reward. These emotional thoughts are not relevant to the goal of healthy eating and can trigger previously learned associations, stimulating consumers to focus on pleasure-seeking rewards and indulging their impulses. However, consumers skilled in EA are likely to use emotional information to regulate their desire to order unhealthy options. These consumers would likely make healthier choices by better integrating goal-relevant emotional thoughts into their decisions, such as apprehension or mild caution, allowing them to think more judiciously about what they will eat. Thus, we predict the following:

> H_2: People trained in EA will make significantly higher-quality food choices than those in a control condition.

EA Versus Cognitive Training in Food Choice

Government programs and mandates regarding nutrition are often designed to increase cognitive knowledge (of factors such as nutrition content and nutrition facts) in an effort to improve food choice. However, while nutrition facts and caloric postings are often presented to consumers in an effort to improve decision quality, the impact of this information on choice quality is mixed (Bollinger, Leslie, and Sorensen 2011; Mohr, Lichtenstein, and Janiszewski 2012). In the presence of emotional cues, people often have difficulty thinking more rationally about their choices (Evans 2008). Because cognitive information does not assist them in managing their pleasure-seeking goals (Ramanathan and Menon 2006), heuristics and simple emotional cues are likely to continue to drive behavior. However, enhanced EA can provide consumers with awareness of what they are feeling, how it makes them feel, what feels right, and how they can take control of these feelings. As a result, we suggest that increasing one's nutrition knowledge will not be as effective as EA training at improving choice. Therefore, we predict the following:

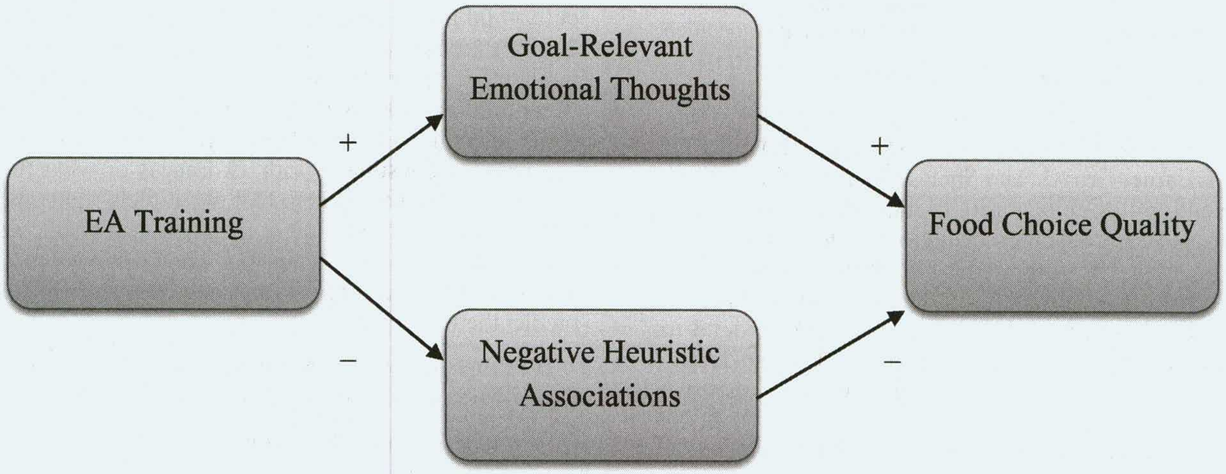
> H_3: People trained in EA will make significantly better food choices than those trained in nutrition knowledge.

Conceptual Framework for How EA Improves Food Choice

To explore why EA training improves food choice, we extend the work of Chartrand, Van Baaren, and Bargh (2006), who report that emotion can lead to either more thoughtful, deliberative thinking or less thoughtful reliance on heuristic associations. Deliberative thought is more conscious and resource driven than heuristics, which are more implicit and automatic (Chartrand, Van Baaren, and Bargh 2006). Figure 1 displays our conceptual model of EA and mindful eating.

Dual process models, such as the default-interventionist model (Evans 2008), suggest that people are guided by heuristic associations in decision making unless deliberative thought intervenes for more mindful consideration. In food choices, the default-interventionist approach posits that consumers have previously formed biases of or heuristic associations with foods that repeatedly drive their decisions. Research has identified several heuristic food associations underlying food choices, including the perceived tastiness of unhealthy food (Raghunathan, Naylor, and Hoyer 2006), plate size (Chandon and Wansink 2007), perceptions of package size (Scott et al. 2008), and the pairing of unhealthy vices with virtuous foods to increase perceived healthiness (Chernev and Gal 2010). These heuristics act as cues during decision making, and people often adhere to them because of the short-term pleasure they provide. This adherence occurs even in the presence of potentially negative long-term consequences. As a result, consumers form habits from a simple consideration of emotional cues and continually make poor food choices. However, when consumers improve their EA, they more carefully consider their emotions before making a decision. As more emotional thoughts are contemplated (relative to simple emotional cues), a more mindful consideration of food choices should occur. We suggest that through the power of EA training, consumers engage in more situationally goal-relevant emotional thoughts. If so, choice quality should improve as they reduce their reliance on heuristic associations. For example, the unhealthy = tasty intuition (Raghunathan, Naylor, and Hoyer 2006) is a bias in which people associate the unhealthiness of food with its tastiness, thereby perceiving that unhealthy foods taste better. We suggest that EA training will increase mindfulness of food choices and reduce

Figure 1
CONCEPTUAL MODEL OF EA AND MINDFUL EATING



heuristic associations such as the unhealthy = tasty intuition studied here. In summary, we predict the following:

H_{4a}: People trained in EA will have more goal-relevant emotional thoughts, and this processing will result in significantly better food choices.

H_{4b}: Goal-relevant emotional thoughts will mediate the relationship between EA training and food choice quality.

H_{5a}: People not trained in EA will be more likely to engage the unhealthy = tasty intuition, and this heuristic food processing will result in significantly worse food choices.

H_{5b}: The unhealthy = tasty intuition will mediate the relationship between EA training and food choice.

EA TRAINING METHODOLOGY

We created our EA training procedure to enhance each dimension outlined in Mayer and Salovey's (1997) ability-based conceptualization of EA. We employed a small group discussion approach (6–10 participants per session) to facilitate interactions during each session. One of two trainers educated in EA methodology led each session. Trainers were randomly assigned to conditions and sessions. Information was delivered orally to participants and supplemented with a PowerPoint slideshow presentation. The training was designed to be domain general, so that it could apply broadly to various consumer outcomes and not specifically to food choice. Throughout the training, few examples pertained to food; rather, examples focused on financial decisions, product selection, and interactions with salespeople and other consumers. We varied the examples in this manner to reduce the potential for demand effects of training participants in the domain of food and then assessing their food choices. We took other precautions to reduce demand effects, including providing filler tasks and a cover story, assessing the effects of training longitudinally, and demonstrating how actual behavior was affected (through weight loss). The training program focused on the four EAs of perceiving, facilitating, understanding, and managing emotion. The Web Appendix provides a full outline of the program.

Emotional Perceiving

Considerable evidence shows that people differ in their ability to accurately recognize emotions in facial expressions (Izard 1971). However, only a few studies have attempted to train emotional perception, such as Daus and Cage (2008), who successfully enhanced the perceiving ability of participants. We developed a lecture-based training method with several illustrations, similar to the materials used in Daus and Cage (2008). This portion of the training was intended to increase participants' awareness and recognition of various emotions. Participants began with an overview of perceiving emotion that focused on the importance of not "living *for* the moment" but rather "living *in* the moment." Living in the moment refers to being cognizant of emotions, as it is essential to take stock of how a situation makes a person feel. This was followed by a discussion of recognizing six basic emotions (happiness, sadness, fear, anger, disgust, and surprise) in facial expressions. Furthermore, participants were asked to determine which emotions were elicited from several products. For example, the cover of a video game might elicit feelings of excitement or fear with the purpose of generating interest in the product. Developing the ability to perceive emotions in people and emotions elicited by objects should increase consumers' recognition of emotions in their environment and allow them to better generate goal-relevant emotional thoughts.

Emotional Facilitation

While limited research exists on training emotions to facilitate thought, substantial evidence exists to support its development (Daus and Cage 2008; Mayer and Salovey 1997; Mayer, Salovey, and Caruso 2004). Prior research has shown that emotions influence the way people process information and make decisions (Pham 1998). Therefore, to train consumers in facilitating emotional thought, we presented an overview of facilitating emotion, followed by a discussion of which emotions were goal relevant in various consumption settings. This portion of the training was intended to increase participants' ability to incorporate and use emotions to make more effective decisions. For example, participants discussed a scenario in which they were confronted by an aggressive salesperson. A variety of responses were posed, and then participants talked through each potential response. The purpose of this exercise was to help develop a more mindful consideration of emotional information by instructing participants to think more about the long-term consequences of emotional responses and rely less on immediate affective reactions.

Emotional Understanding

Again, few training programs exist that enhance people's ability to understand emotional information (Daus and Cage 2008). Nevertheless, research has provided a strong theoretical foundation on the learning and development of emotional understanding (Mayer and Salovey 1997; Mayer, Salovey, and Caruso 2004). To train emotional understanding, we provided participants with an overview of how emotions develop, blend, and progress over time. This portion of the training was intended to increase participants' knowledge of how emotions can change across situations. Next, participants discussed how feelings combine to form more complex emotions and how people react emotionally to changes in situations. One example discussed was how emotions such as guilt and sadness can arise from overspending, which can lead to depression. Also discussed were the long-term development and consequences of emotions such as envy, anxiety, joy, and pride. Having knowledge of the complex nature of various emotions should lead to greater mindfulness of feelings and an increased usage of goal-relevant emotional thoughts during decision making.

Emotional Managing

Not surprisingly, emotion regulation has been the focus of training programs in many contexts. Most training programs, however, focus on role playing, behavioral modeling, empathic communication, and lectures on self-control (Daus and Cage 2008). Few training programs have enhanced emotional management using a theoretically grounded, ability-based technique (Mayer and Salovey 1997; Mayer, Salovey, and Caruso 2004). Therefore, to train participants in their ability to regulate their own and others' emotions, we began with an overview of managing emotion that emphasized "owning one's emotions" and discussed how this self-statement allows people to claim power over their decisions. For example, when a person says "I was angry," it is a reflective, after-the-fact statement. However, when a person says "I *am* angry," it empowers him or her to understand those powerful feelings to gain a sense of control over them. Owning emotions makes emotional outbursts and intense feelings less mysterious and frustrating. This discussion was followed by a presentation of strategies for controlling emotions to increase participants' self-control and reduce their susceptibility to impulsive reactions. These strategies included how to reduce intense emotions and more effectively express emotions that people often try to conceal. Some examples were visualizing an emotional role model who handles positive and negative life events calmly and skillfully and attempting to monitor one's breathing and physiology to remain calm in the face of impulses. These discussions provided insight into how to sustain positive feelings, overcome negative feelings, and withstand and control impulses.

In the studies that follow, we assess the effectiveness of our training program and examine whether emotionally trained participants become more mindful of their food decisions. In Study 1, we examine the effectiveness of the EA training program on snack choice. In Study 2, we compare food choices over a 24-hour period for participants trained in EA with those trained in domain-specific nutrition knowledge. In Study 3, we offer an initial assessment of the underlying process for why our training is effective. Finally, in Study 4, we examine the longitudinal effects of EA training on weight loss.

STUDY 1

The goals of Study 1 are threefold. First, we assess the effectiveness of our EA training program by demonstrating that it significantly improves the objective EA of participants. Second, we extend the work of Kidwell, Hardesty, and Childers (2008) by investigating whether heightened EA improves food choice after completion of the training. Third, to provide evidence for the progressive cascading model of EA (Joseph and Newman 2010), we compare single-dimension training of EA with training in all four dimensions. We intend to show that training in any one dimension does not fully lead to the development of the emotional skills necessary to significantly improve food choices. In support of the cascading model of EA, we suggest that the ability to perceive emotion causally precedes the ability to facilitate emotion, which in turn precedes understanding emotion and, finally, regulating emotion. This model allows created knowledge in one dimension to enhance subsequent dimensions, providing a more complete understanding of emotional information. We advocate this cascading pattern in our framework to elicit the greatest impact of our training and contend that training in all four dimensions of EA is necessary to elicit the intended benefits on decision making.

Method

Sample. We selected 170 students with low EA (based on the 50th percentile for EA scores) from a prescreening survey that included the consumer emotional intelligence scale (CEIS; Kidwell, Hardesty, and Childers 2008) because these people are most at risk of poor food choices. We randomly assigned participants to one of six (28 in EA training, 28 in perceiving emotion training, 26 in facilitating emotion training, 27 in understanding emotion training, 29 in managing emotion training, and 32 in the control) between-subjects conditions.

Procedure. Study 1 took place in the behavioral lab at Ohio State University. Upon arrival at the lab, participants were seated around a conference table in a large room in groups of 6 to 10. In the EA training condition, participants completed a 45-minute session, outlined in the Web Appendix. Participants in the single-dimension training received the introduction on EA (see the Web Appendix) followed by a definition of EA and training on the specified dimension. Each single-dimension training session lasted approximately 20 minutes (10 minutes for introducing EA and 10 minutes for specific dimension-level training). Although the overall EA training was longer than the single-dimension training sessions, each of the single dimensions received more individualized time and focus in the sessions to provide a more equivalent comparison across conditions.

We included single-dimension training sessions to assess whether improvement across the totality of all emotional skills is necessary to improve decision making. We also included them to rule out alternative explanations that diminish the comprehensive benefits of EA training, including that EA training is similar to the development of emotional awareness (associated with higher perceiving EA) or self-control (associated with higher managing EA). All training sessions began with a cover story about the purpose of the lab session. Participants were told that they would take part in a training session designed to improve their decision making. Participants in the control condition received no training.

After completing the training, participants responded to measures evaluating the effectiveness of the training session. On five-point scales, they reported whether the information in the EA training was equally as informative (M = 4.57, SD = .97) and clear (M = 4.75, SD = .58) as the emotional perceiving training (informative and clear: Ms = 4.35 and 4.58, SDs = 1.12 and .78, respectively), the emotional facilitating training (Ms = 4.27 and 4.58, SDs = 1.03 and .54), the emotional understanding training (Ms = 4.30 and 4.52, SDs = .93 and .58), and the emotional managing training (Ms = 4.36 and 4.57, SDs = .84 and .74; all comparison *p*s > .05). Note that participants rated the training sessions as relatively high on both informativeness and clarity.

Next, participants in all conditions completed the CEIS, which we again collected to assess changes across conditions in EA as a result of EA training. To reduce the potential for demand effects, participants then completed a series of tasks for an unrelated study for approximately 20 minutes. After this, they completed a gender item and a self-report measure of their activity level ("Please provide your typical activity level"; 1 = "very sedentary," and 5 = "very active"). Last, participants were told that they would receive a snack of their choice in appreciation of their participation. Participants could choose either a granola bar (healthy option) or a candy bar (unhealthy option). Granola bars were either oatmeal raisin or chocolate chip, and candy bars were Hershey's or Reese's. Snack choice was the focal outcome of the study. After selecting a snack, participants were given their choice and thanked.

Results

Training effectiveness. To ensure that each training session improved the associated dimension(s) of EA, we conducted a series of analyses of variance (ANOVAs) to compare the EA dimension scores of participants in the various conditions (using normalized CEIS scores with a mean of 100 and a standard deviation of 15; Kidwell, Hardesty, and Childers 2008). Table 1 summarizes the results. For the perceiving dimension, the condition variable predicted differences in perceiving EA scores (F(5, 164) = 9.54, $p < .01$). Planned contrasts revealed a more significant improvement in perceiving EA scores for participants trained in perceiving EA than for participants in the other dimension trainings and the control condition (contrast value = 11.53, SE = 2.87; t(137) = 4.02, $p < .01$). Furthermore, a paired-samples t-test revealed that the perceiving EA of trained participants (M = 106.7, SD = 10.1) significantly increased relative to their scores before training (M = 96.1, SD = 12.1; t(27) = 3.66, $p < .01$). For the facilitating dimension, the condition variable predicted differences in facilitating EA scores (F(5, 164) = 8.67, $p < .01$). Planned contrasts revealed a more significant improvement in facilitating EA scores for participants trained in facilitating EA than for participants in the other dimension trainings and the control condition (contrast value = 13.20, SE = 3.05; t(137) = 4.33, $p < .01$). Furthermore, the facilitating EA of trained participants (M = 110.4, SD = 12.8) significantly increased relative to their scores before training (M = 95.0, SD = 12.8; t(25) = 5.49, $p < .01$). For the understanding dimension, the condition variable predicted differences in understanding EA scores (F(5, 164) = 7.83, $p < .01$). Planned contrasts revealed a more significant improvement in understanding EA scores for participants trained in understanding EA than for participants in the other dimension trainings and the control condition (contrast value = 10.20, SE = 2.89; t(137) = 3.53, $p < .01$). Furthermore, the understanding EA of trained participants (M = 107.2, SD = 7.9) significantly increased relative to their scores before training (M = 94.2, SD = 15.7; t(26) = 4.73, $p < .01$). Last, for the managing dimension, the condition variable predicted differences in managing EA scores (F(5, 164) = 2.52, $p < .05$). Planned contrasts revealed a more significant improvement in managing EA scores for participants trained in managing EA than for participants in the other dimension trainings and the control condition (contrast value = 7.27, SE = 2.87; t(137) = 2.54, $p < .05$). Furthermore, the managing EA of trained participants (M = 104.6, SD = 18.0) significantly increased relative to their scores before training (M = 92.3, SD = 2.9; t(28) = 3.56, $p < .01$). Together, these results suggest that each dimension training of EA effectively increased the associated dimension, providing initial support for H_1.

To ensure that overall EA was enhanced for participants who completed the full EA training, we conducted an ANOVA. The condition variable predicted differences in overall EA scores (F(5, 164) = 6.43, $p < .01$). Planned contrasts revealed a more significant improvement in overall EA scores for participants who completed the full EA training than for participants in all other conditions (contrast value = 13.49, SE = 2.78; t(164) = 4.85, $p < .01$). Furthermore, a paired t-test revealed that the EA of participants in the EA training condition significantly improved after training (M = 111.6 vs. 89.2, SD = 6.8; t(27) = 8.44, $p < .01$). This finding suggests that objective EA can be systematically increased through training, in further support of H_1.

Snack choice. We conducted a logistic regression to examine the impact of training condition on choice, controlling for gender and activity level. The results by gender and activity level are available in the Web Appendix. The model significantly predicted the selection of the healthy option (the granola bar; Nagelkerke $R^2 = .194$, $p < .01$). The results revealed that consumers trained in EA (M = 75%) selected the healthy option more frequently than those in the control condition (M = 34.4%; $\beta_{exp} = 9.57$, $p < .01$). Consumers trained only in emotional perceiving (M = 46.4%; $\beta_{exp} = 1.63$, $p > .05$), emotional facilitating (M = 53.9%; $\beta_{exp} = 2.76$, $p > .05$), emotional understanding (M = 40.7%; $\beta_{exp} = 1.36$, $p > .05$), and emotional managing (M = 44.8%; $\beta_{exp} = 1.59$, $p > .05$) were not significantly more likely to select the healthy option than those in the control condition. These

Table 1

STUDY 1 RESULTS

	n	*Perceiving CEIS Score*	*Facilitating CEIS Score*	*Understanding CEIS Score*	*Managing CEIS Score*	*Overall CEIS Score*	*Healthy Option (%)*
EA training	28	110.3[a,c,d,e] (10.3)	111.8[a,b,d,e] (10.9)	111.4[a,b,c,e] (9.9)	104.5[a] (14.7)	111.6[a,b,c,d,e] (11.9)	75[a,b,d,e] (8.18)
Emotional perceiving training	28	106.7[a,c,d,e] (10.1)	99.2 (15.6)	96 (16.5)	98.2 (14.2)	98.2 (14.5)	46.4 (9.42)
Emotional facilitating training	26	93.1 (15.2)	110.4[a,b,d,e] (12.8)	93.2 (13.1)	98.6 (12.2)	97.6 (13.5)	53.9 (9.78)
Emotional understanding training	27	97 (14.3)	97.4 (15.8)	107.2[a,b,c,e] (7.9)	98.1 (13.0)	99.3 (14.5)	40.7 (9.45)
Emotional managing training	29	90.6 (13.2)	98.9 (10.6)	100.5 (15.9)	104.6[a] (17.9)	102.6[a] (13.9)	44.8 (9.23)
Control	32	99.7 (14.7)	93.2 (14.6)	98.2 (12.2)	94.3 (10.3)	92.9 (12.4)	34.4 (8.40)

[a]$p < .05$ relative to the control condition.
[b]$p < .05$ relative to the perceiving training condition.
[c]$p < .05$ relative to the facilitating training condition.
[d]$p < .05$ relative to the understanding training condition.
[e]$p < .05$ relative to the managing training condition.
Notes: All CEIS scores are normalized with a mean of 100 and a standard deviation of 15 for ease of interpretation. Standard deviations are in parentheses.

results provide support for H_2 and are consistent with the cascading model of EA. Training in all four dimensions is necessary to enhance food choice.

Discussion

Study 1 demonstrates that people can be trained in EA, leading to improved decision making. This study also demonstrates that training all aspects of EA improves decision making more than training a single dimension and that increasing emotional awareness (associated with higher perceiving EA) or self-control (associated with higher managing EA) alone is insufficient to improve food choice. To enhance the policy implications of our findings, in Study 2 we compare the food choices of people trained in EA with those of people trained in nutrition knowledge.

STUDY 2

Although Study 1 effectively demonstrates how training EA can lead to increased EA and subsequently improved food choice, some shortcomings exist. First, proponents of cognitive knowledge might suggest that training in nutrition knowledge should similarly improve decision making. Many government programs in nutrition currently aim to develop consumers' cognitive knowledge, so EA training should be compared with a nutrition knowledge program of similar duration. Second, the proximity of the decision task to the training could be taken as a potential demand effect because participants are asked to make a food selection not long after the completion of the training, even with ample filler tasks and a disguised snack choice. However, if participants are provided a more in-depth cover story, in which they believe that they are participating in a different survey by a local restaurant interested in college students' eating habits two days after training, demand effects should be substantially reduced. If EA training is beneficial to decision making beyond cognitive knowledge, participants trained in EA should select better food choices after training, as reported in a food diary.

Thus, the goals of Study 2 were threefold. First, we assess whether our EA training program is externally valid by showing improved consumer food choices across a 24-hour period two days after completion of the training session. Second, we test whether consumers trained in EA make better food choices than those receiving nutrition knowledge training that follows current government standards and mandates. Third, we alleviate concerns about demand effects related to our training program. As we noted previously, EA training is domain general, while the nutrition knowledge training is domain specific and focuses on food choice. Furthermore, we made every attempt to eliminate any cues, during training or otherwise, that could have led participants to report healthier choices for reasons other than the training itself. We wanted people trained in EA to think about their feelings in more effective ways so that these new emotional skills would translate into better food choices. If demand effects were to occur, they would likely be the result of training participants specifically in nutrition knowledge and then asking them to report their food choices. Thus, if we can demonstrate significantly higher-quality food choices in the EA training than in the nutrition knowledge training, we will have further evidence that EA training is having the desired impact.

Method

Sample. We recruited 74 students with low EA (based on the 50th percentile for EA scores) from a prescreening survey that included the CEIS (Kidwell, Hardesty, and Childers 2008). Participants were given course credit and offered the chance to win cash prizes in a drawing by completing the EA training, nutrition knowledge training, or a control session. We randomly assigned participants to one of three (25 in EA training, 24 in nutrition knowledge training, and 25 in the control) between-subjects conditions.

Procedure. Upon arrival at the behavioral lab at University of Kentucky, participants were seated around a large conference table. We designed each session as either a training condition or a control condition. In the training conditions, we randomly assigned participants for training in either nutrition knowledge or EA. All training sessions took approximately 45 minutes. Training sessions began with a cover story about the purpose of the lab session. Participants were told that they would take part in a training session intended to improve their decision-making abilities. The EA training sessions were identical to the overall EA training from Study 1.

Nutrition knowledge training. Nutrition knowledge training (see the Web Appendix) consisted of a discussion about the importance of thinking about making good decisions, followed by strategies for making healthy food choices and assessing factual information on calorie content and health guidelines. Sessions began with a discussion of the factors that have led to the increase of obesity. Then, participants were provided an overview of how to use nutrition knowledge when evaluating foods, planning a healthy diet, and deciding which foods to eat. A review and discussion of the U.S. Department of Agriculture (USDA) guidelines for healthy eating was provided, with special emphasis on foods that college students typically eat. Each session concluded with a decision-making exercise designed to help participants practice applying cognitive knowledge in decision making. Material was delivered in a similar manner to the EA training group (through a PowerPoint presentation). For example, typical food choices of college students were presented, and participants discussed how to evaluate available nutrition information and plan to make healthier choices. Feedback regarding food selection and healthy food choices was also provided by the trainer and through discussion. Three independent trainers conducted nutrition knowledge sessions with groups of 6 to 10 students. We carefully designed the sessions to be identical to the EA training session.

After completing the training, on five-point scales (5 = "informative and clear"), participants reported that the information in both the EA training ($M = 4.08$, $SD = .51$) and the nutrition knowledge training ($M = 3.90$, $SD = .64$) was equally informative ($t(43) = 1.05$, $p > .05$). They also reported that the information was presented clearly in both the EA training ($M = 4.61$, $SD = .49$) and the nutrition knowledge training ($M = 4.41$, $SD = .50$; $t(43) = 1.35$, $p > .05$).

Control condition. We assessed a control condition along with the EA and nutrition knowledge training sessions. We recruited participants with low EA from the same pool used previously. This control condition was identical to the training sessions but did not receive training. Its purpose was to establish a baseline of food choices among the selected demographic.

Next, participants in all conditions completed the CEIS. Directly afterward, participants were given a filler task associated with an unrelated study that took approximately 20 minutes. We included this filler task to reduce the potential for demand effects. Then, participants were told that the study had ended but that they would take part in a new study sponsored by a local restaurant to help develop its menu. Specifically, they were told that the restaurant was about to open and was interested in knowing what types of foods students eat on an average day. To do so, they were asked to keep a record of all the food and drink they consumed in a 24-hour period two days after completing the session in a food diary. To standardize the amount of food reported, we asked participants to list the serving sizes of the foods they consumed. Independent coders used online resources to estimate the calories in each serving. At the end of the food diary, participants completed the gender and activity-level items from Study 1.

Measures. After participants returned their food diaries, we computed total calories using quantities cross-referenced from nutritional guides (e.g., www.calorieking.com). We averaged caloric totals based on USDA guidelines across coders to form the dependent measure. Independent coders unaware of the purpose of the study demonstrated high reliability for caloric totals (r = .82, $p < .01$). Inconsistencies were resolved by discussion between the two coders. Food choices resulted in a mean caloric intake of 2,244 calories.

In addition to total calories, we assessed a dichotomous dependent variable that accounted for a healthy range of calories. It could be argued that people who eat too little are also making unhealthy food choices. Thus, we used calorie ranges to assess the healthiness of choices. We took the calorie ranges for men (2,000–3,000) and women (1,600–2,400) suggested by the DASH guidelines (published by the USDA) as healthy. For the dichotomous values, 1 represented a healthy range of calories, and 0 represented an unhealthy range. Furthermore, to examine how the quality of food choices varied between groups, two independent coders rated the healthiness of foods reported in the food diary. Specifically, our goal was to assess whether participants who ate fewer calories in the EA training condition did so by eating more healthy foods than those in the nutrition training and control conditions. Overall healthiness ratings were coded from 1 ("very unhealthy") to 10 ("very healthy"). We classified fruits, vegetables, whole grains, and lean meats as healthy foods and processed or deep-fried foods (e.g., fries, potato chips), commercially baked goods (e.g., donuts, cookies), fatty meats (e.g., sausages, hot dogs), and canned and refined goods (e.g., canned raviolis, frozen dinners) as unhealthy foods. Together, the coders computed an overall healthiness rating based on the combination and quantity of healthy and unhealthy foods reported. The independent coders were reliable in their healthiness ratings (r = .71, $p < .01$), and inconsistencies were resolved by discussion. Last, the coders divided the number of unhealthy foods eaten by the total number of foods listed to compute a percentage of unhealthy foods eaten. Unhealthy foods were those that scored from 1 to 5 on the overall healthiness scale.

Results

Of the 49 participants who completed the training sessions, 4 did not return their food diaries. These participants did not differ in their EA after training from those who returned their food diaries. Therefore, we included 70 participants (23 in EA training, 22 in nutrition knowledge training, and 25 in the control) in the data analysis. We collected information on all participants' age and gender in our prescreening survey. No differences existed in the age (EA training: M = 21.56; nutrition knowledge training: M = 20.68; control: M = 20.84; $F(2, 69) = 1.54, p > .20$) or gender (EA training = 39.1% female, nutrition knowledge training = 31.8% female, control = 48% female; $\chi^2 = 1.29$, $p > .50$) across conditions in our study. Table 2 summarizes the results. First, we examined changes in EA by condition. The results demonstrate significantly improved EA for the group trained in EA (M = 109.8, SD = 9.6 vs. M = 92.5, SD = 9.7; $t(22) = 6.95, p < .01$). No significant change in EA occurred for the nutrition knowledge group (M = 88.0, SD = 13.5 vs. M = 91.4, SD = 11.2; $t(21) = -1.09, p > .05$) or the control condition (M = 96.1, SD = 10.5 vs. M = 98.4, SD = 15.1; $t(24) = -.63, p > .05$). Furthermore, participants trained in EA had significantly higher EA than those in the control condition (M = 96.1, SD = 10.5; $t(46) = 4.71, p < .05$). No significant change in EA occurred in the control condition (M = 98.4, SD = 15.1; $t(24) = -.63, p > .05$). These findings provide support for H_1. More important, EA training significantly influenced the quality of food choices (i.e., fewer calories consumed). A one-way ANOVA revealed a significant effect of condition on caloric intake ($F(2, 65) = 5.50, p < .01$) when controlling for gender and activity level. The results by gender and activity level are available in the Web Appendix. The EA-trained participants consumed fewer calories (M = 1,846, SD = 579) than participants trained in nutrition knowledge (M = 2,277, SD = 809; $t(43) = -2.07, p < .05$) and those in the control group (M =

Table 2

STUDY 2 RESULTS

	Total Calories	*Healthy Eating Range*	*Healthiness Ratings*	*Unhealthy Foods Selected*
EA training	1,846[a,b] (579)	52.2%[a] (10.42)	7.59[a,b] (1.33)	32.1%[a,b] (9.73)
Nutrition knowledge training	2,277 (809)	36.4% (10.26)	5.70[a] (1.72)	53.2% (10.64)
Control	2,498 (914)	16% (7.33)	4.58 (1.50)	57.1% (9.90)

[a]$p < .05$ relative to the control condition.
[b]$p < .05$ relative to the nutrition knowledge condition.
Notes: Standard deviations are in parentheses.

2,498, SD = 914; $t(46) = -2.92, p < .01$), in support of H_2 and H_3. Although those trained in nutrition knowledge had lower calories reported, the nutrition knowledge training and control conditions did not significantly differ ($t(45) = -.87, p > .05$).

Furthermore, we compared healthy ranges of calories across the EA training, nutrition knowledge training, and control conditions. The model significantly predicted eating within the healthy range of calories (Nagelkerke $R^2 = .138, p < .05$). The results revealed that consumers trained in EA (M = 52.2%) were more likely to eat within the healthy range of calories than consumers in the control condition (M = 16%; $\beta_{exp} = 5.72, p = .01$). Consumers who completed nutrition training (M = 36.4%) were not significantly more likely to select the healthy option than those in the control condition ($\beta_{exp} = 3.00, p > .10$). The results revealed a significant difference in healthy eating across groups ($\chi^2 = 7.02, p < .05$); participants trained in EA (52.2%) were more likely to eat within the healthy range of calories than those trained in nutrition knowledge (36.4%) and those in the control group (16%). Next, we examined differences in healthiness ratings across conditions. A one-way ANOVA revealed a significant effect of condition on healthiness ratings ($F(2, 67) = 23.76, p < .01$). Specifically, participants in the emotional training condition exhibited significantly higher healthiness ratings (M = 7.59, SD = 1.33) than those in the nutrition knowledge condition (M = 5.70, SD = 1.72; $t(43) = 4.13, p < .01$) and the control group (M = 4.58, SD = 1.50; $t(46) = 7.33, p < .01$). Those in the nutrition knowledge condition also had significantly higher healthiness ratings than those in the control condition ($t(45) = 2.39, p < .05$). Last, we examined the percentage of unhealthy foods selected across conditions. A one-way ANOVA revealed a significant effect of condition on the percentage of unhealthy foods selected ($F(2, 67) = 15.07, p < .01$). Specifically, participants in the emotional training condition selected a smaller percentage of unhealthy foods (M = 32.1%) than those in the nutrition knowledge condition (M = 53.2%, $p < .01$) and the control group (M = 57.1%, $p < .01$). The total number of foods consumed was not significant across conditions (all *p*s > .05). These results again provide support for H_2 and H_3.

Discussion

Study 2 further demonstrates the impact of EA training on food choice. The results indicate that our domain-general EA training significantly improved consumer food choice compared with a domain-specific nutrition knowledge training program and a control condition. Participants consumed fewer calories and selected healthier foods after EA training. Furthermore, these choices occurred over a 24-hour period two days after participants had left the training session, thus attenuating concerns about potential demand effects in Study 1.

STUDY 3

We designed Study 3 to test our conceptual model to provide initial process evidence for EA and mindful eating displayed in Figure 1. Specifically, we examine differences in how consumers think about their emotions. People with higher EA are likely to have more goal-relevant emotional thoughts before making a food decision and, thus, to make healthier snack choices (H_{4a}). Furthermore, they are less likely to rely on the unhealthy = tasty intuition as a pervasive food association (H_{5a}). Increased goal-relevant emotional thoughts (H_{4b}) and decreased reliance on the unhealthy = tasty intuition (H_{5b}) should mediate the relationship between EA training and food choice.

The goals of Study 3 are twofold. First, we want to replicate our finding that increased EA leads to enhanced food decision making. Second, we explore whether increased goal-relevant emotional thoughts and reduced reliance on the unhealthy = tasty intuition underlie the relationship between higher EA and enhanced decision quality.

Method

Seventy undergraduate students with low EA (based on the 50th percentile for EA scores) participated in this study for course credit. We randomly assigned participants to a two-factor (36 in EA training, and 34 in the control condition), between-subjects design.

The procedures were similar to Study 1 for both the EA training and control conditions. We conducted the study in the behavioral lab at University of Kentucky to better understand the underlying process of EA training and to control for any potential self-reporting issues related to food diaries. Upon arrival at the lab, participants in the EA training condition completed the EA training as described previously. Participants in the control condition did not receive the EA training. Both conditions then completed the CEIS, followed by a series of filler tasks associated with an unrelated study to reduce the potential for demand effects.

Next, participants completed the focal measures of the study, beginning with the snack choice from Study 1. After selecting a snack, participants completed a thought-listing task in which they listed their thoughts when selecting a snack. The number of goal-relevant emotional thoughts (e.g., "I thought about how the snack would make me feel," "Choosing a granola bar would make me feel healthy") were coded and used to capture emotional thinking. Two independent coders were reliable in coding the number of goal-relevant emotional thoughts ($r = .64, p < .01$). The number of goal-relevant cognitive thoughts (e.g., "I thought about the calories of each snack," "Granola bars have less fat") was also coded to examine whether EA training also affects cognitive thought. The coders were again reliable in coding the number of goal-relevant cognitive thoughts ($r = .68, p < .01$). Then, participants completed an implicit association test (Greenwald, McGhee, and Schwartz 1998). For this test, we used the materials and procedures of Raghunathan, Naylor, and Hoyer (2006) to assess the unhealthy = tasty intuition. This procedure represents a measure of heuristic associations with and simple emotional reactions to food choices. We calculated respondent D scores and used them as the measure of heuristic food association. Then, participants completed the gender and activity-level items from the previous studies. Last, participants were thanked and given their snack choice.

Results

To ensure that the manipulation effectively increased EA, we compared differences in the CEIS across groups. Participants in the EA training manipulation received significantly higher CEIS scores (M = 109.7, SD = 11.6) than those who did not (M = 92.6, SD = 12.0; t(68) = 6.05, $p < .01$). Furthermore, a paired t-test revealed that the EA of participants in the EA training condition significantly improved after training (M = 109.7 vs. 89.2, SD = 7.1; t(35) = 8.55, $p < .01$). These findings provide additional support for H_1.

First, we examined differences in snack choice. We conducted a logistic regression to examine the impact of training on choice, controlling for gender and activity level. (The results by gender and activity level are available in the Web Appendix.) The model significantly predicted selection of the healthy option (the granola bar; Nagelkerke $R^2 = .170$, $p < .01$). The results revealed that consumers trained in EA (M = 63.9%) selected the healthy option more frequently than consumers in the control condition (M = 35.3%; $\beta_{exp} = 3.93$, $p < .05$), in further support of H_2.

Second, we examined differences in emotional and cognitive thoughts from the snack choice task. As we expected, participants trained in EA had significantly more goal-relevant thoughts about their feelings (M = 1.93, SD = 1.32) during the snack choice task than participants in the control condition (M = 1.31, SD = .86; t(68) = 2.32, $p < .05$). This result provides initial support for H_{4a}. Furthermore, no differences emerged in the number of goal-relevant cognitive thoughts between participants in the EA training (M = .82, SD = .56) and participants in the control condition (M = .93, SD = .91; t(68) = –.60, $p > .05$).

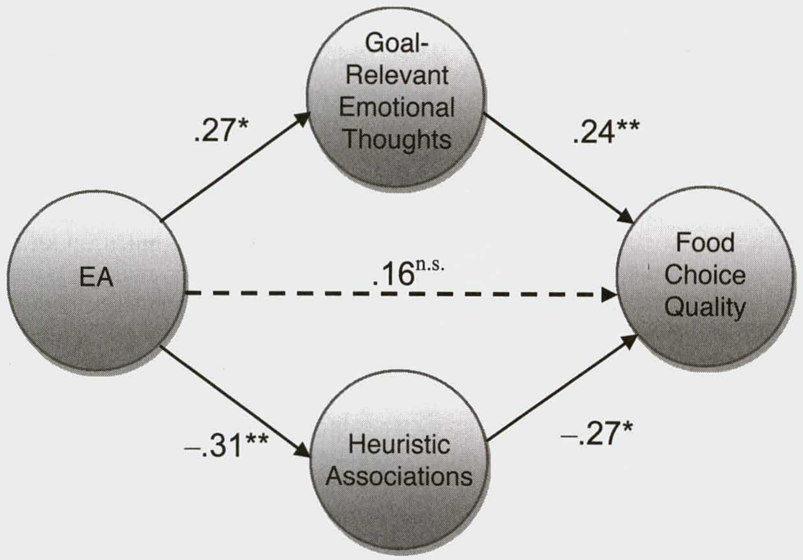
In addition, we examined differences in response latencies to the unhealthy = tasty intuition to determine whether training affects the heuristic association with the perceived tastiness of unhealthy foods (Raghunathan, Naylor, and Hoyer 2006). Consumers trained in EA were significantly slower (M = 825 milliseconds, SD = 277 milliseconds) in responding to unhealthy stimuli as tasty than consumers in the control condition (M = 711 milliseconds, SD = 182 milliseconds; t(68) = 2.02, $p < .05$). This finding suggests that EA training was effective at increasing control over the persuasive impact of the unhealthy = tasty intuition in food choice and provides initial support for H_{5a}. No differences emerged between consumers trained in EA (M = 719 milliseconds, SD = 147 milliseconds) and consumers in the control condition (M = 767 milliseconds, SD = 148 milliseconds; t(68) = 1.37, $p > .05$) in responding to healthy stimuli as tasty.

Last, to test the conceptual model of EA and improved food choice, we adopted a structural equation modeling approach using AMOS. We assessed EA on goal-relevant emotional thinking and the unhealthy = tasty intuition (see Figure 2). The path model provided good model fit ($\chi^2 = 1.80$, $p > .05$; goodness-of-fit index = .99; root mean square error of approximation = .06). The EA training was positively related to goal-relevant emotional thoughts (β =.27, t = 2.33, $p < .05$), in support of H_{4a}, and negatively related to the unhealthy = tasty intuition (as captured by the D statistic; β = –.31, t = –2.85, $p < .01$), in support of H_{5a}. Furthermore, goal-relevant emotional thinking was positively related to selecting a healthy snack (β = .24, t = 2.18, $p < .05$), in further support of H_{4a}, and the unhealthy = tasty intuition was negatively related to snack choice (β = –.27, t = –2.37, $p < .05$), in further support of H_{5a}. The direct effect of EA training on snack choice was nonsignificant when goal-relevant emotional thinking and the unhealthy = tasty intuition were present =2in the model (β = .16, t = 1.33, $p > .05$). This finding suggests that goal-relevant emotional thoughts and the unhealthy = tasty intuition mediate the relationship between EA training and snack choice, in support of H_{4b} and H_{5b}.

Discussion

Study 3 provides preliminary evidence for how EA improves food choice. People trained in EA exhibited

Figure 2
PATH MODEL FOR STUDY 3



*p < .05.
**p < .01.
n.s.Represents the nonsignificant direct effect when including the mediators.

more goal-relevant emotional thoughts and relied less on the unhealthy = tasty intuition. These factors subsequently led to improved snack choice. In Study 4, we expand on the substantive implications associated with EA training for policy makers by investigating potential improvements in weight loss across time after completion of EA training.

STUDY 4

Studies 1–3 demonstrate that EA training improves food choices and suggest that this is due to the increased use of goal-relevant emotions and less reliance on the unhealthy = tasty intuition. However, the lasting impact of these training effects remains unclear. Thus, we examined food choices three months after the training. In addition, we assessed whether the training effects influenced actual behavior using objective measurements of weight before and after EA training. If participants were to lose weight in the EA training condition and not in the control condition, we would have compelling evidence that our EA training had the desired impact on consumer choices. Furthermore, we compared the EA training condition with a nutrition knowledge training condition to examine how the EA training can improve weight-loss efforts beyond a greater knowledge of nutrition.

Method

We recruited 106 undergraduate students with low EA (based on the 50th percentile for EA scores) to participate in this study for course credit. We randomly assigned participants to one of three (EA training, nutrition knowledge training, and the control) between-subjects conditions.

The procedures were similar to the previous studies for all conditions, except that we obtained individual measurements. When participants arrived at the behavioral lab at Ohio State University, we assessed their weights using a standard bathroom digital scale. We then randomly assigned participants to the EA training, nutrition knowledge training, or control condition. Those in the EA and nutrition knowledge conditions received training, while the control condition participants received no training. All three conditions then took part in filler tasks for an unrelated study. At the conclusion of the lab session, participants were thanked and dismissed.

Approximately three months later, participants returned to the lab. Participants first were weighed again and then completed the CEIS, followed by a series of filler tasks for an unrelated study. They were then thanked and dismissed.

Results

To ensure that the benefits of EA training persisted over time, we computed changes in EA scores across the three-month period and analyzed them across conditions. A one-way ANOVA revealed a significant effect of condition on change in EA ($F(2, 103) = 8.70, p < .01$). Table 3 displays the results. The change in normalized CEIS scores over time was significantly greater for EA-trained participants ($M = 13.02$, $SD = 21.1$) than for participants trained in nutrition knowledge ($M = -.73$, $SD = 16.2$; $t(79) = 3.28, p < .01$) and the control condition ($M = -4.33$, $SD = 17.4$; $t(64) = 3.44, p < .01$). These findings provide additional support for H_1 and suggest that the benefits of EA training are robust.

Table 3
STUDY 4 RESULTS

	EA Change (Based on Normed CEIS Scores)	*Weight Change (Pounds)*
EA training	13.02* (21.1)	−1.89* (5.08)
Nutrition knowledge training	−.73 (16.2)	.39 (5.05)
Control	−4.33 (17.4)	2.61 (4.71)

*$p < .05$ relative to the control condition.
Notes: Standard deviations are in parentheses.

A one-way ANOVA revealed a significant effect of condition on weight change ($F(2, 103) = 6.49, p < .01$). After three months, participants in the EA training condition lost significantly more weight ($M = -1.89$ lbs., $SD = 5.08$) than participants in the nutrition knowledge training condition ($M = .39$ lbs., $SD = 5.05$; $t(79) = 2.03, p < .05$) and the control condition ($M = 2.61$ lbs., $SD = 4.71$; $t(64) = 3.59, p < .05$). Furthermore, the results of a one-sample t-test comparing the EA training condition with no weight loss (0 lbs.) showed that participants who completed EA training actually lost a significant amount of weight over the three-month period ($t(40) = -2.38, p < .05$). These results provide support for H_2.

Discussion

Study 4 indicates that the effects of EA training are robust over time. The trained participants had improved EA and lost significantly more weight approximately three months after the training. Importantly, the effects on weight loss elicit greater confidence in our findings and provide strong evidence that demand effects were not at play. Overall, these findings provide further support for the effectiveness of EA training.

GENERAL DISCUSSION

This research provides a framework for how consumers can make better food choices through EA training and overcome mindless eating tendencies (Wansink 2006). In Study 1, we developed a training program to increase the EA of consumers with low ability. The results reveal that the training program increased EA on each of its dimensions as well as overall. Importantly, only the overall training was sufficient in improving consumers' snack choice, in support of a cascading model of emotional intelligence (Joseph and Newman 2010). In Study 2, we compared this program with a domain-specific nutrition knowledge training program, with participants making significantly healthier food choices in the 24-hour period after EA training. Furthermore, to minimize potential experimental demand concerns, we demonstrated that a *domain-general* training of EA outperformed a *domain-specific* training of nutrition knowledge. Study 3 tested the conceptual model of EA training and mindful eating. Initial process evidence shows that consumers trained in EA exhibit more goal-relevant emotional thoughts and rely less on the unhealthy = tasty intuition. Although this preliminary evidence lends support to our proposed model, further research is necessary to more thoroughly delineate how and why EA enhances food choices. Study 4 demonstrates the longitudinal impact of EA training on overall health and well-being. We found that people lost more weight three months after EA training than those in the nutrition knowledge training group and control group. Thus, EA training can provide an effective means to change people's actual eating behavior. In addition, the longitudinal nature and demonstration of behavioral change further minimizes concerns with experimental demand.

Theoretical Implications

We develop a conceptual model of EA training and mindful eating to show that EA helps consumers be more mindful of their food choices. Specifically, we show that consumers trained in EA think more about their emotions and rely less on the unhealthy = tasty intuition, which ultimately enhances mindfulness of food choices. These findings extend recent research that suggests that food choice is often a result of heuristic associations. For example, Scott et al. (2008) find that restrained eaters consume greater amounts of food from small packages than unrestrained eaters. This package size heuristic causes restrained eaters to perceive food as healthier and thus leads to overconsumption. However, we suggest that EA training increases mindfulness and, in doing so, helps consumers overcome negative heuristic food associations.

Furthermore, we demonstrate that our nutrition knowledge training, though often advocated as a way to improve food choice, was not as effective as EA training in reducing caloric intake. A caveat here is that we only compared our EA training with our nutrition knowledge training. Although we consulted dietitians and nutrition experts to develop our cognitive training, we urge researchers to examine how our nutrition knowledge training compares with other types of cognitive interventions and persuasive efforts. Nevertheless, because cognitive knowledge does not help people manage their pleasure-seeking goals (Ramanathan and Menon 2006), simple food associations are likely to continue to drive behavior unless people learn to think more deliberatively about their emotions.

Policy and Health Care Implications

In this research, we demonstrate that consumer EA can be enhanced through a 45-minute training session. We provide evidence that our training not only affects food choices made soon after the training but also persists three months later. Furthermore, our EA training program helped improve food choice beyond the effects of an equivalent 45-minute nutrition knowledge training. Efforts to increase nutrition knowledge, such as providing calorie content on restaurant menus, are prevalent. However, because food choices are often highly emotion laden and eating decisions are often heuristic in nature, training consumers' EA is more likely to improve decision making. Trained consumers are better able to recognize, understand, use, and manage impulsive feelings in consumption settings. In turn, they are able to engage in more goal-relevant emotional thoughts and avoid relying on negative heuristic associations. Overcoming these biases is difficult, but we show that it is possible through EA training.

After EA training, consumers made healthier food choices. Specifically, not only did trained consumers eat fewer calories on average, but they also selected healthier foods to eat. Although it is plausible that emotionally trained consumers might merely reduce the quantity of food they eat or limit their portion sizes, they actually do something even more important: they eat more healthfully. We demonstrated that consumers improved the quality of their food choices in a 24-hour period by eating more fruits, vegetables, whole grains, and leaner meats while minimizing fats, oils, sweets, processed and refined foods, and commercially baked goods. In Study 4, trained consumers lost weight three months after training, indicating the robustness of EA training on food choice.

We believe that training EA is more effective than other interventions because it is a holistic approach to a healthy lifestyle. That is, EA training focuses on changing the way people think about and use their emotions in general. This is powerful because it enables people to begin making a series of smarter, better-informed, and healthier choices. They may reduce or even eliminate many of the goal-irrelevant emotions in their lives that lead to stress, complacency, or self-doubt. With a better understanding of how they feel and how to use emotions to make better decisions, people will not only eat better but also likely be happier and healthier because they relate better to others and are more concerned with their overall well-being.

Marketer Outreach Initiatives

Training implementation. While the development of a 45-minute EA training method is important to show potential success in improving food choice, it is also necessary to provide a realistic means for health care professionals and dietitians to implement this method in practice. Thus, we suggest that practitioners should continue to provide nutrition information but also set aside 45 minutes to emphasize the importance of thinking about emotions. First, practitioners could discuss how their patients can live in the moment by recognizing how they feel in the presence of unhealthy foods. Second, they could discuss how to appraise those emotions by thinking about how these foods make them feel and which emotions are most goal relevant for healthy eating. Third, they could discuss how to understand these emotions by thinking about what feels right and how pervasive negative feelings can perpetuate unhealthy decisions. Fourth, they could discuss how their patients can gain control over their emotions by using emotional regulation strategies, such as counting to three or thinking about an emotional role model. With these four steps, consumers will be better able to use their emotions effectively, to maintain a healthier lifestyle and improve well-being.

Promotional campaigns. While our 45-minute sessions led to significant improvements in food choice, other modalities of EA training also might help consumers become mindful of their emotions. For example, advertising campaigns that provide more incremental changes in EA may similarly improve food choice. These ads would slowly but methodically raise people's mindfulness of goal-relevant emotions while decreasing the reliance on heuristic food associations. This incremental advertising approach may prove a useful alternative to a single 45-minute training session. In addition, this approach would have a broader reach, for example, by targeting specific television shows viewed by vulnerable high-risk groups, such as obese, low-income, or less educated people who are disproportionately likely to eat unhealthy foods.

Marketers could also use aspects of the training in their promotional appeals. For example, healthier brands could emphasize how hedonically rewarding decisions of unhealthy brands can change over time, leaving consumers emotionally distressed and unsatisfied. By helping consumers develop an understanding of emotions, marketers could also position these products as emotionally satisfying in the short run while remaining sustainable over time. Such appeals might not only enhance consumers' ability to consider goal-relevant emotional thoughts but also subvert unhealthy food choices by persuading them to become more mindful of their food choices.

Future Research Directions

Further validation of EA training. Although our studies provide support for our EA training program, additional tests are necessary to further validate our findings. For example, in Study 1, a limitation of our comparison of single dimensions with the overall EA training is the differences in the time allotted to each training method. To provide further support for the effectiveness of our training, research could examine how each individual dimension compares with the overall EA training while holding time spent training single versus overall conditions constant. In addition, research could more fully assess the cascading model—for example, by comparing EA training in perceiving and facilitating with training in perceiving and any other dimension (Joseph and Newman 2010). Furthermore, the focus of our research was caloric intake; further research could consider fat intake as well.

Another limitation of our studies is the limited sample sizes collected for the training. Although we found that our EA training was effective with the employed sample sizes, such training would be somewhat expensive to administer on a large scale. Thus, it may not be necessarily comparable to programs such as mandatory calorie postings that reach more people and can be implemented at a lower cost. Further research could compare the costs and benefits of a large-scale EA training program with these less expensive programs.

Underlying processes associated with enhanced EA. We introduce a conceptual model of EA training and food choice, but additional research could generalize the effects of EA training in domains such as financial planning and health care. Careful attention should also be paid to examining why EA improves decision making. Although we provide preliminary evidence that thinking about goal-relevant emotions can benefit food choices, research could examine other cognitive factors than knowledge (e.g., attitudes, beliefs, perceptions of social pressure, self-efficacy, social context) that can influence food choices.

EA training and resource depletion. Additional research is necessary to assess how EA training might help consumers implement control strategies that arm them against temptation in situations in which executive control is hampered, such as in states of hunger, fatigue, stress, or time pressure. It would also be useful to examine whether this regulatory form of executive control can raise the threshold when self-control resources are impoverished through prior task performance (Vohs and Heatherton 2000).

Dietary restraint and EA training. Prior research has identified dietary restraint as a critical factor affecting food consumption (Bublitz, Peracchio, and Block 2010; Scott et al. 2008). Ironically, restraints on food consumption often lead to more consumption. Given that affective forces often have an impact on dietary restraint and subsequent consumption (Bublitz, Peracchio, and Block 2010), the interaction between dietary restraint and EA training warrants consideration. For example, for consumers with both high dietary restraints and high EA, would their emotional skills outweigh their negative feelings from trying to control their food intake?

Consumer well-being and transformative research. As Calder, Philips, and Tybout (1981) advocate, theory-based interventions provide a sound basis for translating theoretical explanations into change programs. Prior studies have investigated pledges and incentives to encourage healthier eating (Raju, Rajagopal, and Gilbride 2010). Our training program suggests that consumer educational programs should reconsider their current emphasis on communicating factual information, such as nutrition labels, and instead stimulate experience-based learning that incorporates EA. Our EA training provides such a program, offering a means for consumers to gain control of their unhealthy eating habits by processing less heuristically and becoming more mindful of their emotions and food choices.

REFERENCES

Avnet, Tamar, Michel Tuan Pham, and Andrew T. Stephen (2012), "Consumers' Trust in Feelings as Information," *Journal of Consumer Research*, 39 (4), 720–35.

Bollinger, Bryan, Phillip Leslie, and Alan Sorensen (2011), "Calorie Posting in Chain Restaurants," *American Economic Journal: Economic Policy*, 3 (1), 91–128.

Bublitz, Melissa G., Laura A. Peracchio, and Lauren G. Block (2010), "Why Did I Eat That? Perspectives on Food Decision Making and Dietary Restraint," *Journal of Consumer Psychology*, 20 (2), 239–58.

Calder, Bobby J., Lynn W. Philips, and Alice M. Tybout (1981), "Designing Research for Application," *Journal of Consumer Research*, 8 (September), 197–207.

Chandon, Pierre and Brian Wansink (2007), "The Biasing Health Halos of Fast-Food Restaurant Health Claims: Lower Calorie Estimates and Higher Side-Dish Consumption Intentions," *Journal of Consumer Research*, 34 (October), 301–314.

——— and ——— (2012), "Does Food Marketing Need to Make Us Fat? A Review and Solutions," *Nutrition Reviews*, 70 (10), 571–93.

Chartrand, Tanya L., Rick B. van Baaren, and John A. Bargh (2006), "Linking Automatic Evaluation to Mood and Information Processing Style: Consequences for Experienced Affect, Impression Formation, and Stereotyping," *Journal of Experimental Psychology: General*, 135 (1), 70–77.

Chernev, Alexander and David Gal (2010), "Categorization Effects in Value Judgments: Averaging Bias in Evaluating Combinations of Vices and Virtues," *Journal of Marketing Research*, 47 (August), 738–47.

Damasio, Antonio R. (1994), *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: Grosset/Putnam.

Daus, Catherine S. and Tiffani Cage (2008), "Learning to Face Emotional Intelligence: Training and Workplace Applications," in *Research Companion to Emotion in Organizations*, Cary L. Cooper and Neal M. Ashkanasy, eds. Cheltenham, UK: Edward Elgar Publishing, 245–62.

Elder, Ryan S. and Aradhna Krishna (2010), "The Effects of Advertising Copy on Sensory Thoughts and Perceived Taste," *Journal of Consumer Research*, 36 (5), 748–56.

Evans, Jonathan St. B.T. (2008), "Dual-Processing Accounts of Reasoning, Judgment, and Social Cognition," *Annual Review of Psychology*, 59 (1), 255–78.

Garg, Nitika, Brian Wansink, and J. Jeffrey Inman (2007), "The Influence of Incidental Affect on Consumers' Food Intake," *Journal of Marketing*, 71 (January), 194–206.

Greenwald, Anthony G., Debbie E. McGhee, and Jordan L.K. Schwartz (1998), "Measuring Individual Differences in Implicit Cognition: The Implicit Association Test," *Journal of Personality and Social Psychology*, 74 (6), 1464–80.

Izard, Carroll E. (1971), *The Face of Emotion*. New York: Appleton-Century-Crofts.

Joseph, Dana L. and Daniel A. Newman (2010), "Emotional Intelligence: An Integrative Meta-Analysis and Cascading Model," *Journal of Applied Psychology*, 95 (January), 54–63.

Keller, Punam Anand and Lauren G. Block (1997), "Vividness Effects: A Resource-Matching Perspective," *Journal of Consumer Research*, 24 (December), 295–304.

Kidwell, Blair, David M. Hardesty, and Terry L. Childers (2008), "Consumer Emotional Intelligence: Conceptualization, Measurement, and the Prediction of Consumer Decision Making," *Journal of Consumer Research*, 35 (June), 154–66.

Mayer, John D. and Peter Salovey (1997), "What Is Emotional Intelligence?" in *Emotional Development and Emotional Intelligence: Implications for Educators*, Peter Salovey and David Slusher, eds. New York: Basic Books, 3–31.

———, ———, and David R. Caruso (2004), "Emotional Intelligence: Theory, Findings, and Implications," *Psychology Inquiry*, 15 (3), 197–215.

McEnrue, Mary Pat, Kevin S. Groves, and Winny Shen (2009), "Emotional Intelligence Development: Learning Individual Characteristics," *Journal of Management Development*, 28 (2), 150–74.

Mohr, Gina S., Donald R. Lichtenstein, and Chris Janiszewski (2012), "The Effect of Marketer-Suggested Serving Size on Consumer Responses: The Unintended Consequences of Consumer Attention to Calorie Information," *Journal of Marketing*, 76 (January), 59–75.

Ogden, Cynthia L., Margaret D. Carroll, Brian K. Kit, and Katherine M. Flegal (2012), "Prevalence of Obesity and Trends in Body Mass Index Among U.S. Children and Adolescents, 1999–2010," *Journal of the American Medical Association*, 307 (5), 483–90.

Peter, Paula C. and David Brinberg (2012), "Learning Emotional Intelligence: An Exploratory Study in the Domain of Health," *Journal of Applied Social Psychology*, 42 (6), 1394–1414.

Pham, Michel Tuan (1998), "Representativeness, Relevance, and the Use of Feelings in Decision Making," *Journal of Consumer Research*, 25 (September), 144–59.

Raghunathan, Rajagopal, Rebecca Walker Naylor, and Wayne D. Hoyer (2006), "The Unhealthy = Tasty Intuition and Its Effects on Taste Inferences, Enjoyment, and Choice of Food Products," *Journal of Marketing*, 70 (October), 1–6.

Raju, Sekar, Priyali Rajagopal, and Timothy J. Gilbride (2010), "Marketing Healthful Eating to Children: The Effects of Incentives, Pledges, and Competition," *Journal of Marketing*, 74 (May), 93–106.

Ramanathan, Suresh and Geeta Menon (2006), "Time-Varying Effects of Chronic Hedonic Goals on Impulsive Behavior," *Journal of Marketing Research*, 43 (November), 628–41.

Schwarz, Norbert and Gerald L. Clore (1996), "Feelings and Phenomenal Experiences," in *Social Psychology: A Handbook of Basic Principles*, E. Troy Higgins and Arie W. Kruglanski, eds. New York: Guilford Press, 433–65.

Scott, Maura L., Stephen Nowlis, Naomi Mandel, and Andrea Morales (2008), "The Effects of Reduced Food Size and Package Size on the Consumption Behavior of Restrained and Unrestrained Eaters," *Journal of Consumer Research*, 35 (October), 391–405.

Vohs, Kathleen D. and Todd F. Heatherton (2000), "Self-Regulatory Failure: A Resource Depletion Approach," *Psychological Science*, 11 (3), 249–54.

Wadhwa, Monica, Baba Shiv, and Stephen M. Nowlis (2008), "A Bite to Whet the Reward Appetite: The Influence of Sampling on Reward-Seeking Behaviors," *Journal of Marketing Research*, 45 (August), 403–413.

Wansink, Brian (2006), *Mindless Eating: Why We Eat More Than We Think*. New York: Bantam-Dell.

Wilcox, Keith, Beth Vallen, Lauren Block, and Gavan J. Fitzsimons (2009), "Vicarious Goal Fulfillment: When the Mere Presence of a Healthy Option Leads to an Ironically Indulgent Decision," *Journal of Consumer Research*, 36 (3), 380–93.