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Little empirical research has examined the implicit effects of environmental cues on consumer behavior. Across six studies using a combination of field and laboratory methods, the authors find that products are more accessible, evaluated more favorably, and chosen more frequently when the surrounding environment contains more perceptually or conceptually related cues. The findings highlight the impact of frequent—in addition to recent—priming in shaping product evaluation and choice: More frequent exposure to perceptually or conceptually related cues increases product accessibility and makes the product easier to process. In turn, this increased accessibility influences product evaluation and choice, which are found to vary directly with the frequency of exposure to conceptually related cues. These results support the hypothesis that conceptual priming effects can have a strong impact on real-world consumer judgments.

*Keywords:* environmental cues, priming, advertising, product choice, product evaluation

## Dogs on the Street, Pumas on Your Feet: How Cues in the Environment Influence Product Evaluation and Choice

On July 4, 1997, NASA landed the Pathfinder spacecraft on the surface of Mars. This “Mission to Mars” captured media attention worldwide over the course of the following months, and during this period, candy maker Mars Inc. also noticed a rather unusual increase in sales (White 1997). Although the Mars Bar takes its name from the company founder and not from Earth’s neighboring planet, consumers apparently responded to news about the planet Mars by purchasing more Mars Bars. This was a lucky turn of events for the candy company, but what does it mean for understanding consumer choice?

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In this article, we examine how repeated incidental exposure to features of the everyday environment can influence product evaluation and choice. Building on recent processing fluency research (Lee and Labroo 2004; Whittlesea 1993), as well as classic work on spreading activation (Collins and Loftus 1975), we hypothesize that exposure to environmental cues repeatedly “prime” perceptually or conceptually related product representations in memory. In turn, the resultant ease of processing the product representation can cause increases in product evaluation, purchase likelihood, and choice (Lee and Labroo 2004; Nedungadi 1990).

Using a combination of laboratory and field methods, we investigate several hypotheses that further the understanding of priming effects in the everyday consumer environment and the processes underlying such effects. First, we examine whether consumers whose environments contain more perceptually or conceptually related cues evaluate products more positively and choose them more often. Second, we examine the role of frequency of cue exposure in priming, hypothesizing that increased exposure frequency leads to increases in evaluations of related products. By doing so, we highlight the underlying role of fluency in producing these effects, and we extend prior research by demonstrating that an accumulation of previous exposures

to related cues can increase product accessibility and evaluation in the same way as recent exposure.

We also pursue several smaller objectives that contribute to the understanding of priming effects in consumer environments. We examine whether such effects can arise through newly constructed links between previously unrelated constructs (in addition to well-learned semantic links), whether they occur for familiar brands (or only unfamiliar brands), and whether they can occur outside conscious awareness. Six studies examine these hypotheses and related objectives.

### THEORETICAL BACKGROUND

When concepts are activated through direct exposure, they are known to affect judgment and decision making. For example, recently primed brands are more likely to be included in and chosen from a consumer's consideration set (e.g., Nedungadi 1990; Shapiro 1999). Similarly, repeated exposure to an object can produce more favorable ratings of that object (Zajonc 1968), and such "mere exposure" effects have been shown to occur for everything from the attractiveness of people (Moreland and Beach 1992) to brands (Baker 1999; Janiszewski 1993). Thus, it has been well established that people prefer objects they have previously encountered, but can similar effects emerge for objects *related* to those that were previously encountered?

Psychological research has demonstrated that situational cues or primes can automatically activate associated representations in memory, leading them to become more accessible (e.g., Higgins, Rholes, and Jones 1977). This activation can also spread to related constructs automatically through an associative network (Anderson 1983; Collins and Loftus 1975; Neely 1977). According to this spreading-activation account, priming (or activating) a given construct in memory leads to the spontaneous activation of related constructs in memory. Thus, priming a given construct can have downstream effects on perceptually or conceptually related constructs.

Indeed, although most studies have focused on direct exposure, research also suggests that product choice and evaluations can be influenced by exposure to perceptually or conceptually related stimuli (Gordon and Holyoak 1983; Whittlesea 1993). For example, participants repeatedly exposed to random polygons showed increased favorability toward previously unseen polygons that were perceptually similar (Monahan, Murphy, and Zajonc 2000). Exposure to a given stimulus can also increase the choice and evaluation of conceptually related targets (e.g., those with semantic or conceptual links to the primed stimulus; Lee and Labroo 2004; Whittlesea 1993). Nedungadi (1990) finds that brand choice is affected by prior exposure not only to that specific brand but also to competing brands. He theorizes that activation of a brand spreads to related brands, causing them to be more accessible, which leads to increased likelihood of their inclusion in the consideration set. Predictive contexts can also lead people to evaluate items more positively. Participants rated a bottle of ketchup more favorably after viewing a pictorial story about a fast-food restaurant than about a supermarket, presumably because ketchup is more closely linked to fast-food restaurants (Lee and Labroo 2004). Because ease of processing is often positively valenced (Harmon-Jones and Allen 2001), Lee and Labroo

(2004) suggest that these findings are driven by increases in conceptual fluency (ease of processing) that arise from exposure to the predictive context.

Importantly, according to the discrepancy-attribution hypothesis, such processing ease positively influences judgment only when the fluency is unexpected (Whittlesea and Williams 1998, 2001a, b). When people are aware of the reason for processing ease, there is no discrepancy between how much fluency they feel and how much they expect to feel (because they can easily attribute the ease of processing to the source), and thus there is no reason to attribute the fluency to positive qualities of the target. However, if there is a discrepancy between expected and experienced fluency, people are likely to attribute it to positive qualities of the target.

An implication of this hypothesis is that obvious direct exposure to an object may not always positively affect judgment, because people may attribute their fluency experience to their recent observation of the object. In contrast, indirect exposure or conceptual priming—when people are exposed to an object that is cognitively linked with the target—may be especially likely to produce positive judgments, because people are unlikely to attribute the fluency to exposure to a seemingly irrelevant object. In this situation, people are not expecting to experience fluency and thus are less likely to correct for it.

### DOWNSTREAM PRIMING EFFECTS IN THE EVERYDAY ENVIRONMENT

The previously mentioned research presents a case for the importance of cue exposure in constructing evaluations and making choices, but there have been few examinations of such effects in real-world contexts. In everyday life—as opposed to the carefully controlled laboratory—consumers are inundated with a seemingly infinite number of cues (Peter and Olson 2005); how much influence can any one cue really have? Indeed, Bargh (2006) recently noted that a major remaining issue in the basic priming literature is how these effects play out in real-world environments, which are infinitely more complex than those in the lab. Simonson (2005) suggests that until researchers can show that these automatic priming effects produce real-world change, the impact and importance of these laboratory findings is undetermined. The current article contributes to growing efforts to understand how priming effects shape everyday judgment and decision making (Berger and Heath 2005; Berger, Meredith, and Wheeler 2006; Kay et al. 2004).

Furthermore, it is known that direct product exposure (e.g., advertising, aisle displays) positively affects sales (e.g., Baker 1999; Bemmaor and Mouchoux 1991), but what about exposure to perceptually or conceptually linked stimuli? The more consumers see advertisements for Puma brand sneakers, the more they should like and purchase Puma sneakers, but what about exposure to stimuli related to Puma? Might it be the case that the more consumers see dogs, the more they will like and purchase Pumas?

### CURRENT RESEARCH

The current research investigates the impact of incidental exposure to everyday environmental cues on product evaluation and choice. Because of the lack of empirical data on priming product representations in the everyday con-

sumer environment, we first sought evidence that when consumers were in environments that provided many cues to a given product, the cognitive accessibility of that product would increase.

H<sub>1</sub>: Products are more accessible when consumers are frequently exposed to real-world stimuli with perceptual or conceptual links to those products.

We examine this hypothesis in Field Study 1 and the pretest to Experiment 4.

In turn, this increased accessibility can have positive downstream consequences. Environments that contain perceptual or conceptual cues to a given product should repeatedly prime the product representation in memory, leading the product to be processed more easily. This should result in increased product choice, greater purchase likelihood, and more positive evaluations.

H<sub>2</sub>: Products are more likely to be chosen if consumers are frequently exposed to real-world stimuli with perceptual or conceptual links to those products.

We examine this hypothesis in Experiments 1 and 3.

H<sub>3</sub>: Products are evaluated more positively if consumers are frequently exposed to real-world stimuli with perceptual or conceptual links to those products.

We examine this hypothesis in Field Study 2 and Experiments 2 and 4.

Beyond examining these primary effects of conceptual priming, we also extend prior research by emphasizing the hypothesis that conceptual fluency is the underlying mechanism producing these effects. Prior research in the consumer domain has not directly tested the underlying mechanisms: Indeed, Lee and Labroo (2004) note the need for work that tests the underlying role of ease of processing or fluency.

The current research furthers this goal in two ways: First, we investigate exposure frequency. Prior research has focused on effects of *recent* incidental exposure on evaluations, in which judgments immediately follow cue exposure (i.e., within seconds or minutes; Lee and Labroo 2004; Whittlesea 1993). We examine whether similar effects result from *frequent* exposure to conceptual cues. We hypothesize that the more frequently consumers are exposed to conceptually linked stimuli in their everyday lives, the higher are the resultant product evaluations, even when judgments are not immediately preceded by cue exposure.

H<sub>4</sub>: As frequency of exposure to conceptually linked stimuli increases, the positivity of product evaluations increase.

We both measure self-reported frequency of exposure (Experiments 2 and 3) and manipulate it (Experiment 4).

Second, we explore the role of conscious awareness in this process. Because research has suggested a dissociation between explicit and implicit responses to prior exposure (e.g., Janiszewski 1993; Zajonc 2001), we expect that conceptual priming effects on evaluation are unlikely to depend on conscious processing or rehearsal.

H<sub>5</sub>: The effects of exposure to conceptually linked stimuli do not depend on conscious awareness or deliberate learning.

We examine this hypothesis in Experiment 4.

### FIELD STUDY 1: THE HALLOWEEN STUDY

Because little research has been conducted on priming in everyday environments, our first study simply sought to establish that real-world environmental cues can activate—or make more accessible—related product representations. To do so, we took advantage of a natural temporary difference in the prevalence of certain environmental cues (the color orange) due to a holiday (Halloween). We examined the accessibility of various consumer products at two times: the day before Halloween and one week later. Right before the holiday, pumpkins adorn the neighborhoods, and stores and advertisements prominently feature orange displays. As of November 1, however, these orange cues disappear. If the prevalence of real-world environmental cues can influence product accessibility, products that are associated with the color orange (e.g., Reese's, a product whose logo and packaging are largely orange in color, or orange-colored products, such as Sunkist or Orange Crush) should be relatively more accessible before Halloween than one week later.

#### Method

Respondents (N = 144) were approached as they entered or exited a local supermarket and were asked to complete a "Quick Thinking" questionnaire. All participants were approached on a Saturday afternoon; half were approached the day before Halloween (target condition), and half were approached a week later (control condition). All other aspects of the study were identical across the two conditions.

Respondents were told that the experimenters were "interested in what things come to mind when people think of different categories" and were asked to "list the first things that come to your mind" in the categories of candy/chocolate and soda. For the candy/chocolate category, they were asked to "list eight types of candy/chocolate," and for the soda category, they were asked to list six brands of soda.

We measured product accessibility in two ways. First, we examined the percentage of lists on which the product was mentioned. Second, we examined the ease with which these products came to mind relative to other products in the category, using a "primacy of output" method (Higgins, King, and Mavin 1982). Items generated earlier in the list were considered more accessible in memory. For example, if Reese's was listed fifth, it received a score of five for that respondent. If the product did not appear on the list, a score was recorded equivalent to the number below the last one on the list (i.e., nine for chocolates and seven for sodas).

#### Results

As we predicted, orange-associated products were relatively more accessible when the color orange was more prevalent in the environment. For the chocolate category, participants mentioned Reese's more on the day before Halloween (54%) than one week later (30%;  $\chi^2(1, N = 144) = 3.97, p = .05$ ). Similarly, among sodas, participants mentioned orange sodas (e.g., Orange Crush, Sunkist) more on the day before Halloween (47%) than one week later (30%;  $\chi^2(1, N = 143) = 4.37, p < .04$ ). The participants did not generate any other orange products.

We also examined product ordering within consumers' lists. As we predicted, Reese's was more accessible—that

is, it was generated more easily than other products—the day before Halloween ( $M = 6.00$ ) than a week later ( $M = 7.18$ ;  $t(142) = 2.34$ ,  $p < .02$ ). Participants also generated orange sodas more easily the day before Halloween ( $M = 5.84$ ) than a week later ( $M = 6.21$ ), but this effect did not reach significance ( $t(141) = 1.49$ ,  $p = .14$ ).

### Discussion

Consistent with  $H_1$ , in times when there should have been more real-world orange cues in the environment, orange-related products (e.g., Reese's, orange sodas) were more accessible. Our results demonstrate that the prevalence of environmental cues as simple as color can affect product accessibility, even in noisy real-world consumer environments.

It is difficult to explain these results through patterns of holiday consumption. Outside of color, Reese's is not uniquely linked with Halloween. A separate set of respondents ( $N = 30$ ) did not list Reese's more frequently than other types of candy (e.g., Snickers, Kit Kat, Hershey's Kisses) when asked what candy they associated with Halloween ( $ps > .20$ ). Furthermore, other chocolate products that were highly associated with Halloween (Snickers and Kit Kat) showed no significant boost in accessibility due to the holiday ( $\chi^2s(1, N = 144) < 1.00$ ,  $ps > .20$ ).

As with most field studies, however, threats to internal validity exist. Rather than increased exposure to the color orange, it could be argued that increased direct exposure to the products (on the shelves of the store) or different active goals consumers had before Halloween (e.g., to buy something festive) may have driven the results. The fact that half the participants completed the survey before entering the store casts doubt on the first possibility, but this study does not allow us to rule out the second concern. Our next study uses an experimental design to hold constant other aspects of the situation while directly manipulating environmental cues.

### EXPERIMENT 1: THE PEN COLOR STUDY

Experiment 1 used a more controlled design to examine whether exposure to perceptually related environmental cues can influence product choice. Participants were asked to complete a survey and were randomly given either an orange pen or a green pen to do so. The survey asked them to make choices between consumer goods, some of which were related to the color orange (e.g., Fanta) or green (e.g., Sprite) and others of which were not linked to either color (e.g., Pepsi). We predicted that exposure to perceptually related environmental cues (in this case, pen color) would influence product choice. That is, participants who used an orange pen would be more likely to choose orange-related products than participants who used a green pen, and vice versa.

### Method

Participants ( $N = 29$ ) were approached on a university campus, asked to complete a short "Consumer Choice Survey," and randomly assigned to a condition. The experimenter carried ten pens in his pocket; half were orange and wrote in orange ink, and half were green and wrote in green ink. After giving them a survey, the experimenter reached into his pocket, randomly selected a pen, and gave it to the participant to use to complete the survey.

Participants were told that the experimenter was interested in the types of things people like, and to ensure that they had been exposed to the ink color, they were first asked to write a few sentences about a book they read recently. After writing, they were asked which option they would choose from 20 different choice pairs (e.g., beverages, detergents, candies). They were shown pictures of each option; some of the options were related to the color orange (e.g., Sunkist orange soda), some were related to green (e.g., Lemon-Lime Gatorade), and some were related to neither (e.g., All detergent).

### Results

We summed the number of orange-related and green-related products each participant chose and examined this in a 2 (environmental cues: orange versus green)  $\times$  2 (product color: orange versus green) repeated measures analysis of variance (ANOVA). As we predicted, exposure to different environmental cues influenced product choice. In addition to a main effect of product color ( $M_{\text{Orange}} = 6.39$  versus  $M_{\text{Green}} = 5.11$ ;  $F(1, 27) = 6.57$ ,  $p = .02$ ), there was a significant environmental cue  $\times$  product color interaction ( $F(1, 27) = 7.23$ ,  $p = .01$ ). Participants who wrote with an orange pen were more likely to choose orange products ( $M = 7.15$ ) than participants who used a green pen ( $M = 5.63$ ;  $F(1, 27) = 4.46$ ,  $p = .04$ ). Similarly, participants who wrote with a green pen were more likely to choose green products ( $M = 5.69$ ) than participants who used an orange pen ( $M = 4.54$ ;  $F(1, 27) = 5.05$ ,  $p = .03$ ). Pen color did not affect choice of the control products ( $M_{\text{Orange}} = 8.20$  versus  $M_{\text{Green}} = 8.31$ ;  $F < .5$ , not significant [n.s.]).

### Discussion

In support of  $H_2$ , the results illustrate that exposure to perceptually related environmental cues can influence product choice. Exposure to a colored pen led participants to choose more products of that same color. Participants chose more orange (green) products when they were exposed to the color orange (green).

Field Study 1 and Experiment 1 both examine the effects of existing perceptual links between products and environmental cues. Field Study 2 and Experiment 2 examine whether similar effects occur using newly constructed links that are conceptual in nature. During an initial lab session, participants learned a slogan that linked a product to a previously unrelated everyday object. Because linking a product to a positive object could elicit increased choice or evaluation through conditioning, we chose objects that were neutral in valence (i.e., dining hall trays and luggage).

### FIELD STUDY 2: THE LUGGAGE STUDY

Field Study 2 examined whether real-world priming effects extend to purchase likelihood and willingness to pay, in addition to considering conceptual (rather than perceptual) priming effects and newly constructed (rather than preexisting) links. We investigated whether consumers who are frequently exposed to a given cue (a common, everyday object) would react to conceptually related products more favorably. Exposure to conceptually related cues should increase a product's fluency (Lee and Labroo 2004) and lead to greater purchase likelihood and willingness to pay.

As in Field Study 1 and Experiment 1, this study takes advantage of preexisting differences in exposure to certain

environmental cues. We conducted our study before the beginning of the school year when some students had already arrived on campus and others had not yet traveled to campus (they would travel between Time 1 and Time 2 of our study). Thus, some participants (who had not yet arrived) would be frequently exposed to luggage through the act of traveling to campus, and others (who had already arrived) would not be frequently exposed to luggage during the week of our study. At the onset of the study, all participants were contacted by e-mail and were repeatedly exposed to a slogan that linked the target product (a new digital music player) to an environmental cue. Half the participants learned a slogan that linked the product to luggage—a cue whose prevalence varies between these groups—and the other half were exposed to a control slogan that linked the product to a cue that should not vary across groups (dining hall trays). One week later, all participants responded to a follow-up e-mail survey and indicated their purchase likelihood and willingness to pay. Thus, we used a 2 (slogan: luggage versus tray)  $\times$  2 (group: travelers versus nontravelers) between-subjects design.

We hypothesized that these variables would be affected by our “environment” grouping, which was simply based on whether participants traveled between Time 1 (when they learned the slogan) and Time 2 (when they completed the dependent variables). Participants who had not yet traveled to campus should be exposed to luggage more frequently during the week of the study. Consequently, among participants who learned the slogan linking the product to luggage, those who traveled during the study should show greater purchase likelihood and willingness to pay. Traveling should have no effect on participants who learned the control (dining hall tray) slogan.

### Method

A week before the start of the school year, students ( $N = 116$ , 64% female) completed the first part of a two-part “Advertising Campaigns” study as part of a larger group of studies. One participant did not complete all the measures and was removed from the analysis.

**Slogan exposure.** Participants were told that a company was about to release a new digital music player (named ePlay) and were asked to provide feedback on the company’s upcoming ad campaign. They read an in-depth product description and were shown the campaign’s slogan. Half received a slogan that linked the product to luggage (“Luggage carries your gear, ePlay carries what you want to hear”), and the other half received a slogan that linked the product to dining hall trays (“Dinner is carried by a tray, music is carried by ePlay”). Participants then completed several tasks that were designed to link the digital music player to the designated environmental cue (e.g., reciting the slogan in their heads or evaluating the slogan in different fonts). They also wrote the slogan from memory several times. In all, they were exposed to the slogan (either directly or by rehearsal) 20 times.

**Dependent measures.** Four days later, participants were contacted by e-mail and were asked to complete the second part of the study (dependent and ancillary measures). Participants responded to two questions regarding purchase likelihood (“How interested are you in purchasing the ePlay digital music player?” and “How likely would you be to purchase an ePlay digital music player?”; participants

assessed both questions on seven-point scales). As we expected, these two items were highly correlated ( $r = .81$ ), and we averaged them to form a purchase likelihood index. Participants were also asked to list how much they would be willing to pay for the music player (in dollars).

We also included a few final measures (all on seven-point scales). Participants rated how much they would like to have a digital music player, how much having one would have made their past week more enjoyable, and how much they liked their luggage and dining hall trays. Participants were also asked, “How much attention did you pay to the first portion of the study?” This enabled us to examine whether our results could be explained by participants who had not yet traveled somehow finding the luggage slogan to be more relevant and thus showing increased elaboration. Finally, they were asked whether they had traveled to campus during the week of the study.

### Results

**Preliminary analyses.** Traveling had no influence on how much participants reported wanting to have a digital music player ( $M_{\text{Travel}} = 4.90$  versus  $M_{\text{No Travel}} = 5.10$ ;  $F < .5$ , n.s.) or whether they thought it would have made their past week more enjoyable ( $M_{\text{Travel}} = 4.63$  versus  $M_{\text{No Travel}} = 4.87$ ;  $F < .5$ , n.s.). Similarly, traveling did not influence how much participants liked their luggage ( $M_{\text{Travel}} = 4.45$  versus  $M_{\text{No Travel}} = 4.53$ ;  $F < .5$ , n.s.) or dining hall trays ( $M_{\text{Travel}} = 3.63$  versus  $M_{\text{No Travel}} = 3.78$ ;  $F < .5$ , n.s.). Finally, although participants who received the luggage slogan reported paying more attention to Part 1 of the study than participants who received the tray slogan ( $M = 5.17$  versus 4.58;  $F(1, 112) = 5.56$ ,  $p < .02$ ), the slogan  $\times$  group interaction was not significant ( $F < .75$ , n.s.), indicating that travelers did not report paying significantly more attention to the luggage slogan relative to the tray slogan ( $M = 5.09$  versus 4.31) than did nontravelers ( $M = 5.24$  versus 4.84).

**Main dependent measures.** A 2  $\times$  2 ANOVA examined the effect of slogan and group on purchase likelihood and willingness to pay (see Table 1). In addition to the main effects of slogan (purchase likelihood:  $F(1, 112) = 5.68$ ,  $p = .02$ ; willingness to pay:  $F(1, 112) = 4.06$ ,  $p = .05$ ), the analyses revealed the predicted slogan  $\times$  group interaction (purchase likelihood:  $F(1, 112) = 4.91$ ,  $p < .03$ ; willingness to pay:  $F(1, 112) = 3.71$ ,  $p < .06$ ). Specifically, among participants who received the luggage slogan, those who had traveled were more likely to purchase the product ( $M = 3.55$  versus 2.55;  $F(1, 112) = 6.68$ ,  $p = .01$ ) and were willing to pay over \$50 more to purchase it ( $M = \$103.10$  ver-

Table 1  
EFFECT OF TRAVEL AND SLOGAN ON PURCHASE  
LIKELIHOOD AND WILLINGNESS TO PAY (FIELD STUDY 2)

	Purchase Likelihood		Willingness to Pay	
	No Travel	Travel	No Travel	Travel
Luggage slogan	2.55 <sup>a</sup>	3.55 <sup>b</sup>	\$68.16 <sup>a</sup>	\$103.10 <sup>b</sup>
Tray slogan	2.50 <sup>a</sup>	2.22 <sup>a</sup>	\$67.05 <sup>a</sup>	\$50.31 <sup>a</sup>

Notes: Within each dependent variable, means with different superscripts differ significantly at  $p < .05$ . Participants reported greater purchase likelihood and greater willingness to pay for a digital music player when it was linked conceptually to cues that were encountered frequently in their everyday environment.

sus \$68.16;  $F(1, 112) = 3.81, p = .05$ ). There was no corresponding difference among participants who received the dining hall tray slogan ( $F_s < .75, n.s.$ ). When we consider the data another way, among participants who had traveled, those who saw the luggage slogan were more likely to purchase the product ( $M = 3.55$  versus  $2.22$ ;  $F(1, 112) = 7.73, p < .01$ ) and were willing to pay more than \$50 more ( $M = \$103.10$ ;  $F(1, 112) = 5.69, p = .02$ ) than those who saw the tray slogan ( $M = \$50.31$ ). There was no corresponding difference among participants who had not yet traveled over the period ( $F_s < .5, n.s.$ ).

### Discussion

The results of Field Study 2 suggest that the prevalence of conceptually related environmental cues can influence consumers' purchase likelihood and willingness to pay. As we predicted, consumers whose environments provided more conceptually related cues to a digital music player reported being more likely to purchase the player and were willing to pay more to get it. We believe that this is the first evidence to indicate that marketers can benefit by creating novel conceptual links between their product and features of the consumer environment, a finding that could lead to innovative marketing strategies.

The results help rule out several alternative explanations. Because groups did not differ in how much they reported needing a digital music player or liking their luggage, it is unlikely that our effects were due to travelers recognizing a greater need to transport music or to any kind of "affective contagion" spreading from luggage to the music player. Travelers also did not report paying more attention to the luggage slogan during Time 1 of the study, which helps rule out the alternative that differences in elaboration or attention to the slogan drove the effects.

As with most field studies however, threats to internal validity remain. Participants in our nontraveling group arrived at school earlier than those in the traveling group, and the type of students who arrive on campus early may be different from those who arrive later (e.g., involved in sports or special academic programs). Although it is less clear how such differences between these groups would lead to the interactive pattern of results found, the next study uses an experimental grouping variable (whether the dining hall uses trays at meals) for which such differences should be less likely. Furthermore, even stronger support for our hypothesis would come from providing direct evidence that exposure to related cues drove the effects. Thus, Experiment 2 uses a more controlled design.

### EXPERIMENT 2: THE TRAY STUDY

Experiment 2 uses a  $2$  (slogan)  $\times$   $2$  (group) design to investigate whether the frequency of exposure to conceptually related cues increases product evaluations. We used the slogans from Field Study 2, but rather than examining participants who varied in their exposure to luggage, we compared participants who varied in their exposure to dining hall trays. Half the participants ate their meals in dining halls that used trays, and half ate in dining halls that did not use trays.

We predicted a slogan  $\times$  dining hall interaction. Participants whose dining halls use trays and who are exposed to a slogan linking the product to trays should report greater product evaluations. Repeated priming of the product by

tray exposure should cause the product to be more accessible, which (because it should be unexpected) should lead to positive product evaluations (Whittlesea and Williams 1998). We also measured reported exposure to trays to investigate the role of frequency of cue exposure on evaluation.

### Method

Undergraduate students ( $N = 65, 55\%$  female) completed a two-part "Advertising Study" as part of a group of studies for which they were paid \$10. They were randomly assigned to a condition, and approximately half ate in dining halls that used trays.

*Slogan exposure.* The slogan exposure procedure and the slogans themselves were identical to those used in Field Study 2.

*Dependent measures.* Ten days later, participants were contacted by e-mail and completed the dependent measures (on seven-point scales). Two items measured participants' overall product evaluation: "How much do you like the ePlay digital music player?" and "How favorable are your attitudes toward the ePlay digital music player?" ( $r = .79$ , averaged to form product evaluation index). Participants rated how much they thought they needed a digital music player, how much they liked dining hall trays, and how frequently they had seen trays in the previous week. Finally, they provided their dorm name and whether the dining hall used trays.

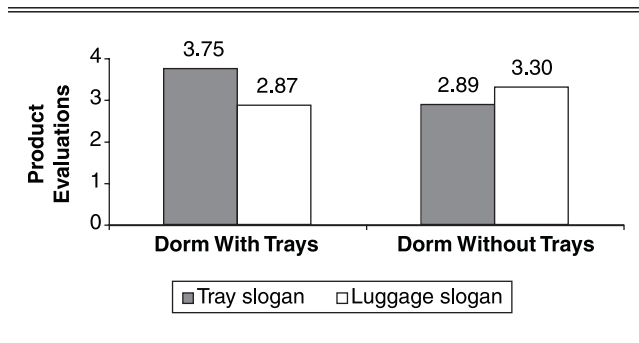
### Results

*Preliminary analyses.* As we expected, participants who ate in dining halls with trays reported seeing trays more frequently ( $M = 6.03$ ) than those who ate in dining halls without trays ( $M = 1.79$ ;  $t(63) = 12.61, p < .001$ ). Furthermore, conditions did not differ in reported need for a digital music player ( $p_s > .20$ ). There was an unexpected marginal effect of slogan on tray liking ( $F(1, 65) = 3.07, p = .09$ ), indicating that participants who received the luggage slogan reported liking trays somewhat more ( $M = 4.41$ ) than those who received the tray slogan ( $M = 3.77$ ), but if anything, the direction of this effect should work against our hypothesis.

*Product evaluations.* A  $2$  (slogan)  $\times$   $2$  (group) ANOVA examined the effects of slogan and group on product evaluations. There were no main effects of either slogan or group ( $F_s < 1, n.s.$ ), but as we hypothesized, there was a significant slogan  $\times$  group interaction ( $F(1, 61) = 5.26, p < .03$ ; see Figure 1). Participants who received the tray slogan evaluated the product more favorably if they ate in dorms that used trays ( $M = 3.75$ ) than if they ate in dorms that did not use trays ( $M = 2.89$ ;  $F(1, 61) = 4.49, p < .04$ ). There was no difference between dorms for those who received the luggage slogan ( $F(1, 61) = 1.23, p > .25$ ). If we consider this another way, participants who ate in dining halls with trays evaluated the product more favorably if they had received the tray slogan ( $M = 3.75$ ) than if they had received the luggage slogan ( $M = 2.87$ ;  $F(1, 61) = 5.65, p < .02$ ). No effects due to slogan emerged for participants who ate in dining halls without trays ( $F < 1, n.s.$ ).

*Moderated mediation analysis.* We also conducted a moderated mediation analysis (Preacher, Rucker, and Hayes 2006) to examine whether, as predicted, reported exposure to dining hall trays would mediate the relationship between

Figure 1  
EXPOSURE TO ENVIRONMENTS THAT CONTAIN MORE  
CONCEPTUALLY LINKED PRODUCT CUES LEADS TO MORE  
FAVORABLE PRODUCT EVALUATIONS (EXPERIMENT 2)



group and product evaluation for people exposed to the tray slogan but not for people exposed to the luggage slogan. An ordinary least squares regression found that the independent variable (experimental group) predicted the mediator (reported exposure to trays;  $t(1, 64) = 12.61, p < .001$ ). We used an ordinary least squares multiple regression model to predict the product evaluations based on the mediator (frequency of seeing trays), the moderator (slogan), the independent variable (group), and the interaction between the mediator and the moderator.

As we predicted, the results indicate the presence of moderated mediation (for a full illustration, see the Web Appendix at <http://www.marketingpower.com/jmrfeb08>); the effect of the mediator on the dependent variable depended on the moderator as evidenced by a significant mediator  $\times$  moderator interaction ( $t(1, 64) = 2.35, p < .02$ ). Specifically, reported exposure to trays mediated the relationship between group and product evaluation for participants exposed to the tray slogan (indirect effect;  $z = 2.81, p < .005$ ) but not for participants exposed to the luggage slogan (indirect effect;  $z = .57, n.s.$ ).

Individual mediational analyses for each condition clarify the results. For participants in the tray slogan condition, all four conditions for mediation were met. Dining hall type was correlated with device liking ( $\beta = .37, p < .04$ ) and the frequency of seeing trays ( $\beta = .91, p < .001$ ). When we included both dining hall and frequency of trays in a regression predicting device liking, the frequency of seeing trays was significant ( $\beta = .82, p < .04$ ), but dining hall was not ( $\beta = -.38, p > .20$ ). This pattern of results did not emerge in the luggage slogan condition. Dining hall type was correlated with the frequency of seeing trays ( $\beta = .79, p < .001$ ) but not with device liking ( $\beta = -.19, p = .28$ ), and when we included both terms in a regression predicting product evaluation, neither dining hall ( $\beta = -.30, p = .30$ ) nor trays ( $\beta = .13, p = .64$ ) were significant predictors.

*Effect of experimental grouping in the absence of cue exposure.* We also conducted a pretest to examine whether existing differences between the experimental groupings could have similar effects on product evaluation. Participants ( $N = 38$ , half from each type of dining hall) learned just the tray slogan and filled out product evaluation measures immediately, instead of ten days later. Because the dependent measures were collected right away and the sur-

vey was completed online (when conceptually related cues were unlikely to be present), we precluded the possibility that intervening exposure to the conceptually related cue (dining halls trays) could influence product evaluations. As we expected, participants who ate in dining halls with trays reported seeing trays more frequently ( $M = 6.57$ ) than participants in dining halls without trays ( $M = 2.06; t(37) = 10.07, p < .001$ ), but there were no corresponding differences on product evaluation ( $M_{\text{Trays}} = 3.81$  versus  $M_{\text{No Trays}} = 3.43; t(37) < 1, n.s.$ ). This suggests that any effects of experimental group in the main study are not caused by preexisting group differences, and it provides greater confidence that they are due to frequency of tray exposure.

### Discussion

In support of  $H_3$ , the results of Experiment 2 illustrate that frequent exposure to conceptually related cues can influence product evaluations. Participants evaluated a novel product more favorably when the product had a conceptual link to cues that were encountered frequently in their everyday environment. The use of a control slogan and control groups that evaluated the product in the absence of exposure to environmental cues helps rule out alternative explanations. A moderated mediation provided further support for  $H_4$  that differences in frequency of exposure to conceptually related cues drove the difference in evaluations. Reported exposure to trays mediated the relationship between group and product evaluation but only for participants who had previously learned a conceptual link between the product and that cue. For participants who learned to link the product to a different cue (luggage), no such pattern of mediation emerged.

### EXPERIMENT 3: THE FRUIT AND VEGETABLE STUDY

Experiment 3 examines how everyday exposure to features of the environment can influence actual consumption. We investigated whether students would eat more fruits and vegetables if a slogan reminding them to do so was linked to a common feature of their everyday environment (dining hall trays). Participants recorded what they ate over a two-week period; half-way through, they learned one of two slogans. Because only some of our participants ate in dining halls that use trays, we again chose a slogan that involved the word "tray." We theorized that this differential cueing by the environment would cause participants who were exposed to trays in their daily environment to consume more fruits and vegetables.

We created two control conditions to test this hypothesis. First, we compared the effect of our tray slogan for participants who eat in dining halls with trays (frequently cued group) with those who eat in dining halls without trays (noncued group). Second, we compared the effects of the tray slogan on our frequently cued group with a group that received a slogan that should not be cued as frequently by the environment (competing-slogan group).

### Method

*Slogan pretest.* Before conducting the main study, we pretested possible slogans. Thirty-five respondents (all from dining halls with trays) rated several slogans. They were told that the National Board for Better Health was designing



a campaign, and they were asked to rate how much they liked each of ten slogans (1 = "not at all," and 7 = "a great deal"). They also rated how much they thought each slogan would influence their fruit and vegetable consumption (1 = "not at all," and 7 = "a great deal"). We selected two slogans for our main experiment: one that would not be cued by the environment (competing slogan: "Live the healthy way, eat five fruits and veggies a day") and one that would be frequently cued for half the sample (target slogan: "Each and every dining hall tray needs five fruits and veggies a day"). Participants actually liked the competing slogan ( $M = 4.11$ ) more than the target slogan ( $M = 1.91$ ;  $t(34) = 8.85$ ,  $p < .001$ ) and believed that it was more likely to influence their consumption ( $M = 3.54$  versus  $2.27$ ;  $t(34) = 5.15$ ,  $p < .001$ ).

**Main study procedure.** Undergraduate students ( $N = 59$ , 56% female) completed a group of studies and were compensated \$20 for their time. Participants were told that the experimenter was interested in how eating habits varied by day of the week, and they were asked to record what they ate over a two-week period. Each evening, participants received an e-mail directing them to a Web site where they recorded their meals. They were asked to complete the survey as soon as they received the e-mail and to be specific regarding what they ate.

After one week, participants came to the lab for an ostensibly unrelated study. They were told that the National Board for Better Health wanted feedback about a new campaign aiming to increase student health. The slogan exposure materials were similar to those used in the previous two studies but were modified to involve fruits and vegetables. Approximately half the participants whose dining halls used trays received the target slogan (frequently cued group), and the other half received the competing slogan (competing-slogan group). All participants whose dining halls did not use trays received the target slogan (noncued group).

After two weeks, participants completed the final measures. They were asked how positively they felt about dining hall trays and how frequently they had seen trays in the past week (on seven-point scales). Participants recorded their gender and whether their dining hall used trays.

## Results

**Preliminary analyses.** Participants who ate in dining halls that used trays reported seeing trays more frequently in the past week than participants whose dining halls did not use trays ( $M = 5.89$  versus  $1.42$ ;  $t(57) = 13.02$ ,  $p < .001$ ). There were no differences in liking for trays across the conditions ( $M_{\text{Frequently Cued}} = 4.43$  versus  $M_{\text{Noncued}} = 3.96$  versus  $M_{\text{Competing Slogan}} = 4.13$ ;  $F < 1$ , n.s.).

Using federal serving-size guidelines, a coder (blind to the conditions) recorded the number of fruit and vegetable servings each participant consumed each day before and after the slogan manipulation. Because gender has been shown to have a significant impact on eating behaviors (Roos et al. 1998), our main analysis included gender as a covariate. A 2 (week)  $\times$  4 (day)  $\times$  3 (condition: noncued versus frequently cued versus competing slogan) repeated measures analysis of covariance (ANCOVA) found no significant week  $\times$  day  $\times$  condition interaction ( $F(6, 165) = 1.05$ ,  $p > .5$ ); thus, we collapsed across days of the week

and examined consumption using a 2 (week)  $\times$  3 (condition) repeated measures ANCOVA.

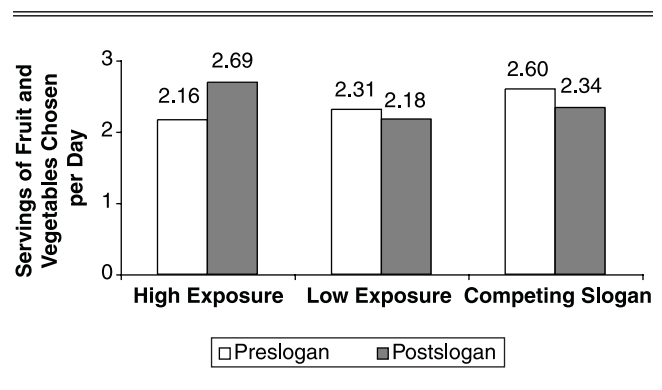
**Fruit and vegetable consumption.** There were no main effects of week or condition ( $ps > .20$ ), but as we predicted, a significant week  $\times$  condition interaction emerged ( $F(2, 55) = 3.14$ ,  $p = .05$ ; see Figure 2). Participants in the frequently cued group were more affected by the slogan than those in the noncued ( $F(1, 55) = 4.02$ ,  $p < .05$ ) and competing-slogan ( $F(1, 55) = 4.89$ ,  $p < .03$ ) groups. Whereas participants in the control groups did not change their consumption (noncued group:  $M_{\text{Preslogan}} = 2.31$  versus  $M_{\text{Postslogan}} = 2.18$ ; competing-slogan group:  $M_{\text{Preslogan}} = 2.60$  versus  $M_{\text{Postslogan}} = 2.34$ ;  $F_s < 1$ , n.s.), those in the frequently cued group increased consumption by 25% ( $M_{\text{Preslogan}} = 2.16$  versus  $M_{\text{Postslogan}} = 2.69$ ;  $F(1, 55) = 5.23$ ,  $p < .03$ ).

**Relation to perceptions of cue frequency.** We also examined whether participants' self-reports of how frequently they were exposed to trays were correlated with product consumption. Consistent with our hypotheses, the more target slogan participants reported seeing trays, the more they increased their consumption of fruits and vegetables ( $r = .33$ ,  $p = .03$ ). When we entered both frequency of tray exposure and dorm type in a mediational analysis, however, neither remained significant predictors of consumption behavior ( $\beta_s < .19$ ,  $ps > .50$ ).

## Discussion

In support of  $H_1$ , the results of Experiment 3 illustrate that the prevalence of everyday stimuli affected product choice outside of the laboratory setting. Creating a conceptual link between a reminder to eat more fruits and vegetables and a common real-world object increased fruit and vegetable consumption. Comparison groups and pretests enable us to eliminate several alternative explanations. These effects cannot be attributed to qualities of the slogan itself because the same slogan did not change consumption for participants in the noncued group. The findings also cannot be attributed to the particular dining halls. Consumption did not increase for participants in the competing-slogan group. Thus, neither the slogan nor the environment themselves caused the consumption change but rather the

Figure 2  
CONCEPTUALLY LINKING A PRODUCT TO A CUE THAT FREQUENTLY APPEARS IN THE ENVIRONMENT CAN INCREASE PRODUCT CHOICE (EXPERIMENT 3)





interaction between the slogan and prevalent cues in the environment.

The correlation between reported tray exposure and consumption is consistent with our hypothesis that product evaluations (measured here by consumption) increase with exposure frequency ( $H_4$ ). However, in contrast, the mediational test did not reach significance, as it did in Experiment 2. Although exposure to conceptually related cues should increase fluency and, thus, product evaluation, choice and consumption are based on many factors in addition to evaluation. In this case, whether participants chose fruits and vegetables was likely due not only to their evaluations of those foods but also to what they were doing before the meal, who they were talking to while ordering, and so on. In addition, both the priming and the mere exposure literature streams have repeatedly emphasized the disconnect between explicit or conscious awareness of exposure to the cue/prime and various downstream effects on everything from judgment to complex behaviors (Bargh et al. 2001; Fitzsimons and Bargh 2003; Kunst-Wilson and Zajonc 1980). Consequently, it should not be entirely surprising that participants' self-reported perceptions of cue exposure are not always strong predictors of the effects of this exposure on evaluations or choice. Indeed, we failed to find mediation by explicit self-report in Field Study 2 as well. It is possible that our self-report measure was not sensitive enough to pick up small variations in exposure, though it significantly mediated the effects of tray exposure on liking in Experiment 2.

Thus far, our studies have illustrated that exposure to everyday objects in real-world environments can have a strong impact on accessibility, choice, and evaluation. Experiment 4 builds on these results by directly testing the role of our proposed underlying mechanism, conceptual fluency. Prior research has found that fluency generated from exposure to conceptually related primes (i.e., predictive contexts) can have a positive impact on product evaluations (Lee and Labroo 2004). Experiment 2 found initial evidence for the role of frequency of exposure, as measured by explicit self-report. However, Field Study 2 and Experiment 3 did not find evidence for mediation by frequency of exposure, perhaps because of the disconnect between explicit memory and the effects of prior exposure (Kunst-Wilson and Zajonc 1980). Experiment 4 adopts a more objective method of measuring the effects of frequency by manipulating the number of exposures directly.

#### EXPERIMENT 4: THE PUMAS STUDY

Experiment 4 examines the role of frequency in producing conceptual priming effects by investigating how evaluations are affected by varying the exposures to conceptually related cues. By conducting this study in a lab setting, we can manipulate frequency of exposure (versus relying on self-report), which enables a stronger test of the role of fluency in conceptual priming effects.

Experiment 4 also tests the boundaries of conceptual priming effects on product evaluations. We return to using preexisting conceptual links (in this case, between cats and dogs) to examine further whether our effects are limited to novel or unfamiliar products and whether they are dependent on deliberate learning and practice. Using existing links rather than slogans also enables us to rule out a possible

alternative explanation for our results. It could be argued that the results of Field Study 2 and Experiments 2 and 3 were due to cues priming the slogan over time, leading the slogan to become more fluent and, thus, more effective (rather than the cues influencing the fluency of the product itself). By relying on existing conceptual links, we can avoid this possibility. A funneled debriefing task (Bargh and Chartrand 2000) also enables us to examine the involvement of consciousness ( $H_5$ ).

We hypothesize that participants will evaluate Puma products more favorably when they have been exposed to dog images more frequently. It is well established that cats and dogs have a strong cognitive association in memory because of their many feature similarities as domestic pets (Smith, Shoben, and Rips 1974) and their frequency of co-occurrence in the lexicon (e.g., raining cats and dogs, fighting like cats and dogs; Lucas 1999; O'Seaghdha 1989). Because of the strong links between cat and dog, the activation of "dog" constructs in memory should spread to the related construct "cat." Indeed, research has shown that when people are asked for the first word that comes to mind when they hear the word "dog," 75% respond with the word "cat" (Moss and Older 1996). Consequently, we suggest that when people are exposed to dog images, the cat category will become active.

Research has also shown that activation naturally spreads from the category label to members of that category (Collins and Loftus 1975; Collins and Quillian 1969, 1972), and thus we assume that when the cat category is primed, members of that category (e.g., lions, pumas) will also become more accessible. Because the Puma brand is strongly linked to cats both directly (there is a picture of a cat on the logo) and indirectly (the brand name is a member of the cat category), we assume that the Puma brand will be more accessible in memory after dog priming. The results of a pretest also support this logic.

The increased accessibility of the Puma brand should be unexpected and unpredictable to participants, because they have no recall of exposure to the brand. Thus, following the discrepancy-attribution hypothesis (Whittlesea and Williams 1998), we hypothesize that participants will attribute the fluency to positive feelings toward the Puma brand and respond with higher evaluations of Puma products.

We also provide an even stronger test of our theorizing by examining individual differences in recognition of Puma products. Exposure to dog images may increase the accessibility of the Puma brand, but this accessibility should translate into a boost in evaluation of Puma products only if participants have knowledge that those products are made by Puma. Consequently, we expect that exposure to dog images should increase evaluations of Puma sneakers only for participants who recognize the sneakers as the Puma brand.

#### *Pretest: Effect of Exposure to Dogs on Puma Brand Accessibility*

We first examined the assertion that varying the exposures to dog images would affect the ease of processing (i.e., accessibility) of the Puma brand. If we are correct in suggesting that frequent cue exposure should increase the accessibility of conceptually related products, a greater number of exposures to dog images should increase the

accessibility of the Puma brand and lead participants to recognize Puma as a brand of sneakers more quickly.

Participants ( $N = 46$ ) completed two ostensibly unrelated studies. The first "study" manipulated exposure to images under the guise of examining the ability to perceive hue differences. Participants were shown several photos, told that some of the photos had been altered to have green or red hues, and asked to rate the photos on the basis of the specific color properties displayed.

The purpose of this task was to expose participants to varying numbers of exposures to conceptually related cues (i.e., photos of dogs). Participants were shown 20 images. Those in the zero-exposure condition saw 20 images unrelated to the Puma brand (e.g., a stapler), those in the low-exposure condition saw 5 images of dogs (and 15 unrelated images), and those in the high-exposure condition saw 10 dog images (and 10 unrelated images).

Participants then began a response-time task (for use of a similar task to examine conceptual fluency, see Whittlesea 1993). They were asked to decide quickly whether the presented stimulus (words or images) represented a brand of sneakers and to press one of two keys to indicate their decision. In each of 40 trials, a word or picture appeared in the center of the screen and remained until the participant pressed one of the designated keys. Stimuli appeared in random order. Six were related to Puma (e.g., the word "Puma" or the Puma logo); fillers were from other categories (e.g., the word "Plank" or a Toyota logo). The dependent variable was response latencies to the Puma brand. We averaged the response time for Puma stimuli and examined this index in a one-way (number of product cues: none versus small versus large) ANOVA.

As we predicted, exposure to conceptually related cues influenced product accessibility ( $F(2, 44) = 3.60, p = .04$ ). Response latencies indicated that compared with participants exposed to no images of dogs ( $M = 1118$  ms), participants were able to identify Puma stimuli more quickly if they had been exposed to five ( $M = 813$  ms;  $t(44) = 2.56, p = .01$ ) or ten ( $M = 849$  ms;  $t(44) = 1.99, p = .05$ ) dog images. Participants exposed to five versus ten images did not differ ( $t < .5, n.s.$ ). We now turn to an examination of the effect of exposure to dogs on evaluations of the Puma brand.

#### Main Study Method

Participants ( $N = 109, 71\%$  female) completed two ostensibly unrelated studies. Participants were randomly assigned to a condition and were entered into a drawing for \$25 gift certificates as compensation. The first study was identical to the image exposure task used in the pretest; it exposed participants to varying numbers of conceptually related cues (dog photos).

The second study examined product evaluation. Participants evaluated products from the target brand (four pictures of Puma sneakers,  $\alpha = .82$ ) and products from other sneakers brands (e.g., Reebok sneakers).<sup>1</sup> Participants then

completed some ancillary measures and a funneled debriefing task. To examine whether participants recognized the Puma sneakers as belonging to the Puma brand, they were shown several sneaker images (including the pictures of Puma sneakers) and were asked to write the brand name. In line with Bargh and Chartrand (2000), the debriefing task asked them to speculate on the purposes of the two studies, whether the two studies were connected, whether their response to the second was affected by the first, and, if so, how. Finally, they reported their mood on three seven-point scales (happy, excited, and upbeat;  $\alpha = .89$ ).

#### Results

*Preliminary analyses.* Exposure to product-related cues did not affect participants' reported mood ( $M_{Zero} = 3.96$  versus  $M_{Five} = 4.07$  versus  $M_{Ten} = 3.89$ ;  $F < .07, n.s.$ ). No participants guessed the connection between the two studies. Even when asked to imagine how such influence might have occurred, most participants denied the possibility. We averaged both evaluations of the Puma sneakers and the sneakers from other brands to create an evaluation index for the cue-related and cue-unrelated products, respectively. Participants were split by whether they correctly identified all Puma sneakers as being from the Puma brand. We then examined evaluations using a 3 (cue-exposure frequency: zero versus low versus high)  $\times$  2 (product recognition: high versus low)  $\times$  2 (sneaker brand: conceptually related versus unrelated) ANOVA.

*Main analyses.* The analysis revealed a main effect of sneaker brand ( $F(1, 106) = 4.30, p = .04$ ), a two-way sneaker brand  $\times$  product recognition interaction ( $F(1, 106) = 4.63, p = .03$ ), and the predicted three-way cue-exposure frequency  $\times$  product recognition  $\times$  sneaker brand interaction ( $F(2, 106) = 5.72, p < .005$ ; see Table 2). To better understand this interaction, we split the data in two ways. First, we ran separate cue-exposure frequency  $\times$  sneaker brand ANOVAs for participants who did versus did not recognize Puma sneakers. As we predicted, among participants who recognized the Puma sneakers, the analysis revealed a significant cue-exposure frequency  $\times$  sneaker brand interaction ( $F(2, 66) = 5.42, p < .01$ ). Specifically,

Table 2  
EFFECT OF FREQUENCY OF EXPOSURE TO INDIRECT  
PRODUCT CUES AND RECOGNITION OF PRODUCT MAKER  
ON EVALUATION OF DIFFERENT TYPES OF PRODUCTS  
(EXPERIMENT 4)

	Low Puma Recognition		High Puma Recognition	
	Puma Sneakers	Non-Puma Sneakers	Puma Sneakers	Non-Puma Sneakers
Zero dog images	3.39 <sup>a</sup>	3.55 <sup>a</sup>	2.85 <sup>a</sup>	3.67 <sup>a</sup>
Five dog images	3.17 <sup>a</sup>	4.00 <sup>a</sup>	3.67 <sup>b</sup>	3.84 <sup>a</sup>
Ten dog images	2.93 <sup>a</sup>	4.18 <sup>a</sup>	4.53 <sup>c</sup>	3.50 <sup>a</sup>

Notes: In a given column, means with different superscripts differ significantly at  $p < .05$ . Participants evaluated Puma sneakers more favorably the more frequently they were exposed to conceptually related cues (images of dogs) but only if they recognized the sneakers as being made by the Puma brand. Similar effects were not found for sneaker brands that were conceptually unrelated to the cue.

<sup>1</sup>A few pairs of the sneakers contained small pictures of cats next to the Puma insignia. We digitally removed these images to ensure that we were measuring evaluations of the Puma brand itself, removing any possible interfering role of cat images alone. Participants could still recognize the sneakers as Pumas (based on the insignia and brand-typical features).

exposure to a greater number of dogs increased evaluations of the conceptually related products (i.e., Puma brand sneakers;  $F(2, 66) = 7.43, p = .001$ ), but it had no effect on evaluations of unrelated products (i.e., other sneakers;  $F < .25, n.s.$ ). Among participants who did not recognize the Puma sneakers, there was no frequency  $\times$  sneaker brand interaction ( $F = 1.38, p > .25$ ); there was only a main effect of sneaker brand ( $F(1, 41) = 7.58, p = .01$ ).

Second, we ran separate frequency  $\times$  product recognition ANOVAs for each sneaker brand. For Puma sneakers, there was a significant frequency  $\times$  product recognition interaction ( $F(2, 106) = 4.64, p = .01$ ). Frequency of exposure to dogs influenced the evaluation of Puma sneakers among participants who recognized the products as being made by Puma ( $F(2, 106) = 7.20, p = .001$ ), but it had no effect on participants who did not recognize the products as being made by Puma ( $F < .5, n.s.$ ). Specifically as we hypothesized ( $H_4$ ), among the people who should have had a conceptual connection between the cue and the product, the effects of cue frequency on product evaluations were linear in nature. Compared with the evaluations of participants who saw zero pictures of dogs ( $M = 2.85$ ), participants evaluated Puma sneakers more favorably if they saw five pictures ( $M = 3.67; t(66) = 2.11, p = .04$ ) or ten pictures ( $M = 4.53; t(66) = 16.11, p < .001$ ) of dogs. Participants who saw ten pictures of dogs also evaluated Puma sneakers more favorably than participants who saw only five pictures ( $t(66) = 2.00, p = .05$ ). For unrelated products, there were no significant effects ( $F_s < .75, n.s.$ ).

### Discussion

In support of  $H_3$  and  $H_4$ , Experiment 4 illustrates that fluency caused by repeated exposure to a conceptually related stimulus can increase product evaluations. Participants evaluated Puma sneakers more favorably the more frequently they were exposed to pictures of dogs, but only if they should have had a conceptual link between the cue (dogs) and the product (Puma sneakers). We did not find similar effects on evaluations of products that were less related to the cue (i.e., sneakers from other brands). These findings extend the findings of the previous experiments to a context in which cue exposure is manipulated rather than measured.

In support of  $H_5$ , these results also illustrate that conceptual priming effects can emerge without deliberate learning and can occur outside of conscious awareness. Although participants in prior studies learned to link the product and cue and thus could have elaborated on it consciously when making product evaluations, the preexisting conceptual link between dogs and cats produced the same pattern of results in Experiment 4. Responses to the funnel debriefing task further support the lack of conscious involvement in these conceptual priming effects, indicating that participants possessed no awareness of how the dog photos affected their ratings of Pumas. Given this lack of awareness, it is safe to presume that participants were not consciously thinking about the conceptual connection between dogs and Pumas and that these effects resulted from the automatic spreading of activation from one construct to another.

Finally, the accessibility pretest supports the suggestion that frequent exposure to conceptually related cues affects a product's conceptual fluency or ease of processing (Lee and

Labroo 2004). Participants were quicker to recognize Puma as a sneaker brand when they had been previously exposed to pictures of dogs. Together, these findings underscore our suggestion that conceptual priming elicits positive evaluations by increasing fluency. By manipulating frequency of exposure, we were able to avoid the problems of measuring exposure through explicit and memory-based self-report items. Furthermore, the finding that directly manipulating exposure frequency produced a linear pattern of results on evaluations provides strong support for the role of exposure frequency in producing conceptual priming effects, which helps answer some of the questions raised by the inconsistent results using reported exposure as a mediator in our prior studies. Importantly, although this lab experiment provided a better test of our proposed mechanism by manipulating exposure in a controlled setting, it used repeated exposures occurring over a brief period. The types of cue exposure we are most interested in occur over days and weeks, not seconds. If accessibility were measured after a week in which participants were exposed to different numbers of conceptually related cues, accessibility increases should be more visible.

### GENERAL DISCUSSION

Researchers have argued that "consumer behavior is strongly influenced by subtle environmental cues" (Dijksterhuis et al. 2005, p. 193), but few studies have empirically investigated this argument. The current research contributes to this goal by examining how everyday exposure to conceptually related cues can affect product accessibility, evaluation, and choice. The following sections review the key findings and implications.

#### Summary of Findings and Contributions

Six studies illustrate that the prevalence of perceptually and conceptually related stimuli can shape real-world judgment and decision making. Experiment 1 found that merely using a different color of pen to complete a survey led people to choose more perceptually related products; participants who used an orange (green) pen chose more orange (green) products. We found similar effects using conceptually related cues and actual product choice in the real-world environment. People who learned a slogan linking fruits and vegetables to an environmental cue and whose daily environment contained more of those cues consumed more fruits and vegetables (Experiment 3). The results showed that the prevalence of conceptual primes also influences product evaluations and purchase likelihood, whether those primes were measured in participants' everyday environments (Field Study 2, Experiment 2) or manipulated in the lab (Experiment 4).

The data further suggest that these effects reflect an increase in fluency. Field Study 1 illustrated that products were more accessible during times of the year when there were more perceptually related cues in the surrounding environment. Participants' reported exposure to conceptually related cues was also correlated with product evaluations (Experiment 2) and actual consumption (Experiment 3). We found similar results when we directly manipulated exposure to conceptual primes (Experiment 4), and the pretest to Experiment 4 illustrates that exposure to concep-

tual primes increased ease of processing. The set of results also suggests that conceptual fluency effects are not dependent on deliberate learning of the conceptual link, can operate outside of awareness, and can occur for novel and familiar brands.

These findings contribute to the understanding of the influence of real-world environments on consumer behavior. People do not choose products in a vacuum, but little is known about the role of daily environments in shaping consumer choice. By showing that cues have an impact even in noisy real-world situations, this work extends psychological research on priming (e.g., Dijksterhuis and Bargh 2001) and marketing research on the effects of cue exposure (e.g., Lee 2002; Shapiro 1999). The ecological validity of priming has recently attracted interest in both marketing and psychology literature streams (Bargh 2006; Dijksterhuis et al. 2005; Simonson 2005); our findings support the relevance of this research for real marketing contexts.

These findings also support Lee and Labroo's (2004) argument that exposure to related cues can influence responses to a stimulus through conceptual and perceptual connections. Most research on cue exposure has focused on the influence of direct exposure to a stimulus (e.g., Zajonc 1968). Our findings show that cue exposure can affect attitudes not only toward the exposed object but also toward any object that shares a conceptual relationship (see also Lee and Labroo 2004; Nedungadi 1990; Whittlesea 1993). By moving beyond the use of preexisting conceptual links by constructing novel associations, the results provide a powerful demonstration of the impact of conceptual priming effects on consumer behavior.

Finally, these findings contribute to recent research on conceptual fluency. Prior research has focused on the effects of recent exposure on judgment and decision making, showing that conceptually related stimuli are evaluated more positively immediately after priming. Our findings extend this work by suggesting that similar effects can result from frequent exposure to a related stimulus. This finding suggests that conceptual fluency can "accumulate" in some sense over time. In support of previous research on the role of fluency in cue-exposure effects (Lee and Labroo 2004; Whittlesea 1993), our findings also show that an underlying mechanism of conceptual priming effects is ease of processing.

### Implications

Our results suggest that marketers will be more effective to the extent that they link their product to prevalent environmental cues. In addition to relying on existing conceptual relationships, the data indicate that marketers can also create novel links between their product and a commonly encountered feature in the consumer environment. This finding could lead to innovative marketing strategies, in which marketers customize slogans, brand names, and advertising messages on the basis of the specific features common to various environments, whether those be specific geographic regions (e.g., palm trees for West Coast consumers) or even specific demographic groups (e.g., lockers for students, toys for new parents). Notably, though, a given cue may have different conceptual links for different subpopulations (e.g., men and women may have different asso-

ciations with shopping), and thus the same cue may have different effects on different groups (Wheeler and Berger 2007). Consequently, marketers should be aware of the specific links among the group they are trying to reach.

These results also speak to marketers' efforts to make their slogans catchy to increase sales. In Experiment 3, participants liked the comparison slogan more and found it more persuasive. Nonetheless, the slogan that was more effective was the one that linked the product to a commonly encountered feature of the participants' everyday environment. Thus, although catchiness may indeed be important, this result suggests that marketers should also pay greater attention to whether their slogans (and products) will be cued by the environment.

More generally, these results speak to the importance of examining how the distribution of cues in different environments affects consumer behavior. Although laboratory-based studies have made great strides in understanding the mechanisms behind the effects on primes on behavior, research is just beginning to examine how these effects play out in real-world consumer environments (Berger and Heath 2005; Berger, Meredith, and Wheeler 2006; North, Hargreaves, and McKendrick 1997). Environmental cues influence the success of implementation intentions (Gollwitzer 1999), trigger addictive behaviors (Bernheim and Rangel 2004), and influence the salience of cultural identities (Hong et al. 2000). Consequently, the distribution of cues in different environments should have important effects on the prevalence of different behaviors in those environments (for methods of measuring cue distribution, see Berger and Heath 2005; Saiz and Simonsohn 2007).

In conclusion, marketers should consider the nature of consumer environments when designing product names, packages, and advertising campaigns. A car dealership in Minnesota might consider linking itself to cold weather or mittens, whereas a restaurant in Arizona might want to consider links to the dry climate. Depending on what planet NASA decides to go to next, the Mars candy company might even want to think about introducing a new candy bar.

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