Spillover effects of sensory stimulation

Tilottama G. Chowdhury[1,*] , Adwait Khare[2] and Robin A. Coulter[3,4]

[1]Department of Marketing, Quinnipiac University, Hamden, Connecticut, USA

[2]Department of Marketing, University of Texas at Arlington, Arlington, Texas, USA

[3]Department of Marketing, University of Connecticut, Farmington, Connecticut, USA [4]Department of Marketing and Management, University of Pretoria, Pretoria, South Africa

* Corresponding author: Tilottama G. Chowdhury can be contacted at: tilottama.ghoshchowdhury@quinnipiac.edu

Abstract

Purpose: This paper aims to propose the sensory stimulation spillover effect phenomenon, defined as the process by which sensory stimulation in one area generates positive impressions and favorably impacts opinions in other areas. Specifically, this paper demonstrates that the spillover effect of sensory priming via an advertised brand impacts the viewer's self-brand connections (the mental representation of a brand connected to an individual's self-concept), brand attitude and brand purchase intention.

Design/methodology/approach: Across six experiments, 883 participants considered advertised brands from diverse product categories (food snacks, electronics and detergent). The multisensory prime in Studies 1–3 uses positively valenced sensory imagery and text, whereas the multisensory prime in Studies 4–6 is a sensory imaging task. Studies 1–4 examine the spillover effect of the multisensory prime on consumers' self-brand connections, as well as downstream brand-related variables. Studies 5 and 6, respectively, examined the moderating roles of advertising appeal, regulatory focus (promotion vs prevention) and cognitive versus affective tone.

Findings: Results provide robust evidence of the proposed sensory stimulation spillover effect. Sensory priming strengthens self-brand connections and positively impacts brand attitude and purchase intention; self-brand connections mediate the relationship between a multisensory prime and brand attitude and purchase intention. The sensory stimulation spillover effect is stronger when advertisements have a promotion (vs prevention) focus and particularly for participants with a stronger intrinsic promotion (vs prevention) orientation, as well as for advertisements with an affective (vs a cognitive) tone.

Research limitations/implications: The authors manipulated sensory stimulation using visual images and text as well as using a multisensory-imaging task. Future work can explore the use of actual sensory stimulation, and retail spaces or public venues may provide opportunities for field experiments to study sensory stimulation *in situ*.

Practical implications: The research focuses on spillover effects in an advertising context with broader implications for consumers' in-store shopping experiences based on multisensory store architecture and atmospherics, as well as online shopping that is impacted by multisensory information.

Originality/value: This paper introduces the phenomenon of sensory stimulation spillover effect, the process by which sensory stimulation in one area generates positive impressions and favorably impacts opinions in other areas and demonstrates that multisensory priming strengthens self-brand connections and downstream brand-related variables, with self-brand connections as the mediator. The results are robust across multiple product categories and are contingent upon the type of advertising appeal. The research focuses on spillover effects in an advertising context with broader implications for consumers' in-store shopping experiences based on multisensory store architecture and atmospherics, as well as online shopping which is impacted by multisensory information.

Keywords: Advertising context, Affective appeals, Regulatory focus, Sensory priming,

Sensory stimulation, Spillover effect

Introduction

Anne is online considering destinations for her family's next vacation. She checks on tripadvisor.com and is engaged by the following review:

> An amazing sensory experience," a reviewer shares about the Westin Golf Resort and Spa, Playa Conchal. "WOW!! […] Every morning was beautiful, sunny and glorious! […] We were greeted with a welcome drink of strawberry puree, passion fruit juice topped with soda water, and garnished with starfruit – absolutely refreshing and delicious! […] The grounds are surrounded by mango trees, lush plants, and an array of wildlife. Walking along the paths, your senses are filled with the most amazing, sweet scents coming from plants and the wonderful sounds of the various birds and animals throughout the property. The pool is absolutely gorgeous. It is very extensive and meanders around to different areas. It is surrounded by lush plants and is truly lagoon-looking. It is warm, but refreshing enough to enjoy […] The beach is GORGEOUS!!! […] crystal clear, turquoise-green, just stunning!!!! We spent the majority of our time here! The beach is a mix of sand and crushed shells […] We took out the kayaks and got to see the mother and baby humpback whale. (TripAdvisor.com, 2015).

What are the effects of Anne's exposure to these sensory images and words when Anne sees an advertisement for Bose audio speakers that pops up on her screen? More specifically, how does the sensory stimulation experience created by viewing the TripAdvisor review impact her reactions to the Bose brand and her evaluation of the Bose audio speakers? With Mastercard's Chief Marketing Officer, Raja Rajamannar, commenting, "As a brand, you want to enter the

minds and hearts of your consumers, customers, and prospects through all their five senses" (Forbes, 2021), an exploration of the effects of sensory stimuli on consumers' reactions to brand information is warranted.

In this research, we introduce the phenomenon, *sensory stimulation spillover effect*, which we define as the influence of sensory information on an individual's subsequent reaction to the brand. Theoretically, we draw upon research on the spillover effect (Ahluwalia *et al.*, 2001; Balachander and Ghose, 2003; Li *et al.*, 2023; Nilsson *et al.*, 2017; Raufeisen *et al.*, 2019) defined as the process by which positive impressions of an object in a certain area favorably impact opinions in other areas. Our general hypothesis is that sensory stimulation engages broad activation in memory, and upon subsequently reviewing brand-related information, consumers are more likely to experience sensorial brand associations and experiences (Brakus *et al.*, 2009; Schmitt, 1999), yielding a stronger connection between the consumer's self-identity and the advertised brand (Escalas and Bettman, 2005) which in turn positively impacts brand evaluations.

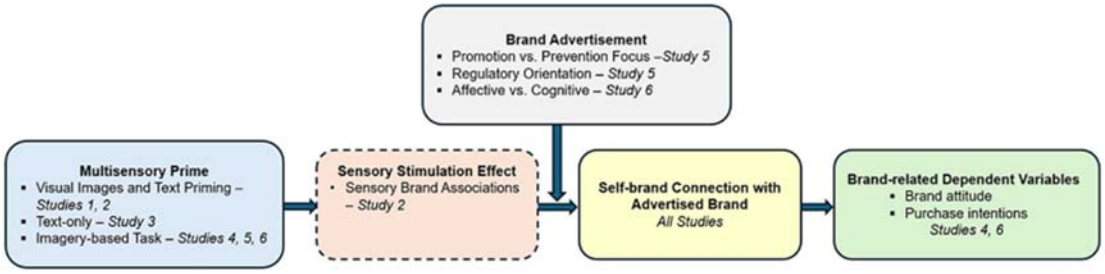
Our empirical work includes six studies. Across these studies, we test the sensory stimulation spillover effect using two different multisensory primes. Studies 1–3 use a visual sensory imagery with text prime (Chaiken and Eagly, 1976; Paivio, 1991; Keller and Lehmann, 2008; Walters, Sparks, and Herington, 2012), whereas Studies 4–6 use a sensory-imaging task that requires recalling and writing about sensory imagery in a given context (Chowdhury and Coulter, 2006; Zaltman and Coulter, 1995). We explore the sensory stimulation spillover effect; that is, how exposure to a multisensory prime followed by exposure to a purchase scenario with an advertised brand affects consumer brand reactions (i.e. self-brand connections, brand attitude and purchase intention). We examine consumer self-brand connections as a mediator of sensory stimulation on brand preference-related outcome variables, including brand attitude and purchase intention. Furthermore, we test whether the sensory stimulation spillover effect is moderated by the type of advertisement appeal (i.e. promotion vs prevention; cognitive vs affective).

Our research makes important contributions at the intersection of sensory information processing, advertising, consumer behavior and marketing strategy. First, our work addresses a recent review of and call for sensory marketing research (Wörfel *et al.*, 2022) by introducing the sensory stimulation spillover effect, theoretically grounded to explore the spillover effect (Ahluwalia *et al.*, 2001; Raufeisen *et al.*, 2019) of a multisensory prime on subsequent brand-related connections and evaluations. Our empirical studies document a robust sensory stimulation spillover effect using an array of product categories (mobile phones, food snacks and audio speakers), and brands (Apple, Lays, Bose and Sony). Thus, our work builds upon extant research about the spillover effects of advertising contexts (Erdem and Sun, 2002; Stipp, 2018). Second, from a methodological perspective, we demonstrate that two different multisensory primes, one that uses positively valenced visual sensory images with text and one that uses a sensory-imaging task, have robust spillover effects on consumer self-brand connections and downstream brand-related variables. Third, our findings indicate that strengthened consumer self-brand connections, as a spillover effect from sensory stimulation, positively impact brand attitude and purchase intentions (Kalwani and Silk, 1982; Morwitz, *et al.*, 2007) which are often studied by advertising researchers (Ma, *et al.*, 2023; Wirtz, *et al.*, 2018). Finally, we demonstrate boundary conditions involving the advertising appeal in which the sensory stimulation effect strengthens self-brand connections for promotion (vs prevention) and affective (vs cognitive) appeals. Hence, our research extends work done in the emerging field of digital sensory marketing (e.g. Petit *et al.*, 2019) by highlighting how and when

multisensory interfaces engage consumers. We speculate that the implications of the *sensory stimulation spillover effect* are broad-ranging to include not only advertising effects but also retail effects as in-person and online sensory retailing is increasingly used as a critical marketing strategy (Forbes, 2021; Nghiêm-Phú, 2017; Samadi *et al.*, 2020). Thus, our work has significant theoretical and managerial implications which we explore in our discussion.

Conceptual underpinnings

Figure 1 illustrates our concepts of interest, our hypothesized relationships and the identification of the empirical work that tests our hypotheses. In the subsequent sections, we provide the theoretical rationale and empirical support for our hypotheses.



Source: Authors' own work

Figure 1. The sensory stimulation spillover effect

Spillover effects and sensory stimulation

Raufeisen *et al.* (2019) define a spillover effect as the effect of the assessment of one entity on the assessment of a different entity. Following on this work, we define spillover effect as the process by which positive impressions of an object in one area favorably impact opinions in other areas. Within marketing, research has explored this spillover effect in a variety of contexts, including advertising and nonadvertising domains. For example, in a nonadvertising domain, Chae *et al.* (2017) studied how seeded brand campaigns focused on online word-of-mouth have spillover effects on a focal product that dissuades consumers from discussing other products. Lehr *et al.* (2020) demonstrate the spillover effects of an unintended product trial on product attitude and purchase intention. Furthermore, Thøgersen and Ölander (2003) explore spillover effects in terms of environment-friendly consumer behavior across different domains. Zheng *et al.* (2018) show how consumer social comparison in an unrelated context can have spillover effects on consumer materialism; and Colicev and de Bruyn (2023) investigate the spillover effects of positive and negative buzz of a specific brand on attitude toward competitor brands.

With regard to spillover effects in advertising, Li *et al.* (2023) examined how consumers exposed to advertisements for certain destinations are more likely to visit those travel destinations, and Yegiyan (2015) found that consumers have higher levels of positivity and negativity, respectively, when they view advertisements after exposure to positive versus negative movie clips. Furthermore, research on advertisement context effects specifically addresses the issue of halo or spillover effects, including the effects of television programming as well as viewing space, media technology use and interference of competing advertisements on consumer reactions to embedded advertisements (Goldberg and Gorn, 1987; Jayasinghe and

Ritson, 2013; Malaviya, 2007; Stipp, 2018). Importantly, research has argued that these halo or affective spillover effects occur nonconsciously and individuals are generally unaware of the effects (Landy and Sigall, 1974; Nisbett and Wilson, 1977).

Herein, we introduce the phenomenon, *sensory stimulation spillover effect*, which we define as the influence of sensory information on an individual's subsequent reaction to brand-related information. The basis for proposing the sensory stimulation spillover effect is grounded in marketing literature, as well as literature in cognitive neuroscience and multisensory processing. Specifically, research indicates that multisensory information can evoke cross-modal sensory engagement (Hoegg and Alba, 2007; Murray and Wallace, 2012; Sathian and Zangaladze, 2002) across regions of the brain, enabling "sensory cross-talk" or multisensory processing (Jordan and Baker, 2011; Rosenblum, 2013; Shams and Seitz, 2008). Inputs from different senses converge and give rise to an integrated multisensory experience (Clemo *et al.*, 2012; Murray *et al.*, 2016; Stein *et al.*, 2010).

Past work has used a variety of methods to activate sensory stimulation. In marketing and psychology, a popular method to trigger sensory stimulation is to use images and text, in combination or isolation, in nonsensory contexts (Chaiken and Eagly, 1976; Keller and Lehmann, 2008; Paivio, 1991; Walters *et al.*, 2012). Relatedly, a significant body of work in marketing documents that specific and multisensory-related product information (visual, tactile, olfactory, auditory and gustatory) in advertisements impacts an array of consumer responses to the advertised product, including emotional responses, arousal, attitude toward a brand or product and purchase intention (see Krishna, 2012 for a review; Biswas *et al.*, 2014; Krishna *et al.*, 2016; Spence, 2012).

Herein, we argue that the sensory stimulation effect occurs when sensory priming engages broad sensorial associations in memory (Brakus *et al.*, 2009; Schmitt, 1999), and upon subsequent exposure to brand-related information, consumers indicate a stronger connection to the advertised brand (Escalas and Bettman, 2005). Specifically, we speculate that positively valenced sensory stimulation will result in extensive sensory imaging expanding the consumers' overall network of associations representing the brand's schema (Mandler, 1984) with a more extensive associative memory around and connectivity to the brand; that is, stronger self-brand connections (Anderson, 1983; Keller, 2008; van Osselaer and Janiszewski, 2001). Furthermore, prior research substantiates that self-brand connections influence brand-related intentions, including brand evaluation, brand attitude, brand advocacy and purchase intentions (Chand and Fei, 2021; Dwivedi *et al.*, 2014; Kemp *et al.*, 2012; Kırcova *et al.*, 2015). Thus, we propose:

> *H1*. A (positively valenced) multisensory prime has spillover effects, such that subsequent exposure to brand-related information results in stronger self-brand connections.
>
> *H2*. The spillover effect is a function of consumer exposure to a (positively valenced) multisensory prime resulting in sensorial associations; thus sensorial associations mediate the effect of a (positively valenced) multisensory prime on self-brand connections.
>
> *H3*. A consumer's self-brand connection with an advertised brand mediates the relationship between a (positively valenced) multisensory prime and the consumer's brand-related reactions (brand attitude, purchase intention).

Moderating role of regulatory focus brand advertisements and individual orientation

With regard to brand advertisements, regulatory focus theory holds that promotion (prevention)-focused advertising messages emphasize arguments involving positive (negative) outcomes, gains (losses) and desired (undesirable) end states (Aaker and Lee, 2001; Brendl and Higgins, 1996; Higgins and Tykocinski, 1992; Idson *et al.*, 2000; Kees *et al.*, 2010). Moreover, regulatory focus theory argues and empirical work demonstrates that promotion (vs prevention)-focused primes cause individuals to concentrate more on positive cues in the environment and engage in more relational elaboration involving abstract concepts (Zhu and Meyers-Levy, 2007). Other research shows that a promotion (vs prevention)-focused message results in greater persuasiveness and perceived elaboration for happy moods (Baek and Reid, 2013) and generates sensory satisfaction (Sengupta and Zhou, 2007). In addition, prior work substantiates that positively (vs negatively)-framed messages are more effective in garnering attention, generating elaboration of the ad and developing more favorable brand attitudes (Chang, 2008). Based on such past research on promotion versus prevention regulatory focuses, we propose that the strength of the spillover effect of sensory stimulation on self-brand connections is moderated by the regulatory focus of the appeal of a brand's advertisement. Specifically, we expect that after exposure to a positively valenced multisensory prime consumers will express stronger self-brand connections after viewing a promotion (vs prevention) advertising appeal.

Regulatory focus literature also suggests that individuals have a regulatory focus orientation, that is, some individuals have a more promotion (approach) orientation and others have a more prevention (avoidance) orientation (Higgins, 2005). Higgins (2005) suggests that the regulatory fit effect, the match between an individual's regulatory focus orientation (promotion vs prevention) and that of context or situational conditions (promotion vs prevention) determines how an individual responds to the context or situation (Cesario *et al.*, 2004; Kees *et al.*, 2010). Empirical work establishes that the compatibility between an individual's regulatory focus orientation and context results in a "feels right" feeling that increases engagement and processing fluency (Aaker and Lee, 2006; Cesario *et al.*, 2004; Lee and Aaker, 2004). Thus, we propose that the strength of the sensory stimulation spillover effect on self-brand connections is moderated by the fit between an individual's regulatory focus orientation and the context. In our experimental work, we examine the fit between an individual's regulatory focus orientation and the regulatory focus in the target brand's advertisement (e.g. Lockwood *et al.*, 2002). We thus qualify our expectation of a moderation of the main effect of sensory priming related to the regulatory focus in the target brand's advertisement, with a second moderation (Hayes, 2018), that is, individual-level regulatory focus orientation. Thus, we expect a three-way moderated effect involving individual regulatory focus orientation, the regulatory focus of the ad and sensory priming; we hypothesize:

> *H4.* The sensory spillover effect of a (positively-valenced) multisensory prime on self-brand connections is stronger for promotion (vs prevention) focused ads, and this effect is stronger for individuals with a promotion (vs prevention) orientation.

Moderating role of affective versus cognitive brand advertisements

Brand advertisements can also vary in terms of their affective and cognitive tones (Clarkson *et al.*, 2011; Septianto and Pratiwi, 2016). Advertisements with positively valenced affective appeals typically focus on experiential consumption and positive emotions (e.g. the relaxing or happy mood during the production-consumption experience (Panda *et al.*, 2013); emotional

appeals and affect intensity (Zhang *et al.*, 2014); advertising images and experiential offerings (Septianto *et al.*, 2021). Alternatively, cognitive appeals focus on product attributes and utilitarian arguments (Septianto and Pratiwi, 2016; Snyder and DeBono, 1985). We speculate that the sensory stimulation spillover effect on consumer self-brand associations is stronger for an affectively (vs cognitively focused) advertisement. Specifically, we suggest that a brand advertisement emphasizing positive emotions and product consumption experiences reinforces and generates stronger sensory associations, broadening the brand associative network and thus yielding stronger self-brand connections. By contrast, we expect a product attribute-based advertisement will engage more cognitive processing, effectively not broadening the brand associative network, and in contrast to an affective appeal results in weaker self-brand connections. Consequently, we propose:

> *H5*. The sensory spillover effect of a (positively valenced) multisensory prime on self-brand connections is moderated by the cognitive-affective tone of the brand advertisement, such that the spillover effect is stronger for an affective (vs. cognitive) brand advertisement.

Overview of research and empirical work

Our work includes six experiments in which participants were assigned randomly to the experimental conditions; all experiments included a multisensory prime (vs no/other prime). The procedure across all experiments included:

- exposure to a multisensory prime (vs no/other prime);
- completion of a distraction task (matching states and capitals);
- exposure to a purchase scenario for the focal product and advertised brand; and
- completion of the self-brand connection measure (Escalas and Bettman, 2005) as well as other brand-related dependent measures and manipulation checks. Additional details are reported for each experiment.

To test our hypotheses, our studies used two multisensory primes. In Studies 1–3, drawing on past research that used images, words and phrases with sensory representations (Baron-Cohen and Harrison, 1997; Cornil and Chandon, 2016; Cytowic, 2002; Marks, 1978; Miller and Stoica, 2003; Walters *et al.*, 2007), we designed a multisensory prime with positively valenced multisensory images with text that provided the scope for engagement of all senses (Appendix 1). In Studies 4–6, and consistent with past research which engages individuals by asking multisensory imagery-based questions (Chowdhury and Coulter, 2006; Chowdhury *et al.*, 2024; Zaltman and Coulter, 1995), we designed the multisensory prime as a multisensory-imaging task that provided the scope for engagement of multiple senses (Appendix 2). Additional details of the multisensory primes are provided in the experiments.

In addition, in designing our experiments, we created purchase scenarios and advertisements for products based on two criteria:

1. gender neutrality; and
2. representation of a dominant sense (e.g. sound and touch).

Given these criteria and based on research regarding products and sensory stimulation (Gobé, 2001; Krishna, 2012; Schmitt, 1999), a pretest and informal discussions, we identified five product categories and related brands: Sony audio speakers, Apple computer, Apple earbuds, Tide detergent and Lays potato chips. The purchase scenarios and advertised brands followed

similar language across studies (see Study 1 for details). Note, the proposed research was approved by the relevant Institutional Review Board and Ethical standards and consent processes were met in accordance.

Sensory stimulation via multisensory priming with imagery and text

Studies 1–3 explored the sensory stimulation spillover effect using a multisensory prime focused on a fictitious Cove Island Resort and consisted of a promotional three-slide presentation (see Appendix 1). Slide 1 provided a brief description of the resort with a visual image of the resort; Slide 2 provided a visual image of the resort, as well as visual images of multiple sensory experiences (e.g. strawberry dipped in chocolate, sandy beach); Slide 3 included text referencing specific imagery shown in Slide 2 (e.g. "the rich taste of chocolate-covered strawberries," "walking on the soft white sandy beach").

In a pretest conducted to assess the creation of sensory stimulation, 15 participants were shown the three slides and indicated the clarity [extremely unclear (1) to extremely clear (7)] of the sensory effects: the magnificent colors of the sunset (M = 6.60), the sweet taste of chocolate-covered strawberries (M = 6.53), the tangy smell of salmon on the outdoor grill (M = 5.73), the sound of the waves crashing against the rocks (M = 5.87) and the feel of the soft touch of the white sandy beach (M = 6.20). The mean for each measure of sensory clarity was significantly above the scale midpoint (ps < 0.001) indicative of the successful manipulation of the multisensory prime.

Study 1

A total of 143 undergraduate students were assigned randomly to a between-subjects experimental design (multisensory prime vs control), where those in the positively valenced multisensory prime condition viewed the three Cove Island Resort slides (Appendix 1, A1) and those in the control condition did not view the slides. Participants then completed a distraction task (matching states and capitals) and indicated whether or not they had previously purchased four different products, including potato chips, the focal product in this study. Next participants read the brand purchase scenario:

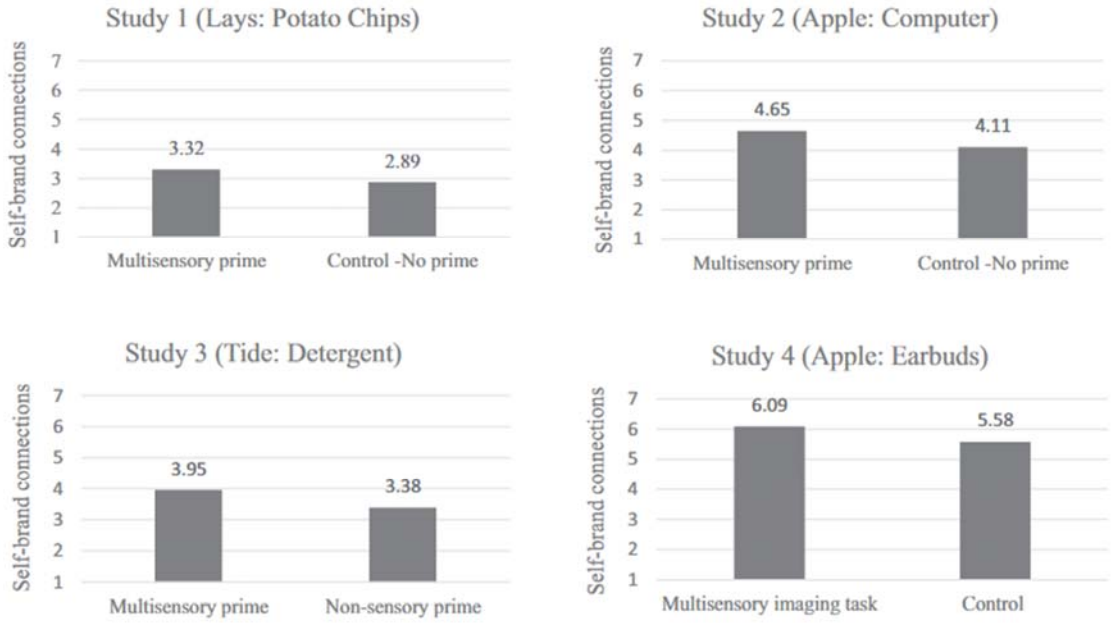
> You just realized that you have no snacks, and your friends are coming over in the evening to watch a movie. While at the local convenience store, you see the shelf tag for Lays (Naturally delicious Frito-Lay®). After looking at the other brands on the shelf, you decide to buy Lays.

Then, participants completed four seven-point Likert [strongly disagree (1) to strongly agree (7)] self-brand connection items (α = 0.80) (Escalas and Bettman, 2005) for Lays: "The Lays brand reflects who I am," "I can identify with the Lays brand," "I consider the Lays brand to be me," "The Lays brand suits me well." Finally, participants indicated whether or not they had previously purchased Lays potato chips.

Results. To assess the success of the multisensory prime manipulation within the experiment, participants in the prime condition indicated their level of interest [uninterested (1) to interested (7)] in four activities; two of which were included in the multisensory prime (Watching the magnificent colors of the sunset, Walking on the soft white sandy beach) and two were not (Swimming or snorkeling in the waters around Cove Island, Hiking on the trails). Participants exposed to the multisensory prime showed significantly higher interest in the two activities

included (vs not included) in the prime [M = 6.16 vs M = 5.40; t (71) = 6.53, $p < 0.001$], reinforcing the success of the multisensory prime.

Consistent with *H1*, we find a significant sensory stimulation spillover effect. Participants exposed to the multisensory prime reported significantly stronger connections with the Lays brand (M = 3.32, SD = 1.17) than those in the no-prime control condition [M = 2.89, SD = 1.27; t (141) = 2.07, $p < 0.05$; see Figure 2].



Note: Mean differences in each study are significantly different ($p < 0.05$)
Source: Authors' own work

Figure 2. Sensory stimulation spillover effects across studies

Forty-three percent of the respondents had a prior history of purchasing Lays brand potato chips. Results of a 2 (Lays prior purchase vs not) by 2 (prime vs control) ANOVA affirm the sensory stimulation spillover effect, with a significant priming effect [F (139) = 4.01, $p < 0.05$], and no main effect of prior purchase [F (139) = 1.0, $p > 0.3$], and no prior purchase by prime interaction [F (139) < 1, $p > 0.4$]. These findings indicate that the sensory stimulation spillover effect occurs, improving self-brand connections, irrespective of prior purchase of the product. When included as a covariate, gender was not significant ($p > 0.7$).

Study 2

Studies 2a and 2b assessed *H1* and *H2*, in the context of computers. Following the same procedures as Study 1, one-hundred and twenty-three undergraduate student participants in Study 2a were exposed to the multisensory prime (vs no prime) and then exposed to a purchase scenario with Apple as the focal brand. Participants reported their Apple self-brand connections ($\alpha = 0.93$). Our results reaffirm *H1*; participants exposed to the multisensory prime reported stronger self-brand connections for the advertised Apple brand (M = 4.65, SD = 1.52) than those in the control condition [M = 4.11, SD = 1.33; t (121) = 2.10, $p < 0.05$; see Figure 2].

In Study 2b, we explored *H2*, sensory brand associations as the mediator of the relationship between the multisensory prime and self-brand connections. Thirty-eight undergraduate students participated, following the same procedures and completing the same measures as Study 2a, as well as measures of sensory, symbolic, and utilitarian brand associations. Specifically, participants responded to brand-related sensory association items: "Apple is a brand that excites my senses," "I find this brand interesting in a sensory way," "This brand makes a strong impression on my visual senses or other senses," and "This brand does not appeal to my senses (reverse-coded)" [strongly disagree (1) to strongly agree (7); Brakus *et al.*, 2009; $\alpha = 0.85$]. For comparative purposes, we assessed two brand-related experiential items: "The brand Apple is fun and exciting," "The brand Apple has a lot of symbolic associations" ($r = 0.78$); and two brand-related utilitarian items: "The Apple brand represents quality," "The Apple brand represents reliability" ($r = 0.92$). The Cronbach's alpha for self-brand connections was 0.93.

Consistent with *H1*, participants in the multisensory prime condition reported stronger self-brand connections for the advertised Apple brand (M = 4.88, SD = 1.90) than those in the control condition [M = 3.76, SD =1.44; t (36) = 2.02, $p = 0.05$]. To examine the mediating role (Preacher and Hayes, 2004; Mediation Model 4), we included the multisensory prime as the independent variable with self-brand connections as the dependent variable, and sensory, experiential and utilitarian brand associations as multiple parallel mediators. Using 20,000 iterations to derive a 95% confidence interval (CI) for the total indirect effect, and consistent with *H2*, we find a significant indirect effect of sensory brand associations (indirect effect index = 0.92; 95% CI: 0.10–2.24). We find no significant indirect effect for experiential brand associations (indirect effect index = −0.01; 95% CI: −1.07 to 1.13) or for utilitarian brand associations (indirect effect index = 0.21; 95% CI: −0.49 to 0.99). These results support the mediating role of sensory brand associations, but not of experiential or utilitarian brand associations, indicating the multisensory prime triggered sensory brand associations which resulted in stronger self-brand connections.

Study 3

In Study 3, we explore the sensory stimulation spillover effect by contrasting a text-only multisensory prime with a nonsensory service attribute prime in a between-subjects experiment (Appendix 1, A2). In total, 143 undergraduate students were randomly assigned to the two conditions. The purchase scenario referred to detergent with Tide as the focal brand. In the multisensory prime condition, participants were exposed to ten positively valenced sensory-focused statements about Cove Island Resort, whereas the nonsensory text-only prime included ten focal travel attributes related to business travel (e.g. airfare cost, hotel – 3 stars, internet access – $10 per day). The purchase scenario stated, "You are running short of laundry detergent, but you won't need to do laundry until next week. After seeing the following ad online […] 'New Tide Freshness' (with the Tide logo) […] You decide to purchase Tide when you go to the store next week." Next, participants completed the four items measuring self-brand connections for Tide ($\alpha = 0.79$).

Consistent with *H1*, participants in the multisensory text-only prime condition (M = 3.95, SD = 1.54) had significantly stronger self-brand connections than those in the nonsensory text-only prime condition [M = 3.38, SD = 1.29; t (122) = 2.15, $p < 0.05$; see Figure 2].

Summary

The first three experiments support the sensory stimulation spillover effect. Specifically, they document that when consumers are exposed to a multisensory prime, followed by a purchase scenario including an advertised brand, their self-brand connections with the advertised brand are strengthened and that this spillover effect is attributable to increased sensory brand associations. These findings hold across multiple product categories, including food snacks, computers and detergents, as well as when the multisensory prime is both visual and textual in nature, as well as when it is text-only.

Sensory stimulation via multisensory priming via imaging task

In Studies 4–6, we examine our proposed sensory stimulation spillover effect using a multisensory-imaging task (Appendix 2) to trigger sensory stimulation. For each of these studies, participants first read:

> Consumers often have insights in product categories and consumption activities which they love to share with others. The knowledge comes through personal consumption experience, observation of others, interest in a category, media exposure, and reflection of personal and observed experiences. To give a few examples, consumers can be very engaging with respect to smartphones, wines, vacation spots, and reading lists among many others.

Then, participants were asked to "Please list two product categories in which you think you have insights which you believe you can use to engage with others." Next, they read the following:

> *Imagine that you are at a social gathering and meeting interesting people.* Picture yourself discussing your interest in (*product category 1)* with the people there in a multisensory way and keep them engaged! In the next step, please describe how you would get the crowd excited about your interest in (product category 1) through multisensory descriptions (sound, taste, touch, smell, and sight). *Let your imagination bloom!*

Participants then answered five open-ended questions (see Zaltman and Coulter, 1995), one for each sense (e.g. "How would you describe product category 1 as a *taste* experience; the flavors of [product category 1]?). Finally, participants completed measures of self-brand connections, brand attitude, and purchase intention.

Study 4

Study 4 investigated the sensory stimulation spillover effect using the multisensory-imaging task described above. One hundred and eleven Amazon Mechanical Turk participants were randomly assigned to the positively-valenced multisensory prime and control (no prime) conditions in a between-subjects experiment. The study followed similar procedures as Study 2a/b, with the following exceptions:

- this study focused on Apple earbuds (vs computer); and
- participants responded not only to measures assessing self-brand connections (α = 0.87), but also to brand attitude and willingness to purchase the brand.

Brand attitude was measured with three seven-point bi-polar statements (negative/positive, unfavorable/favorable, really dislike/really like, α = 0.80). Willingness to purchase was

measured by one seven-point Likert item, "I plan to buy Apple Air Pods" [strongly disagree (1)/strongly agree (7)].

Results. To check that the multisensory prime triggered sensory stimulation, participants indicated their clarity [extremely unclear (1) to extremely clear (7)] of the sensory images in their mind's eye (e.g. "The sound of the music that was playing," "the taste of the desserts that were served," "the sound of the welcoming high five claps from your friends."). The average clarity score of the sensory imagery items (M = 5.91 vs 4.0) was significantly greater than the mid-point of the scale [t (42) = 14.87, $p < 0.01$]. Moreover, 98% of the participants in the sensory prime condition correctly mentioned that they were given (vs not given) a scenario regarding social gatherings and product discussions involving sensory experiences. Thus, the manipulation of our multisensory prime was successful.

Consistent with *H1*, we find the sensory stimulation spillover effect; participants in the multisensory prime condition reported significantly stronger connections with the Apple brand (M = 6.09, SD = 0.68) than those in the control condition [M = 5.58, SD = 1.22; t (109) = 2.54, $p < 0.05$; see Figure 2]. This spillover effect is also evident for brand attitude [6.21 vs 5.79; t (109) = 2.20, $p < 0.05$] and willingness to purchase [6.51 vs 6.04; t (109) = 2.44, $p < 0.05$].

To assess the mediating role of self-brand connections on the relationship between the multisensory prime and the downstream variables, we conducted a bootstrapping analysis (Hayes, 2013; Model 4). Consistent with *H3*, self-brand connections mediate the effect of multisensory priming on brand attitude (indirect effect index = 0.33, 95% CI: 0.11–0.61) and willingness to purchase the brand (indirect effect index = 0.37, 95% CI: 0.11–0.71).

Study 5: Assessing the moderating role of regulatory focus-framed brand advertisement and individual orientation

In Study 5, we examined *H4* which proposed a three-way moderated effect involving the multisensory prime, regulatory focus framed advertisement, and individual regulatory focus orientation (measured). Two hundred and three undergraduate students were randomly assigned to the experimental conditions of the 2 (multisensory prime vs control) × 2 (advertisement regulatory focus: promotion vs prevention) between-subjects study. Participants first responded to the multisensory imaging task and then completed a measure of individual regulatory focus orientation including separate promotion ($\alpha = 0.88$) and prevention ($\alpha = 0.81$) orientation scales (Lockwood *et al.*, 2002). Using participants' scores on the promotion and prevention individual regulatory orientation, we calculated a mean-centered promotion-prevention difference score for use in our analysis. Next, participants completed (or not) the multisensory-imaging task and the state-capital distraction task. Then, participants were exposed either to the promotion (approach positive) or prevention (vs avoid negative) advertisement (Appendix 3, A3; Chowdhury *et al.*, 2015); a post-test (34 undergraduate students) confirmed the successful advertisement manipulation ($p = 0.05$). Finally, participants completed measures of self-brand connections, brand attitude, and willingness to purchase the brand (see Study 4).

Results. We assessed the regulatory focus advertising manipulation, and found that a strong majority of participants accurately mentioned that the ad focused on *achieving* positive outcomes (99%) and *avoiding* negative outcomes (90%) in their respective promotion and prevention conditions. Similarly, we assessed the effectiveness of the multisensory imagery task and found that a majority (80%) of the participants in the sensory prime condition correctly

mentioned that they were given (vs not given) a scenario regarding social gatherings and product discussions involving sensory experiences.

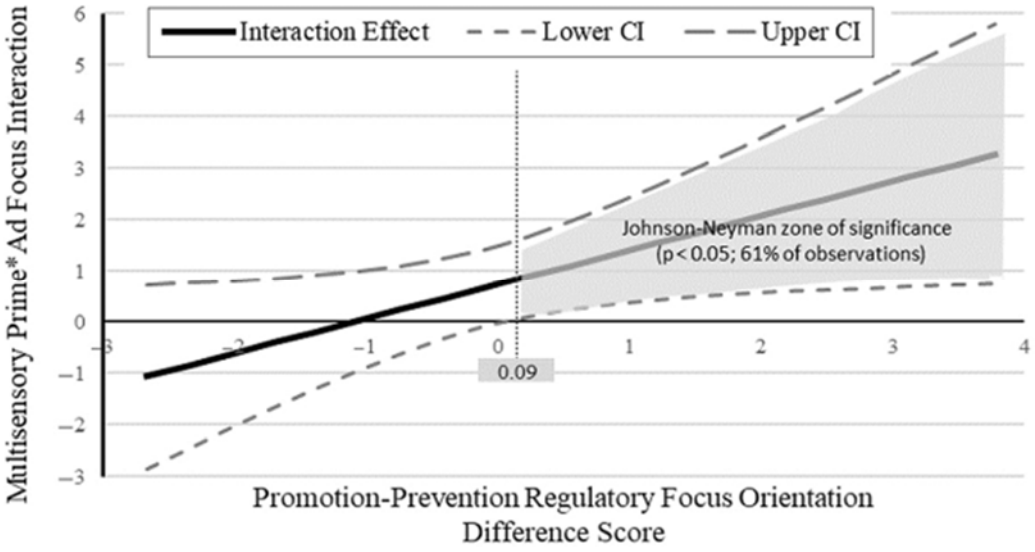
To examine *H4*, our regression analysis included mean-centered individual regulatory focus orientation, promotion versus prevention regulatory ad focus and multisensory prime versus no prime condition on self-brand connections. Results show three significant interaction effects:

- three-way multisensory prime by ad regulatory focus by individual regulatory focus orientation interaction [t (195) = 2.12, β = 0.28, $p < 0.05$];
- two-way individual regulatory orientation by ad regulatory focus interaction [t (195) = −2.40, β = −0.33, $p < 0.05$]; and
- two-way multisensory prime by ad regulatory focus interaction [t (195) = 1.83, β = 0.22, $p < 0.1$].

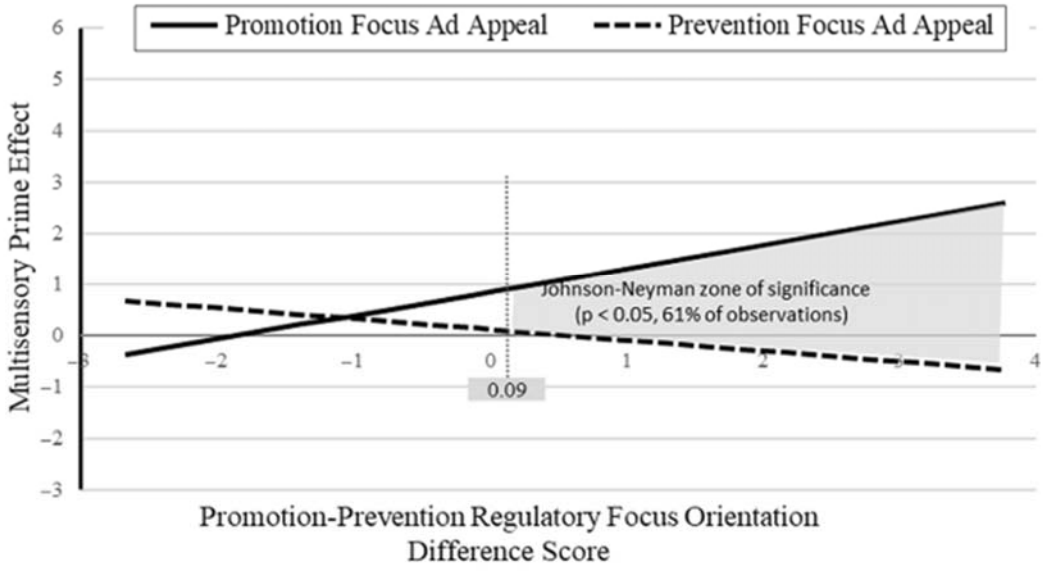
We observe no significant main effects (ps > 0.1).

To assess *H4*, we use Hayes' floodlight method (e.g. Hayes, 2018; Spiller *et al.*, 2013) to examine the three-way interaction as a moderated moderation effect. In this analysis, the moderation of multisensory prime ("x" variable) by ad regulatory focus ("w" or primary moderator variable) is moderated by individual regulatory focus orientation (mean-centered; "z" or secondary moderator variable). Consistent with *H4*, we observe a significant two-way multisensory prime by ad regulatory focus (x*w) interaction; the interaction increases in strength from low-to-high values of individual regulatory promotion versus prevention focus orientation (z), as illustrated in Figure 3(a) and (b). Figure 3(a) shows that the coefficient of the two-way multisensory prime by ad regulatory focus (x*w) interaction continuously grows in magnitude and significance [as the three-way interaction's positive, significant coefficient indicates; β = 0.28, t (195) = 2.12, $p < 0.05$] as individual regulatory promotion versus prevention focus orientation increases. The Johnson-Newman (JN) line in this figure shows the value of regulatory focus orientation difference score [0.09, t (195) = 1.98, $p < 0.05$] at which the two-way interaction becomes and continues to stay significant at higher values of the difference score (the t-value, by definition, is 1.98, because the effect transitions from nonsignificance to significance here at the 0.05 level; at higher values of the regulatory focus difference score, the t-value is larger). In Figure 3(b), we provide additional detail by separating the x*w interaction's coefficient into the multisensory prime's (x's) effect for the promotion ad focus (continuous line) and for the prevention ad focus (dotted line). As can be seen, for the promotion (prevention) ad focus, the multisensory prime's effect increases (decreases) as individual regulatory promotion versus prevention focus orientation increases (decreases). The Johnson-Newman (JN) line shows the value of regulatory focus orientation [same as in Figure 3(a), 0.09] at which the difference between the promotion and prevention lines [this difference if plotted as a line would be is identical to the interaction effect line in Figure 3(a)] becomes significant.

These findings demonstrate that the multisensory prime (vs control) coupled with a promotion-focused ad (vs prevention-focused ad) strengthens self-brand connections with increasing individual promotion (vs prevention) orientation, thereby supporting *H4*.



(a)



(b)

Notes: (a) Multisensory prime *promotion vs. prevention regulatory focus Ad appeal interaction effect across individual promotion-prevention regulatory focus orientation difference score values; (b) multisensory prime effect across individual promotion-prevention regulatory focus orientation difference score values under ...
Source: Authors' own work

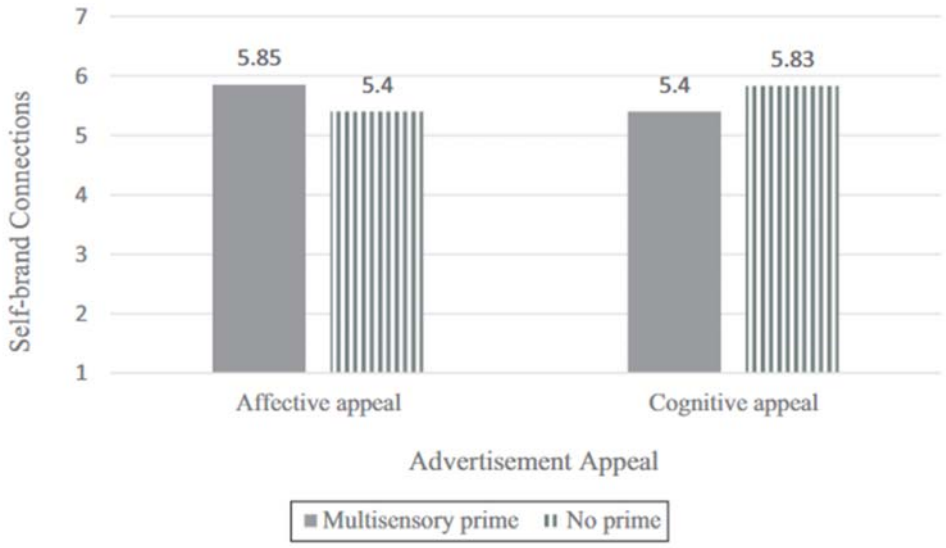
Figure 3. Study 5: Multisensory prime and promotion/prevention advertisement appeal interaction effects on self-brand connections across individual promotion-prevention regulatory orientation

Study 6: Moderating role of affective versus cognitive brand advertisement

In this study, we examine *H5* which proposed a moderation effect of an affectively- versus cognitively-framed brand advertisement on the relationship between multisensory prime and self-brand connections. The focal brand for this study was Sony, and 179 Amazon Mechanical Turk participants were randomly assigned to the conditions of a between-subjects experiment: 2 (multisensory prime vs no prime) × 2 (brand advertisement: affective vs cognitive; Appendix 3, A4). Participants indicated the clarity of sensory images (see Study 4) and also reported their self-brand connections, brand attitude, and willingness to purchase the brand (see Study 1 and Study 4 measures).

Results. An analysis of the sensory imagery clarity check for the multisensory prime affirms a successful manipulation; the average sensory clarity score in the multisensory prime condition is significantly greater than the neutral point of the scale [$5.54 > 4.0$, t (df = 72) = 16.81, $p <$ 0.01].

To examine *H5*, we conducted a 2 (multisensory versus no prime) by 2 (cognitive vs affective ad appeal) ANOVA, and results show a significant two-way interaction on self-brand connections [α = 0.79; F (175) = 9.07, $p < 0.01$] with no significant main effects ($ps > 0.1$). Follow-up analyses of the interaction support *H5*. Specifically, in the affective ad appeal condition, the multisensory prime increases self-brand connections [M_{prime} = 5.85 vs $M_{No\text{-}prime}$ = 5.40, SD = 0.75 vs 1.13, t (83) = 2.02, $p < 0.05$; see Figure 4], whereas in the cognitive ad appeal condition, the multisensory prime significantly reduces self-brand connection [M_{Prime} = 5.40 vs $M_{No\text{-}prime}$ = 5.83, SD = 0.98 vs 0.79, t (92) = −2.25, $p < 0.05$].The two-way multisensory prime by ad appeal interaction was marginally significant on brand attitude [F (175) = 3.23, $p < 0.1$] and willingness to purchase [F (175) = 3.01, $p < 0.1$].



Note: Mean differences are significantly different ($p < 0.05$) for each ad appeal condition
Source: Authors' own work

Figure 4. Study 6: Multisensory prime and affective/cognitive advertisement appeal interaction effects on self-brand connections

We also find supportive evidence for *H3*, the mediating role of self-brand connections for the ad appeal by sensory priming interaction effects on these downstream variables (Hayes, 2013; Model 59). Results for the affective appeal show that self-brand connections mediated the effect of the multisensory prime on brand attitude (indirect effect index = 0.30, 95% CI: 0.03–0.58) and willingness to purchase the brand (indirect effect index = 0.18, 95% CI: 0.02–0.36). Similarly, for cognitive appeals, self-brand connections mediated the effect of the multisensory priming on brand attitude (indirect effect index = −0.30, 95% CI: −0.56 to −0.03) and willingness to purchase the brand (indirect effect index = −0.26, 95% CI: −0.52 to −0.02).

Summary

The last three studies using the multisensory-imaging task support the sensory stimulation spillover effect. In addition, self-brand connections mediate the multisensory prime effect on brand-related variables such as brand attitude and willingness to purchase the brand. Furthermore, we find that the type of ad appeal (promotion vs prevention and affective vs cognitive) moderates the multisensory prime effect on self-brand connections.

Discussion

Over the past two decades, the importance of leveraging our senses for developing product and brand experiences has been highlighted by many researchers (e.g. Joy and Sherry, 2003). Research in marketing has examined how advertisements and the physicality associated with taste, touch, sound and smell affect a variety of consumer responses, including time spent processing, ad recall, attitudes, preferences and choice behavior. Notably, a vast majority of extant research has been focused on an individual sense, that is, taste, touch, sound, smell or sight (exceptions related to multisensory imagery include research by Joy and Sherry, 2003; Macklin, 1994; Wirtz and Mattila, 2001). Furthermore, although a few researchers have investigated multisensory effects, we focus on a sensory stimulation *spillover effect* and investigate the influence of a multisensory prime on a subsequent purchase situation which includes a specific brand advertisement and in which we measure participants' self-brand connections and other brand-related variables. Importantly, we study the spillover effect by employing two alternative methods of multisensory priming.

In this paper, across six experimental studies, we draw attention to the multisensory prime effect within the purchase and advertising contexts with attention to both a multisensory prime with images and text, as well as using a multisensory-imaging task. Our results are summarized in Table 1 and Figure 1. Our mediation analyses of sensory (vs experiential and utilitarian) associations in Study 2b provide evidence for the multisensory prime triggering more sensory associations which then positively impact consumers' self-brand connections to the advertised brand. These results provide support for our theorizing around sensory priming engaging broad activation in memory and evoking sensorial brand associations. Furthermore, Study 4 results establish that upon exposure to a purchase scenario and an advertised brand, the multisensory-imaging task evokes stronger self-brand connections (Escalas and Bettman, 2005) that mediate the relationships between the multisensory-imaging task and consumers' brand-related evaluations.

Table 1. Summary of studies – sensory stimulation spillover effects

Study	Experimental multisensory prime condition	Purchase scenario and advertisement		Self-brand connections (Mean)	Hypothesis test results
		Product purchase	Advertised brand		
Study 1	Multisensory (image + text) prime	Potato chips	Lays	3.32	*H1* – Supported
	Control			2.89	*n* = 143
Study 2	Multisensory (image + text) prime	Computer	Apple	4.65	H1 – Supported
	Control			4.11	*n* = 123
Study 3	Multisensory (text) prime	Detergent	Tide	3.95	H1 – Supported
	Nonsensory (text) prime			3.38	*n* = 124
Study 4	Multisensory-imaging task	Earbuds	Apple	6.09	H1 –Supported
	Control			5.58	*n* = 111
Study 5	Multisensory-imaging task	Earbuds	Apple		H4 – Supported
	Regulatory focus			NA	*n* = 203
	Control				
	Regulatory focus			NA	
	Regulatory trait measured			NA	
Study 6	Multisensory-imaging task	Audio speakers	Sony		H5 – Supported
	Affective appeal			5.85	*n* = 179
	Cognitive appeal			5.41	
	Control				
	Affective appeal			5.40	
	Cognitive appeal			5.83	

Note: Mediation analyses supporting *H2* and *H3* are discussed in the text and not included in the table
Source: Authors' own work

Through a series of six experiments involving purchase scenarios related to a variety of product categories with advertised brands, we demonstrate that a multisensory prime, with images and text or text alone and via a multisensory-imaging task enhances self-brand connections. Specifically, through Studies 1–3, we demonstrate that the multisensory prime (via images with text and text only) strengthens a consumer's connections with an advertised brand. We refer to this phenomenon as the *sensory stimulation spillover effect*. This sensory stimulation spillover effect on self-brand connections is replicated using a multisensory imaging-based task in Studies 4–6. In Study 5, we demonstrate that multisensory priming (vs no priming) leads to stronger self-brand connections for ads with a promotion focus, particularly for individuals whose individual regulatory orientation is more promotion- than prevention-focused. In Study 6, we find that multisensory priming (vs no priming) leads to stronger self-brand connections after viewing an affectively focused ad, and weaker self-brand connections after viewing a cognitively focused ad. In Studies 4 and 6, our findings affirm the mediating role of self-brand connections on downstream brand-related evaluations.

Managerial implications

With an increased focus on sensory marketing, our research within the advertising context has important and broad managerial implications for brand managers, advertisers, retailers and public space designers. Lindstrom (2005) pointed out firms need to generate more focused sensory branding strategies, and our research suggests that an intentionality of creating sensory stimulation around a brand can be particularly effective in generating consumer connections to the brand. Several brands have been creating a "branded sense" to enhance customer connection and loyalty. For example, Mastercard is launching unique culinary experiences that consumers can access only through Mastercard usage, these taste associations with the brand cannot be experienced directly, yet they are expected to positively impact brand image and brand-related evaluations (Brands That Engage All 5 Senses Stand Out From The Competition [forbes.com]). Other examples of firm attempts to trigger sensory stimulation include the unique sound consumers hear after completing their VISA transaction (Hubspot, 2020), the store aroma in Starbucks as every store grinds their unique coffee beans (hubspot.com), and the spring fragrance that Walmart teaming up with Glade is adding to their packing pillows included in Walmart.com's delivery boxes (Contagious, 2019).

Our findings suggest that advertisers placing ads in a sensory-rich environment can positively impact consumers' self-brand connections. For example, advertisers can program their product ads next to user reviews which have a higher sensory content. Banner and popup ads can be programmed to show when the incidental online content is multisensory in nature. According to Talkwalker's Social Media, 2023 global trend report (www.talkwalker.com/social-media-trends), multisensory social media will only increase going forward. Our findings also suggest that consideration of promotion-focused messages and affective appeals coupled with multisensory stimuli may be effective in creating stronger connections with advertised brands and intentions to purchase. Opportunities for leveraging sensory stimulation exist within traditional print magazine formats. Multipage travel advertisements or food magazines with multisensory images and descriptions would likely have positive sensory spillover effects on subsequently viewed ads for other products and services. Thus, opportunities exist to leverage those as favorable spillover multisensory contexts for how consumers relate to and feel about brands.

Our findings have interesting implications for larger retailing spaces, including public retailing spaces like Pier 91 in Seattle, Faneuil Hall Marketplace in Boston, New York's Grand Central

Station Holiday Bazaar and global venues, including bazaars of Iran (Samadi *et al.*, 2020), Istanbul's spice bar and outdoor markets of cities in Japan (Nghiêm-Phú, 2017), as well as for individual retailers. Many of these venues have multisensory stimuli that could positively impact consumers' brand connections, as well as their shopping experiences. Consider, for example, the inclusion of sparkling holiday decorations, music, and twinkling lights and the aura that these sensory experiences may also have spillover effects.

Researchers recently expressed a renewed focus on store atmospherics. Prior studies have shown that multisensory cues in in-store atmospherics influence consumers' store purchases (Helmefalk and Hultén, 2017). Researchers point out how store atmospherics (de Farias *et al.*, 2014; Soars, 2009; Vilnai-Yavetz *et al.*, 2021) and sensory branding (Pine and Gilmore, 1998) influence consumer attitudes and intentions toward the brand, store and mall. Store atmospherics, however, are often directly related to in-store products and brands and are therefore not a source of spillover effects. Our sensory stimulation spillover effects are based on multisensory stimuli which we believe can exist not just in a store's atmosphere but also may be a function of the shopping venue and atmosphere (Spence *et al.*, 2014). For example, in revisiting our introduction, we speculate that Anne who is gift shopping along the beach-front stores, amid the soft sandy beach, beautiful seashells, the waves crashing against the rocks and the soft breeze on her face may experience stronger self-brand connections than if she were walking around in a nearby mall with less sensory ambiance.

Another domain in which sensory stimulation may be of interest is public space design. Public policy researchers, for example, recently examined healthy living via smart sensory cities (Perakaki and Sinou, 2022), sensory gardens (Krzeptowska-Moszkowicz *et al.*, 2021) and special sensory rooms at airports to calm stressed travelers (www.northjersey.com/story/news/transportation/2023/12/22/newark-airport-nj-sensory-room-travelers-autism/72003492007/). These venues are designed for individual and social health, as well as community participation. Our work on sensory stimulation may be particularly relevant to how interior designers, architects and urban planners incorporate sensory elements in the spaces they design (https://sensoryone.com/incorporating-sensory-spaces-in-interior-design-of-public-buildings/) and enhance this recent focus on sensory spatial perception in urban planning (Dai and Zheng, 2021).

Future research directions

Our work on the sensory stimulation spillover effect points to multiple opportunities for future research. First, our findings indicate that sensory stimulation within a constrained context has positive spillover effects on consumers' self-brand connections, brand attitude and brand purchase intention. Past research indicates that self-brand connections is positively related to brand evaluations and brand love (Batra *et al.*, 2012). Future research could explore sensory stimulation spillover effects on brand love. Furthermore, understanding the appropriate balance of sensory stimulation is an interesting question. Under what circumstances is sensory stimulation "too much," that it hits a tipping point for overstimulation and has a boomerang rather than a positive impact on consumers' brand connections, intentions and shopping experiences? Thus, opportunities exist to explore sensory overstimulation and its effects on self-brand connections, as well as other downstream brand variables, as well as effects on shopping enjoyment.

Findings from our studies document that the sensory stimulation spillover effects on self-brand connections, brand attitude and brand purchase intentions are contingent upon the type of ad

that follows the sensory stimulation. Specifically, promotion-focused ad copy appeals facilitate the sensory stimulation spillover effect, whereas prevention-focused ad copy appeals have no effect. Moreover, sensory stimulation followed by an affective advertisement strengthens self-brand connections, but a cognitive advertisement weakens self-brand connections. Future work might explore other advertisement content or other contextual or situational features, as well as retailing and service contexts contrasting pleasant or discordant combinations of music, chatter, tastes and textures.

Another avenue for future investigation is the specific articulation of a multisensory prime. The multisensory prime used in Studies 1 and 2 included sensory images (in color) reinforced by consistent text resulting in stronger connections with the advertised brand. A straightforward extension of our work would be to examine the effects of the sensory images only (without the reinforcing text). Although past research has documented that images in ads with consistent (vs inconsistent) verbal attribute information resulted in increased product attribute recall (Unnava and Burnkrant, 1991), we speculate that a multisensory prime with images (vs no text) can result in stronger connections to the advertised brand. Additional research might examine other executional aspects of a multisensory prime. For example, past work has documented that colored versus black-and-white images generate more attention (Lohse, 1997); future research could contrast the effects of a multisensory prime with images in color, such as the one we used, relative to an identical prime in black-and-white. Our sensory prime context (Cove Island Resort) was hedonic and experiential in nature. Future research might consider black-and-white sensory images to determine if they would have a dampening effect when the context is hedonic and experiential but possibly a positive effect when the context is functional. Furthermore, additional work could involve contrasting concrete (vs abstract) images. Research has shown that concrete pictures generate a more favorable attitude toward the ad (Mitchell and Olson, 1981) and a greater purchase likelihood (Miller and Stoica, 2003). Our findings suggest that an abstract multisensory prime might allow for more abstract thinking and broader spreading activation. Thus, future work might contrast abstract images with concrete images to more fully understand the implications of changes in images on the spillover effects of sensory abstract versus concrete images.

Also, in this research, we explore sensory stimulation and sensory associations as the underlying process for the multisensory prime effect. Could it be that positive sensory priming is leading to a positive mood that is driving strengthened self-brand connections? Positive mood has often been studied with regard to brand evaluations, brand attitudes or brand choices (e.g. Barone *et al.*, 2000; Gardner and Hill, 1988; Howard and Barry, 1994). Thus, future research could examine such alternative process explanations for the proposed spillover effect.

Conclusion

Our work has introduced the sensory stimulation spillover effect, and in our experimental work, we triggered sensory stimulation via multisensory priming techniques using visual images with text as well as using a sensory-imaging task. Our work significantly advances our understanding of how multisensory priming can trigger sensory brand associations, and positively impact self-brand connections. In addition, we have provided insights about how different advertising appeals can impact the sensory stimulation spillover effect to not only impact self-brand connections, but also brand-related reactions. Moreover, we have advanced a substantial future research agenda, and we encourage marketing scholars to contribute to impactful sensory-related research not only from firms' perspectives related to marketing

strategy, but also from consumers' perspectives and reactions that affect their marketplace and brand preferences and choices.

References

Aaker, J.L. and Lee, A.Y. (2001), "I' seek pleasure and 'we' avoid pain: the role of self-regulatory goals in information processing and persuasion", Journal of Consumer Research, Vol. 28 No. 1, pp. 33-49.

Aaker, J.L. and Lee, A.Y. (2006), "Understanding regulatory fit", Journal of Marketing Research, Vol. 43 No. 1, pp. 15-19.

Ahluwalia, R., Unnava, H.R. and Burnkrant, R.E. (2001), "The moderating role of commitment on the spillover effect of marketing communications", Journal of Marketing Research, Vol. 38 No. 4, pp. 458-470.

Anderson, J.R. (1983), "A spreading activation theory of memory", Journal of Verbal Learning and Verbal Behavior, Vol. 22 No. 3, pp. 261-295.

Baek, T.H. and Reid, L.N. (2013), "The interplay of mood and regulatory focus in influencing altruistic behavior", Psychology and Marketing, Vol. 30 No. 8, pp. 635-646.

Balachander, S. and Ghose, S. (2003), "Reciprocal spillover effects: a strategic benefit of brand extensions", Journal of Marketing, Vol. 67 No. 1, pp. 4-13.

Baron-Cohen, S. and Harrison, J.E.(Eds.), (1997), Synaesthesia: Classic and Contemporary Readings, Blackwell, Cambridge, MA.

Barone, M.J., Miniard, P.W. and Romeo, J.B. (2000), "The influence of positive mood on brand extension evaluations", Journal of Consumer Research, Vol. 26 No. 4, pp. 386-400.

Batra, R., Ahuvia, A. and Bagozzi, R.P. (2012), "Brand love", Journal of Marketing, Vol. 76 No. 2, pp. 1-16.

Biswas, D., Labrecque, L.I., Lehmann, D.R. and Markos, E. (2014), "Making choices while smelling, tasting, and listening: the role of sensory (dis) similarity when sequentially sampling products", Journal of Marketing, Vol. 78 No. 1, pp. 112-126.

Brakus, J.J., Schmitt, B.H. and Zarantonello, L. (2009), "Brand experience: what is it? How is it measured? Does it affect loyalty?", Journal of Marketing, Vol. 73 No. 3, pp. 52-68.

Cesario, J., Grant, H. and Higgins, E.T. (2004), "Regulatory fit and persuasion: transfer from feeling right", Journal of Personality and Social Psychology, Vol. 86 No. 3, pp. 388-404.

Chae, I., Stephen, A.T., Bart, Y. and Yao, D. (2017), "Spillover effects in seeded word-of-mouth marketing campaigns", Marketing Science, Vol. 36 No. 1, pp. 89-104.

Chaiken, S. and Eagly, A.H. (1976), "Communication modality as a determinant of message persuasiveness and message comprehensibility", Journal of Personality and Social Psychology, Vol. 34 No. 4, pp. 605-614.

Chand, V.S. and Fei, C. (2021), "Self-brand connection and intention to purchase a counterfeit luxury brand in emerging economies", Journal of Consumer Behaviour, Vol. 20 No. 2, pp. 399-411.

Chang, C. (2008), "Ad framing effects for consumption products: an affect priming process", Psychology and Marketing, Vol. 25 No. 1, pp. 24-46.

Chowdhury, T.G. and Coulter, R.A. (2006), "Getting a 'sense' of financial security for generation Y", *American Marketing Association 2006 Winter Educators' Conference Proceedings*, Jean L. Johnson and John Hulland, (Eds), Chicago, IL: *American Marketing Association*, pp. 191-192.

Chowdhury, T.G., Murshed, F. and Messier, M. (2024), "Reassessing brand versus concept associations: comparing free association task and sensory cue-based task", International Journal of Internet Marketing and Advertising, Vol. 20 No. 2, pp. 119-140.

Chowdhury, T.G., Micu, C., Ratneshwar, S. and Kim, E. (2015), "What to get and what to give up: how different decision tasks and product types affect the persuasiveness of promotion-versus prevention-focused messages", Psychology and Marketing, Vol. 32 No. 9, pp. 922-933.

Clarkson, J.J., Tormala, Z.L. and Rucker, D.D. (2011), "Cognitive and affective matching effects in persuasion: an amplification perspective", Personality and Social Psychology Bulletin, Vol. 37 No. 11, pp. 1415-1427.

Clemo, H.R., Kensington, L.P. and Meredith, M.A. (2012), "Structural basis of multisensory processing: convergence", The Neural Bases of Multisensory Processes, Micah M. Murray and Mark T. Wallace, (Eds), CRC Press/Taylor and Francis, Boca Raton, FL, pp. 3-14.

Colicev, A. and de Bruyn, A. (2023), "The spillover effects of positive and negative buzz on brand attitudes", European Journal of Marketing, Vol. 57 No. 9, pp. 2382-2406.

Contagious (2019), available at: www.contagious.com/news-and-views/glade-sneaks-into-packaging-pillows-in-walmart-online-shopping-campaign

Cornil, Y. and Chandon, P. (2016), "Pleasure as a substitute for size: how multisensory imagery can make people happier with smaller food portions", Journal of Marketing Research, Vol. 53 No. 5, pp. 847-864.

Cytowic, R.E. (2002), Synesthesia: A Union of the Senses, MIT Press, Cambridge, MA.

Dai, T. and Zheng, X. (2021), "Understanding how multi-sensory spatial experience influences atmosphere, affective city image and behavioural intention", Environmental Impact Assessment Review, Vol. 89, p. 106595.

de Farias, S.A., Aguiar, E.C. and Melo, F.V.S. (2014), "Store atmospherics and experiential marketing: a conceptual framework and research propositions for an extraordinary customer experience", International Business Research, Vol. 7 No. 2, pp. 87-99.

Dwivedi, A., McDonald, R.E. and Johnson, L.W. (2014), "The impact of a celebrity endorser 's credibility on consumer self-brand connection and brand evaluation", Journal of Brand Management, Vol. 21 Nos 7/8, pp. 559-578.

Erdem, T. and Sun, B. (2002), "An empirical investigation of the spillover effects of advertising and sales promotions in umbrella branding", Journal of Marketing Research, Vol. 39 No. 4, pp. 408-420.

Escalas, J.E. and Bettman, J.R. (2005), "Self-construal, reference groups, and brand meaning", Journal of Consumer Research, Vol. 32 No. 3, pp. 378-389.

Forbes (2021), "Brands that engage all 5 senses stand out from the competition (forbes.com)".

Gardner, M.P. and Hill, R.P. (1988), "Consumers' mood states: antecedents and consequences of experiential versus informational strategies for brand choice", Psychology and Marketing, Vol. 5 No. 2, pp. 169-182.

Gobé, M. (2001), Emotional Branding: The New Paradigm for Connecting Brands to People, Allworth Press, New York, NY.

Goldberg, M.E. and Gorn, G.J. (1987), "Happy and sad TV programs: how they affect reactions to commercials", Journal of Consumer Research, Vol. 14 No. 3, pp. 387-403.

Hayes, A.F. (2013), "Mediation, moderation, and conditional process analysis", Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach, Guilford Publications, New York, NY, Vol. 1 No. 6, pp. 12-20.

Hayes, A.F. (2018), Introduction to Mediation, Moderation, and Conditional Process Analysis, The Guilford Press, New York, NY.

Helmefalk, M. and Hultén, B. (2017), "Multi-sensory congruent cues in designing retail store atmosphere: effects on shoppers' emotions and purchase behavior", "pp", Journal of Retailing and Consumer Services, Vol. 38, pp. 1-11.

Higgins, E.T. (2005), "Value from regulatory fit", Current Directions in Psychological Science, Vol. 14 No. 4, pp. 209-213.

Higgins, E.T. and Tykocinski, O. (1992), "Self-discrepancies and biographical memory: personality and cognition at the level of psychological situation", Personality and Social Psychology Bulletin, Vol. 18 No. 5, pp. 527-535.

Hoegg, J. and Alba, J.W. (2007), "Taste perception: more than meets the tongue", Journal of Consumer Research, Vol. 33 No. 4, pp. 490-498.

Howard, D.J. and Barry, T.E. (1994), "The role of thematic congruence between a mood-inducing event and an advertised product in determining the effects of mood on brand attitudes", Journal of Consumer Psychology, Vol. 3 No. 1, pp. 1-27.

Hubspot (2020), available at: https://blog.hubspot.com/marketing/sensory-branding

Idson, L.C., Liberman, N. and Higgins, E.T. (2000), "Distinguishing gains from nonlosses and losses from nongains: a regulatory focus perspective on hedonic intensity", Journal of Experimental Social Psychology, Vol. 36 No. 3, pp. 252-274.

Jayasinghe, L. and Ritson, M. (2013), "Everyday advertising context: an ethnography of advertising response in the family living room", Journal of Consumer Research, Vol. 40 No. 1, pp. 104-121.

Jordan, K.E. and Baker, J. (2011), "Multisensory information boosts numerical matching abilities in young children", Developmental Science, Vol. 14 No. 2, pp. 205-213.

Joy, A. and Sherry, J.F. (2003), "Speaking of art as embodied imagination: a multisensory approach to understanding aesthetic experience", Journal of Consumer Research, Vol. 30 No. 2, pp. 259-282.

Kalwani, M.U. and Silk, A.J. (1982), "On the reliability and predictive validity of purchase intention measures", Marketing Science, Vol. 1 No. 3, pp. 243-286.

Keller, K.L. (2008), Strategic Brand Management, 3rd ed. Prentice Hall, Upper Saddle River, NJ.

Keller, P.A. and Lehmann, D.R. (2008), "Designing effective health communications: a meta-analysis", Journal of Public Policy and Marketing, Vol. 27 No. 2, pp. 117-130.

Kees, J., Burton, S. and Tangari, A.H. (2010), "The impact of regulatory focus, temporal orientation, and fit on consumer responses to health-related advertising", Journal of Advertising, Vol. 39 No. 1, pp. 19-34.

Kemp, E., Williams, K.H. and Bordelon, B.M. (2012), "The impact of marketing on internal stakeholders in destination branding: the case of a musical city", Journal of Vacation Marketing, Vol. 18 No. 2, pp. 121-133.

Kırcova, İ., Enginkaya, E. and Yılmaz, H. (2015), "Influence of consumers' self-brand connections on purchase intentions", *Annual International Conference on Social Sciences*.

Krishna, A. (2012), "An integrative review of sensory marketing: engaging the senses to affect perception, judgment and behavior", Journal of Consumer Psychology, Vol. 22 No. 3, pp. 332-351.

Krishna, A., Cian, L. and Sokolova, T. (2016), "Sensory and semantic bases of interactive imagery in an advertising context", Current Opinion in Psychology, Vol. 10, pp. 142-147.

Krzeptowska-Moszkowicz, I., Moszkowicz, L. and Porada, K. (2021), "Evolution of the concept of sensory gardens in the generally accessible space of a large city: analysis of multiple cases from kraków (Poland) using the therapeutic space attribute rating method", Sustainability, Vol. 13 No. 11, p. 5904.

Landy, D. and Sigall, H. (1974), "Beauty is talent: task evaluation as a function of the performer's physical attractiveness", Journal of Personality and Social Psychology, Vol. 29 No. 3, pp. 299-304.

Lee, A.Y. and Aaker, J.L. (2004), "Bringing the frame into focus: the influence of regulatory fit on processing fluency and persuasion", Journal of Personality and Social Psychology, Vol. 86 No. 2, pp. 205-218.

Lehr, A., Buettgen, M., Benoit, S. and Merfeld, K. (2020), "Spillover effects from unintended trials on attitude and behavior: promoting new products through access-based services", Psychology and Marketing, Vol. 37 No. 5, pp. 705-723.

Li, S., Lyu, T., Park, S. and Choi, Y. (2023), "Spillover effects in destination advertising: an electroencephalography study", Annals of Tourism Research, Vol. 102, p. 103623.

Lindstrom, M. (2005), “Broad sensory branding”, Journal of Product and Brand Management, Vol. 14 No. 2, pp. 84-87.

Lockwood, P., Jordan, C.H. and Ziva, K. (2002), “Motivation by positive or negative role models: regulatory focus determines who will best inspire us”, Journal of Personality and Social Psychology, Vol. 83 No. 4, pp. 854-864.

Lohse, G.L. (1997), “Consumer eye movement patterns on yellow pages advertising”, Journal of Advertising, Vol. 26 No. 1, pp. 61-73.

Ma, J., Zhao, Y. and Zichuan, M. (2023), “Dynamic luxury advertising: using lifestyle versus functional advertisements in different purchase stages”, Journal of Advertising, Vol. 52 No. 1, pp. 39-56.

Macklin, M.C. (1994), “The impact of audiovisual information on children’s product–related recall”, Journal of Consumer Research, Vol. 21 No. 1, pp. 154-164.

Malaviya, P. (2007), “The moderating influence of advertising context on ad repetition effects: the role of amount and type of elaboration”, Journal of Consumer Research, Vol. 34 No. 1, pp. 32-40.

Mandler, J.M. (1984), Scripts, Stories and Scenes: Aspects of Schema Theory, Erlbaum, Hillsdale, NJ.

Marks, L.E. (1978), The Unity of the Senses: Interrelations Among the Modalities, Academic Press, New York, NY.

Miller, D. and Stoica, M. (2003), “Comparing the effects of a photograph versus artistic renditions of a beach scene in a direct response print ad for a Caribbean resort island: a mental imagery perspective”, Journal of Vacation Marketing, Vol. 10 No. 1, pp. 11-21.

Mitchell, A.A. and Olson, J.C. (1981), “Are product attribute beliefs the only mediators of advertising effects on brand attitudes?”, Journal of Marketing Research, Vol. 18 No. 3, pp. 318-322.

Morwitz, V.G., Steckel, J.H. and Gupta, A. (2007), “When do purchase intentions predict sales?”, International Journal of Forecasting, Vol. 23 No. 3, pp. 347-364.

Murray, M.M. and Wallace, M.T. eds. (2012), The Neural Bases of Multisensory Processes, CRC Press/Taylor and Francis, Boca Raton, FL.

Nghiêm-Phú, B. (2017), “Sensory marketing in an outdoor out-store shopping environment–an exploratory study in Japan”, Asia Pacific Journal of Marketing and Logistics, Vol. 29 No. 5, pp. 994-1016.

Nilsson, A., Bergquist, M. and Schultz, W.P. (2017), “Spillover effects in environmental behaviors, across time and context: a review and research agenda”, Environmental Education Research, Vol. 23 No. 4, pp. 573-589.

Nisbett, R.E. and Wilson, T.D. (1977), “The halo effect: evidence for unconscious alteration of judgments”, Journal of Personality and Social Psychology, Vol. 35 No. 4, pp. 250-256.

Paivio, A. (1991), "Dual coding theory: retrospect and current status", Canadian Journal of Psychology / Revue Canadienne de Psychologie, Vol. 45 No. 3, pp. 255-287.

Panda, T.K., Panda, T.K. and Mishra, K. (2013), "Does emotional appeal work in advertising? The rationality behind using emotional appeal to create favorable brand attitude", IUP Journal of Brand Management, Vol. 10 No. 2, pp. 7-23.

Perakaki, R. and Sinou, M. (2022), "Smart sensory city as the new public place: investigate resilience and sustainability of urban public spaces to promote healthier environments and community participation", *Proceedings of the International Conference on Changing Cities V: Spatial, Design, Landscape, Heritage and Socio-Economic Dimensions*, *Corfu Island, Greece*, pp. 20-25.

Petit, O., Velasco, C. and Spence, C. (2019), "Digital sensory marketing: integrating new technologies into multisensory online experience", Journal of Interactive Marketing, Vol. 45 No. 1, pp. 42-61.

Pine, B.J. and Gilmore, J.H. (1998), "Welcome to the experience economy", Harvard Business Review, Vol. 76 No. 4, pp. 97-105.

Preacher, K.J. and Hayes, A.F. (2004), "SPSS and SAS procedures for estimating indirect effects in simple mediation model", Behavior Research Methods, Instruments, and Computers, Vol. 36 No. 4, pp. 717-731.

Raufeisen, X., Wulf, L., Köcher, S., Faupel, U. and Holzmüller, H.H. (2019), "Spillover effects in marketing: integrating core research domains", AMS Review, Vol. 9 Nos 3/4, pp. 249-267.

Rosenblum, L.D. (2013), "A confederacy of senses", Scientific American, Vol. 308 No. 1, pp. 72-75.

Samadi, J., Sattarzadeh, D. and Balilan, A. (2020), "Qualitative assessment of the sensory dimensions of space in historical bazaars from the users' point of view", Bagh-e Nazar, Vol. 16 No. 81, pp. 17-34.

Sathian, K. and Zangaladze, A. (2002), "Feeling with the mind's eye: contribution of visual cortex to tactile perception", Behavioural Brain Research, Vol. 135 Nos 1/2, pp. 127-132.

Schmitt, B.H. (1999), Experiential Marketing: How to Get Customers to Sense, Feel, Think, Act, Relate, The Free Press, New York, NY.

Sengupta, J. and Zhou, R. (2007), "Understanding impulsive eaters' choice behaviors: the motivational influences of regulatory focus", Journal of Marketing Research, Vol. 44 No. 2, pp. 297-308.

Septianto, F. and Pratiwi, L. (2016), "The moderating role of construal level on the evaluation of emotional appeal vs. cognitive appeal advertisements", Marketing Letters, Vol. 27 No. 1, pp. 171-181.

Septianto, F., Sheng, Y. and Northey, G. (2021), "The effectiveness of advertising images in promoting experiential offerings: an emotional response approach", Journal of Business Research, Vol. 122, pp. 344-352.

Shams, L. and Seitz, A.R. (2008), "Benefits of multisensory learning", Trends in Cognitive Sciences, Vol. 12 No. 11, pp. 411-417.

Snyder, M. and DeBono, K. (1985), "Appeals to image and claims about quality: understanding the psychology of advertising", Journal of Personality and Social Psychology, Vol. 49 No. 3, pp. 586-597.

Soars, B. (2009), "Driving sales through shoppers' sense of sound, sight, smell and touch", International Journal of Retail and Distribution Management, Vol. 37 No. 3, pp. 286-298.

Spence, C. (2012), "Managing sensory expectations concerning products and brands: capitalizing on the potential of sound and shape symbolism", Journal of Consumer Psychology, Vol. 22 No. 1, pp. 37-54.

Spence, C., Puccinelli, N.M., Grewal, D. and Roggeveen, A.L. (2014), "Store atmospherics: a multisensory perspective", Psychology and Marketing, Vol. 31 No. 7, pp. 472-488.

Spiller, S.A., Fitzsimons, G.J., Lynch, J.G., Jr. and McClelland, G.H. (2013), "Spotlights, floodlights, and the magic number zero: simple effects tests in moderated regression", Journal of Marketing Research, Vol. 50 No. 2, pp. 277-288.

Stein, B.E., Burr, D., Constantinidis, C., Laurienti, P.J., Alex Meredith, M., Perrault, T.J., Jr, Ramachandran, R., Röder, B., Rowland, B.A., Sathian, K. and Schroeder, C.E. (2010), "Semantic confusion regarding the development of multisensory integration: a practical solution", European Journal of Neuroscience, Vol. 31 No. 10, pp. 1713-1720.

Stipp, H. (2018), "How context can make advertising more effective", Journal of Advertising Research, Vol. 58 No. 2, pp. 138-145.

Thøgersen, J. and Ölander, F. (2003), "Spillover of environment-friendly consumer behaviour", Journal of Environmental Psychology, Vol. 23 No. 3, pp. 225-236.

Unnava, H.R. and Burnkrant, R.E. (1991), "An imagery-processing view of the role of pictures in print advertisements", Journal of Marketing Research, Vol. 28 No. 2, pp. 226-231.

van Osselaer, S.M.J. and Janiszewski, C. (2001), "Two ways of learning brand associations", Journal of Consumer Research, Vol. 28 No. 2, pp. 202-223.

Vilnai-Yavetz, I., Gilboa, S. and Mitchell, V. (2021), "Experiencing atmospherics: the moderating effect of mall experiences on the impact of individual store atmospherics on spending behavior and mall loyalty", Journal of Retailing and Consumer Services, Vol. 63, p. 102704.

Walters, G., Sparks, B. and Herington, C. (2007), "The effectiveness of print advertising stimuli in evoking elaborate consumption visions for potential travelers", Journal of Travel Research, Vol. 46 No. 1, pp. 24-34.

Walters, G., Sparks, B. and Herington, C. (2012), "The impact of consumption vision and emotion on the tourism consumer's decision behavior", Journal of Hospitality and Tourism Research, Vol. 36 No. 3, pp. 366-389.

Wirtz, J. and Mattila, A. (2001), "Congruency of scent and music as a driver of in-store evaluations and behavior", in Asia Pacific Advances in Consumer Research, Paula M. Tidwell and Thomas E. Muller, (Eds), Association for Consumer Research, Provo, UT, Vol. 4, p. 363.

Wirtz, J.G., Sparks, J.V. and Zimbres, T.M. (2018), "The effect of exposure to sexual appeals in advertisements on memory, attitude, and purchase intention: a meta-analytic review", International Journal of Advertising, Vol. 37 No. 2, pp. 168-198.

Wörfel, P., Frentz, F. and Tautu, C. (2022), "Marketing comes to its senses: a bibliometric review and integrated framework of sensory experience in marketing", European Journal of Marketing, Vol. 56 No. 3, pp. 704-737.

Yegiyan, N.S. (2015), "Explicating the emotion spillover effect", Journal of Media Psychology, Vol. 27 No. 3, pp. 134-145.

Zaltman, G. and Coulter, R.H. (1995), "Seeing the voice of the customer: metaphor-based advertising research", Journal of Advertising Research, Vol. 35 No. 4, pp. 35-51.

Zhang, H., Sun, J., Liu, F. and Knight, J.G. (2014), "Be rational or be emotional: advertising appeals, service types and consumer responses", European Journal of Marketing, Vol. 48 Nos 11/12, pp. 2105-2126.

Zheng, X., Baskin, E. and Peng, S. (2018), "The spillover effect of incidental social comparison on materialistic pursuits: the mediating role of envy", European Journal of Marketing, Vol. 52 Nos 5/6, pp. 1107-1127.

Zhu, R. and Meyers-Levy, J. (2007), "Exploring the cognitive mechanism that underlies regulatory focus effects", Journal of Consumer Research, Vol. 34 No. 1, pp. 89-96.

Further reading

Coulter, R.H. and Zaltman, G. (1994), "Using the Zaltman metaphor elicitation technique to understand brand images", in NA - Advances in Consumer Research, Chris T. Allen and Deborah Roedder John, (Eds), Association for Consumer Research, Provo, UT, Vol. 21, pp. 501-507.

Appendix 1

Sources: Adapted from the internet with Creative Common Licenses; authors' own work

Figure A1. Studies 1 and 2: multisensory (visual and text) stimulation prime

Sources: Adapted from the internet with Creative Common Licenses; authors' own work

Figure A2. Study 3: text only prime – multisensory vs nonsensory

Appendix 2

Studies 4, 5 and 6: multisensory-imaging task.

STEP 1: The multisensory prime read: "Consumers often have insights in product categories and consumption activities which they love to share with others. The knowledge comes through personal consumption experience, observation of others, interest in a category, media exposure, reflection of personal and observed experiences, etc. To give a few examples, consumers can be very engaging with respect to smartphones, wines, vacation spots, and reading lists among many others."

STEP 2: Then we asked participants to: "Please list two product categories in which you think you have insights which you believe you can use to engage with others."

STEP 3: Once the consumers mentioned their two categories, the following questions were asked for their first product category listed in their responses: "*Imagine that you are at a social gathering and meeting interesting people.* Picture yourself discussing your interest in <*product category 1*> with the people there in a multisensory way and keep them engaged! In the next step, please describe how you would get the crowd excited about your interest in <product category 1> through multisensory descriptions (sound, taste, touch, smell, and sight). *Let your imagination bloom!"*

STEP 4: *This was followed by five specific questions for each sense, for example: "*How would you describe using < product category 1> as a **taste** experience? The flavors of < product category 1>!

Source: Adapted from the internet with Creative Common Licenses

Appendix 3

Advertising appeal stimuli

Sources: Adapted from the internet with Creative Common Licenses; authors' own work

Figure A3. Study 5: Promotion vs prevention advertising appeals

Sources: Adapted from the internet with Creative Common Licenses; authors' own work

Figure A4. Study 6: Cognitive vs affective advertising appeal