A Sweet Romance: Divergent Effects of Romantic Stimuli on the Consumption of Sweets

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Drawing from research on food consumption, conceptual metaphors, and assimilation and contrast, we examine how exposure to romantic stimuli (e.g., watching a romantic ad, reading a romantic note) affects consumers' subsequent consumption of sweets. Across five studies, we find that romantic stimuli exposure increases sweet food consumption among abstract thinkers but reduces sweet food intake among concrete thinkers. We also identify the moderating role of metaphor content on this finding such that the effects of romantic exposure on the consumption of sweets occur only when the metaphoric association between love and sweetness is highlighted but dissipate when a competing metaphor is accentuated.

Keywords: food consumption, conceptual metaphors, assimilation and contrast, romantic exposure, construal level, contextual influence

It is no secret that American consumers have a predilection for sweet foods. The US Department of Agriculture (USDA) recently declared that the average American consumes as much as 156 pounds of sugar, amounting to 31 five-pound bags of sugar per person, each year (Brownlee 2011). That means, on average, American consumers gulp down 22.2 teaspoons (or 355 calories) of sugar per day, standing in stark contrast to the three to nine teaspoons of sugar intake recommended by the American Heart Association (2015). Given the redoubtable social and health consequences of sugar overconsumption, it is crucial to understand when consumers fall prey to or resist the temptation of sweet foods.

Recent research on food consumption has shed light on when and why consumers overindulge in food, acknowledging that a plethora of physiological, psychological, and social factors may be at play (Bublitz, Peracchio, and Block 2010; Pham 2014). In particular, researchers have established that certain contextual cues such as loudness of the background music (McElrea and Standing 1992), harshness of the ambient light (Stroebele and de Castro 2004), and exposure to a negative stereotype (an overweight person; Campbell and Mohr 2011) may nudge consumers into making diverging food decisions or induce them to consume different amounts of food. Understanding these contextual variables may engender insights that help

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consumers avoid eating traps by recognizing and correcting consumption triggers that contribute to the obesity epidemic (Pham 2014).

Joining this important stream of research, this article examines a seemingly unrelated contextual cue in food consumption: exposure to romantic stimuli (e.g., watching a romantic ad, reading a romantic note). Furthermore, unlike most food research, our work focuses on delineating a particular taste (sweet) because conceivably factors facilitating consumption of sweet foods may not necessarily coincide with those triggering consumption of foods featuring other tastes (e.g., salty). Hence, focusing on the unique contributors to sweet food consumption enables us to gain precise insights into its antecedents and mechanism and to develop accurate discernment that leads to more effective interventions on the overconsumption of sweets.

Garnering insights from research on food consumption influences (Pham 2014), conceptual metaphors (Zhang and Li 2012), and assimilation and contrast (Bless and Schwarz 2010), we predict that through the metaphoric association between love and sweetness, exposure to romantic stimuli may increase or decrease consumers' likelihood of choosing sweet foods. Specifically, exposure to romantic stimuli prompts thoughts about sweetness and subsequently increases the propensity to choose a sweeter food option (an assimilation effect) among abstract-thinking consumers, who are less likely to differentiate between psychological sweetness (induced by romantic stimuli) and physiological sweetness (induced by sweet foods). By contrast, exposure to romantic stimuli reduces thoughts about sweet foods and subsequently lowers the likelihood of choosing a sweeter food option (a contrast effect) among concrete-thinking consumers, who tend to distinguish different types of sweetness. We also examine a boundary condition for the above effects and find that the influence of romantic stimuli exposure on sweet food choices prevails when consumers form a metaphoric association between love and sweetness, but dissipates when a competing metaphor (e.g., love is blind) leads them to connect love with a sense other than taste (e.g., vision).

We contribute to consumer behavior literature on food consumption, conceptual metaphors, and assimilation and contrast effects in the following ways. First, we add to research that examines the influence of contextual cues on food consumption by establishing romantic stimuli exposure as an antecedent, and by documenting when and how it affects the consumption of sweets. Second, contributing to work on conceptual metaphors, which has largely documented metaphor-consistent influences of metaphoric activation, we establish that both assimilation (metaphor-consistent) and contrast (metaphor-inconsistent) consequences of metaphoric activation on consumer behavior may occur. In the context of sweet food consumption, psychological sweetness induced by romantic stimuli may further enhance or inhibit the accessibility of physiological sweetness, resulting in increased (assimilation) or reduced (contrast) subsequent tendency to choose sweet foods. Third, we also contribute to research on assimilation and contrast—which has recorded the effects of a variety of contextual variables on people's judgment and decision making, ranging from semantic activations (Martin 1986) to mood (Schwarz and Clore 1983) and to embodied sensations (Meyers-Levy, Zhu, and Jiang 2010)—by establishing metaphoric activation as a context.

For the remainder of the article, we first review pertinent literature on conceptual metaphors and assimilation and contrast effects. Then, we articulate our theoretical framework delineating how romantic exposure increases or decreases subsequent sweet food choice propensity. Next, we present five studies lending support to our hypotheses. Finally, we discuss the contributions of our research findings.

THEORETICAL BACKGROUND

Conceptual Metaphors and Spreading Activation

Research on conceptual metaphors proposes that people sometimes resort to metaphorical thinking and recruit knowledge from a seemingly unrelated conceptual domain (source domain) to construe variegated social phenomena (target domain; Lakoff and Johnson 1980; Landau, Meier, and Keefer 2010). A conceptual metaphor consists of a set of mappings between the constituent elements of the corresponding target and source concepts. In particular, consumers' vernacular abounds in metaphoric expressions linking a perceptual state to a social concept. Consider the metaphoric expression at the core of our thesis—love is sweet—which connects people's perceptual knowledge about sweet taste with the social experience of love. Indeed, the conceptual metaphor between romantic love and sweetness has long found its way into our daily language and rituals, is prevalent in advertising themes, and is deeply engrained in our culture. For example, people address their romantic partners as "honey" or "sweetheart," and lovers customarily exchange candies on Valentine's Day. Food advertising for sweets often uses emotionally charged words and themes designed to evoke romantic thoughts of pleasure and indulgence. Here we investigate how these common associations may influence food choice and consumption.

Conceptual metaphors not only pervade people's daily language, but also influence their thinking and behavior. Work on conceptual metaphors has offered considerable insights into how consumer judgments and decisions can be influenced by experiences undertaken in seemingly unrelated domains (Landau et al. 2010; Zhang and Li 2012). For example, Jostmann, Lakens, and Schubert (2009) show that, grounded in the metaphorical connection between the importance of a subject matter (a social

concept) and physical weight (perception), respondents holding a heavy (vs. light) clipboard when completing a survey considered the survey topic more important. Williams and Bargh (2008a) demonstrate that, through the conceptual link between physical warmth and friendliness, respondents holding a cup of hot (vs. cold) coffee judged a target person friendlier. Sundar and Noseworthy (2014) find that, through the metaphorical association between power and height, consumers evaluated a powerful brand more favorably when its logo was located high on the product package. Similarly, Meier et al. (2012) evince that, based on the conceptual metaphor between people's friendliness and the gustatory taste of sweet, respondents tended to judge people with a sweet tooth to be friendlier.

Recent research suggests that spreading activation in people's associative network can play a pivotal role in explaining the effects of conceptual metaphors (Landau et al. 2010; Zhang and Li 2012). Landau et al. (2010) posit that conceptual metaphors build mental associations or mapping between two conceptual domains (e.g., a perceptual state and a social phenomenon). When a particular consumer experience renders a conceptual domain salient, its activation also spreads through the conceptual metaphor to instigate the corresponding concept in a seemingly unrelated domain. For example, to account for why consumers holding heavy objects consider the subject matter they are contemplating more important, Zhang and Li (2012) posit that changes in perceptual systems (e.g., holding a heavy shopping bag) activate the corresponding concept of weight in the associative network. Because people do not always discern the source of this activation, whether it is elicited psychologically (by the importance of a subject matter) or physically (by a heavy shopping bag), they end up perceiving the subject matter as more important.

These insights suggest that exposure to romantic stimuli may influence consumers' subsequent sweet food decisions. Triggered by the metaphorical connection between romantic love and sweetness, exposure to romantic stimuli renders the concept of sweetness accessible in consumers' associative network. Although extant literature on conceptual metaphors mostly finds metaphor-consistent effects on subsequent judgment and decision making, evidence for metaphor-inconsistent influences also exists. For example, Hong and Sun (2012) document that through the metaphorical association between romance and warmth, low temperatures increase consumers' preference for romance movies. Accordingly, through the lens of the assimilation and contrast effects that will be reviewed next, we propose that the sweetness concept induced by romantic exposure serves as a context for subsequent sweet food decisions and that opposing effects of this activation may be observed; that is, the activated psychological sweetness can either enhance or inhibit the accessibility of physiological sweetness, leading to increased or reduced tendency to choose sweet foods. We further posit that the direction of this influence depends on consumers' construal level of the sweetness concept.

Assimilation and Contrast Effects of Romantic Exposure

As denoted by a large body of consumer psychology literature, consumer judgments, decisions, and behavior are circumstantially bounded and influenced by the context in which they are rendered (Bless and Schwarz 2010). Food decisions are no exception. Our research revolves around a particular context that may potentially affect consumer decisions on sweet food consumption: the romantic stimuli consumers are exposed to (e.g., a romantic-themed ad, a romantic note) and the sweetness concept activated psychologically through the metaphorical association between romantic love and sweetness.

Past research on assimilation and contrast suggests that contextual influences can systematically alter target judgments and related behavior in opposite directions. An assimilation effect typically occurs when the boundary between the target and its context is ambiguous, undefined, or permeable (Bless and Schwarz 2010; Dijksterhuis, Spears, and Lépinasse 2001; Herr, Sherman, and Fazio 1983; Kim and Meyers-Levy 2008; LeBoeuf and Estes 2004). Accordingly, irrelevant contextual influence is often incorporated into the judgments of the target, resulting in judgments and behavior consistent with the activated contextual information. On the other hand, a contrast effect may take place when the boundary between the target and its context is explicit, unambiguous, or impenetrable (Bless and Schwarz 2010; Dijksterhuis et al. 2001; Herr et al. 1983; Kim and Meyers-Levy 2008; LeBoeuf and Estes 2004). Because of the augmented discernibility of the target from its context, the contextual information is often removed from target judgment, resulting in evaluations or behavior opposite to the activated contextual information. Notably, research evidence suggests that this contrasting process in many situations occurs without consumer awareness or consciousness (Martin, Seta, and Crelia 1990).

Building on this line of research, we posit that the sweetness concept activated psychologically through the metaphorical association between love and sweetness after romantic exposure serves as a context for subsequent food decisions involving physiological sweetness (target decision), engendering either an assimilation or a contrast effect on the consumption of sweets. Specifically, when the boundary between psychological sweetness (context) and physiological sweetness (target) is ambiguous and permeable, an assimilation effect results such that romantic stimuli exposure and the ensuing psychological sweetness increase the accessibility of the physiological sweetness concept and also consumers' subsequent propensity to consume sweet foods. On the other hand, when the boundary between psychological and physiological sweetness is

defined and unambiguous, and thus the difference between the two is discernable, a contrast effect emerges such that romantic stimuli exposure and the ensuing psychological sweetness inhibit the accessibility of the physiological sweetness concept and hence reduce subsequent consumption of sweets.

In this research, we posit that consumers' mental construal of the concept of sweetness determines whether consumers are likely to discern psychological and physiological sweetness and hence whether romantic exposure engenders an assimilation or a contrast effect on subsequent sweet food consumption. Construal level, or the level of abstraction with which consumers represent an object or event, has been acknowledged to play a pivotal role in decision and judgment making (Trope, Liberman, and Wakslak 2007). Higher-level construals comprise generic, schematic, decontextualized representations of the object or event that are abstracted from the available information. In contrast, lower-level construals consist of aspects about the object or event that are more concrete, specific, and contextualized.

We propose abstract- versus concrete-thinking consumers construe the concept of sweetness differently. Consumers with higher-level construals (abstract thinkers) focus on the gist of the concept of sweetness rather than its incidental and contextualized features, and thus they are less likely to differentiate between psychological sweetness induced by romantic stimuli (context) and physiological sweetness involved in sweet food decisions (target), resulting in an amorphous boundary between the two. As a result, exposure to romantic love not only activates the concept of psychological sweetness, but also renders the concept of physiological sweetness more accessible. This conjecture is consistent with Zhang and Li (2012), who assert that when consumers do not differentiate the sources of an activated concept, a consumer experience activating the concept in one domain could heighten the accessibility of a metaphorically linked concept in a seemingly different domain.

Because exposure to romantic stimuli likely heightens the accessibility of psychological sweetness among consumers with an abstract mindset, an assimilation effect is predicted in a subsequent decision involving physiological sweetness such that exposure to romantic stimuli tends to increase the propensity to choose sweet foods. Evidence in line with our prediction can be found in prior research, which has documented that consumers assuming a distant psychological perspective (a distant, broad viewpoint or a far-future orientation) tend to focus on general categories rather than establishing a defined boundary between the context and target, and consequently the assimilation effect is likely observed in their judgments (Förster, Liberman, and Kuschel 2008; Hansen, Kutzner, and Wänke 2013; Huntsinger 2014; Nussinson et al. 2010). Given the well-established link between increased psychological distance and abstract, higher-level construals (Trope and Liberman 2010), these findings support our proposition that among abstract-thinking consumers, exposure to romantic stimuli and the ensuing activation of psychological sweetness are likely to engender an assimilation effect on subsequent sweet food decisions.

On the other hand, consumers with lower-level construals (concrete thinkers) assume a local perspective and focus on incidental and contextualized features of sweetness. Thus, they are more likely to consider the differences between psychological and physiological sweetness, resulting in a more defined, less ambiguous boundary between the two types of sweetness. As concrete-thinking consumers construe psychological sweetness and physiological sweetness as distinct, the activated psychological sweetness (due to exposure to romantic stimuli) is likely accompanied by inhibited accessibility of physiological sweetness. This prediction is consistent with the literature, which suggests that two distinct concepts associated with the same category may compete with each other for accessibility, and that increasing the accessibility of one concept may lower the accessibility of the other (Alba and Chattopadhyay 1986; Moskowitz 2005), leading to a contrast effect in judgments involving the inhibited concept (Newman and Uleman 1990). Research on conceptual metaphors has also demonstrated activation and inhibition effects involving metaphor-related concepts (Glucksberg, Newsome, and Goldvarg 2001; Landau et al. 2010). Specifically, processing a metaphor (e.g., "my lawyer is a shark") tends to activate concepts in the associated domain that are considered directly related to the metaphor (aggressiveness), but inhibit associated concepts that are deemed irrelevant to the metaphor (ability to swim). Accordingly, because concrete-thinking consumers experience suppressed activation of physiological sweetness, a contrast effect is likely observed in an ensuing sweet food decision such that these concrete-thinking consumers have a lower propensity to choose sweet foods. This prediction is also supported by the extant literature showing that a close psychological distance (a proximal, detailed perspective, or a near-future temporal orientation) leads consumers to focus on specific instances rather than general categories, engendering a contrast effect (Förster et al. 2008; Huntsinger 2014; Nussinson et al. 2010).

STUDY 1

The primary goal of study 1 is to investigate how construal level and exposure to romantic stimuli influence the consumption of sweet foods. Specifically, we anticipate that an assimilation effect of romantic exposure will occur for abstract thinkers such that these respondents are more likely to crave sweet foods after exposure to a romantic stimulus (vs. a nonromantic stimulus). Conversely, a

contrast effect of romantic exposure should take place when respondents are primed to think concretely, such that these respondents are less likely to crave sweet foods when exposed to a romantic stimulus (vs. a nonromantic stimulus). In addition to sweet food consumption, this study also examines how romantic exposure affects consumers' food choices of other tastes (i.e., salty, sour, bitter, and spicy). We anticipate that, through the metaphorical connection between love and sweetness, romantic exposure influences only sweet food consumption, not desire for other taste categories.

Design, Participants, and Procedure

One hundred undergraduate students participated in a 2 (exposure: romantic vs. nonromantic stimuli) × 2 (construal level: abstract vs. concrete) between-subjects ANOVA design in exchange for course credit. Upon arrival, respondents were told that the marketing survey contained several unrelated parts. They were then exposed to the romantic stimuli manipulation. Specifically, respondents were told that a local greeting card company was soliciting college students' feedback regarding the lines they plan to incorporate into their greeting cards.

In the romantic stimuli exposure condition, respondents went through a list of 10 quotes that were highly romantic. Examples included: "If kisses were snowflakes, I'd send you a blizzard"; "You remind me of a library book, because I always want to check you out." In the nonromantic stimuli condition, respondents went through a list of 10 quotes that bore no relevance to romance. Examples included: "Pleasure in the job puts perfection in the work"; "Education begins a gentleman, conversation completes him." After reading these quotes, respondents were asked to provide their opinions of the quotes that they had just read using seven-point Likert scales (e.g., "these quotes are excellent"). Embedded among these questions was a manipulation-check measure of the romantic exposure manipulation ("these quotes are romantic"). Please see the web appendix for the quotes used.

We then followed an existing procedure to manipulate construal level, wherein respondents were asked to examine a city map (Förster et al. 2008; Friedman et al. 2003). In the abstract-thinking condition, respondents were told to look at the map as a whole so that they could answer questions about the overall shape of the city. In the concrete-thinking condition, respondents were asked to examine the details of the map so that they could answer questions about these details. After spending time examining the map per the instructions, respondents completed manipulation-check measures of the construal level manipulation using four seven-point Likert scales (e.g., "I focused on the overall shape/the details of the map," $\alpha = .61$; measures were averaged to form a construal-level index, with higher scores indicating abstract processing).

After that, respondents indicated their intentions of consuming a variety of food items using seven-point scales (1 = not at all; 7 = very much). Following an empirical precedent (Meier et al. 2012), five foods per taste category were selected, resulting in a total of 25 food items. To reduce the order effect, taste categories and the food items in each food category were randomly presented. An average score was calculated for the sweet food category and for the other nonsweet food categories (sweet items: sugar, strawberry, raisins, chocolate cake, and ripe pear, $\alpha = .66$; bitter items: bitter melon, black coffee, cottage cheese, grapefruit, and rye bread, $\alpha = .57$; salty items: saltine crackers, salty peanuts, salt, beef jerky, and bacon, $\alpha = .69$; spicy items: cayenne peppers, horseradish, spicy sausage, peppers, and jalapeno peppers, $\alpha = .84$; and sour items: limes, lemons, lemon drops, sour cream, and vinegar, $\alpha = .80$). Next, as a precaution, we measured involvement as a confound check, using two seven-point Likert scales ("I was involved in the survey" and "I was motivated to do the survey"; $r = .52$, $p < .001$). Finally, respondents answered a few demographic questions and were thanked and debriefed.

Results

Manipulation Checks. To provide evidence for the romantic exposure manipulation, a two-way ANOVA involving the independent variables (romantic exposure and construal level) was performed on respondents' perceived romantic level of the quotes they read. The results revealed only a main effect of romantic exposure such that respondents reading through the romantic quotes reported the quotes to be more romantic than those reviewing the nonromantic quotes ($M_{\text{romantic quotes}} = 4.24$ vs. $M_{\text{nonromantic quotes}} = 2.37$, $F(1, 96) = 47.50$, $p < .001$; $\eta_p^2 = .33$). No other main effect or interaction effect was significant ($ps > .1$). The same two-way ANOVA was also performed on the manipulation check of construal level, the results of which showed only a main effect of construal level such that respondents assigned to the abstract condition reported that they attended to the city map at a more abstract, general level rather than at a concrete, detailed level ($M_{\text{abstract}} = 4.79$ vs. $M_{\text{concrete}} = 4.38$, $F(1, 96) = 3.84$, $p = .05$; $\eta_p^2 = .04$). No other main effect or interaction effect was significant ($ps > .1$). Thus, our analyses suggest that our two manipulations—romantic exposure and construal level—were successful. We also performed the same ANOVA on respondents' involvement as a confound check, and the results showed that our manipulations did not affect involvement ($ps > .1$).

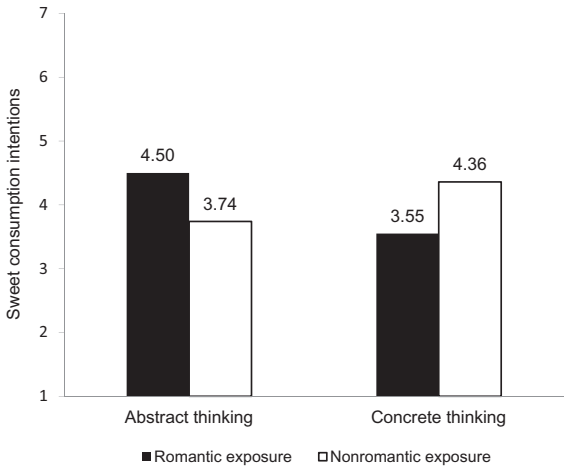
Food Consumption Intentions in Different Taste Categories. We conducted 2 (exposure: romantic vs. nonromantic stimuli) × 2 (construal level: abstract vs. concrete) × 2 (taste: sweet vs. nonsweet) mixed ANOVA on

respondents' intentions to consume foods, with the first two factors as between-subjects factors and the third factor as a within-subjects factor. The results showed an interaction of exposure and construal level ($F(1, 96) = 6.33$, $p = .01$, $\eta_p^2 = .06$). More important, the expected three-way interaction of romantic exposure, construal level, and taste was significant ($F(1, 96) = 5.95$, $p = .02$, $\eta_p^2 = .06$). To explore this interaction further, we conducted separate analyses for sweet and nonsweet foods. As we expected, the two-way interaction of romantic exposure and construal level turned out to be significant only for the sweet foods ($F(1, 96) = 9.11$, $p < .01$, $\eta_p^2 = .09$), but not for the nonsweet foods ($p > .10$).

Follow-up contrast analyses revealed support for our predictions (please see figure 1). Specifically, when respondents were primed to think abstractly, they showed higher intentions to consume sweet foods after reading through romantic quotes, compared to quotes with no romantic relevance ($M_{romantic} = 4.50$ vs. $M_{nonromantic} = 3.74$; $F(1, 96) = 4.25$, $p = .04$, $\eta_p^2 = .04$). Conversely, respondents primed to think concretely reported lower intentions of sweet food consumption when reading through romantic quotes, compared with quotes to no romantic relevance ($M_{romantic} = 3.55$ vs. $M_{nonromantic} = 4.36$; $F(1, 96) = 4.86$, $p = .03$, $\eta_p^2 = .05$).

FIGURE 1

STUDY 1: SWEET CONSUMPTION INTENTIONS AS A FUNCTION OF CONSTRUAL LEVEL AND ROMANTIC EXPOSURE



Discussion

The findings of study 1 showed support for our theorizing using food consumption intentions as a dependent variable. We observed an assimilation effect of romantic exposure for abstract thinkers such that these respondents indicated higher sweet consumption intentions after reading romantic (vs. nonromantic) quotes; we also identified a contrast effect of romantic exposure for concrete thinkers such that these respondents showed lower sweet consumption intentions after encountering romantic stimuli. Importantly, we demonstrated that our manipulations influenced only respondents' tendency to consume sweet foods, not nonsweet foods.

STUDY 2

The primary goal of study 2 is to replicate the findings of study 1 with a different operationalization of construal level. We posit that consumers' relationship status (whether consumers are currently involved in a romantic relationship) determines their construal of romantic love and the ensuing psychological sweetness. In particular, for romantically uninvolved consumers, their perceptions of romantic love and the ensuing psychological sweetness (i.e., the context of subsequent sweet food decisions) are likely to be construed at a more abstract, higher level, because these perceptions are based mostly on distant romantic experiences, such as other people's romantic experiences or their own romantic experiences in the past. In other words, their perceptions are construed at a greater psychological distance (remote social or temporal distance) and are more generic and abstract. Based on our theorizing, an assimilation effect is likely to emerge among romantically uninvolved consumers, who should be more likely to choose sweet foods following romantic exposure. On the other hand, for romantically involved consumers, their construal of romantic love and ensuing psychological sweetness tend to be more idiosyncratic, concrete, and low-level because these perceptions likely consist of consumers' own, current romantic experiences, which are proximal on both the social and temporal dimensions of psychological distance. Therefore, our theorizing predicts that exposure to romantic stimuli should engender a contrast effect on consumers' sweet food choice among romantically involved consumers such that they become less likely to choose sweet foods after exposure to romantic stimuli.

In addition, study 2 attempts to augment the ecological validity of the findings of study 1 by involving respondents in actual food choices. We also seek to increase the robustness of findings of study 1 by resorting to a different manipulation of romantic exposure.

Design, Participants, and Procedure

Two hundred forty-three undergraduate students participated in this study, examining the interactive effect of romantic exposure and construal level on their subsequent preferences for sweet versus nonsweet food options. Whereas romantic exposure (romantic vs. nonromantic stimuli) was manipulated, construal level was

operationalized and measured by respondents' relationship status. We conducted a separate test to evince that romantically uninvolved consumers indeed construe romantic love and ensuing sweetness at a higher, more abstract level than those who are romantically involved. Please see the web appendix for details.

At the outset of the study, respondents were told that they were participating in a research study consisting of several unrelated parts. Respondents then received the romantic exposure manipulation, in which they read a short paragraph that described a couple's post-marriage life (adapted from Dahl, Sengupta, and Vohs 2008). In the romantic stimuli exposure condition, the paragraph portrayed a young couple as very romantic and completely devoted to each other. The story also gave examples of the couple's daily life in which they exhibited love for each other, such as walking along the beach holding hands and leaving love notes for each other. In the nonromantic stimuli exposure condition, respondents read about a young couple who were less romantic. The description provided various examples of how the partners each maintained their own personal space. For instance, the husband might go out for a drink with his friends while the wife stayed at home reading a novel. A separate pretest was conducted to ensure this manipulation indeed influenced respondents' perceptions of romance. Pretest respondents ($n = 58$), randomly assigned to read through either the romantic or nonromantic version, assessed whether the couple was romantic using a seven-point Likert scale ("the couple was romantic"). This romantic perception measure was subjected to an ANOVA with romantic exposure condition as the independent variable. The results showed that the romantic version of the story elicited a higher level of romantic perceptions than the nonromantic version of the story ($M_{\text{romantic}} = 6.03$ vs. $M_{\text{nonromantic}} = 5.38$, $F(1, 56) = 4.60$, $p = .04$, $\eta_p^2 = .08$). Thus, our romantic exposure manipulation was supported.

Following the romantic exposure manipulation, respondents were told that, as a token of appreciation, they would receive a snack. They were presented with pictures of two cookie choices—Ritz Bits (less sweet option) and Mini Oreo (sweeter option)—and were asked to circle the snack they would like to receive at the end of study. We conducted a separate pretest to examine whether these two snacks were indeed associated with different sweet perceptions. Forty respondents participated in the pretest and were randomly assigned to see the picture of either Ritz Bits or Mini Oreo cookies. They were then asked to indicate the sweetness of the snack using two seven-point scales (anchored by "not sweet/not sugary" and "sweet/sugary"; $r = .83$, $p < .001$; averaged to form a sweetness index). An ANOVA performed on the sweetness index showed that Mini Oreo cookies were perceived to be sweeter than Ritz Bits ($M_{\text{mini oreo}} = 6.13$ vs. $M_{\text{ritz bits}} = 3.74$, $F(1, 38) = 27.98$, $p < .001$, $\eta_p^2 = .42$), consistent with our expectation.

After choosing which snack they would receive as a gift, respondents then completed several demographic measures, among which they were asked to indicate their relationship status (yes vs. no). Finally, respondents received the snack they had chosen and were thanked and debriefed.

Results

Snack Choice. We performed a logistic regression to examine the effects of romantic exposure and relationship status on snack choice. Snack choice was dummy-coded as 1 if the sweeter snack was chosen (i.e., Mini Oreo) and as 0 if the less sweet snack was selected (i.e., Ritz Bits). Romantic exposure (1 = romantic exposure; –1 = nonromantic control), romantic relationship status (1 = romantically involved; –1 = romantically uninvolved), and their interaction were included as independent variables.

The logistic regression revealed a significant interaction between romantic exposure and relationship status ($b = –.39$, $\chi^2 = 8.41$, $p < .01$, $exp\ (b) = .68$). Please see figure 2 for an illustration of the interaction. Our subsequent analysis shows that respondents not in a romantic relationship, who construed the concept of sweetness at an abstract level, were more likely to choose the sweeter (Mini Oreo) option after reading the romantic (66%) than the nonromantic (49%) version of the story ($b = .70$, $\chi^2 = 3.58$, $p = .058$, $exp\ (b) = 2.02$). The reverse was true for respondents involved in a romantic relationship, who think about sweetness at a concrete level. These respondents were less likely to choose the sweeter (Mini Oreo) option after reading the romantic (52%) than after reading the nonromantic version (71%) of the story ($b = –.85$, $\chi^2 = 4.86$, $p = .03$, $exp\ (b) = .43$).

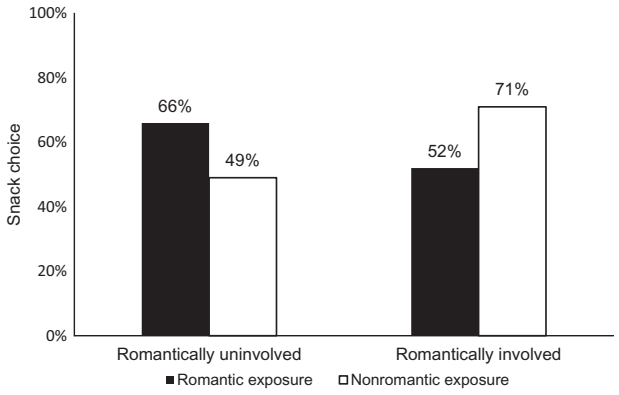
Discussion

Using a different operationalization of construal level—the respondent's romantic status—study 2 provides further evidence for our theorizing that romantic exposure can produce an assimilation or a contrast effect on respondents' subsequent food choice. Specifically, romantic exposure makes abstract-minded, romantically uninvolved respondents more likely to choose a sweet food option (assimilation) but renders concrete-thinking, romantically involved respondents more likely to choose a less sweet food option (contrast).

Though study 2 supported our theorizing, the two food options respondents selected from (i.e., Mini Oreo and Ritz Bits) not only differed in the level of sweetness but also featured different brands, a situation that might inadvertently confound our findings. To overcome this issue and establish generalizability of our findings, we designed study 3 with different manipulations of romantic stimuli exposure and sweet food options.

FIGURE 2

STUDY 2: PERCENTAGE OF CHOOSING A SWEETER SNACK AS A FUNCTION OF ROMANTIC STATUS AND ROMANTIC EXPOSURE



STUDY 3

Study 3 seeks to provide further empirical support for our theorizing and bolster the validity of our findings. The following modifications were introduced. First, study 3 uses a different manipulation of romantic exposure with direct marketing implications: respondents were asked to watch TV commercials of romantic versus nonromantic themes. Second, in study 3 we ask respondents to choose between two flavors of the same brand to rule out the possible contamination effect of brand.

Design, Participants, and Procedure

One hundred ninety-nine undergraduate students participated in this study in exchange for course credit. The design of study 3 remains the same as study 2 and examines the effect of romantic stimuli exposure and relationship status on respondents' subsequent preferences for sweet versus less sweet food options. As in study 2, romantic stimuli exposure (romantic vs. nonromantic) was manipulated and relationship status was measured.

Similar to study 2, respondents were told that they were participating in a marketing research study consistent of unrelated parts. Respondents then received the romantic exposure manipulation in which they were asked to watch three TV commercials and be prepared to answer questions related to these commercials. In the romantic stimuli exposure condition, respondents watched three ads with romantic themes. In the nonromantic stimuli condition, respondents watched three commercials with nonromantic themes. None of these commercials were related to consumption of sweet foods. After watching the TV commercials, respondents were asked to provide their opinions about production quality of the commercials using seven-point Likert scales (e.g., "these ads are excellent"). Embedded among these questions was a manipulation-check measure of the romantic exposure manipulation ("these ads are romantic").

Then respondents were told that they would receive a bag of Ghirardelli chocolate to take home as a token of appreciation. They were shown the images of the two available options: intense dark flavor (less sweet option) versus milk and caramel flavor (sweeter option) and were asked to indicate the snack they would like to receive at the end of the study. We conducted a separate pretest to examine whether these two snacks were indeed associated with different sweet levels. Thirty-five pretest respondents, randomly assigned to see a picture of one of the two flavors of chocolate used in the main study, were asked to indicate the level of sweetness using the same scales as in study 2 ($r = .88$, $p < .001$). As expected, a one-way ANOVA performed on the sweetness index showed that the milk and caramel flavor was perceived to be sweeter ($M_{\text{intense dark}} = 3.63$ vs. $M_{\text{milk and caramel}} = 6.30$, $F(1, 33) = 29.61$, $p < .001$. $\eta_p^2 = .47$).

Next, respondents were asked to indicate their current moods using PANAS (Positive Affect Negative Affect Schedule; Watson, Clark, and Tellegen 1988) as a confound check. Respondents also reported their romantic status using three seven-point Likert scales (I am in a romantic relationship, dating someone, and seeing someone; 1 = strongly disagree, 7 = strongly agree; $\alpha = .90$), and level of involvement using the same scales as in previous studies ($r = .63$, $p < .001$). Finally, respondents received the snack they had chosen and were thanked and debriefed.

Results

Manipulation Checks. To provide evidence for the romantic stimuli exposure manipulation, a regression analysis with romantic exposure (1 = romantic ads; –1 = nonromantic ads) and respondents' romantic status (mean-centered) as the independent variables was performed on respondents' perceived romantic level of the commercials. The results revealed only a main effect of romantic exposure such that respondents watching commercials with a romantic theme reported that the ads were more romantic than those viewing ads with nonromantic themes ($M_{\text{romantic ads}} = 6.01$ vs. $M_{\text{nonromantic ads}} = 1.96$; $b = 2.03$, $t = 28.15$, $p < .001$, $\eta_p^2 = .80$), confirming the success of our romantic exposure manipulation. We also performed the same regression analysis on the confounding-check measures of ads' production quality, respondents' mood, and involvement. Our results showed no effects on these measures ($ps > 1$), suggesting that

romantic stimuli exposure did not inadvertently affect these variables to confound our results.

Snack Choice. As in study 2, our main dependent variable was respondents' snack choice, which was dummy-coded as 1 if the sweeter snack (milk and caramel flavor) was chosen and 0 if the less sweet snack (intense dark flavor) was chosen. We performed a logistic regression analysis on respondents' snack choice, with romantic stimuli exposure (1 = romantic ads; −1 = nonromantic ads), relationship status (mean-centered), and their interaction as independent variables.

The logistic regression revealed a significant interaction of romantic exposure and relationship status ($b = -.17$, $\chi^2 = 6.91$, $p < .01$; *exp (b)* = .85). Based on the recommendation of Spiller et al. (2013), to probe this interaction we employed the Johnson–Neyman technique to identify the ranges of romantic status for which the simple effect of romantic exposure was significant (please see figure 3). Consistent with our expectation, the effect of romantic exposure on snack choice was positive and significant ($b_{JN} = .39$, SE = .20, $p = .05$) among participants with romantic status lower than 1.55, indicating that exposure to the romantic ads (vs. nonromantic ads) made romantically uninvolved respondents more likely to choose the sweeter snack option. In contrast, the effect of romantic exposure on snack choice was negative and significant among participants ($b_{JN} = -.47$, SE = .24, $p = .05$) with romantic status higher than 6.64, suggesting that exposure to the romantic (vs. nonromantic) ads made romantically involved respondents less likely to choose the sweeter snack option.

Discussion

Study 3 attests to the robustness of our theorizing by employing a different manipulation of romantic stimuli exposure—exposure to romantic or nonromantic TV commercials. The findings of study 3 further confirm our theorizing that romantic stimuli exposure increases sweet food choices among abstract-minded, romantically uninvolved respondents but reduces sweet food choices among concrete-thinking, romantically involved respondents.

The main tenet of our assertion that romantic stimuli exposure will influence subsequent consumption of sweets rests on the tendency of consumers to metaphorically connect romantic love and sweetness, so that the sweetness concept activated psychologically (psychological sweetness) upon exposure to romantic stimuli serves as the context for subsequent food decisions involving physiological sweetness. When the metaphoric link between romantic love and sweetness is deactivated, or when the link is disrupted by some competing metaphoric associations involving romantic love (e.g., love is blind), romantic stimuli would no longer be a relevant context for subsequent sweet food decisions, and the effects of romantic exposure on the consumption of sweets should dissipate. Study 4 empirically examines interference in the metaphorical connection between love and sweetness as a boundary condition.

STUDY 4

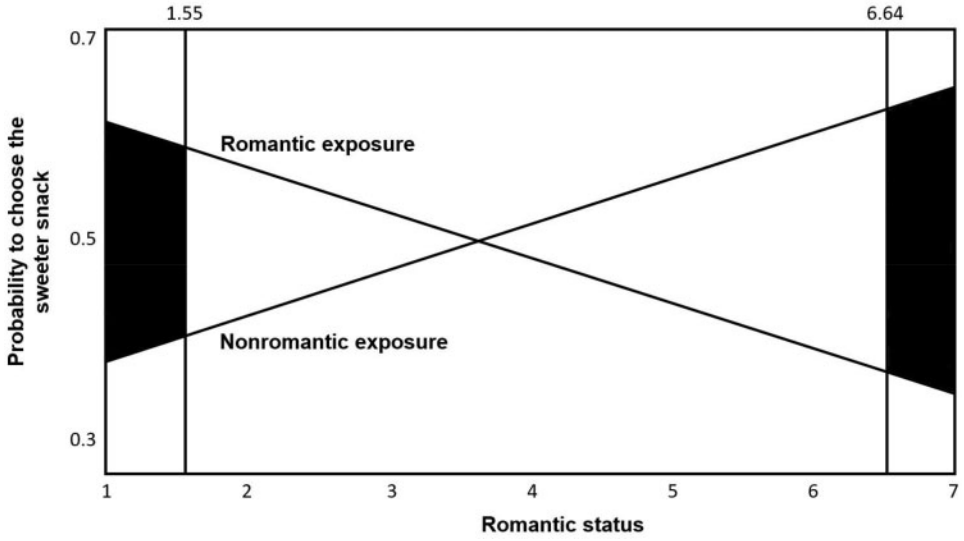
Study 4 aims to address several crucial questions. First, it seeks to provide further evidence for and to extend our theorizing by examining potential moderating factors of the findings obtained in studies 1 through 3. A pivotal assumption of our theorizing is that consumers connect remotely associated categories—love and sweetness—through a metaphoric association. If this conjecture is tenable, we should not find the effects of romantic exposure on sweet food choice when such a metaphoric association between the two categories (i.e., love is sweet) is less accessible. Despite the prevalent metaphor linking romantic love with gustatory experience of taste, metaphors that connect romance with other types of physiological experience also exist. For example, the metaphor "love is blind" associates romance with visual experience, emphasizing how love may cloud people's judgments or viewpoints about their romantic partners. When this competing metaphor becomes salient, retrieval of the association between love and sweetness is interrupted and less likely (Burke and Srull 1988). Accordingly, our earlier findings pertaining to the effects of romantic exposure on sweet food consumption should dissipate. Hence, we anticipate that the interaction between romantic exposure and construal level will be replicated only when the metaphoric association between love and sweetness is accessible, such that an assimilation effect of romantic exposure on subsequent sweet food intake will emerge for abstract thinkers while a contrast effect of romantic exposure will occur for concrete thinkers. When a competing metaphor involving love (love is blind) is highlighted, interfering with the metaphoric association between love and sweetness, we expect that romantic exposure will no longer influence sweet food consumption. Second, across studies 1 through 3, we found converging evidence for our theorizing by employing food choice (the choice between sweeter and less sweet options) and intentions to consume sweet food as dependent variables. To provide additional evidence for the robustness of our findings, study 4 examines the actual amount of sweet consumption as a dependent variable.

Design, Participants, and Procedure

One hundred seventy-eight undergraduate students participated in this study, in exchange for course credit, to examine the effect of romantic exposure, construal level, and metaphor content on consumers' subsequent sweet food consumption. Whereas romantic exposure (romantic vs.

FIGURE 3

STUDY 3: SNACK CHOICE AS A FUNCTION OF ROMANTIC STATUS AND ROMANTIC EXPOSURE



nonromantic stimuli) and metaphor content (taste vs. vision) were manipulated as between-subjects variables, respondents' general tendency to construe events at an abstract versus a concrete level was measured and analyzed as a continuous individual difference variable.

Upon arrival, respondents were told that the marketing survey contained several unrelated parts. Before the manipulation of romantic exposure, respondents first received the metaphor content manipulation, in which they were asked to read a paragraph designed to activate either taste or vision metaphors. In the taste metaphor condition, respondents were encouraged to compare their life events to the gustatory experience of taste, whereas those in the vision metaphor condition were encouraged to associate their life events with visual experience. We expect that, following this metaphor content prime, respondents are more likely to metaphorically connect subsequent romantic exposure (i.e., the romantic exposure manipulation) with either the gustatory taste of sweetness or the visual experience of blindness or blurriness. Note that, to ensure this metaphor content manipulation was independent from the subsequent manipulation of romantic exposure, we did not specify the concept of romantic love or the metaphorical association between romance and sweetness or blindness in the manipulation of metaphor content, a consideration that also prevented the activation of sweetness in only one condition (i.e., the taste condition rather than the vision condition).

Specifically, respondents in the taste metaphor condition read the following paragraph and were then asked to describe a scenario in their lives that could be compared to taste:

> Many daily encounters in our lives are just like our experience with food. Emotionally enticing one taste bud or another, these encounters bring about opportunities to experience different types of tastes. Just like when you consume foods, sometimes you have to savor the taste of every bite to truly relish the tidbits of events that you have encountered in life.

In the vision metaphor condition, respondents read the following paragraph and were then asked to describe a scenario in their lives that could be compared to vision:

> Many daily encounters in our lives can be understood in association with our experience of vision. Sometimes you are capable of perceiving things with unusual shrewdness, as if you were granted with ultra-clear vision; on other occasions, however, you may not be able to view things with perspicacity, as if your vision were impaired.

After the metaphor content manipulation, respondents received the romantic exposure manipulation similar to study 1. Specifically, they were told to read through a list of romantic versus nonromantic quotes. Then respondents were told to sample and provide their opinions about a candy product. They were asked to open a sandwich bag containing 20 pieces of candy and were told to consume as many or as few candies as they like. The number of candies consumed by respondents served as our main dependent variable. After sampling the candy, they provided their opinions and answered a few filler questions about the

candy. Next, respondents completed the behavioral identification form (Vallacher and Wegner 1989), which consisted of 25 dichotomous questions that have been widely used to measure people's tendency to engage in abstract or concrete thinking (answers representing abstract [concrete] thinking were coded as 0 [1] and respondents' answers were summed to form a construal-level score, with higher scores indicating concrete thinking; $\alpha = .74$). They also completed a manipulation-check measure of romantic exposure (same as in previous studies), followed by the confounding-check measures of involvement (same as in previous studies; $r = .43$, $p < .001$) and mood (1 = "bad/negative" and 7 = "good/positive"; $r = .85$, $p < .001$). Finally, after answering a few demographic questions, respondents were thanked and debriefed.

Results

Manipulation Checks. To provide evidence for the romantic exposure manipulation, we performed a regression analysis on the perceived romantic level of the ads, with romantic exposure (1 = romantic quotes; –1 = nonromantic quotes), construal level (mean-centered), metaphor content (1 = taste metaphor; –1 = vision metaphor), all two-way interaction terms, and the three-way interaction term as independent variables. The results revealed only a main effect of romantic stimuli exposure such that respondents reading through the romantic (vs. nonromantic) quotes reported the quotes to be more romantic ($M_{\text{romantic quotes}} = 4.71$ vs. $M_{\text{nonromantic quotes}} = 2.75$, $b = .96$, $t = 8.40$, $p < .001$, $\eta_p^2 = .29$). No other main effects or interaction effects were significant ($ps > .1$). We also performed the same regression analysis on the confounding-check measures of mood and involvement and found an unexpected effect of the metaphor content manipulation on mood ($b = .18$, $t = 2.11$, $p = .04$, $\eta_p^2 = .03$). Though not part of our manipulation, the construal-level measure also had an effect on involvement ($b = –.03$, $t = –2.00$, $p = .05$, $\eta_p^2 = .02$). No other main effects or interaction effects were significant ($ps > .1$). However, including involvement and mood as covariates in our subsequent analysis showed that they neither affected our findings pertaining to candy intake nor were significant covariates, suggesting that they did not confound our findings (Perdue and Summers 1986).

Candy Consumption. We performed the same regression analysis on candy consumption, with romantic exposure (1 = romantic quotes; –1 = nonromantic quotes), construal level (mean-centered), metaphor content (1 = taste metaphor; –1 = vision metaphor), all two-way interaction terms, and the three-way interaction term as independent variables. The results showed a significant interaction of romantic exposure and mental construal ($b = –.22$, $t = –2.29$, $p = .02$, $\eta_p^2 = .03$). More importantly, the hypothesized three-way interaction of romantic exposure, mental construal, and metaphor content was significant ($b = –.24$, $t = –2.50$, $p = .014$, $\eta_p^2 = .04$). To facilitate understanding of this interaction, we examined simple interaction effects of romantic exposure and construal level in the two metaphor content conditions and found that the interaction between romantic exposure and mental construal was present in the taste metaphor condition ($b = –.46$, $t = –3.11$, $p < .01$, $\eta_p^2 = .05$) but was absent in the vision metaphor condition ($t < 1$).

Following Spiller et al. (2013), to probe the significant interaction between construal level and romantic exposure under the taste metaphor condition, we employed the Johnson–Neyman technique to identify the ranges of construal level for which the simple effect of romantic exposure was significant (see figure 4). This analysis showed that the effect of romantic exposure on candy consumption was positive and significant ($b_{JN} = 1.82$, SE = .92, $p = .05$) among participants whose construal level scores were lower than 3.66, indicating that reading romantic quotes (vs. nonromantic quotes) led abstract-thinking respondents to consume more candy; conversely, the effect of romantic exposure on candy consumption was negative and significant ($b_{JN} = –1.65$, SE = .83, $p = .05$) among participants whose construal scores were higher than 11.23, suggesting that that exposure to the romantic (vs. nonromantic) ads led concrete-thinking respondents to consume less candy.

Discussion

The findings of study 4 bolster and extend our theorizing. They uphold the contention that the effect of romantic stimuli exposure on subsequent sweet food consumption is observed only when the metaphorical association between love and sweetness is accentuated. Offering key insights into this postulate, the results of prior studies are replicated only when the metaphoric link between love and sweetness is highlighted; no effect of love on sweet food consumption was found when a competing metaphor (love is blind) was accentuated.

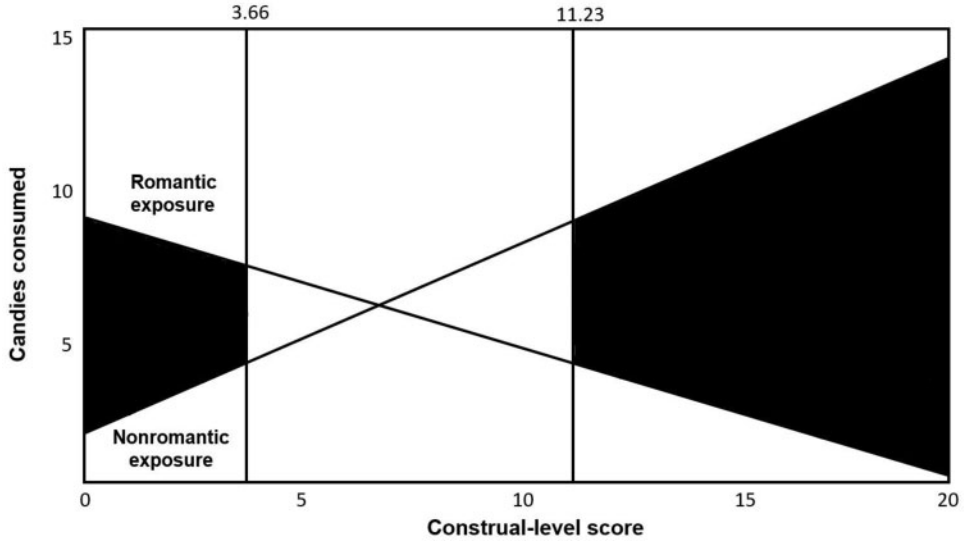
Studies 1 through 4 have provided corroborative evidence that romance exposure influences subsequent sweet food decisions through the metaphoric association between romantic love and sweetness. In study 5, we seek further evidence that the assimilation and contrast effects of romantic exposure are manifested through increased or reduced accessibility of physiological sweetness.

STUDY 5

Our theory suggests that romantic exposure and the ensuing psychological sweetness serve as a context for subsequent sweet food decisions. They increase the accessibility of physiological sweetness and subsequent sweet food decision among abstract-minded consumers (who do not differentiate between psychological and physiological sweetness), but reduce the accessibility of physiological

FIGURE 4

STUDY 4: CANDY CONSUMPTION AS A FUNCTION OF ROMANTIC EXPOSURE AND CONSTRUAL LEVEL IN THE TASTE METAPHOR CONDITION



sweetness and subsequent sweet food decision among concrete-minded consumers (who do differentiate between psychological and physiological sweetness). Thus, although romantic (vs. nonromantic) exposure always increases the accessibility of psychological sweetness, it should have divergent effects on the accessibility of physiological sweetness, depending on consumers' construal levels. The varied accessibility of physiological sweetness then contributes to the assimilation and contrast effects observed in studies 1–4.

To examine whether romantic exposure and construal level influence the accessibility of psychological and physiological sweetness as theorized, study 5 follows the procedure employed by Laran (2010a, 2010b) and Zhang and Li (2012), in which reaction times to words involving the two types of sweetness were used as proxies for accessibility, with shorter [longer] reaction times indicating greater [less] concept accessibility. To be more specific, we anticipate that although romantic exposure (vs. nonromantic exposure) always shortens reaction times to words involving psychological sweetness, it should reduce the reaction times to the physiological sweetness words among abstract-thinking consumers but prolong reaction times to these words among concrete-thinking consumers.

Design, Participants, and Procedure

Three hundred five undergraduate students participated in this study for course credit. The design featured a 2 (romantic exposure: romantic stimuli vs. nonromantic stimuli) × 2 (construal level: abstract vs. concrete) × 2 (word type: psychological vs. physiological sweetness) mixed ANOVA, with romantic exposure and construal level as between-subjects factors and word type as a within-subjects factor.

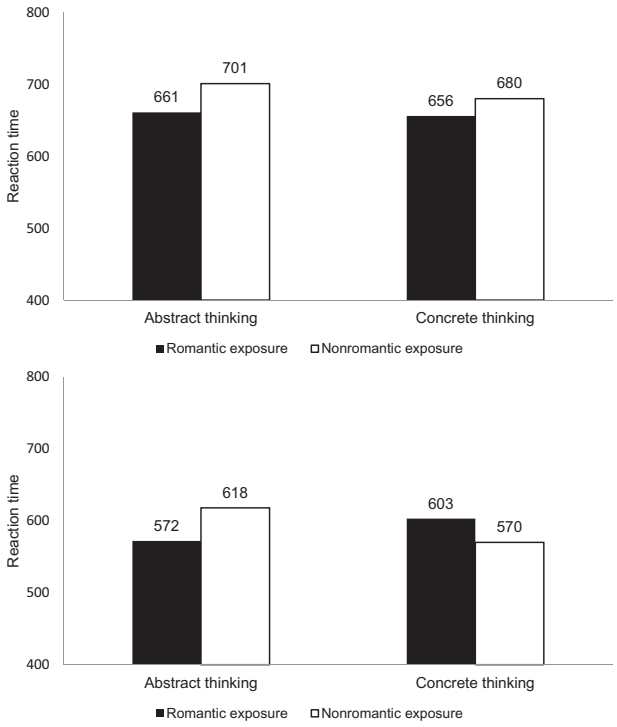
Respondents were assigned to a computer workstation to work on the study on their own. They first received the construal level and romantic exposure manipulations as used in study 1. Afterward, respondents completed a reaction time task in which they were asked to identify whether a letter string appeared on the computer screen was a word (Laran 2010a, 2010b). A total of 60 letter strings were presented on the screen, one letter string at a time. Respondents were instructed to press "q" on the keyboard if the letter string was a word, and "p" if the letter string was not a word. Of the randomly presented 60 trials, 10 words were related to psychological sweetness (e.g., affection, intimacy), and 10 words pertained to physiological sweetness (e.g., cake, candy). These target word trials were mixed with the remaining trials, which were either neutral words unrelated to psychological or physiological sweetness (e.g., cartoon, steel), or nonmeaningful letter strings (e.g., dondge, iwago). The time respondents took to press the key served as the main dependent variable. After the reaction time task, respondents completed several demographic measures. Please see the web appendix for the words used.

Results

Reaction Times. Our preliminary analysis showed no effects of the manipulations on the reaction times to the

FIGURE 5

STUDY 5: REACTION TIME (MILLISECONDS) AS A FUNCTION OF ROMANTIC EXPOSURE, CONSTRUAL LEVEL, AND WORD TYPE



neutral words, and we subsequently focused on the two groups of sweetness words—psychological and physiological sweetness. Consistent with the procedure used in the literature (Laran 2010a, 2010b; Zhang and Li 2012), we log-transformed respondents' reaction times (in milliseconds) and removed incorrect identifications from subsequent analysis. Respondents' log-transformed reaction times for correct identifications were averaged across the word types (psychological and physiological sweetness) and were then subjected to a mixed ANOVA. The results (see figure 5) revealed a significant main effect of word type ($F(1, 301) = 300.55$, $p < .001$, $\eta_p^2 = .50$), and an interaction of word type and romantic exposure also emerged ($F(1, 301) = 5.57$, $p = .02$, $\eta_p^2 = .02$). Importantly, as we expected, these lower-order effects were superseded by a significant three-way interaction of romantic exposure, construal level, and word type ($F(1, 301) = 12.01$, $p = .001$, $\eta_p^2 = .04$). For the psychological sweetness words, a significant main effect of the manipulation of romantic exposure emerged such that respondents' reaction times to psychological words were faster after respondents read the romantic quotes (vs. nonromantic quotes) ($M_{romantic} = 659$ ms vs. $M_{nonromantic} = 690$ ms; $F(1, 301) = 4.31$, $p = .04$, $\eta_p^2 = .01$). For the physiological sweetness words, there was a significant interaction of romantic exposure and construal level ($F(1, 301) = 9.85$, $p < .01$, $\eta_p^2 = .03$). Follow-up analysis revealed that after reading romantic (vs. nonromantic) quotes, abstract-thinking respondents were faster to recognize physiological sweetness words ($M_{romantic} = 572$ ms vs. $M_{nonromantic} = 618$ ms; $F(1, 301) = 6.72$, $p = .01$, $\eta_p^2 = .02$), but concrete-thinking respondents were slower to recognize physiological sweetness words ($M_{romantic} = 603$ ms vs. $M_{nonromantic} = 570$ ms; $F(1, 301) = 3.35$, $p = .07$, $\eta_p^2 = .01$).

Discussion

Consistent with our theorizing, study 5 showed that exposure to romantic stimuli reduced reaction times to words involving psychological sweetness, suggesting that romantic stimuli activate the metaphorically associated concept of (psychological) sweetness. Study 5 also documented that exposure to romantic stimuli reduced reaction times to physiological sweetness words among abstract thinkers but increased reaction times to these words among concrete thinkers. Taken together, these findings suggest that romantic stimuli and the ensuing psychological sweetness heightened the accessibility of physiological sweetness among abstract thinkers but inhibited the accessibility of physiological sweetness among concrete thinkers. Accordingly, study 5 provides process evidence for the assimilation and contrast effects of romantic exposure on subsequent food decisions.

GENERAL DISCUSSION

Findings and Contributions

Across five studies, we demonstrate that exposure to romantic stimuli influences consumers' subsequent sweet food decisions. Specifically, exposure to romantic stimuli produces an assimilation effect on sweet food choices among abstract thinkers or romantically uninvolved consumers, making them more likely to choose sweeter foods; on the other hand, exposure to romantic stimuli engenders a contrast effect among concrete thinkers or romantically involved consumers, rendering them more likely to choose less sweet food options. These effects of romantic exposure are related to the heightened or inhibited accessibility of physiological sweetness accompanied by the activation of psychological sweetness. We also identify a boundary condition for these effects such that the effects of romantic exposure on sweet food consumption dissipate when the metaphoric link between love and sweetness is interrupted by a competing metaphor that focuses on a different sensory connection. We find support for our predictions in multiple operationalizations of romantic stimuli exposure (rating romantic quotes, reading about a romantic couple, or watching romantic-themed TV commercials), mental construal (chronic measures and manipulation), and sweet food decisions (intentions to consume sweet food, real

food choices between sweet and less sweet options, and real sweet food consumption).

Two alternative theoretical accounts are related to the phenomenon investigated in this article. The embodied cognition account (Barsalou 2009; Williams, Huang, and Bargh 2009; Williams and Bargh 2008b) posits that sensations and bodily experiences are stored as an integral part of the representation of abstract concepts. Thus, processing an abstract concept (e.g., sweetness) may automatically activate the simulation of the associated perceptual experience (e.g., eating sweet food). This is different from the conceptual metaphor account, which suggests that the conceptual knowledge of sweetness does not necessarily include the bodily experience of eating sweets, but instead is semantically mapped with the experience through metaphors (Landau et al. 2010; Zhang and Li 2012). Landau et al. (2010) proposes "an alternative source strategy" to empirically differentiate whether a phenomenon is driven by embodied cognition or a conceptual metaphor. This strategy assesses whether interpretations and judgments would be affected by altering the linguistic framing of a concept to create an alternative metaphoric mapping. While the conceptual metaphor account predicts a change of outcome when a new mapping is primed, the embodied cognition account, which suggests that the bodily experience is automatically simulated as the consumer processes the concept and therefore is independent of conceptual mapping, would predict no different outcomes when a new mapping is activated. Our study 4 utilizes this alternative source strategy and manipulates the metaphorical associations of romantic love with either taste or vision. Our findings—that the assimilation and contrast effects persist only when the metaphor "love is sweet" is salient and not when the competing metaphor "love is blind" is accentuated—provide evidence for the semantic basis of this phenomenon, indicating that the conceptual metaphor account rather than embodied cognition is more likely to drive these effects.

Another theory relevant to our research is compensatory consumption (Rucker and Galinsky 2013), which proposes that consumers often use product acquisition or consumption as a vehicle to make up for their frustrations or deficiencies, such as powerlessness (Rucker and Galinsky 2008) or social exclusion (Lee and Shrum 2012). Compensatory consumption could serve as an alternative explanation for the assimilation effect observed in studies 2 and 3 in that a romantic prime may trigger feelings of frustration and deficiency among people who are not romantically involved, and as a compensation mechanism these people may increase their sweet food consumption. However, this account is not a good fit with the contrast effect observed in studies 2 and 3, or the assimilation and contrast effects in studies 1 and 4, in which our main findings are replicated when construal level is operationalized in ways other than relationship status. In addition, to empirically test compensatory consumption as a possible mechanism, we measured respondents' compensatory consumption tendency in study 2. Please see the details of this analysis in the web appendix. In essence, the results demonstrate that while romantically uninvolved (vs. involved) consumers showed a stronger compensatory consumption tendency, it did not mediate the interactive effect of romantic exposure and construal level on sweet food choice. This evidence reduces the likelihood that romantic exposure influences sweet food consumption through compensatory consumption.

Taken together, although our findings are partially consistent with the embodied cognition theory and the compensatory consumption theory, the conceptual metaphor account offers the best fit with the entire set of empirical evidence gathered across the five studies.

Theoretical Contributions

Our research adds to burgeoning research on the role of contextual cues on food consumption. For example, prior research shows that consumers tend to eat faster when the background music is loud (McCarron and Tierney 1989), that people consume more food in the presence of complementary pleasant ambient odors (Fedoroff, Polivy, and Herman 2003), and that consumers anchor their food decisions on those made by surrounding diners (McFerran et al. 2010). We add to this literature by examining how exposure to romantic stimuli, a seemingly unrelated cue, influences the consumption of sweets. Understanding the mechanisms of such influences provides opportunities for consumers to tune into these consumption cues and make healthier choices (Pham 2014). In addition, our findings contribute to the literature of food consumption by investigating the unique antecedents of food consumption featuring one primary taste—sweet foods. Prior food research revolves primarily around general food consumption without discerning specific tastes (sweet, salty, bitter, sour, and umami). Although prior research has delineated a wide array of antecedents of food consumption in general, work examining what factors lead to the consumption featuring specific tastes is lacking. Indeed, the marketplace abounds in food options targeting chiefly one taste. For example, Oreo's sandwich cookies and Cheesecake Factory's Ultimate Red Velvet cheesecake are instantly recognizable as sweet, while snacks such as pretzels and Ritz Bits crackers are most likely categorized as salty.

Our research contributes to the conceptual metaphor literature by investigating the mechanism and direction of conceptual metaphors on judgment and decision making. Prior research on conceptual metaphors mainly posits a positive effect of conceptual metaphor activation such that people's perceptions and judgments are influenced in a metaphor-consistent fashion (Landau et al. 2010; Zhang and Li 2012), although there is also evidence for metaphor-

inconsistent effects on consumer behavior (Hong and Sun 2012). Building on these findings, we demonstrate that the semantic concept activated through metaphoric associations can produce either an assimilation or a contrast effect on subsequent sweet food decisions, dependent on consumers' mental construal levels. That is, in the context of sweet food consumption, not only can consumers' subsequent decisions and behaviors be influenced in a metaphor-consistent fashion (among abstract thinkers), but they may also be affected in the opposite direction as suggested by metaphoric associations (among concrete thinkers).

Our findings also add to the assimilation and contrast literature by examining the case of conceptual metaphors. Prior research on assimilation and contrast effects has focused primarily on how salient contextual factors influence people's judgments and behavior. A wide array of contextual effects, such as mood (Schwarz and Clore 1983) and embodied sensations (Meyers-Levy et al. 2010), have been found to produce either an assimilation or a contrast effect. The current research adds to this list by suggesting that contextual influences of assimilation and contrast effects can also be activated by metaphoric associations.

In addition, two popular explanations have been advanced in the assimilation and contrast literature to account for why a contrast effect occurs. The correction view suggests that people may use the context as a basis of comparison and that this comparison process often highlights the differences between the context and the target, resulting in overcorrection and a contrast effect in subsequent judgment or behavior (Martin 1986; Martin et al. 1990). The inhibition account posits that priming certain contextual information may inhibit the accessibility of a relevant but distinct concept, which then leads to judgments and behavior in a way opposite to the context (Newman and Uleman 1990). Our research findings, which show that among concrete thinkers the activation of one type of sweetness (psychological) inhibits another type of sweetness (physiological) and results in lower likelihood of choosing sweet foods, lends support to the inhibition account as the underlying mechanism for the contrast effect in at least some contexts.

Future Directions

Focusing on the metaphoric association between love and sweetness, our investigation provides preliminary evidence that the activation of a metaphoric association may influence consumer judgment and decision making in opposite ways. Future research can explore if our findings regarding the assimilation and contrast effects of exposure to romantic stimuli can extend to other metaphoric association contexts and if factors other than construal level can moderate the assimilation and contrast effects of metaphoric thinking.

Our research focuses on one specific taste, sweet, and examines a particular antecedent of sweet food consumption (romantic exposure). Future research could examine other physiological, psychological, and social determinants of sweet food consumptions, considering the prevalence of sweet foods in the marketplace and consumers' penchant for sweet food. For example, an unexpected effect we observed in the control condition (no romantic exposure) was the increased propensity to consume sweet food (studies 1–4) and the heightened accessibility of physiological sweetness words (study 5) among consumers adopting concrete (vs. abstract) mental construals or involved (vs. not involved) in a romantic relationship. While this effect is beyond the scope of this article, it seems to suggest construal level could affect sweet food consumption directly, in a way consistent with extant literature that has linked abstract construal with greater self-control (Fujita et al. 2006).

DATA COLLECTION INFORMATION

Data for studies 1 and 4 were collected by research assistants under the supervision of the second author at University of Central Florida in fall 2012 and fall 2014. Data for studies 2, 3, and 5 were collected by research assistants under the supervision of the third author at The Ohio State University from fall 2016 to spring 2017. These data were analyzed by the first author in consultation with the second and third authors.

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