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According to the processing fluency model, advertising exposures enhance the ease with which consumers recognize and process a brand. In turn, this increased perceptual fluency leads to consumers having more favorable attitudes toward the brand. The authors extend the processing fluency model to examine the effect of conceptual fluency on attitudes. In three experiments, the authors show that when a target comes to mind more readily and becomes conceptually fluent, as when it is presented in a predictive context (e.g., a bottle of beer featured in an advertisement that shows a man entering a bar) or when it is primed by a related construct (e.g., an image of ketchup following an advertisement of mayonnaise), participants develop more favorable attitudes toward the target. It is believed that positive valence of fluent processing underlies these processing-fluency effects. When conceptual fluency is associated with negative valence (e.g., hair conditioner primed by a lice-killing shampoo), the authors observe less favorable attitudes.

## The Effect of Conceptual and Perceptual Fluency on Brand Evaluation

It is not uncommon for consumers to see full-size posters and end-of-aisle displays inside a store when they go shopping. The conventional wisdom is that point-of-purchase displays make the target brand more salient and thus enhance the probability of brand choice. Two streams of research provide evidence in support of such practice. First, mere exposure research shows that recent exposures to a target render the target more readily accessible in memory; in turn, this increased accessibility enhances the ease with which consumers identify and recognize the target, which is referred to as “processing fluency” (e.g., Jacoby and Dallas 1981). The view is that processing fluency is affectively positive (Reber, Winkielman, and Schwarz 1998; Seamon et al. 1995); thus, when processing fluency of the target is enhanced by prior exposures, a more favorable attitude is observed (e.g., Anand and Sternthal 1991; Bornstein 1989; Seamon et al. 1995). A second stream of research examining the effects of memory accessibility on brand choice sug-

gests that prior exposure enhances the ease with which the brand comes to mind, which in turn increases the probability of consideration-set membership and brand choice of the particular brand (e.g., Lee 2002; Nedungadi 1990; Shapiro, MacInnis, and Heckler 1997). Taken together, these findings suggest that consumers base their product evaluation and brand-choice decisions not only on information they have about the brand but also on how easy it is for them to process the information.

Extant literature in implicit memory research provides evidence that processing fluency may be perceptual or conceptual in nature (Tulving and Schacter 1990). In particular, perceptual fluency reflects the ease with which consumers can identify a target stimulus on subsequent encounters and involves the processing of physical features, such as modality (e.g., visual versus auditory versus pictorial) and shape (Jacoby and Dallas 1981). Conceptual fluency reflects the ease with which the target comes to consumers’ minds and pertains to the processing of meanings (e.g., Hamann 1990). Furthermore, the two types of fluency represent distinct constructs (e.g., Lee 2002). Although the effect of perceptual fluency on affective judgment is well documented (e.g., Anand and Sternthal 1991; Bornstein 1989), the few studies that examine the effects of conceptual fluency focus more on how it affects consideration-set membership and brand choice than on how it influences judgment (e.g., Lee 2002; Nedungadi 1990; Shapiro 1999). The objective of our research is to examine the role that conceptual fluency plays in affective judgment.

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### THEORETICAL BACKGROUND

There is considerable evidence that people's attitude toward an object becomes more favorable with repeated exposures, even when they are not aware of having been exposed to the object (Zajonc 1968). Researchers have demonstrated this mere exposure effect across a wide range of stimuli using various rating procedures, such as ratings of liking, pleasantness, and forced-choice preference judgments (for a review, see Bornstein 1989). Research in consumer behavior has also shown that incidental exposure to logos, brand names, or pictures of objects may lead to more favorable product evaluations (e.g., Janiszewski 1993). Developments in implicit memory research in the past decade offer a processing-fluency-based explanation to account for this effect (e.g., Bornstein 1997; Lee 2001; Seamon et al. 1995). According to the processing fluency model, prior exposure to a target enhances the ease with which consumers can process the target in subsequent encounters, and in turn, this fluency leads to more favorable attitudes toward the target (Seamon et al. 1995).

Because the stimuli used in previous research were often novel or simple stimuli (e.g., line drawings, abstract painting, Turkish words) that discouraged research participants from engaging in more meaningful processing, the enhanced processing fluency that resulted from the prior exposures is more indicative of how easily participants can perceptually identify and process the stimuli (i.e., perceptual fluency) than of how readily the stimulus comes to mind and its meaning is activated (i.e., conceptual fluency). Thus, empirical evidence reported in the literature in support of a processing fluency model of affective judgment reflects perceptual-fluency-based rather than conceptual-fluency-based evaluation.

#### *Processing Fluency and Affective Judgment*

The ease with which a person perceives and identifies the physical characteristics of a stimulus is referred to as "perceptual fluency" and is known to be enhanced through prior exposures (Jacoby and Dallas 1981). Specifically, empirical evidence from implicit memory research shows that prior exposure to a target often benefits subsequent task performances, such as lexical decision, word completion, and anagram solving, that involve the identification of the perceptual features of the target (for reviews, see Roediger and McDermott 1992; Schacter 1987). More recent studies examining the effects of perceptual fluency indicate that the experience of perceptual fluency is positively valenced (e.g., Reber et al. 1998; Winkielman and Cacioppo 2001); thus, prior exposure that gives rise to enhanced perceptual fluency leads to more favorable attitudes.

However, the nature of processing fluency is not limited to perceptual fluency alone. For example, Tversky and Kahneman (1973, p. 208) suggest that people often make judgments based on "the ease with which instances or associations come to mind." A stimulus that comes to mind readily is considered conceptually fluent.

Although prior exposure can enhance both perceptual and conceptual fluency, the two types of fluency are stochastically independent (Cabeza and Ohta 1993). Empirical evidence also suggests that they are distinct constructs that have unique antecedents and consequences (e.g., Lee 2002; Tulving and Schacter 1990). For example, conceptual flu-

ency is known to benefit from elaboration at the time of exposure (e.g., Hamann 1990), whereas perceptual fluency is not affected by attention or elaboration (e.g., Eich 1984). Furthermore, perceptual fluency has been shown to be sensitive to changes in surface features such as modality shifts and presentation contexts, whereas conceptual fluency is not affected by these changes (e.g., Jacoby and Dallas 1981).

In consumer research, it has been reported that conceptual fluency facilitates consideration-set membership and memory-based choice as the result of increased accessibility of the brand in memory (e.g., Lee 2002; Nedungadi 1990; Shapiro, MacInnis, and Heckler 1997). However, its role in fluency-based affective judgment is less clear. For example, Nedungadi (1990) increased the accessibility of the target brand by exposing participants either to the target brand (i.e., direct priming) or to a competing brand in the same product category (i.e., indirect priming) and found that the increased accessibility of the brand name in memory led to a higher probability of consideration-set membership and brand choice. However, the evaluation of the brand remained unchanged. In contrast, Whittlesea (1993) manipulated processing fluency of common words by presenting the target word in a predictive rather than a neutral context. He reports an increase in participants' liking of the target word as the result of enhanced conceptual fluency, though the interpretation of his results is open to other explanations for the effect.

The objective of our research is to examine the effects of conceptual fluency on affective judgment. The view is that the stimuli that come to mind more readily, and thus their meanings are more easily grasped (i.e., conceptually fluent), are easier to process. Similar to perceptual fluency, this experience of conceptually fluent processing should be a positive one (Reber, Winkielman, and Schwarz 1998; Winkielman and Cacioppo 2001). Thus, people's attitudes toward conceptually fluent stimuli are more favorable.

However, empirical studies show that the effect of processing fluency on affective judgment is not monotonic. As the frequency of exposure rises, boredom may set in, leading to a decline in the participants' evaluation of the target (e.g., Bornstein, Kale, and Cornell 1990). That is, negative associations of the target may interfere with the positive effect of fluency, resulting in less favorable attitudes toward the target. Thus, we hypothesize that consumers evaluate a target that is conceptually fluent more favorably. However, when the fluent processing of the target activates negative materials in its associative network, the negative associations that come to mind may interfere with the conceptual-fluency effect. When this happens, we expect that less favorable attitudes toward the target are observed.

In four experiments, we investigate the role of conceptual fluency in affective judgment. We designed Experiment 1 to examine the effects of processing fluency on judgment and to rule out alternative explanations of the conceptual-fluency-based effect that Whittlesea (1993) reports. In Experiment 1, we operationalize conceptual fluency in two different ways: by varying the context in which the target was presented (Whittlesea 1993) and by indirect priming (Nedungadi 1990). In Experiments 2 and 3, we demonstrate the robustness of the conceptual-fluency effects in a consumer context. Finally, in Experiment 4, we show that the

effect of conceptual fluency is not always positive. Because we primed the target with a product that prompts negative associations, we observed less favorable attitudes. The results across the four experiments contribute to our understanding of how prior exposure affects consumer preference. Furthermore, they provide evidence that conceptual fluency also affects judgment.

### EXPERIMENT 1

In a series of studies, Whittlesea (1993, Experiment 5) examines the effects of conceptual fluency on different kinds of judgment (e.g., duration of previous events, feelings of recency of events), including affective evaluation of the target. In particular, he presented research participants with a series of sentences on the computer screen, and the words of each sentence appeared in rapid succession. Each sentence was constructed such that the context leading to the last word of the sentence was either neutral (e.g., "He saved up his money and bought a boat") or semantically predictive (e.g., "The stormy sea tossed the boat"). Participants were asked to rate the last word of each sentence on a pleasantness scale. The results show that participants rated target words as more pleasant when they were presented in a predictive context than when they were presented in a neutral context. The results support the notion that people form more positive attitudes toward a target if they experience fluency when processing the target. We replicated this pattern of results in a pilot study ( $M = .85$  versus  $.37$ ;  $F(1, 32) = 11.89, p = .002$ ) in which 34 participants evaluated 20 target words on a seven-point scale ( $-3 =$  "Very unpleasant,"  $3 =$  "Very pleasant"). Half the target words were presented in a predictive context, and half were in a neutral context.

However, it can be argued that we obtained the results because participants were anticipating the next word to appear on the screen. Participants experienced a positive feeling when the word they anticipated was indeed the word that appeared, which in turn influenced their affective judgment. Because participants were more successful in correctly guessing target words presented in a semantically predictive context than in a neutral context, their more favorable ratings of the high- versus low-fluency words might reflect their positive feeling of success in the predictive versus the neutral context condition.

An objective of Experiment 1 was to provide evidence for a conceptual-fluency-based model of affective judgment by ruling out the explanation that the results obtained by Whittlesea (1993) and in the pilot study were due to a positive feeling from participants guessing correctly. Another objective was to provide convergent evidence for the effect of conceptual fluency by using a different operationalization of conceptual fluency.

Adopting the procedure from Whittlesea (1993), we used common words as the target stimuli in Experiment 1. To examine the effect of perceptual fluency, participants were first presented with a sentence, the last word of which was either the same as or different from the target word that was presented immediately after the sentence for evaluation (e.g., "They spent three hours looking for the house": "house" or "drink"). When the target is the same as the last word of the preceding sentence (i.e., "house" in the previous example), perceptual fluency of the target should be

enhanced and should, in turn, lead to a more positive evaluation of the target word.

H<sub>1</sub>: Participants evaluate a target word more favorably when it is the same as rather than different from the last word of the preceding sentence.

We operationalized conceptual fluency in two different ways: by the predictive context of the sentence and by the semantic association between the last word of the sentence and the target word. When the preceding sentence provides a predictive context (e.g., "The woman soaked the white sweater in some cold water": "water") rather than a neutral context (e.g., "The woman looked out of her window and saw the water": "water"), the encounter of the target word is more expected and thus more accessible in memory. Conceptual fluency of the target is thus enhanced, resulting in a more positive affective response toward the target.

H<sub>2</sub>: Participants evaluate a target word more favorably when it is presented in a semantically predictive context rather than a neutral context.

According to the spreading-activation view of memory (Collins and Loftus 1975), activation of one construct leads to activation of related constructs in the associative network. Thus, a target word that is semantically related to the last word of the preceding sentence should be primed by the related word (e.g., "He wrote down the number on a piece of paper": "pencil"), which renders it more accessible in memory. The processing fluency model predicts that this increase in conceptual fluency as the result of indirect priming leads to more favorable evaluation of the target word.

H<sub>3</sub>: Participants evaluate a target word more favorably when it is semantically related rather than unrelated to the last word of the preceding sentence.

Adopting the procedure from Whittlesea (1993), we asked participants to rate the pleasantness of a word following a sentence, which provided either a semantically predictive or a neutral context for the ending word. However, unlike Whittlesea's study (1993), in which the target word was always the last word of the sentence, the target word in Experiment 1 could be the same as, related to, or unrelated to the last word of the sentence. We also asked participants to evaluate the pleasantness of target words that were not preceded by any sentence. These ratings served as a baseline measure of words that are neither conceptually nor perceptually fluent.

When the target words are the same as the ending word in the preceding sentence, these words are perceptually fluent. Results showing higher pleasantness ratings for these target words than for those that are not preceded by any sentence (and thus neither perceptually nor conceptually fluent) would be evidence that perceptual fluency leads to more favorable attitudes. Furthermore, target words that are presented in a semantically predictive context (e.g., "The mother told the dirty little boy to go take his bath": "bath") are conceptually and perceptually fluent, whereas those presented in a neutral context are perceptually fluent but not conceptually fluent (e.g., "The short man was getting ready for his bath": "bath"). Results showing more favorable attitudes for those words in a predictive rather than a neutral context would provide support that conceptual fluency leads to more favorable attitudes, when perceptual fluency is held constant.

Target words that are different from the ending word of the preceding sentence are not perceptually fluent. However, words that are semantically related (e.g., “Behind the shed there were some low fences surrounding a tree”: “leaf”) rather than unrelated (e.g., “He was not interested in her story”: “leaf”) to the ending word of the sentence are primed by the ending word, in which case they are conceptually fluent. Target words that are unrelated to the ending word are neither conceptually nor conceptually fluent. Participants’ evaluation of these words should be equivalent to the evaluations in the baseline control condition. Results showing higher pleasantness ratings for target words that are related rather than unrelated would provide convergent evidence that conceptual fluency leads to more favorable attitudes. Furthermore, if the unrelated target words are considered more pleasant when they are preceded by a sentence with a semantically predictive rather than a neutral context (e.g., “She was hopping around looking for her missing shoe”: “water” versus “The construction worker took a look at the shoe”: “water”), this would be evidence that the results observed in the pilot study and by Whittlesea (1993) were due to affect transfer. That is, participants’ positive feeling of correctly guessing the word “shoe” in the predictive context tinted their affective judgment toward the target word “water.” However, if the ratings of the target words in the two conditions do not differ, we can rule out the explanation of affect transfer.

#### Method

*Stimulus development and design.* We first selected 24 commonly used four- to six-letter words to serve as the ending word of sentences to be generated. We refer to the 24 words as the “selected word list.” We randomly divided the 24 words into eight blocks of 3 words. For each selected word, we generated two sentences such that one provided a semantically predictive context and the other provided a semantically neutral context. We then paired each of the selected words with a word that was semantically related to it to form a related word pair (e.g., “crib” and “milk”). The related words make up the associated word list. We then paired each word in the selected word list with a different word from the same associated word list, such that there was no semantic association between the two words, to form an unrelated word pair (e.g., “crib” and “pencil”). Thus, for each word in the selected word list, there is a corresponding related and unrelated word from the associated word list. Across all participants, each associated word appeared as a related word and an unrelated word an

approximately equal number of times. In a pretest, we asked 24 participants to evaluate the association between the two words in the related and unrelated word pairs using a seven-point scale (1 = “Not at all related,” 7 = “Very closely related”). The results show that participants rated the related word pairs as more closely related than the unrelated word pairs ( $M = 5.73$  versus  $1.93$ ;  $F(1, 23) = 981.49$ ,  $p < .0001$ ).

At the time of evaluation, a target word was the same as the last word of the preceding sentence (i.e., same condition), semantically related to the last word (i.e., related condition), had no obvious semantic association with it (i.e., unrelated condition), or was not preceded by any sentence (i.e., control condition; examples of the stimuli in the different conditions are displayed in Table 1). Thus, we used a 2 (sentence context: predictive and neutral)  $\times$  3 (relatedness: same, related, unrelated) within-subjects design and a control condition. Half the target words were from the selected word list (i.e., same and control conditions) and half were from the associated word list (i.e., related and unrelated conditions). We generated eight lists of target words such that each block of words was presented for evaluation in the same and control or in the related and unrelated conditions an approximately equal number of times (for the design, see Table 2). We randomized the order of the target words for each list.

Thus, a comparison of the same target words between the two sentence contexts (predictive and neutral) provides a test for the effect of conceptual fluency and replicates the design of both the pilot study and Whittlesea’s (1993) study. A comparison of the target words between the same and the control conditions provides a test for the effect of perceptual fluency. More specifically, the comparison between the neutral–same and control conditions provides a test for the effect of perceptual fluency, and the comparison between the predictive–same and control conditions provides a test for the combined effect of conceptual and perceptual fluency. Furthermore, a comparison between the related and unrelated target words across the two contexts enables us to examine the effect of conceptual fluency using a different operationalization of conceptual fluency. Results showing that participants evaluate target words in the related condition as more pleasant than those in the unrelated condition would provide convergent evidence that conceptual fluency leads to more favorable attitudes. Finally, a comparison of the unrelated target words between the two contexts enables us to examine whether the higher pleasantness ratings we observed in the pilot study were due to participants’ positive

Table 1  
EXAMPLES OF STIMULI USED IN EXPERIMENT 1

Sentence Context	Sample Sentence	Target Word		
		Same	Related	Unrelated
Neutral	All the neighbors gathered together to talk about the book.	Book	Read	Napkin
<i>Fluency operationalized</i>		<i>Perceptual</i>	<i>Conceptual</i>	<i>Baseline</i>
Predictive	The librarian reached for the top shelf and pulled down a book.	Book	Read	Napkin
<i>Fluency operationalized</i>		<i>Perceptual + conceptual</i>	<i>Conceptual</i>	<i>Baseline</i>

Notes: In addition to these six conditions, the design included a control condition in which we presented the target words to participants for evaluation without any preceding sentences.

Table 2  
DESIGN OF EXPERIMENT 1

	<i>Block 1</i>	<i>Block 2</i>	<i>Block 3</i>	<i>Block 4</i>	<i>Block 5</i>	<i>Block 6</i>	<i>Block 7</i>	<i>Block 8</i>
L1	Predictive Same	Predictive Related	Predictive Unrelated	Control	Neutral Same	Neutral Related	Neutral Unrelated	Control
L2	Predictive Related	Predictive Unrelated	Control	Predictive Same	Neutral Related	Neutral Unrelated	Control	Neutral Same
L3	Predictive Unrelated	Control	Predictive Same	Predictive Related	Neutral Unrelated	Control	Neutral Same	Neutral Related
L4	Control	Predictive Same	Predictive Related	Predictive Unrelated	Control	Neutral Same	Neutral Related	Neutral Unrelated
L5	Neutral Same	Neutral Related	Neutral Unrelated	Control	Predictive Same	Predictive Related	Predictive Unrelated	Control
L6	Neutral Related	Neutral Unrelated	Control	Neutral Same	Predictive Related	Predictive Unrelated	Control	Predictive Same
L7	Neutral Unrelated	Control	Neutral Same	Neutral Related	Predictive Unrelated	Control	Predictive Same	Predictive Related
L8	Control	Neutral Same	Neutral Related	Neutral Unrelated	Control	Predictive Same	Predictive Related	Predictive Unrelated

Notes: Each column represents a block of three selected words that make up the last word of a sentence. The sentence provides either a predictive or a neutral context for the selected words in each block. Each row represents the list of target words to be evaluated and their relationship with the selected words in each block.

experience of successful guessing or to conceptual fluency of the target word. If participants consider the target words in the predictive context more pleasant than those in the neutral context condition, we cannot rule out the explanation of an affect transfer.

In summary, we used words from the selected word list to test the effects of perceptual and conceptual fluency on judgment. We manipulated perceptual fluency by prior exposure, and we manipulated conceptual fluency by the predictive context of the sentence. We measured the effect of perceptual fluency by comparing the neutral–same target words with the control, and we measured the effect of conceptual fluency by comparing the predictive–same target words with the neutral–same target words. We assessed the combined effects of perceptual and conceptual fluency on judgment by comparing the predictive–same target words with the control. We used words from the associated word list to examine further the effects of conceptual fluency as operationalized by the semantic relatedness of the target to the ending word of the preceding sentence. We also sought to rule out an explanation of the fluency effect by comparing the predictive–unrelated words with the neutral–unrelated target words.

*Procedure.* In Experiment 1, 90 undergraduate students from a Midwestern university participated for course credit. Participants were given the cover story that the experimenter was interested in understanding how people process written texts. Participants were presented with 18 sentences that provided either a predictive or a neutral context for the ending word. The words in each sentence appeared on a computer screen one by one in rapid succession. The sentence would disappear, and the target word would appear on the screen for five seconds. Participants were asked to indicate whether the word presented was in the sentence that they just saw (by checking “yes” or “no”) and to rate the word on a seven-point pleasantness scale (−3 = “Very unpleasant,” 3 = “Very pleasant”).

Table 3  
EXPERIMENT 1: EFFECTS OF PERCEPTUAL AND CONCEPTUAL FLUENCY (PREDICTIVE CONTEXT AND SEMANTIC RELATEDNESS) ON AFFECTIVE JUDGMENT

	<i>Relation to Ending Word</i>		
	<i>Same</i>	<i>Related</i>	<i>Unrelated</i>
Predicted context	1.05	.89	.58
Neutral context	.83	.98	.46
Control	.70	—	—

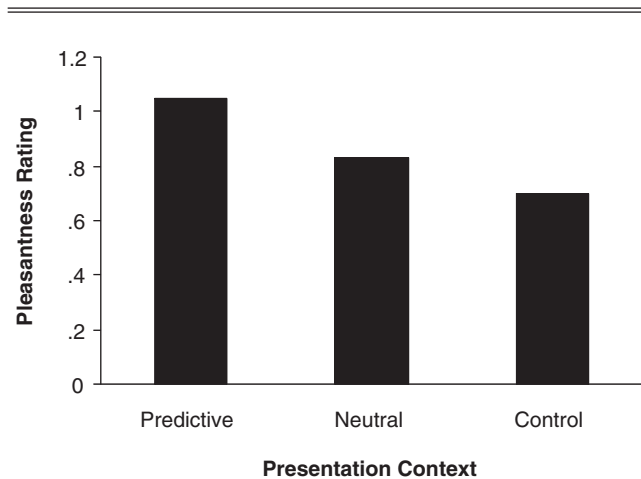
This process was repeated for the 18 target words in the same, related, and unrelated conditions. Participants were then presented with 6 target words in the control condition for evaluation. These target words were not preceded by a sentence.

*Results*

Across all participants, we averaged the ratings of the target words in each block to yield a single pleasantness score for each condition. Thus, each participant provided seven pleasantness scores: predictive–same, predictive–related, predictive–unrelated, neutral–same, neutral–related, neutral–unrelated, and control (see Table 3).

We examined the effect of conceptual and perceptual fluency on target words in the selected word list. We conducted a repeated-measures analysis of variance (ANOVA) to examine the pleasantness ratings for target words in the predictive–same, neutral–same, and control conditions. The results show a significant effect of context ( $F(2, 178) = 6.23, p = .002$ ; see Figure 1). Consistent with  $H_2$ , a planned contrast showed that participants rated the target words presented in the predictive context (i.e., predictive–same condition) as more pleasant than those in the neutral context (i.e.,

Figure 1  
EXPERIMENT 1: EFFECTS OF PERCEPTUAL AND  
CONCEPTUAL FLUENCY (PREDICTIVE CONTEXT) ON  
AFFECTIVE JUDGMENT



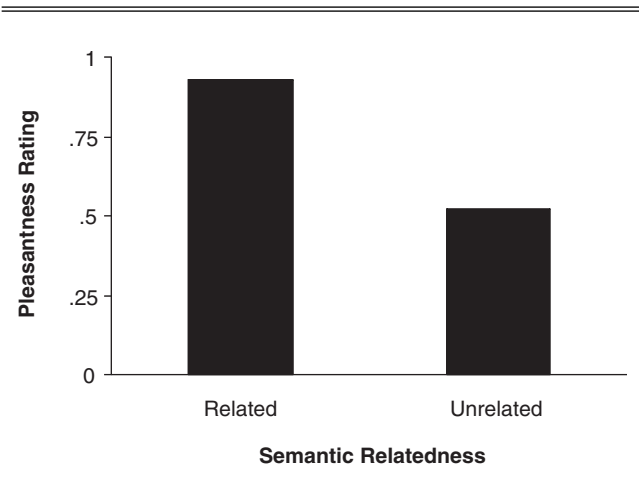
neutral-same condition;  $M = 1.05$  versus  $.83$ ;  $F(1, 89) = 4.65$ ,  $p < .05$ ), which replicates previous findings and provides support for a conceptual-fluency model of affective judgment. Participants also evaluated target words that had been previously presented (i.e., those in the combined predictive-same and neutral-same condition) as more pleasant than those that had not been previously presented (i.e., the control condition;  $M = .94$  versus  $.70$ ;  $F(1, 89) = 7.82$ ,  $p = .006$ ). However, further analyses showed that only the target words in the predictive-same condition were reliably preferred to the control ( $M = 1.05$  versus  $.70$ ;  $F(1, 89) = 12.74$ ,  $p < .001$ ). The more favorable rating of the neutral-same target words did not reach statistical significance ( $M = .83$  versus  $.70$ ;  $F(1, 89) = 1.73$ ,  $p = .19$ ).

Next, we conducted a 2 (sentence context)  $\times$  2 (relatedness) repeated-measures ANOVA on target words from the associated word list that were different from the ending word of the preceding sentence. The results show that the main effect of relatedness was significant ( $F(1, 89) = 17.60$ ,  $p < .001$ ). Consistent with a processing fluency account, participants evaluated target words that were semantically related to the last word of the preceding sentence more favorably than words that were unrelated ( $M = .93$  versus  $.52$ ; see Figure 2), which provides support for  $H_3$ . Neither the main effect of sentence context ( $F < 1$ ) nor the interaction ( $F(1, 89) = 1.67$ ,  $p > .20$ ) was significant, which implies that when the target word did not appear in the preceding sentence, whether that sentence had a semantically predictive or neutral context did not make a difference. Thus, we ruled out the explanation of an affect transfer for the conceptual-fluency effect we observed.

#### Discussion

Replicating Whittlesea's (1993) results and those of the pilot study, the data show that participants rated target words more favorably when they appeared in a predictive context than in a neutral context. Notably, results showing unrelated target words as equally preferred in the predictive rather than the neutral condition suggest that the more favorable attitudes observed for conceptually fluent words

Figure 2  
EXPERIMENT 1: EFFECT OF CONCEPTUAL FLUENCY  
(SEMANTIC RELATEDNESS) ON AFFECTIVE JUDGMENT



presented in the predictive context are not due to affect transfer. In addition, results showing that participants considered related target words that had been primed by the last word of the preceding sentence more pleasant than unrelated target words provide further evidence that conceptual fluency leads to more favorable attitudes. Thus, our data provide support that the processing fluency model also applies to conceptually driven fluency effects. More specifically, our results extend the findings reported previously by Whittlesea (1993) by ruling out alternative explanations for the results and by presenting convergent evidence using a different operationalization of conceptual fluency.

We did not observe a perceptual-fluency effect in the data. The difference between target words previously presented in a neutral context (i.e., neutral-same condition) and in the control condition did not reach statistical significance. This weak perceptual-fluency effect may be due to the minimal overlap between the target word presented in isolation at the time of evaluation and the target word presented as part of a sentence in the previous exposure. Prior research has demonstrated that perceptual fluency is sensitive to changes in surface features; in particular, target words presented in isolation for evaluation are perceptually more fluent when they have also been previously presented in isolation than when they have been presented in a sentence context (e.g., Lee 2002). We would have observed a stronger perceptual-fluency effect if there were more physical resemblance between the target at the time of exposure and at the time of judgment. Another limitation of Experiment 1 is that target words used in the same and control conditions were different from those in the related and unrelated conditions. Thus, we cannot make a meaningful comparison across all the conditions. We address these issues in Experiment 2.

#### EXPERIMENT 2

Although empirical findings in implicit memory have demonstrated that conceptual and perceptual fluency are distinct constructs (e.g., Lee 2002), the results observed in Experiment 1 suggest that conceptual and perceptual fluency should simultaneously contribute to more positive

judgment when participants experience both types of processing fluency. Thus, the objective of Experiment 2 was to examine the robustness of the processing-fluency effect on judgment and its generalizability to a marketing context. To achieve this goal, we used consumer products as the target stimuli. Furthermore, we designed the experiment such that there was maximum overlap between the target product at the time of exposure and at the time of judgment so that we could unambiguously observe the effect of perceptual fluency. Finally, we used the same target product in all the conditions to ensure that we could make comparisons across different conditions. Thus, we used a 2 (conceptual fluency: high and low)  $\times$  2 (perceptual fluency: high and low) between-subjects design.

All participants in Experiment 2 underwent an exposure phase and a test phase. As in Experiment 1, we manipulated perceptual fluency by prior exposure of the target product, and we operationalized conceptual fluency by participants' expectancy of encountering the target product and by the relatedness between the target product and a previously presented product. Thus, we exposed participants in the high-conceptual-fluency condition either to the target product (i.e., high-perceptual-fluency condition) or to a related product (i.e., low-perceptual-fluency condition) presented in a predictive setting. We exposed participants in the low-conceptual-fluency condition either to the target product (i.e., high-perceptual-fluency condition) or to an unrelated product (i.e., low-perceptual-fluency condition) presented in a neutral setting.

### Method

*Stimulus development.* To enhance external validity, we selected a familiar product (ketchup) as the target product. To minimize the variance in the baseline perceptual fluency of the product across the participants, we used the image of a bottle of Kraft ketchup that is available only in Germany as the target stimulus that we presented to the participants for evaluation.

We developed four versions of a mock-up advertisement in the form of a storyboard (see Figure 3). Each storyboard consisted of five frames. The first frame, "One Weekend," was identical across the four conditions. In the high-conceptual-fluency condition, the remaining four frames featured a boy riding a scooter down the street, the inside of a fast-food restaurant, a hamburger being cooked, and a picture of the advertised product. In the low-conceptual-fluency condition, the four frames featured a woman in a supermarket walking toward the product-display shelves, followed by three single-product shots. In the high-perceptual-fluency condition, the last frame featured the target product (i.e., Kraft ketchup). In the low-perceptual-fluency condition, the last frame featured a different product.

To ensure that we properly operationalized conceptual fluency in the low-perceptual-fluency condition, it was important that the storyboard presented at the exposure phase in the high-conceptual-fluency condition enhance the accessibility of the target product in memory without actually presenting the product. To this aim, the advertised product was designed to be closely associated with the target product and presented in a conceptually fluent context. Thus, we selected a jar of mayonnaise as the product featured in the low-perceptual-fluency/high-conceptual-

fluency condition, and we selected a bottle of vitamins for the low-perceptual-fluency/low-conceptual-fluency condition. In summary, we manipulated perceptual fluency by showing the target product (i.e., ketchup) or a different product (i.e., vitamins or mayonnaise) in the final frame of the storyboard during the exposure phase. We manipulated conceptual fluency by creating a scenario that led either to a high expectancy of encountering ketchup, as primed by a fast-food restaurant serving hamburgers (and mayonnaise), or to a low expectancy of such an encounter, as in the supermarket scenario. The storyboards we used are presented in Figure 3.

To ensure that ketchup was conceptually more fluent in the fast-food restaurant scenario than in the supermarket scenario, 12 participants from the same subject pool as those in the main study took part in a pretest. Participants were presented with the first four frames of the fast-food restaurant and the supermarket scenarios and were asked to indicate on a nine-point scale (1 = "Not at all," 9 = "Very much") the extent to which they expected to see ketchup or mayonnaise in the final frame of the storyboard. We counterbalanced the order of the two scenarios. The results of a repeated-measures ANOVA show a significant main effect of scenario ( $F(1, 11) = 99.34, p < .001$ ). Participants expected the target more in the fast-food scenario than in the supermarket scenario ( $M = 7.00$  versus  $2.50$ ). Furthermore, there was no difference between participants' expectancy of encountering ketchup or mayonnaise ( $F < 1$ ). To ensure that the related product (mayonnaise) was considered closely associated with the target product (ketchup), 24 participants in a second pretest indicated on a seven-point scale (1 = "Not at all related," 7 = "Very closely related") how related they believed mayonnaise was to ketchup and to alkaline batteries (the control product). The results show that participants considered mayonnaise more closely related to ketchup than to alkaline batteries ( $M = 5.58$  versus  $1.17$ ;  $F(1, 23) = 192.86, p < .0001$ ).

*Procedure.* A total of 86 undergraduate students at a large eastern university participated in the study for course credit. They were randomly assigned to the four conditions. Each participant was seated individually in front of a computer and received instructions on the computer screen. Participants were given the cover story that the experimenter was interested in their opinion on certain products and advertising campaigns and that the experiment was self-paced. When participants clicked on the mouse to start the study, a screen appeared to thank them for their participation and to explain that they would view some mock-up advertisements in a storyboard form and that the storyboard would consist of a title frame followed by four automatically timed slides. Participants were instructed to click on the mouse to view the storyboard. Each frame of the storyboard then appeared for one second. At the end of the storyboard viewing, participants were asked to evaluate the speed of the presentation on a seven-point scale (1 = "Too slow," 7 = "Too fast"). This task was consistent with the cover story and served as an indicator of the extent of comprehensibility across the four different storyboards.

Next, participants were instructed that their second task was to evaluate different products and that they should click on the mouse when they were ready. Participants were presented with six product images, each presented for three seconds, followed by a screen asking them to evaluate the

Figure 3  
STORYBOARDS USED IN EXPERIMENT 2

High-Conceptual/High-Perceptual-Fluency Condition



High-Conceptual/Low-Perceptual-Fluency Condition



Low-Conceptual/High-Perceptual-Fluency Condition



Low-Conceptual/Low-Perceptual-Fluency Condition



product on a seven-point scale (1 = "Dislike very much," 7 = "Like very much"). After evaluating each product, participants clicked on the mouse to advance to the next screen for product viewing and evaluation. All participants were presented with three filler products; the third one was the control product (i.e., alkaline batteries), which had been shown to be unrelated to the target in the pretest. The fourth product presented for evaluation was the target product (i.e., Kraft ketchup), followed by two other filler products. The expectation was that whereas participants' affective ratings across all four conditions for the control product would not differ, we would observe the effects of conceptual and perceptual fluency for the target product.

Finally, participants responded to some manipulation-check questions on conceptual fluency and involvement. Specifically, participants were asked to rate the extent to which the advertised product came as expected at the end of the storyboard (1 = "Not at all," 7 = "Very much"). They

were also asked to indicate how involved they were when viewing the storyboards (1 = "Skimmed it quickly, not at all involved"; 7 = "Paid a lot of attention, very involved"). Participants then responded to some miscellaneous questions that included demographic measures.

### Results

**Manipulation checks.** We conducted a 2 (conceptual fluency)  $\times$  2 (perceptual fluency) ANOVA on the perceived speed of storyboard presentation. The results show that neither the main effects nor the interaction was significant ( $F_s < 1$ ), suggesting that participants did not perceive the four storyboards to differ in terms of ease of processing. Furthermore, the results of a 2  $\times$  2 ANOVA on the involvement index ( $r = .82$ ) show that none of the effects was significant, which implies that participants' attention on the storyboards did not differ ( $F_s < 1$ ).

Next, we examined participants' responses on the conceptual-fluency manipulation-check question. The results of a  $2 \times 2$  ANOVA on participants' expectancy of seeing the advertised product show that the main effect of conceptual fluency was significant ( $F(1, 82) = 4.12, p < .05$ ). Participants indicated that they expected to see either ketchup or mayonnaise more in the fast-food scenario than to see ketchup or vitamins in the supermarket scenario ( $M = 3.36$  versus  $2.71$ ). No other effects were significant ( $F_s < 1$ ).

Finally, we conducted analyses to examine whether the manipulations had any effect on the control product (i.e., the alkaline batteries), which was neither conceptually nor perceptually fluent at the time of evaluation. The results of a  $2 \times 2$  ANOVA on participants' evaluation of the alkaline batteries show that neither the main effects nor the interaction was significant ( $F_s < 1$ ).<sup>1</sup> The null effects of the manipulations on the control product enable us to interpret the results of conceptual and perceptual fluency with more confidence. In particular, the results rule out the explanation that the predictive-context storyboards induced more positive affect; thus, we cannot attribute any difference in the affective judgment observed for the target product across the different conditions to the transfer of positive feelings generated by the manipulations.

**Hypotheses testing.** Recall that the objective of Experiment 2 was to explore the additive effects of processing fluency on attitudes in a marketing context. Specifically, we hypothesize that the enhancement of perceptual fluency or conceptual fluency leads to more favorable attitudes toward the target product. Thus, participants' attitude toward the target product should be most favorable when both types of fluency are enhanced and least favorable in the baseline condition when the target product is neither perceptually nor conceptually fluent. In line with our predictions, the results of a  $2 \times 2$  ANOVA on participants' evaluation of the target product show that the main effect of perceptual fluency was significant ( $F(1, 82) = 7.45, p < .008$ ), indicating that participants evaluated the product more favorably when it was featured in the storyboard than when it was not ( $M = 4.43$  versus  $3.75$ ). Consistent with the findings in the mere exposure literature,  $H_1$  is supported. The main effect of conceptual fluency was also significant in that participants evaluated the target product more favorably when the storyboards led to a high expectancy rather than a low expectancy of encountering the product ( $M = 4.50$  versus  $3.64$ ;  $F(1, 82) = 11.79, p < .001$ ). The interaction between perceptual and conceptual fluency was not significant ( $F < 1$ ). In summary, participants' attitude toward the target product was more favorable when it was both conceptually and perceptually fluent than when it was conceptually fluent but not perceptually fluent ( $M = 4.73$  versus  $4.27$ ;  $t[82] = 1.72, p < .05$ ) or when it was perceptually fluent but not conceptually fluent ( $M = 4.73$  versus  $4.10, t[82] = 2.21, p < .05$ ). Although participants' attitudes in the latter two conditions did not differ ( $t < 1$ ), their evaluation of the target was, in turn, more favorable than the low-perceptual-fluency/low-conceptual-fluency condition ( $M = 4.19$  versus  $3.23$ ;  $t[83] = 3.25, p < .005$ ). Participants' attitude toward

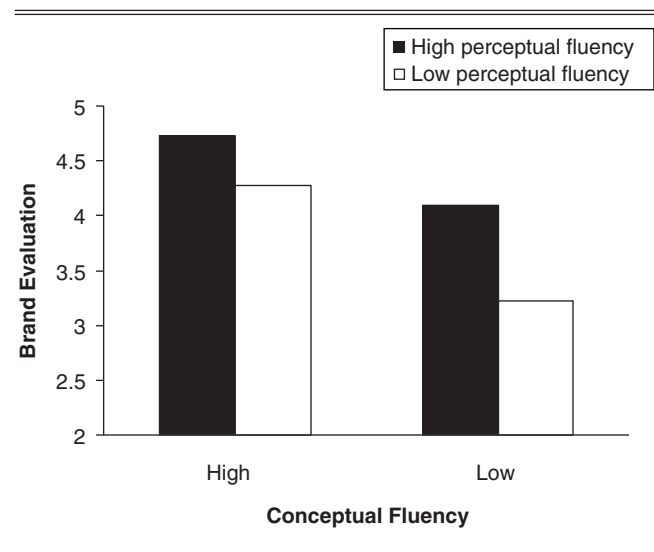
the target product as a function of perceptual and conceptual fluency is presented in Figure 4.

### Discussion

The results of Experiment 2 provide further evidence that both conceptual and perceptual fluency lead to more positive attitudes. Unlike in Experiment 1, in which we used different target stimuli in the different conditions, all participants evaluated the same target product across the four conditions in Experiment 2. Consistent with previous findings (e.g., Janiszewski 1993), prior exposure to the product enhanced participants' attitudes toward the product. Their attitudes were more favorable when the product had been made more accessible in memory, even in the absence of prior exposure, as in the high-conceptual-fluency/low-perceptual-fluency condition in which the storyboard showed a complementary product (i.e., mayonnaise) rather than the target product. Taken together, the data suggest that ease of processing leads to more favorable attitudes toward a product and that ease of processing may be conceptually or perceptually driven. Furthermore, this processing-fluency-based judgment seems to be independent of the extent of cognitive resources expended, as indicated by the null effects obtained for participants' level of involvement and their perceived speed of the presentation.

It is important to note that participants' more favorable attitude as the result of enhanced conceptual and perceptual fluency does not generalize to products other than the target product. That is, the more positive affective judgment we observed was specific to the target product, which benefited from an enhancement in perceptual or conceptual fluency or both. The manipulations did not induce any enhancement in the evaluation of the control product. This result is important in two respects: First, it rules out the possibility that the enhanced affect was due to a transfer of positive feelings experienced by the participants as the result of their accurately anticipating the outcome of the story in the mock-up advertisement. Second, it serves as a check that the effects

Figure 4  
EXPERIMENT 2: BRAND EVALUATION AS A FUNCTION OF  
CONCEPTUAL AND PERCEPTUAL FLUENCY



<sup>1</sup>The results of a  $2 \times 2$  multivariate ANOVA on participants' evaluation of all three filler products that preceded the target product show that none of the main effects or interactions was significant (all  $p_s > .10$ ).

obtained were indeed due to the processing fluency experienced by the participants when evaluating the target product. The manipulations did not enhance the processing fluency of the control product that was neither presented previously nor related to the prime. Thus, we observed a null effect.

Our results across Experiments 1 and 2 show that conceptual fluency as operationalized by presenting the target in a predictive context or by priming the target with a related construct leads to more favorable attitudes. In Experiment 2, presentation of an advertisement for a complementary product from a different product category (i.e., mayonnaise) led to more positive evaluation of the target product (i.e., ketchup). This finding provides evidence that indirect priming may enhance the conceptual fluency of a brand and lead to a more positive attitude toward the brand. Relatedly, Nedungadi (1990) shows that a brand may be made more accessible in memory by exposing participants to statements about the brand or to statements about a competing brand in the product category; in turn, this increase in memory accessibility benefits brand choice. However, participants' evaluation of the brand remained the same, despite the increase in consideration-set membership and brand-choice probability. Calibration is a plausible explanation for the null effect in judgment that Nedungadi (1990) reports. That is, a predictive context may be a stronger manipulation of conceptual fluency than mere prior exposure, as demonstrated by the results in Experiment 1, which show a higher pleasantness rating for words in the expected-same condition than in the neutral-same condition. Similarly, the results in Experiment 2 show more favorable attitudes toward ketchup in the high-conceptual-fluency/high-perceptual-fluency condition than in the low-conceptual-fluency/high-perceptual-fluency condition. We designed Experiment 3 to examine further the robustness of the processing-fluency effects.

### EXPERIMENT 3

Previous research examining the effects of processing fluency on judgment relies mainly on the respondents' repeated exposures to the same stimuli. The results of Experiments 1 and 2 show that attitude toward a stimulus may become more favorable even when the stimulus has not been presented before. The objective of Experiment 3 was to examine further the robustness of the conceptual-fluency effect in the absence of perceptual fluency. We used a 2 (conceptual fluency)  $\times$  2 (perceptual fluency) between-subjects design similar to that of Experiment 2, with the exception that we selected a generic product from the same product category as the target to enhance the conceptual fluency of the target. Thus, we exposed participants in the high-conceptual-fluency condition either to the target product (high conceptual/high perceptual fluency) or to a generic product in the same product category presented in a predictive setting (high conceptual/low perceptual fluency). We exposed participants in the low-conceptual-fluency condition either to the target product (high perceptual/low conceptual fluency) or to an unrelated product presented in a neutral setting (low conceptual/low perceptual fluency).

#### Method

*Stimulus development.* We selected a relatively unfamiliar brand (Sumundi beer) as the target product to minimize the

variance in the brand's baseline perceptual and conceptual fluency. In the high-conceptual-fluency conditions, the storyboard showed a man walking on the street, entering a bar, and talking to the bartender; the final frame featured either Sumundi beer (i.e., the target) in the high-perceptual-fluency condition or a mug of beer in the low-perceptual-fluency condition. We used storyboards that showed the same supermarket scenario as in Experiment 2 in the low-conceptual-fluency conditions, and the last frame featured either a bottle of Sumundi beer (high perceptual fluency) or some vitamins (low perceptual fluency). In summary, we manipulated perceptual fluency by showing the target product (i.e., a bottle of Sumundi beer) or a different product (i.e., vitamins or a mug of beer) in the final frame of the storyboard during the exposure phase. We manipulated conceptual fluency in a scenario that led to either a high expectancy (man in the bar) or a low expectancy (woman in the supermarket) of beer being the advertised product.

*Procedure.* Study participants were 60 undergraduate students at a large eastern university who received course credit for their participation. Participants were randomly assigned to one of the four conditions. Participants followed a similar procedure as in Experiment 2; the only difference was the stimuli we used.

#### Results

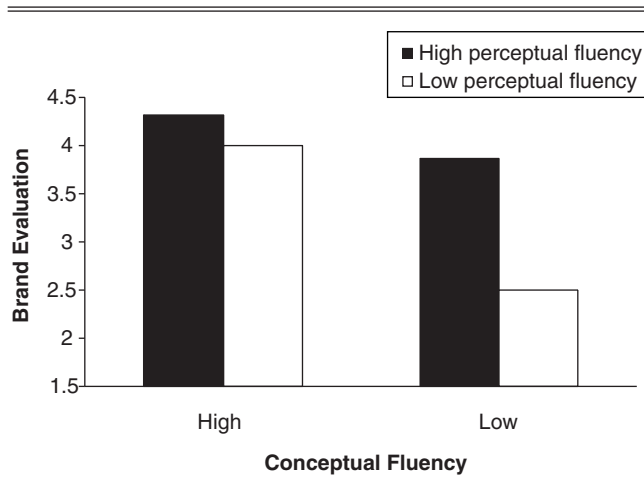
The objective of Experiment 3 was to explore further the additive effects of processing fluency on attitudes. Replicating previous findings, the results of a 2  $\times$  2 ANOVA on affective judgment show that the main effect of perceptual fluency was significant ( $F(1, 56) = 3.92, p = .05$ ). Participants evaluated the target product more favorably when it had been featured in the storyboard than when it had not ( $M = 4.10$  versus 3.28). The main effect of conceptual fluency was also significant ( $F(1, 56) = 5.27, p < .05$ ). Participants evaluated the target product more favorably when the presentation context led to a high expectation rather than a low expectation of encountering the product ( $M = 4.16$  versus 3.21). The interaction was not significant ( $F(1, 56) = 1.55, p > .20$ ). As we predicted, participants' evaluation of Sumundi beer was more favorable when they were exposed to the storyboard that featured the pint of beer in the bar scenario than when they were exposed to the vitamins in the supermarket scenario ( $M = 4.00$  versus 2.50;  $t[56] = 2.46, p < .005$ ). These findings show that a brand can benefit from generic advertising of the product category. Participants' attitude as a function of perceptual and conceptual fluency is displayed in Figure 5.

#### Discussion

The results across Experiments 1–3 show that both conceptual and perceptual fluency lead to more favorable evaluations of the target, and they are consistent with the notion that processing fluency is positively valenced. According to this view, when consumers are presented with a brand that is easy to process, the positive experience of fluent processing underlies their more favorable evaluation of the brand.

A noteworthy question arises as to how judgment might be affected when conceptual fluency is associated with negative valence. For example, a product may be made conceptually more fluent by exposing participants to a related product. However, the related product, which serves as prime, may also activate other constructs in memory, some

Figure 5  
EXPERIMENT 3: BRAND EVALUATION AS A FUNCTION OF  
CONCEPTUAL AND PERCEPTUAL FLUENCY



of which may be negatively valenced. Do negative associations lead to less favorable attitudes toward the target? Note that the stimuli and manipulations we used in Experiments 1–3 were of either neutral or slightly positive valence; this was true of the target stimuli (e.g., ketchup, beer), the related stimuli (e.g., mayonnaise), and the contexts (e.g., supermarket, fast-food restaurant). Therefore, it is reasonable to argue that the stimuli did not prompt negative associations that interfered with the positive feeling of processing fluency. Consider a situation in which a product is activated in memory by exposure to a related product that has negative associations. Although the target product has become more accessible in memory, so have the negative materials that are part of the associative network. When the person is presented with the target product for evaluation, the negative associations also come to his or her mind. The negative valence of the materials may interfere with the person's positive experience of conceptual fluency, thereby resulting in a less favorable attitude toward the product. We designed Experiment 4 to test this hypothesis.

#### EXPERIMENT 4

The results across Experiments 1–3 support the view that the experience of fluency in processing is affectively positive. However, when processing fluency is associated with negative valence, such as when negative and undesirable constructs are brought to mind, participants' attitude toward the target brand may become less favorable. To test this hypothesis, we operationalize conceptual fluency of the target such that it is associated with negative valence, and we compare participants' evaluation of the conceptually fluent target with when it is neither conceptually nor perceptually fluent and with when it is perceptually fluent.

#### Method

**Stimulus development.** We selected a relatively unfamiliar brand (Nutriance Enriching Conditioner) as the target product to minimize the variance in the brand's baseline perceptual and conceptual fluency. To induce processing fluency that may be associated with negative affect, we selected a product that is related to the target product but carries a neg-

ative connotation to serve as the prime (i.e., Not-Nice-to-Lice lice-killing shampoo) to manipulate conceptual fluency of the target product. Results of a pretest show that participants considered hair lice negative and undesirable. On a seven-point scale (1 = "Not at all related," 7 = "Very closely related"), they also indicated that the negative prime was more closely related to the target than to a filler product (alkaline batteries) that served as a control ( $M = 4.66$  versus  $1.59$ ;  $F(1, 28) = 43.49$ ,  $p < .001$ ).

We exposed participants in Experiment 4 to one of three mock-up advertisements: one for the target product (i.e., perceptual prime), one for a product that was related to the target (i.e., conceptual prime), and one for an unrelated product (i.e., control). Specifically, we presented participants in the perceptual-fluency condition with an advertisement featuring a picture of Nutriance Enriching Conditioner with the tagline: "Restores resiliency and leaves hair feeling silky." We exposed participants in the conceptual-fluency condition to an advertisement featuring a picture of Not-Nice-to-Lice 2-in-1 Shampoo with the tagline: "Eliminates both lice and their eggs." Finally, we exposed participants in the no-prime control condition to an advertisement featuring a box of Agnesi Pasta with the tagline: "The finest quality pasta in the Italian tradition; 100% Durum wheat semolina."

**Procedure.** In exchange for course credit, 45 undergraduate students at a large eastern university participated in the study. Participants were randomly assigned to the three fluency conditions (i.e., conceptual fluency, perceptual fluency, and control). They were given the cover story that the experimenter was interested in their opinion on certain products and advertising campaigns and that the experiment was self-paced.

All participants underwent an exposure phase and a test phase. During the exposure phase, participants were presented with a filler advertisement and then one of three priming advertisements. They were asked to evaluate each advertisement on seven-point scales (1 = "Dislike, negative, puts me in a bad mood," 7 = "Like, positive, puts me in a good mood"). Then participants were instructed that their second task was to evaluate different products. They were first presented with the picture of a filler product and were asked to rate the product on a seven-point scale (1 = "Dislike very much," 7 = "Like very much"). Next, they were presented with the picture of the target product for evaluation. Finally, participants were asked to indicate how involved they were during viewing the advertisements for the print campaign (1 = "Skimmed it quickly, not at all involved"; 7 = "Paid a lot of attention, very involved"). They were also asked whether they believed that the mock-up advertisements they saw previously influenced their evaluations of the products. They then responded to some miscellaneous questions.

#### Results

**Manipulation checks.** We selected a subset of the participants at random to indicate on a seven-point scale (1 = "Not at all related," 7 = "Very closely related") how closely related the target was to the negative prime and to the control product in the no-prime condition. The result of a repeated-measures ANOVA showed that the main effect of prime was significant ( $F(1, 24) = 98.06$ ,  $p < .001$ ). Participants perceived the target as more related to the negative

prime than to the control product ( $M = 4.40$  versus  $1.08$ ), which replicates the pretest results.

We conducted a one-way ANOVA to examine whether the fluency manipulation had any effect on the filler product (i.e., alkaline batteries), which was neither conceptually nor perceptually fluent at the time of evaluation. The results show that participants' evaluation of the filler product did not differ between the conditions ( $M_{\text{perceptual}} = 5.11$ ,  $M_{\text{conceptual}} = 4.85$ ,  $M_{\text{control}} = 5.07$ ;  $F < 1$ ), thus enabling us to interpret the results of conceptual and perceptual fluency on the target brand with more confidence.

We averaged the two items that measured participants' evaluation of the priming advertisements to form an attitude-toward-the-ad index ( $\alpha = .91$ ). The results of an ANOVA that examined the effect of the prime on the attitude index showed that participants did not evaluate the priming advertisements in the three conditions differently ( $M_{\text{perceptual}} = 4.08$  versus  $M_{\text{conceptual}} = 3.96$  versus  $M_{\text{control}} = 3.68$ ;  $F < 1$ ). The three advertisements also did not affect participants' mood state differently ( $M_{\text{perceptual}} = 4.67$  versus  $M_{\text{conceptual}} = 3.92$  versus  $M_{\text{control}} = 4.14$ ;  $F(1, 42) = 1.12$ ,  $p > .30$ ). Furthermore, the results of an ANOVA on the involvement index ( $r = .89$ ) show that across the three conditions, participants were equally involved when processing the advertisements ( $F < 1$ ).

*Hypotheses testing.* Our prediction is that enhanced perceptual fluency as the result of prior exposure to the target brand leads to more favorable attitudes toward the target. In contrast, enhanced conceptual fluency as the result of prior exposure to a related product that has negative associations leads to less favorable attitudes toward the target. Our findings provide support for both hypotheses (see Figure 6). Specifically, the results of an ANOVA that examined the effects of the priming advertisements on participants' evaluation of the target product show that the effect of the prime was significant ( $F(1, 42) = 7.12$ ,  $p = .002$ ). Our planned contrasts with one-tailed tests showed that participants in the perceptual-fluency condition evaluated the target brand more favorably than did those in the control condition ( $M = 4.72$  versus  $4.21$ ;  $t[42] = 1.67$ ,  $p = .05$ ). Participants in the conceptual-fluency condition evaluated the target brand less

favorably than did participants in the control condition ( $M = 3.54$  versus  $4.21$ ;  $t[42] = 2.02$ ,  $p = .02$ ). Furthermore, none of the participants indicated that their evaluation of the target might have been influenced by the advertisements they previously saw.

### Discussion

The results of Experiment 4 show that prior exposure to the target product results in more favorable attitude toward the brand. Although it can be argued that the tagline in the mock-up advertisement prompted the more positive attitude, the data are consistent with previous findings in support of a perceptual-fluency effect. A more notable result is that, contrary to the results in Experiments 1–3, prior exposure to a related product leads to less favorable attitudes toward the target. The results suggest that other constructs that have become more accessible as part of the associative network in memory influence affective judgment of the target. Note that participants did not evaluate the three priming advertisements differently, nor did the three advertisements induce different mood states. Thus, a difference in participants' affective state cannot account for their evaluations of the target advertisements across the three conditions. The data showing that evaluation of the filler control product was similar across the three conditions also suggest that the effect of the prime did not affect participants' evaluation of unrelated products, thus providing further support that attitudes toward the target indeed reflect an effect of fluent processing as the result of prior exposure to the target or to a related product. These findings suggest that though processing fluency is affectively positive, fluent processing may be associated with constructs that are negatively valenced; the negative associations may, in turn, give rise to less favorable attitudes toward the target.

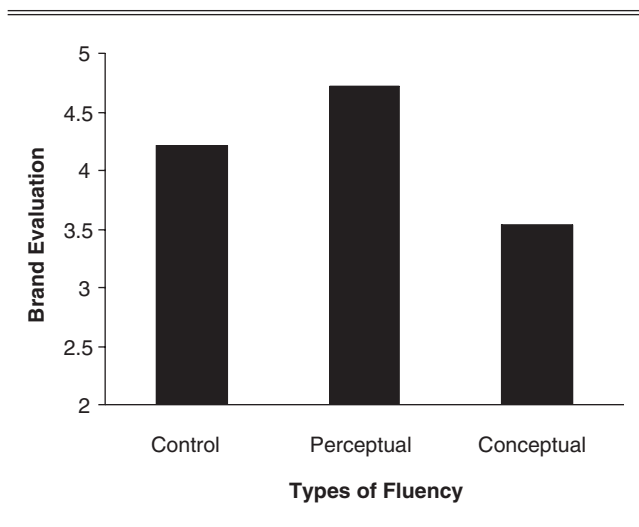
### GENERAL DISCUSSION

Empirical findings in mere exposure research provide evidence that processing fluency is affectively positive, which in turn leads to more positive evaluations (e.g., Reber et al. 1998; Winkielman and Cacioppo 2001). However, most investigations of processing fluency have focused on the effects of perceptual fluency on judgment, though fluency of processing may also be conceptually driven. Previous research on conceptual fluency has been limited to examining its effects on category-exemplar generation, consideration-set formation, and brand choice (e.g., Lee 2002; Nedungadi 1990; Shapiro 1999). The view is that consideration-set membership and brand-choice decisions benefit from an increase in the accessibility of the brand in memory (Nedungadi 1990).

Our research contributes to the understanding of the processing-fluency model by showing that conceptual fluency also affects judgment. Recent findings in the mere exposure literature show that perceptual fluency is positively valenced; thus, people's evaluation of an object increases as it becomes perceptually more fluent. We extend this theoretical framework that relies on positive valence to account for the conceptual-fluency effect. The results of Experiments 1–3 are consistent with this hypothesis. We further show that when conceptually fluent processing is associated with negatively valenced constructs, participants' attitude toward the brand becomes less favorable

Figure 6

EXPERIMENT 4: BRAND EVALUATION AS A FUNCTION OF CONCEPTUAL AND PERCEPTUAL FLUENCY



(Experiment 4). Across all experiments, we show that the processing-fluency effect is specific to the target and not transferable to other stimuli. This research extends previous findings by clarifying the role of conceptual fluency in affective judgment. More specifically, Nedungadi (1990) increased the fluency of target brands by direct and indirect priming but did not find an enhancement in participants' attitudes toward the brands. In contrast, Whittlesea (1993) enhanced the fluency of target words by presenting them in an expected context and found an increase in participants' pleasantness ratings of the words. However, his manipulation of fluency leaves open the explanation that the enhanced pleasantness ratings are due to participants' transferring their positive feelings of correctly guessing the words in the sentence to the target. We provide evidence for a conceptual-fluency effect by relying on different operationalizations of conceptual fluency and by ruling out mood as the explanation of the effect. Our research also shows that the effect may be negative when conceptual fluency brings to mind constructs that are negatively valenced.

It is important to note that the positive valence view is different from the misattribution explanation that Whittlesea (1993) proposes. Although Whittlesea suggests that the conceptual-fluency effect observed is the result of participants misattributing conceptual fluency to affective judgment, his argument is based on findings in previous literature that show that participants misattribute perceptual fluency to judgments on some psychophysical attributes (e.g., how loud the background noise is, how bright or dark the polygons are) rather than on evidence from his data. Whittlesea demonstrates that conceptual fluency affects judgments of meaning, exposure duration, recency of exposure, and pleasantness, and he offers a misattribution explanation to account for the results. Whereas misjudgments of meaning, duration, and recency may be the result of misattribution, enhanced pleasantness ratings are also consistent with the positive valence account. More specifically, it has been suggested that the mechanism underlying the processing-fluency effects on cognitive judgments that have right or wrong answers may be different from mechanisms underlying affective judgments that do not have right or wrong answers (Lee 2001; Zajonc 1980). Thus, although respondents might misattribute fluency to cognitive judgments about a target, they might simply prefer targets that are easier to process.

In our research, the source of processing fluency is prior exposure to the target or to objects that are closely related to the target. These results are consistent with the uncertainty-reduction explanation of the repetition effects on affective judgment (Berlyne 1966). According to the uncertainty-reduction account (Berlyne 1966, 1970), people prefer familiar and predictable stimuli. Repeated exposure reduces uncertainty toward the stimulus and thus enhances liking. In our experiments, conceptual fluency, as operationalized by a heightened expectancy of encountering the target, reduces the uncertainty toward the target, and we observe an enhanced affective judgment. Our results on conceptual fluency are also consistent with recent findings on the self-generation effect, by which people's attitude toward an advertised product is more positive when they are prompted to complete the advertisement mentally by generating the image of the product in memory (Sengupta and Gorn 2002).

Our results that demonstrate a conceptually driven processing-fluency effect add to the growing literature in repetition effects on judgment and decision making. For example, in consumer research, it has been found that advertising repetition is effective in increasing brand evaluation (McCullough and Ostrom 1974), enhancing awareness and brand choice (D'Souza and Rao 1995), and sustaining brand attitude (Haugtvedt et al. 1994). A generally accepted explanation of the repetition effects is the cognitive-response model (Cacioppo and Petty 1979): People learn more about the product when they elaborate on the information and become more persuaded. Although both models predict an enhanced affective response that arises from prior exposure, the processing-fluency model differs from the cognitive-response model in that it posits that a more favorable attitude may derive from the ease with which the information is processed rather than an enhanced appreciation of the benefits offered as the result of learning. Along similar lines, the processing-fluency model predicts a less favorable attitude when the valence of other related constructs (e.g., lice) that are brought to mind is negative, whereas the cognitive-response model proposes that a less positive attitude reflects counterarguments generated by the respondents.

The conceptual-fluency effect, as observed in our research, also differs from the effect of ease of retrieval as information (Schwarz et al. 1991; Wänke, Bless, and Biller 1996). According to Schwarz and colleagues (1991), people may rely on the ease of retrieval of product information as a cue to make inferences about a target object. When people experience ease in generating support (counter) arguments related to the target, their attitudes toward the target become more (less) favorable; the reverse is observed when they experience difficulty in generating support arguments or counterarguments. Thus, inference generation rather than valence underlies the effect of ease of retrieval as information.

According to the processing-fluency model, people's attitude toward an object becomes more positive when they can easily process the object. It is important to note that prior exposure is only one of the ways that processing fluency can be enhanced. Perceptual fluency of a stimulus can also be enhanced by more vivid contrast against the background (Reber et al. 1998) or by improved visual clarity on the computer screen (Whittlesea, Jacoby, and Girard 1990). Similarly, although conceptual fluency benefits from elaboration at the time of exposure (e.g., Hamann 1990), it can also be enhanced by the predictive nature of the context in which the stimulus is presented (e.g., Whittlesea 1993) or by indirect priming that does not require exposure to the target (e.g., Nedungadi 1990), as is evidenced in the current research.

Notably, Nedungadi (1990) does not observe an increase in the respondents' attitude toward the brand, even though the brand has become more accessible in memory. A plausible explanation for the discrepancy between Nedungadi's results and the current data may be a matter of calibration. Specifically, Nedungadi primes participants in the high-accessibility condition by presenting them with statements about different brands; the statements were not designed to provide a predictive context for the target brands and thus would be similar to the neutral condition of high perceptual fluency (i.e., low conceptual fluency) in our research. In

contrast, we designed the sentences (Experiment 1) and storyboards (Experiments 2 and 3) in the high-conceptual-fluency condition to provide a context that leads to a high expectancy of encountering the target. Thus, the stimuli we used may be conceptually more fluent than those Nedungadi used. That conceptual fluency benefits from a meaningful and expected context is consistent with the notion that conceptually driven processes are sensitive to semantic elaboration manipulations (Hamann 1990). In contrast, it can be argued that the brands Nedungadi used are familiar brands for which participants might have a firmly held attitude, and so their attitude was not easily shifted by processing fluency. The target brands we used were less well known (e.g., Sumundi beer, Nutriance conditioner); thus, participants might be less likely to hold a strong prior opinion of the brands, and processing fluency might have exerted its influence on attitude toward the brand. However, this account is less likely because we observed conceptual-fluency effects for Kraft ketchup (Experiment 2), a relatively familiar brand. Investigation of boundary conditions of the processing-fluency model and more direct evidence of the underlying mechanism await further research. In particular, although the less favorable attitudes we observed in Experiment 4 are consistent with the explanation that relies on valence associated with processing fluency, the results are also consistent with a processing-fluency account based on regulatory goal compatibility (Lee and Aaker 2004). That is, a target that matches people's promotion or prevention goals is evaluated more favorably than when it represents a mismatch to goals. In Experiment 4, although the lice-killing shampoo made the hair conditioner conceptually more fluent, the fluency also made salient a prevention goal (to kill lice), which is a mismatch with the promotion goal associated with the target (smooth, shiny hair). If the negative conceptual-fluency effect we observed is the result of goal mismatch rather than negative valence of associations, participants should evaluate a related product that matches the prevention goal of the negative conceptual prime more positively. Further research is warranted to distinguish between these accounts.

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