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TIPPING THE PURCHASE WITH EXTERNAL CUES: INFLUENCING THE BEHAVIORS OF AMBIVALENT CONSUMERS WITH CONTEXTUAL PRIMES

Lifeng Yang and H. Rao Unnava

In this research, we examine how product attitudes that consist of both positive and negative reactions (i.e., ambivalent) can be made predictive of purchase behavior with the use of external cues. In two studies, we provided participants external cues prior to their decision for consumption intention. These external cues were implicitly given without making participants aware of their relevance to their incoming consumption decision. Results from our studies provide convergent support to the notion that the low behavioral predictability of ambivalent attitudes can be rectified with external cues. Managerial implications of the research are discussed.

Often, consumers can explicitly tell how much they like or dislike a product, and these attitudes can be good predictors of purchase. However, there are also situations in which consumers are conflicted and/or undecided about their evaluations about a product (Otnes et al. 1997) or service (Bush et al. 2015). Ambivalence refers to the state of conflicted reactions toward an attitude stimulus. Because of the existence of ambivalence in attitudes, many consumers find it difficult to make purchase decisions because they possess both positive and negative reactions toward the attitude object (Lau-Gesk 2005; Priester et al. 2007). In the political campaign arena, it is reported that the majority of marketing campaign expenditures are used to obtain votes and support from the large number of undecided voters who are ambivalent about whom they should vote for (Granholm 2012).

Often, undecided or conflicted consumers are those who hold highly ambivalent attitudes that contain both positive and negative reactions underlying their overall evaluations. Although not experimental evidence, correlational data collected on the 2008 presidential political campaigns in the United States showed that the amount of political advertising in a given area was associated with decreased ambivalence (Kim et al. 2013). In consumer behavior contexts, a common example is consumers who love foods that are rich and tasty, but who harbor misgivings or guilt about eating these foods because they are also fatty and unhealthy (Raghunathan et al. 2006); similarly, consumers may find certain branded goods extremely favorable because of their well-known superior quality, but may also have reservations about these brands because of their high prices. Often, the existence of the positive and negative components in an ambivalent attitude is difficult to reconcile. For instance, consumers may like BMW vehicles for their design and functionality (positive), but dislike BMW vehicles for their high prices (negative). These ambivalent feelings are found to contribute to the low purchase intention because the positive and negative components are difficult to reconcile.

In this article, we examine the possibility of using external, valenced primes to implicitly affect consumers' behavioral intentions and choices. External cues here are defined as cues that come from the environment. In some situations, consumers may actively search for external cues for decision making. For instance, tourists may actively search for a good place to dine by checking out which restaurant has the longest line waiting outside. The long lines are external cues because they are part of the environment not within control of the perceiver him/herself. In other situations, however, external cues may also exert their influence on perceivers with more implicit presence. In this research, we specifically focused on the usage of external cues of which consumers are not consciously aware. Prior research suggests that ambivalent attitudes contain distinctive valence components (positive and negative) that can be selectively made available to guide behavior (de Liver et al. 2007). Research on racial stereotyping (e.g., Bell and Esses 1997; Katz and Hass

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1988) and political ideology (Lavine et al. 1998) also suggests that making one valence of an ambivalent attitude more accessible can temporarily resolve ambivalence. However, we find that prior research has generally focused on low attitude-behavior correlations between ambivalent attitudes and behaviors. Whether high ambivalence attitudes can be made more predictive of behavior has not received much attention in marketing research. We argue that high ambivalence is accompanied by the spontaneous activation of both positive and negative responses when a consumer is evaluating a product for purchase. We propose that contextual cues that make one of the two components of an ambivalent attitude more salient will cause behaviors to be more consistent with that component of the attitude.

Contextual cues, when present, can serve as a prime that unconsciously affects an individual's subsequent information processing. Contextual cues here are conceptualized as a subset of external cues. In comparison to external cues that are more permanently present in the environment, contextual cues are characterized by their short-term, situational presence. Research in psychology suggests that a consumer's product knowledge is mentally represented by associative networks that consist of nodes and links (Collins and Loftus 1975; Raaijmakers and Shiffrin 1981; Ratcliff and McKoon 1988). Priming is defined as an implicit memory effect in which exposure to one stimulus can affect the activation and processing of nodes adjacent to the prime. In two studies, we show that external cues independent of the product purchase decision can affect consumer behavior among the highly ambivalent whether ambivalence is measured or manipulated. In Study 1, mood was used as a prime that is hedonic but unrelated to the target attitude object. In Study 2, word tasks were used as the prime to activate different nodes associated with the attitude object. Although the primes used for the studies were different from each other, results from both studies provided convergent evidence to our prediction, whether the prime is cognitively related or unrelated to the attitude object, and whether the product is utilitarian or hedonic.

Our results add to marketing theory by showing how to increase or decrease purchase intention in ambivalent consumers. Additionally, we show that the external contextual cues are more effective in affecting purchase intention among highly ambivalent consumers than in low ambivalence consumers. Finally, our studies show how to effectively persuade ambivalent consumers. Our results suggest that communication strategies may use implicit primes to highlight the desired side of an issue just before a choice is made by ambivalent people. Making salient a select valence of the conflicting reactions of an ambivalent attitude can predict and affect behavior in a desired direction.

ATTITUDINAL AMBIVALENCE

Attitudes high in ambivalence consist of strong positive and negative reactions to an attitude object (Kaplan 1972; Priester and Petty 1996; Thompson et al. 1995). For example, an individual may experience strong positive feelings about the taste of chocolate cake, but equally strong negative feelings about its high fat and sugar content. Such consumers may still be able to express an overall favorable or unfavorable attitude toward chocolate cake, based on which of the valenced reactions are more salient. Thus, an ambivalent attitude is an attitude that has two independent components of opposite valence, and the overall evaluation of the product usually has a valence consistent with the dominant component of the attitude.

In social psychological research, attitudes high in ambivalence are found to be generally less predictive of behavior than attitudes low in ambivalence (Cavazza and Butera 2008; Conner et al 2002; Sparks et al. 2004; Sparks et al. 2001). For example, Conner and colleagues (2002) asked participants to indicate their overall attitudes toward different dining options; they measured ambivalence by having participants indicate how favorable or unfavorable the dining options were if they were to consider only the favorable qualities or the unfavorable qualities. Ambivalence toward eating either a low-fat diet or five portions of fruits and vegetables per day was measured. A month later, they asked participants about 1) their subjective perceptions of what their diet had been (e.g., "very low" or "very high" in fat), 2) the content of their diet (e.g., "how much fruits and vegetables did you eat each day?"), and 3) their actual food consumption. Higher levels of ambivalence about fat and fruits were associated with significantly weaker attitude-behavior relationships. That is, individuals who scored higher in the attitude ambivalence measures tended to be less consistent in their food-consuming behavior. Several other studies have reported low attitude-behavior

relationships as well (Keele and Wolak 2006; Sparks et al. 2004).

Investigating how people react when exposed to objects for which they have ambivalent attitudes, Rodriguez et al. (2005) found that chocolate cravers who had both positive and negative feelings about chocolate showed *physiological changes* (based on blood flow in the brain) that reflected these conflicting reactions when exposed to pictures of chocolate. Specifically, participants in their study were exposed to chocolate and images of chocolate. High cravers with ambivalent attitudes toward chocolate were found to experience more pleasure and arousal than the low cravers. In contrast, for those who had univalent attitudes, only one type of reaction was observed. Similar differences in reactions to chocolate were observed in dieters vs. non-dieters as well (Fletcher et al. 2007). Therefore, one reason for low attitude-behavior correlation in high ambivalence individuals is the uncertainty about which of the two reactions will be used to decide behavior.

As mentioned above, existing research on ambivalent attitudes suggests that priming can temporarily increase the accessibility of either the positive or the negative component of an ambivalent attitude, thus resolving the ambivalence and making responses more predictable, at least in the short term (e.g., Bell and Esses 1997; Katz and Hass 1998; Lavine et al. 1998). For example, Katz and Hass (1988) found that priming people with humanitarianism increased pro-black attitudes and priming people with the Protestant work ethic increased anti-black attitudes. In work on political attitudes, Lavine and colleagues (1998) found that weaker political attitudes were more susceptible to context effects. Specifically, having participants answer questions that bring to mind conservative or liberal ideologies before answering political attitude items biased answers to the target item more when attitudes toward those issues were weak. Lavine and colleagues used several measures of attitudinal strength in combination with ambivalence, but their results parallel our hypotheses.

Rather than using a content-specific prime like those used by Katz and Hass (1998) and Lavine and colleagues (1998), we are interested in using a more general cue prime, like mood. Mood has been shown to enhance the recall of mood-consistent information in memory (e.g., Isen et al. 1978; Worth and Mackie 1987) and this effect has been termed *mood congruent memory*. Several studies show that people who are in a good mood are more likely to recall positive events than negative events (e.g., Bullington 1990; Salovey and Singer 1989), although there has been less success in showing an increased recall of unpleasant memories with negative moods (Blaney 1986; Nataley and Hantas 1982). Thus, while positive moods have been shown to increase accessibility of positive memories, negative moods are more likely to reduce access to positive memories than increase access to negative memories.

Because of the effects of mood on thoughts and memory, we hypothesized that manipulations of mood should also increase the accessibility of either the positive or the negative responses of ambivalent attitudes. In particular, positive moods should cue positively-valenced reactions, and negative moods should cue negatively-valenced reactions. Bell and Esses (1997) present some evidence that supports this line of thinking. In their study, they put people in either positive, negative, or neutral moods and measured attitudes toward Canadian Native People. Ambivalent individuals were found to express positive attitudes in the positive mood condition and less positive attitudes in the negative mood condition.

A study by de Liver et al. (2007) examined the structure of ambivalent attitudes and their expression using response latency task and priming. The finding of interest to our research is that when positive primes were used, participants who were ambivalent expressed prime-consistent attitudes, and expressed them faster than non-primed participants. Similar results were obtained with negative primes: participants expressed prime-consistent attitudes and did so faster than non-primed participants. The prime had no effect on neutral attitudes. The purpose of this study was to show that both positive and negative associations that characterize ambivalent attitudes are equally strong. Their results are also initial evidence supporting our hypothesis that priming can resolve attitudinal ambivalence.

Finally, while not an investigation into attitudinal ambivalence, additional support for our priming method can be found in research on contextual priming in consumer contexts. For example, Zhao et al. (2014) used positive mood primes to increase positive responses to nostalgia in advertising. Because nostalgia evokes both positive and negative feelings, the current affective experience of participants made one or the other dominant. This is similar to what we expect in our research. However, our research does not require any exposure to advertisements because it operates on existing ambivalent attitudes (although we also manipulated ambivalence and utilized advertising in

two of our studies). Yi (1993) showed that contextual priming disambiguated product information when participants were given positive or negative product cues (e.g., cues about safety encourage positive interpretations of large cars; cues about fuel economy encourage negative interpretations of large cars), resulting in effects on both brand attitudes and purchase intentions. Additionally, this effect was strongest when people had moderate prior knowledge. The moderate knowledge group is similar to our ambivalent group in that ambivalence requires some level of knowledge, but not so much that the ambivalence is resolved (as would be the case with high knowledge) or so little knowledge that there is no conflict and thus no ambivalence. However, in our research, primes influence accessibility of existing knowledge or reactions to products versus interpretation of new information. We primed participants after presenting product information and before measuring behavioral responses.

In summary, attitudinal ambivalence is characterized by the simultaneous existence of positive and negative feelings toward an attitude object. Consumers experience ambivalence when these inconsistent feelings are retrieved at the point of decision making. The weak relationship between attitude and behavior for a high ambivalence individual is due to the uncertainty about which of the components (dominant or conflicting) is differentially accessible at the point of decision making. Some prior research points to the possibility of affecting access to one of the components of an ambivalent attitude, which makes one feel less ambivalent about the attitude object. We argue that if we can externally create conditions in which such selective access to one of the two attitudes is achieved, we would observe not only lower reported ambivalence levels, but also behaviors that are more consistent with the retrieved attitude. We propose that if we can create implicit conditions when such selective access to one of the two valenced reactions is achieved, we would observe behaviors more consistent with the valence of the retrieved attitudinal component.

PRETEST FOR PRODUCT SELECTION

Selection of Stimulus

We chose the category of food for our first main study because food is the most important substance for all consumers. To select a food product that is familiar to our participants, a pretest was conducted with participants recruited from the same population as those who were to participate in the main study.

Because our studies were to be conducted on a college campus, we preselected a list of food products that we considered highly relevant to college students' everyday life. This list of food products consisted of some healthy but not as tasty options (i.e., green salad, yogurt, and turkey sandwiches), and some tasty but not as healthy options (i.e., ice cream, French fries, and hamburgers) (Raghunathan et al. 2006).

The pretest was distributed online to students enrolled in the introductory marketing classes in a major university in a southern state of the United States. Eighty-five undergraduate (40 males, 45 females) students participated in the pretest in exchange for course credit. Participants were asked to evaluate how the selected food products were familiar or relevant to them on a nine-point scale ("1" = "Not at all"; "4" = "Neutral"; "9" = "Very much"). They also completed the measures of attitude and ambivalence toward each product by first reporting how much they personally liked each product ("1" = "Not at all"; "4" = "Neutral"; "9" = "Very much"). They then separately evaluated only the *positive* (*negative)* aspects of each product on a four-point scale ("1" = "not at all"; "2" = "slightly"; "3" = "quite"; or "4" = "extremely") (Kaplan 1972). The separate evaluation of how positive (negative) the product's positive (negative) qualities while ignoring its negative (positive) qualities were used to calculate individuals' attitude ambivalence scores toward each product. Specifically, ambivalence was derived by taking half of the sum of one's positive and negative ratings of a product, then subtracting half of the absolute value of the difference between the two ratings (Thompson et al. 1995).

Among the products we tested, French fries were found to have a normal distribution (*skewness* = –63, *SE* = .26) of individuals in both low and high ambivalence categories, which would enable us to generate adequate sample sizes for our main studies. In addition, French fries are considered a popular (M = 6.35, SD = 2.07) side dish that is perceived to be familiar (M = 6.27, SD = 1.30) and relevant (M = 4.26, SD = 1.81) to our target population. As shown in Table 1, green salad was also rated as similar in perceived relevance (M = 4.19, SD = 1.67) and familiarity (M = 5.69, SD = 1.57) as French fries. Because green salad and French fries were considered popular, relevant, and familiar side dishes by participants, they were chosen to be the target products for our first experiment.

Table 1
Product Selections Pretest

	Attitude		Ambivalence		Relevance		Familiarity	
Product	**M**	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
French Fries	6.35	2.07	5.55*	1.54*	4.26	1.81	6.27	1.3
Green Salad	5.69	2.12	4.65*	1.27*	4.19	1.67	5.69	1.57
Jeans	5.79	2.26	4.45**	1.98**	4.88	1.8	6.25	1.36

Notes: A total of eighty-five individuals participated in this study. *Ambivalence was measured and computed following procedures outlined by Thompson et al. (1995). **Ambivalence was measured and computed following procedures outlined by Priester and Petty (1996). Attitudes were measured with a four-item seven-point scale, and larger mean value indicated more positive attitude toward E. K. ® Jeans.

STUDY 1

In Study 1, we used mood as a contextual variable to selectively prime either positive or negative reactions to French fries, and hypothesized that behaviors exhibited by ambivalent consumers would be consistent with the valenced reactions that had been selectively made accessible. If a consumer is ambivalent about consuming a product, and the decision context makes one type of feeling more or less accessible, then the resulting behavior should be consistent with the feelings that have been made salient. Thus, our theoretical conceptualization led us to expect that choice probabilities for French fries would differ for highly ambivalent consumers depending on the thoughts made accessible at the time of choice through implicit priming. Specifically, positive mood primes should result in higher probabilities and negative mood primes should lead to lower probabilities. Less ambivalent attitudes, in contrast, should be less affected by primes because individuals who have only reactions of one valence stored in their memory for the target attitude object will not use incidental environmental cues to resolve their ambivalence. Rather than simply having participants choose French fries or nothing (which would have likely resulted in all participants taking a coupon for French fries, whether they intended to use it or not), we had participants choose between French fries and a vegetable side salad. A vegetable side salad was provided as an alternative because it is commonly perceived as a healthy food item, and ambivalence about French fries was driven by the perception that it was not a healthy food. Thus, the expectation was that depending on the thoughts about French fries that are accessible, participants will either choose French fries or the vegetable side salad. If participants evoke predominantly the positive component of their evaluation about French fries, they should choose them over the vegetable side salad; if negative thoughts about French fries are made more salient, they should choose the healthier vegetable side salad over fries.

Thus, regardless of prior attitudes toward French fries, we expected happy mood to increase the choice probability of French fries, but significantly more so when ambivalence was high (rather than low). Formally, we predict that:

H1: For ambivalent attitudes, being in a happy mood will affect choice to be more consistent with the positive component of the ambivalent attitude.

H2: For ambivalent attitudes, being in a sad mood will affect choice to be more consistent with the negative component of the ambivalent attitude.

H3: For attitudes held with low ambivalence, choice of a product is relatively unaffected by happy or sad mood.

Method

Participants and Design

Two hundred and two undergraduates (84 males, 118 females) from a U.S. public university participated in the study online in exchange for course credit. The study utilized a 2 (ambivalence: high vs. low) × 3 (mood: positive vs. negative vs. neutral) design. Participants' attitudes and ambivalence were measured before they were assigned to receive one of three levels of mood primes.

Procedure

To achieve implicit priming, participants were told that the study consisted of several unrelated parts. We measured attitudes toward French fries in the first part of the study by asking participants to indicate how much they personally liked French fries (nine-point scale with 1= "not at all" and 9 = "very much"). Ambivalence toward French fries was measured using identical methods as described in the pretest. To reduce possible reactance effects, we embedded the French fries item in a survey in which participants also reported their

attitudes and ambivalence toward hamburgers, choices of restaurants around campus, yogurt parfait, salad, cooking, and movie-going.

Immediately following the first part of the study, participants were randomly assigned to either the positive, neutral, or negative priming conditions. This manipulation consisted of two parts, which are described below. Because the study was conducted online at participants' leisure, we strengthened our priming effects by using both a reading task and a writing task to prime mood. After completing these tasks, participants were instructed to move on to a third, ostensibly unrelated part of the study.

The third part of the study included the critical dependent measure. Participants read a note that read, "*As a token of thanks for your participation in this research, you will get to choose a coupon for a side dish from a popular dining place near campus. You can choose either a coupon for a free order of French fries, OR a coupon for a free order of a vegetable side salad as our reward for your participation. Coupons for these side dishes are of equal value.*" We then coded whether participants took the coupon for French fries or side salad as the primary dependent measure.

Mood Induction Materials

In the second part of the study, participants were given one of three articles to read. The articles were meant to induce either happy, neutral, or sad mood, depending on which priming condition one was assigned. Those in the happy mood condition read a funny description of the so-called men's natural fragrance; those in the sad mood condition read about sad moments in life; and those in the neutral mood condition read a technical report from IBM (see Appendix 1). To justify the reading task, we told participants that the articles had been recently published in a local magazine and asked participants to indicate whether they had read the article before ("1" = "Yes"; "2" = "No"), and if the article was informative, enlightening, interesting, or inspiring ("1" = "Yes"; "2" = "No"; and "3" = "Somewhat"). Because these were filler questions, we did not include them for further data analysis.

To strengthen the priming manipulation, we included a second part. After reading and evaluating the article, participants were asked to recall and write a detailed description of either a happy event (happy condition) or sad event (sad condition) that happened to them recently. To conclude the writing task, we asked participants to indicate whether they had done a similar writing task before ("1" = "Yes"; "2" = "No") and if they would usually keep a diary for themselves ("1" = "Yes"; "2" = "No"). Those in the neutral mood condition were asked to write a description of the business school buildings instead of a recent life event (see Appendix 2).

These two procedures were pretested with a different sample of students (n = 131) from the same population to avoid revealing the purpose of mood induction to participants in the main studies. Items in the checks included two nine-point questions measuring how "happy-sad," "elated-depressed" one felt after mood induction. We reverse coded the "elated-depressed" responses, then averaged them with the "happy-sad" responses for forming the mood check index anchoring "– 4" = "Very Sad"; "0" = "Neutral"; and "+ 4" = "Very Happy." Participants in the happy mood condition reported feeling more happy and elated (M_{happy} = 2.21) than those in the neutral mood condition ($M_{neutral}$ = 1.03); those in the sad mood condition reported feeling less happy or elated (M_{sad} = -1.47). Because the mood induction procedures were shown effective in inducing the expected levels of mood (F (1,131) = 50.08, $p < .001$), we used the same procedures in this study as primes.

Results

Attitudes and Ambivalence Measured

Because French fries are one of the most popular side dishes among our research population, it was not surprising that the majority of our respondents (80.7percent) indicated that they personally liked French fries; however, over half of the participants (60.9 percent) indicated high levels of ambivalence toward French fries.

Choice. Because our choice measure was a binary option, we used binary logistic regression to analyze our choice data (choice for French fries = 1; choice for vegetable salad = 0). Overall, the model for analysis showed good fit to the data (R^2_{McF} = .10; $R^2_{C\&S}$ = .13) (McFadden 1974; Cox and Snell 1989). The analysis showed that primes and ambivalence interactively affected choice (β = –48, *S.E.* = .22, p = .03). Consistent with prior literature, more positive attitudes (toward French fries) were associated with greater choice of French fries (β = .40, *S.E.* = .09, $p < .001$) regardless of priming conditions. When responses from all conditions were pooled together, priming was

not found to be predictive of choice (β = –30, *S.E.* = .31, p = .32, NS), which demonstrates the conditional effect of priming on choice.

Because our primary interest was to examine if priming procedures had a more pronounced effect when ambivalence was high versus low, we conducted a moderation analysis using PROCESS Model 1 (Hayes 2013). Including attitude toward French fries as the covariate (continuous variable); prime as the predictor variable (1 = positive, 2 = neutral, 3 = negative); binary choice as the dependent variable; and ambivalence toward French fries as the moderator (continuous variable), our moderation analysis shows a significant interaction between ambivalence and prime (β = –.48, *S.E.* = .22, p = .03), which shows that the conditional effect of prime on choice was moderated by how ambivalent one felt toward French fries. Specifically, under low ambivalence (i.e., one standard deviation below the mean for ambivalence), prime did not affect choice at all (β = .41, *S.E.* = .45, p = .37; CI = [–.47, 1.28]), which was indicative of the stability of low ambivalence attitudes in predicting behavior across different contexts. Consistent with our prediction, participants who were low in ambivalence did not show difference in choice probabilities toward French fries whether they were in the happy or sad mood conditions (.32 vs. .41, $p > .05$). Therefore, our H3 was supported.

Contrastingly, priming affected choice significantly when ambivalence was high (i.e., ambivalence scores one standard deviation above the mean; β = –1.01, *S.E.* = .44, p = .02; CI = [–1.88, –.15]), such that choice of French fries was higher in the positive prime condition and lower in the negative prime condition. This result confirmed our predictions in H1 and H2. For participants who were highly ambivalent, being in a happy mood made them much more likely to choose French fries than those in the sad mood (.56 vs. .31, $p < .05$).

Together, our results provided evidence supporting our hypotheses 1, 2, and 3. Results showed that the effects of primes on choice were moderated by how ambivalent people felt toward French fries. Highly ambivalent people exhibited behaviors that were consistent with the valence of the prime, but the effect of valence priming had minimal effect on the less ambivalent people. In other words, consumers with high ambivalence toward French fries are more likely to choose French fries if they are put in a happy mood than if they are put in a sad mood. Consumers who do not have ambivalent attitudes toward French fries are much less likely to choose or not choose French fries because of the mood condition they are in.

Discussion

These findings support the main argument in this article that ambivalent attitudes can be made more predictive of behavior by priming the valenced component consistent with either the dominant or conflicting component in the ambivalent attitude. One might argue that the manipulation of mood may also have triggered multiple mechanisms beyond accessibility (see Andrade 2005 for a review). For instance, individuals put in different mood conditions may feel motivated to manage their moods by choosing to consume or to avoid French fries for mood regulation purposes (Mick and DeMoss 1990; Zillmann 1988); they may also use mood as information (Schwarz and Clore 1983) to choose or not choose French fries because they misattribute mood to the quality of French fries; one may also feel more confident while having thoughts that are mood-consistent (Briñol et al. 2007). Study 2 will examine if the obtained effects can be replicated in the context of a different product, with a different priming manipulation.

STUDY 2

To examine the generalizability of our findings, in other words, to check if the results found were only applicable to food consumption situations and whether the priming procedure only works when moods are used, we conducted Study 2, in which attitudes and ambivalence were manipulated instead of simply measured. Jeans were selected as the target product for this study primarily for two reasons. First, because foods were used as the target products in the first study, we considered it necessary to examine our hypotheses in a different product category to check the generalizability of our conceptualization. Since jeans are commonly worn on college campuses, their familiarity (M = 6.25, SD = 1.36) and relevance (M = 4.88, SD = 1.8) to our participants suggested they would be an appropriate target product for our next study (see Table 1). Secondly, even though people's natural reactions to jeans (as a product category) tend to be more neutral than ambivalent (see Table 1: M = 4.45, SD = 1.98; mid-

point of the felt ambivalence scale = 6), existing theories on ambivalence also suggest that consumers can also be made ambivalent if they learn that certain jeans have both desirable and undesirable attributes (Kaplan 1972; Priester and Petty 1996; Thompson et al. 1995). Thus, if our hypotheses are valid, we should expect to find supporting evidence using any product that consumers feel ambivalent about. To induce different levels of ambivalence (high or low) and attitude favorability (positive or negative) toward jeans, we presented participants information about a fictitious brand of jeans (E. K.® Jeans) in the form of mixed consumer reviews from current users. The usage of a fictitious brand of jeans as attitude object also helps experimentally control for prior knowledge as being a potential covariate for a study.

Participants' intentions to purchase the jeans were measured as the key dependent variable. We expected that consumers whose attitudes were not as ambivalent would show more stable behavioral intentions across different priming conditions. We also expected that consumers with highly ambivalent attitudes toward the jeans would be more (less) likely to show higher purchase intention if they received the positive (negative) word primes. Specifically, we predict that:

H4: For ambivalent attitudes, positive contextual cues will affect purchase intentions to be more consistent with the positive component of the ambivalent attitude.

H5: For ambivalent attitudes, negative contextual cues will affect purchase intention to be more consistent with the negative component of the ambivalent attitude.

H6: For attitudes held with low ambivalence, purchase intentions of a product are relatively unaffected by either positive or negative contextual cues.

Method

Participants and Design

Two hundred and eighty-six undergraduates from a U.S. public university in a southern state participated in the study for course credit toward their introductory marketing class (152 men, 134 women). A 2 (attitude: positive vs. negative) × 2 (ambivalence: high vs. low) × 2 (prime: positive vs. negative) factorial design was employed. To reduce the possibility of reactance toward our priming procedures, participants were made to believe the current study consisted of two independent parts that were conducted by researchers from different disciplines. The first part of the study was said to be conducted by business researchers who would like to know how consumers think about certain products based on select consumer reviewers. The second part of the study was said to be conducted by researchers from the department of communication who were interested in learning how college students may or may not be able to complete certain word tasks within a given amount of time.

Materials and Procedure

Participants completed the study in a computer lab that seated ten people at a time. We utilized an online survey engine called Qualtrics to present instructions and to collect responses from participants. In the first part of the study, participants were directed to a folder placed in front of the computer with information about the target brand, E. K.® Jeans (see Appendix 3).

Past research shows that for purchases of jeans, consumers place high importance on construction quality and how the garment feels when worn (i.e., Adaval 2001). We considered fabric, color, fit, and wash of jeans directly related to these qualities. To test this assumption, we conducted a pretest from the same population of our main study. The pretest was conducted online. Seventy-one participants completed the pretest in which they were asked to rank how important fabric, color, fit, and wash are when they are considering purchasing new jeans. In addition, participants were given open-ended questions to write down any other attributes that are important for the purchase of jeans.

Results from the pretest show that twenty-six participants *also* consider other attributes such as "brand," "length," "comfort," and "stretchiness" when choosing jeans, but the majority of the participants (45 out of 71) indicated that they do not consider other attributes beyond "fabric," "fit," "wash," and "color" when choosing jeans. Frequency analysis was performed on the pretest data. Results showed that the "fit" and "fabric" attributes were viewed as more important than the "color" and "wash" attributes (see Table 2).

Thus, to achieve positive and negative attitudes, we varied the valence of reviews about the first two attributes. The ambivalence manipulation was achieved by varying

Table 2
Attribute Importance Pretest for Study 2

Attributes	Fit		Fabric		Color		Wash	
*Order of Importance	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
1	50	70.4	5	7.0	11	15.5	5	7.0
2	16	22.5	27	38.0	22	31.0	6	8.5
3	4	5.6	21	29.6	24	33.8	22	31.0
4	1	1.4	18	25.4	14	19.7	38	53.5

Notes: A total of seventy-one individuals participated in this study. *1 = the most important; 2 = second most important; 3 = third most important; 4 = fourth most important.

the number of reviews which were positive or negative. For example, in the positive (negative) attitude conditions (high ambivalence), the reviews about the more important attributes were both positive (negative) but were presented with two negative (positive) reviews about the less important attributes; for positive (negative) attitude, low ambivalence condition, three positive (negative) reviews and one negative (positive) review (about a less important attribute) were presented. To examine whether the order of presenting different reviews in a condition may affect one's evaluation of and reactions toward E.K.® jeans, another pretest (26 = male, 34 = female) was conducted with a different sample of participants from the same population as those in the main study. In this online pretest designed in Qualtrics, consumer reviews on E.K.® jeans were randomly presented to participants in each condition. This randomization was performed to control for any possible order of presentation effect on one's perception of E.K.® jeans. Further, participants were asked to evaluate how important each review they read was to their judgment of E.K.® jeans (seven-point scale, "1" = "Not at all Important"; "7" = "Very important"). This measure was implemented to check if the order of reviews presented might interact with the perceived importance of each review that affected the key variables we were to manipulate: attitude and ambivalence. Our overall attitude measure consisted of a four-item semantic differential scale anchored by good-bad, unfavorable-favorable, beneficial-harmful, and undesirable-desirable (seven-point scale) (Wheeler et al. 2005). These scales were averaged to develop a summary measure of each participant's attitude toward E. K.® Jeans (Cronbach's α = .90). In addition, we measured ambivalence using a scale developed by Priester and Petty (1996) to capture how people felt after reading the different sets of consumer reviews. The measure consisted of five items asking participants to rate how much they felt: "mixed vs. one-sided"; "conflicted vs. not conflicted"; "indecisive vs. not indecisive"; "maximum tension vs. no tension"; and "maximum ambivalence" vs. "no ambivalence" (eleven-point scale) toward E.K.® Jeans (Cronbach's α = .88). Results from this pretest showed that even when the order of reviews presented was randomized, the reviews we used were effective in inducing targeted levels of attitude and ambivalence for each of our four experimental conditions. Specifically, participants in the high ambivalence conditions reported feeling more ambivalent (M = 5.87) than those in the low ambivalence conditions (M = 4.96; F (1, 58) = 3.38, p = .07); similarly, participants in the positive attitude conditions indicated more positive attitudes (M = 4.48) toward E. K.® Jeans than those in the negative attitude conditions (M = 3.43; F (1, 58) = 10.12, p = .002). After reading all reviews, participants across all conditions reported that the review on "fit" was the most important review to their evaluations of E. K.® Jeans (M = 6.18, SD = 1.26), followed by "fabric" (M = 5.35, SD = 1.55), "color" (M = 5.02, SD = 1.27) and "wash" (M = 5.03, SD = 1.41). These results provided confidence that the materials we were to use for the main study would be able to induce targeted effects. We ruled out the possibility that the order of reviews presented in each condition and the importance of each review presented could create confounds to our study.

We realized that varying the number of positive reviews will affect participants' attitudes as well— low ambivalence conditions will be characterized by more positive attitudes toward the jeans. This condition could have been remedied by varying the number of arguments presented to equate the attitudes but that would have altered the information base underlying the attitudes. We therefore chose to let initial attitudes vary and statistically controlled for them in subsequent analyses.

After reading the materials, participants were asked for their opinions (i.e., attitudes, ambivalence) about the product based on what they had learned about it. Our overall attitude measure consisted of a four-item semantic differential scale anchored by good-bad, unfavorable-favorable, beneficial-harmful, and undesirable-desirable (seven-point scale) (Wheeler et al. 2005). These scales were averaged to develop a summary measure of each participant's attitude toward E. K.® Jeans (Cronbach's α = .91). In addition, we measured objective ambivalence using Griffin's ambivalence measure (Thompson et al. 1995) as it was entailed in our first two studies. In addition to Griffin's measure of ambivalence, we also adopted a subjective or felt ambivalence measure developed by Priester and Petty (1996) to capture how people felt after reading the different sets of consumer reviews. This measure helped us establish the discomfort felt by high ambivalence participants. The measure consisted of five items asking participants to rate how much they felt "mixed vs. one-sided"; "conflicted vs. not conflicted"; "indecisive vs. not indecisive"; "maximum tension vs. no tension"; and "maximum ambivalence" vs. "no ambivalence" (eleven-point scale) toward E.K. ® Jeans (Cronbach's α = .92).

To contextually influence consumer decision without their conscience of being influenced, we presented participants the ostensibly independent word tasks at this time. This ostensibly independent study consisted of a word jumble task and a word categorization task that were said to help language researchers understand the order in which words might be found and categorized (see Appendix 4). In the word search task, participants were asked to find words in a word jumble and then note the order in which each word was found. A total of eight words were to be found, with a few valenced words that could be somewhat related but not always related to clothing and four neutral words that were independent of clothing. Four valence neutral words, "bottle," "article," "pen," and "electronic" were common to the positive and negative prime conditions. To minimize detection of patterns, each valenced word was placed between two neutral words. Participants were told that researchers were interested in the order in which participants found the words so a common pattern of search could be discerned.

Because the study was conducted online, we strengthened our priming effects by a second priming task called the "Word/Non-Word Study." In this part of the task, participants were to identify quickly whether the groups of letters displayed on their computer screens formed an English word. Participants were informed that if the letter group appearing on the screen formed an English word, they should press "Q" using the keyboard; if the letter group on the screen did not form an English word, they should press "P" using the keyboard. A total of forty-one groups of letters were used. In order to balance the frequencies of pressing "Q" and "P" on the keyboard, twenty groups of letters were real words, and twenty-one groups of letters were non-words. Among the twenty real words, eleven were valenced words; the rest of the real words were filler words neutral in meaning to this task.

To examine whether the word tasks may affect mood that may act as a covariate on the dependent variables for the main study, a pretest of the word tasks with mood as the dependent variable was conducted. A different sample (n = 90) from the same population as the main study participated in this pretest in exchange for the same course credit. Participants were given the same instructions and materials for the word tasks. After that, they reported how they felt on a five-item, seven-point bipolar scale anchoring "sad-happy," "bad-good," "irritable-pleased," "depressed-cheerful," and "mad-glad" (Cronbach α = .95). We formed a mood index by averaging the five mood measuring items. Analysis with mood index as the dependent measure shows that subjects in different priming conditions did not differ in mood after the priming tasks (F (1, 89) = .74, p = .39, NS). Thus, the possibility that the priming task might have changed participants' mood in line with the valence of the priming items was ruled out. To understand whether the word tasks may or may not be able to prime valenced thoughts, a second pretest (n = 44) was conducted with another sample from the same population as the main study. In this pretest, participants completed the same word tasks, and then were asked to list up to five thoughts that came to their minds. Before the end, participants were asked to evaluate each thought they listed as "positive," "negative," or "neutral." A non-negative thought index was formed by taking the sum of the number of positive and neutral thoughts minus the number of negative thoughts, then dividing that by the total number of thoughts listed, with a higher non-negative thought index indicating a greater proportion of non-negative thoughts that were accessible to the individuals. Results from the pretest showed that individuals in the positive priming condition produced more non-negative thoughts than those in the negative

prime condition (78.41percent vs. 60.29 percent; F (1, 43) = 2.90, p = .09). Because the word tasks were found to elicit different portions of valenced thoughts, we considered these word tasks to be appropriate primes for the main study.

In the main study, after completing the word tasks, participants were asked to report their intent to purchase and recommend E. K.® Jeans when they were available in the marketplace. Specifically, participants rated "How likely would you consider E. K.® Jeans when you are purchasing a new pair of jeans?" and "How likely will you consider recommending E. K.® Jeans to others?" on a seven-point scale anchored by "1 = Not at all likely" and "7 = Very likely." By averaging one's purchase intention and recommendation intention (r = .86, p < .01), we formed a behavioral intention index as the indicator of how likely one would be to purchase and/or recommend E. K.® Jeans. This measure was adapted from the prior literature (Wheeler et al. 2005).

Results

Manipulation Checks for Attitudes and Ambivalence

Participants reported a more positive attitude toward E. K.® Jeans in the positive attitude conditions than in the negative attitudes conditions (M <4.63 vs. 3.36*;* F (1, 215) = 57.44, p < *.001*). As expected, for both the objective and subjective measures of ambivalence, participants were significantly more ambivalent toward E. K.® Jeans in the high ambivalence conditions than in the low ambivalence conditions (*objective ambivalence*: 2.62 vs. 1.65*; F (*1, 215*)* = 26.18, p < .001*; subjective ambivalence: 6.32 vs. 4.69;* F (1, 215) =40.85, p < .001). Thus, the manipulations of attitudes and ambivalence were deemed successful (see Table 3).

Behavioral Intentions

Because attitude valence was not found to interact with ambivalence and primes, we submitted the behavioral intention index to a 2 (ambivalence condition: high vs. low) × 2 (priming condition: positive vs. negative) ANCOVA with attitude toward E. K.® Jeans as a covariate. The analysis showed that primes and ambivalence interactively affected behavioral intentions (F (1, 215) = 5.10, p = .03). Confirming our H6, primes did not affect behavioral intention among those low in ambivalence (3.11 vs. 3.32, F (1, 215) = 1.18, p = .28 *NS*). As predicted by H4 and H5, valenced contextual cues would cause purchase intention to be more consistent with the primed component of an ambivalent attitude. Results from the high ambivalence conditions offered support to these hypotheses: participants who received the positive primes reported higher levels of behavioral intention (3.46) than those in the negative prime condition (3.08; F (1, 215) = 4.60, p = .03). Thus, prime-consistent behavior was exhibited by high ambivalence participants.

GENERAL DISCUSSION

Research in this manuscript investigates how high ambivalence in product attitudes (attitudes consisting of both positive and negative reactions toward a product) can predict purchase intention using implicit contextual cues. Prior research has generally focused on low attitude-behavior correlations between ambivalent attitudes and behaviors. Product attitudes high in ambivalence are generally viewed as unstable and nonpredictive. When and how high ambivalence attitudes can be made more or less predictive of consumer behavior have not received much attention in marketing research. Our two studies find that implementing external cues (affective or cognitive) prior to consumers' decision making can predict behavior among those who are ambivalent, whether the choice is hedonic (i.e., French fries), or more utilitarian (i.e., jeans).

Through these studies we show that primes, even those unrelated to the target product, can elicit purchase intention that can be predicted. Our results demonstrate that the provision of external cues to consumers before their purchase decision has more pronounced effects on those with highly ambivalent attitudes than attitudes that are low in ambivalence. We show that contextual priming affects ambivalent attitudes in the desired direction, making high ambivalence easier to manage. Thus, instead of worrying about ambivalent attitudes, marketers can contextually prime the positive aspects of their products and obtain stronger attitude-behavior relationships. Two types of primes— affective and cognitive— are used to show the generalizability of these effects.

Attitudinal ambivalence has generally been viewed as indicative of a weak attitude (Thompson et al. 1995). Ambivalent attitudes are less predictive of behavior, more prone to change with attacks, they cause

Table 3
Manipulation Checks for Attitudes and Ambivalence for Study 2

	Low Ambivalence Conditions				High Ambivalence Conditions			
	Positive Attitude Condition		Negative Attitude Condition		Positive Attitude Condition		Negative Attitude Condition	
	Positive Prime	Negative Prime	Positive Prime	Negative Prime	Positive Prime	Negative Prime	Positive Prime	Negative Prime
	(n = 34)	(n =2 4)	(n = 24)	(n = 31)	(n = 31)	(n = 36)	(n = 28)	(n = 30)
Attitude								
M	5.13	5.05	2.27	2.69	4.36	4.19	4.07	4.03
SD	0.92	0.94	1.23	1.47	1.11	1.15	0.72	0.78
Amb_α								
M	1.82	1.40	1.67	1.63	2.50	2.72	2.36	2.95
SD	1.35	0.97	1.42	1.23	1.51	1.36	1.73	1.57
Amb_β								
M	4.82	4.02	4.98	4.52	6.28	6.21	6.67	6.37
SD	1.69	1.65	1.54	1.98	2.11	2.14	1.63	2.21

Notes: Amb_α refers to objective ambivalence (Thompson et al. 1995). Amb_β refers to felt ambivalence (Priester and Petty 1996). Attitudes were measured with a four-item seven-point scale, and larger mean value indicated more positive attitude toward E. K. ® Jeans.

psychological discomfort, and they increase the desire to process information as a way to alleviate the discomfort. These effects are caused by the retrieval of both positive and negative feelings when people encounter an object about which they feel ambivalent (e.g., Kaplan 1972; Priester and Petty 1996; Rodriguez et al. 2005). Then, whatever feelings that are most salient at the point of attitude expression seem to guide their behavior. Because it is difficult to predict which valenced component of the ambivalent attitude— the dominant one or the conflicting one— will be retrieved and used *a priori*, the consistency of attitudes with behavior is reduced. Our research shows that priming can increase attitude-behavior consistency by making one of the valenced components more accessible.

Prior research on ambivalent attitudes also shows that priming causes expressed attitudes to be consistent with the valence of the prime (Bell and Esses 1997; Katz and Hass 1988; Lavine et al. 1998). We go beyond attitudinal effects and focus on behavioral intentions and behavior in this research. At the point of decision making, highly ambivalent participants showed purchase intentions and behaviors that were consistent with the valence of the prime, thus solving the problem of poor prediction *and* showing that ambivalence can be beneficial from a marketing perspective. Participants with attitudes low in ambivalence did not show any effects of the prime, which is consistent with the status of low ambivalence as a sign of attitudinal strength.

Our research advances the understanding of consumer ambivalence in three important ways. First, we study the attitude-behavior relationship for ambivalent individuals and how priming can affect that relationship. Past literature on priming and ambivalence has been mostly confined to attitudinal effects and our research expands on that. Valenced priming is achieved through spontaneous access to prime-consistent reactions that subsequently guide choice and behavioral intentions. Second, instead of focusing only on established attitudes toward issues of personal relevance, we demonstrate our effects with new products as participants formed attitudes, and established products with well-formed attitudes. Third, we show that priming effects are not limited to primes that are cognitively related to the attitude object. Prior research that has employed primes has relied on activation of select valenced cognitions through priming. We showed that priming effects extend to more general primes that are unconnected to the attitude object, such as the mood primes we used in Study 1 that were independent of the attitude object and choice context.

Instead of treating ambivalence as undesirable because it undermines attitude-behavior relationships, we looked into theoretical mechanisms that make

ambivalent attitudes predictive of behavior. We presented probabilistic accessibility of attitudinal components as the driver behind the low attitude-behavior correlations for high ambivalence people, and showed that when the probability of accessing a component is enhanced, it will help us predict the behaviors of high ambivalence people. Not only will it increase our ability to predict the behaviors, we have shown that simple valenced primes significantly *influenced* behavior, which suggests that the decreased attitude strength associated with ambivalence may actually be desirable, rather than undesirable, because consumers' behaviors may be easier to control when they are ambivalent.

Managerial Implications

The results of our studies suggest to marketers that to influence purchase decisions for ambivalent consumers, communication strategies can be aimed at highlighting the desired side of an issue just before a choice is made. To do so implicitly without activating consumer awareness of the external cues, marketers can present buyers environmental cues that induce happy moods and positive thoughts. These cues can include happy background music, happy videos, or happy activities prior to purchase such as providing consumers coupon incentives to participate in a crossword puzzle or simple word search tasks using positive words. The cues do not have to be explicitly related to the product being promoted. Positive environmental cues such as atmosphere, decor, and background music should promote the purchase of products among those who hold ambivalent attitudes and who are skeptical toward explicit marketing strategies. To effectively persuade consumers who hold both positive and negative reactions toward a product, our research shows that the implicit presence of external cues can persuade buyers in a predictable direction.

Prior research (Defever et al. 2011; Obermiller et al. 2005) has found that negative attitudes or suspicion toward advertisements (versus positive attitudes and the consideration of ads as informative) reduces attention paid to advertisements, reliance on them, and their overall effects on behavior. Other research has found similar negative effects from distracting ads that consumers are actively trying to ignore (Duff and Faber 2011). If the external cues were embedded in an advertisement, we might expect them to be less effective irrespective of ambivalence. However, we have shown that completely unrelated external cues, such as happy readings and writings, nonetheless influenced behavior, so marketers may be able to develop interventions at the point of purchase that would not be perceived as advertisements and thus not arouse suspicion.

Although most of the time, marketers are interested in using positive contextual cues to increase purchase, proper usage of negative primes can implicitly activate the feeling of anticipated regret (i.e., regret due to no purchase), which indirectly increases purchase intention. For political campaign promotions, our research suggests that negative primes can be most effective in directing voters' opinion if voters are highly ambivalent toward the competitive candidate. For retailers who wish to discourage consumer purchase from specific competitors, the implementation of negative prime to activate the negative component of an ambivalent attitude may also be an effective strategy for competitive marketing. In addition, recent statistics show that about one third of the shoppers in stores are explorers (Marketingcharts 2012), thus consumers being in a store does not necessarily suggest they are inclined to make a purchase. Similarly, consumers' decision to browse online for product information may not indicate purchase intention. Results from our research also suggest an important time of intervention—just before a choice is made— when trying to persuade ambivalent consumers.

One important finding from our studies shows that consumers who do not have ambivalent attitudes are not as susceptible to external cues. Thus, if marketers' focus is to influence ambivalent consumers, for consumer goods, point of purchase appears to be the place where behaviors of ambivalent individuals may be changed. Past research has also shown that ambivalence can be resolved through biased information search, at least when involvement with the issue is high (Lavine et al. 2000), so it is possible that priming at a remote time period could motivate selective exposure to information of the same valence as the prime. Although this biased information search might permanently resolve the ambivalence and produce a stable attitude, it is also likely to be restricted to situations in which motivation and ability are high, making it potentially less useful for marketers.

Limitations and Future Research

Although the studies from current research provide convergent support to our findings, whether the findings will hold across different purchase scenarios still needs to be further examined in future studies.

There are several additional issues worth further consideration. First, we used priming manipulations which were quite heavy-handed. Study 1 used two mood manipulations; Study 2 used two types of mood-irrelevant tasks to get priming effects. Thus it is unclear how strong a prime should be to achieve the results we propose. Whether prime strength is related to the strength of activation of prime-consistent material is not yet known. Additionally, how does ambivalence interact with other attitude strength variables in this context? If ambivalent individuals are highly confident of their attitudes (Clarkson et al. 2008), would a prime be able to suppress retrieval of prime-inconsistent information? Further, do valenced primes increase the accessibility of the same valence component in ambivalent attitudes (i.e., positive primes increase the accessibility of positive reactions; negative primes increase the accessibility of negative reactions)? Future research may be conducted to examine the mechanism through which priming may also disambiguate ambivalent responses. Further, since our studies were conducted with student samples who were familiar with the target products used in the studies, it remains unclear if the results obtained in the studies are generalizable to other market segments who are not frequent consumers of French fries and jeans. Are they as susceptible to the priming effects shown in our studies? If someone is already in a fast food restaurant, he/she may already be in a situation determining to make a purchase. Is it possible, that consumers already in a retail environment are more susceptible to priming effects than consumers who are not physically present in the retail environment? For consumers who have committed relationships with brands and products, will the contextual cues be effective enough to change their attitudes and purchase likelihood? For products other than French fries and jeans, will the presence of contextual primes affect their responses as well? Although our research suggests such possibilities, we did not empirically test them in our studies. Thus, future research is still warranted to address these limitations and concerns.

Future research should be conducted to further explore the boundary conditions and potential moderators to the effects we found. For example, are ambivalent consumers more or less likely to consider which retail store to shop at when they are primed? Will the presence of implicit contextual cues be effective in persuading ambivalent consumers even in the higher risk purchase scenarios (e.g., financial risk, social risk, and so on)? Will factors such as budget constraints and the extension of decision making time affect how ambivalent consumers react to the implicit contextual cues? For example, would someone purchasing a vehicle under budget constraints be able to cognitively overcome those constraints when they are primed? Specifically, will the implicit cues existing in an environment be robust enough to change stable cognitions and habitual behaviors? How long priming effects remain persuasive? These questions warrant further research.

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APPENDIX 1

Readings Used for Mood Induction

Positive Mood Condition

Most American guys are reluctant to use fragrances, on the theory that if you start wearing perfume, you're heading down a slope that inevitably will lead to rouge, leotards, watching Oprah, and so on. So most guys prefer to emit only natural male aromas such as B.O. and ketchup.

To change this attitude, the fragrance industry keeps running ad campaigns based on the theme that a fragrance-wearing guy will need a cattle prod to fend off women.

When I hear real women talk about what they find attractive in a man, they never mention fragrance. Women don't care about shallow, superficial qualities. Women care about spiritual issues, such as: does the man have cute buns?

Take my research department: Judi Smith. I want to stress that Judi is happily married to her husband, Tim. But sometimes, for research purposes, Judi puts photographs of male models on the office wall, and these photographs tend to be bun-oriented.

So the question is: Do male fragrances really attract women? I conducted a scientific test of two fragrances for men, starting with Giorgio Cologne for Men.

I selected Giorgio because it met my stringent criterion, namely, I got a free sample in the mail. I used the standard scientific test procedure of (1) sneaking up behind the males in my office, (2) firing a burst of cologne at their heads and (3) sprinting off to a safe distance. The results were as follows:

- The males reacted to Giorgio in exactly the same way that a cockroach reacts to Raid. If there had been a giant refrigerator nearby, they would have scurried under it.
- Females in the vicinity definitely experienced a passionate emotion. "What is that smell?" was how they expressed it.

I had higher hopes for the next fragrance product: Liquid Magnet.

I found out about this thanks to alert reader Robert T. Germaux, who sent me an email advertisement that begins:"Would you like to turn beautiful women on instantly? Would you like beautiful girls to ignore your face and stare at your pants?"

Frankly, no, because of the ravioli stains. But anyway, according to the ad, Liquid Magnet contains a "rare distilled Swiss pheromone formula" that is irresistible to women. If you wear it, the ad claims, "salesgirls, dental hygienists and other women will try to touch you!"

I, personally, would not be thrilled if I were having my teeth cleaned, and a dental hygienist wearing gloves and a mask suddenly lunged for me. Especially if she were holding a sharp instrument. But I felt it was important to test this product, so I generously sent off $39.95 of the Miami Herald's money.

Weeks later I received an oozing brown package that looked as though it had been delivered by Edward Scissorhands. Inside was a leaking plastic spray bottle containing a yellowish fluid that you might mistake for public-restroom deodorant if you didn't know it was a rare distilled Swiss pheromone formula. I sprayed some on myself and a colleague, John Dorschner; then we walked into the Herald newsroom.

The results were striking. We walked by at least two dozen women, engaged in their normal work routines, and the instant we got close, every single one of these women continued to engage in her normal work

routine. We were forced to lean close to some of them, so they could become crazed with lust.

"Notice anything?" we said, arching our eyebrows.

"Yuck," they said, moving away.

"That's even worse than Giorgio," announced Judi, who refused to remain in the room with Liquid Magnet.

We are forced to conclude that either (1) these particular pheromones work only on Swiss people, or (2) Liquid Magnet is a scam.

Maybe fragrance is not the way to a woman's heart after all. Maybe we men, instead of using superficial tricks, should concentrate on becoming more sensitive and loving and caring. Although I personally would recommend surgical bun augmentation.

Negative Mood Condition

He said she told him she needed some time to herself, time to sort things out. I got the news when I called to invite the two to an end-of-summer party.

She said little, took less. He was devastated.

Sometimes all you can do is listen. In this age, who among us has not had the opportunity to practice unlicensed telephone therapy when the hour is late and the room crowds in and everything our "patient" sees reminds him of what may be irreparably sundered? We're cheaper than analysis or Jack Daniels, and too many of us know the feeling of being on the other end of the phone line.

Three years ago, almost to the day, I had their wedding reception in my back yard. It was an afternoon filled with the bright ring of banjo and fiddle, good company, and sentimental toasts. After garter and bouquet had been lofted over the deck rail, the couple set out full of fresh hope and lasagna for their honeymoon. I watched their shiny red pickup sprint past the pines as they departed, if not to conquer the world, at least to beat the odds against marriage.

He said there are songs that make him cry. I know his musical preferences. Don't listen to country, I told him, until it is final or unless you have someone around to hide the razor blades. Listen to classical. There are no slamming doors or waiting taxis in the Brandenberg Concerto. Black humor is the only humor that offers momentary comic relief from such murky despair.

He shares this humor at times, having conceded to writing a song titled "She Left Me One Knickknack at a Time." It has a great line about a velvet Elvis painting and is full of humor as dry as a leather washer in a Death Valley water pump. Yet it offers him but brief surcease from the morass of uncertainty in which he flounders.

"I didn't know who else to call," he apologized jokingly when last we spoke. "Dad's dead."

There are middle-of-the-night phone calls that make the heart skip a beat and some that make it only hurt.

Sometimes, all you can do is listen.

"Maybe I'll sell the house," he ventured. "Get an apartment in town."

I know he has been counting rosebuds on the wallpaper, husbanding grief as if it were the dwindling rations on a lifeboat adrift.

"A change of scenery wouldn't hurt," I told him, though on reflection it seems an insipidly cheery concurrence.

Mostly I try to measure my words.

"Maybe things will work out after all" has the ring of "Well, at least he's at peace now."

I want to joke with him, to laugh, to remind him that in his innocent prepubescence he had once asked Mom whether he could have my typewriter if I didn't make it back from Vietnam.

But these are brooding hours, moments when the clock runs too fast during their tentative meetings and too slow afterward. And sometimes all you can do is listen.

I have a friend who survives matrimony's dark incidents by recalling that his father once told him that marriage's low spots are best endured by simply reciting, "There is a river in China."

The advice stems from paternal knowledge of the routine flooding of the Yangtze and the inevitable ability of that river to restore itself to a true and natural course after the casualties and the flotsam have been removed.

But right now, his life is filled with floating houses and trees, roosters perched on the prows of eaves singing mournfully for their lives.

"It will work out," I could tell him with an optimism that time might mock. "Maybe it won't work out," I could counsel, thus aiding and abetting his misery.

"There is a river," I really want to tell him.

But sometimes all you can do is listen.

Neutral Mood Condition

The IBM Review

In projects that are developing computing systems for business solutions, it is generally recognized that the use

of predefined, reusable assets in the form of architectural, analysis, and design patterns can enable large reductions in project cost, time scale, and risk. However, effective large-scale deployment of architectural patterns is dependent on key concepts, terms, and notations being used consistently, and being understood and accepted across a broad community of information technology (IT) architects and systems integrators. Without a common language, deployment is likely to be patchy, inefficient, and error-prone and to require huge support resources. Lack of consistency seriously inhibits scalability.

In 1996 and 1997, IBM's Global Industries business unit, which has the mission of developing and supporting packaged industry solutions, recognized the need to adopt an improved, asset-based approach to its product development. At the same time, IBM's Global Services business unit had independently concluded that IBM and its customers, and IBM's services professionals worldwide, would benefit greatly from an asset-based approach to solutions development in which architectural and design assets would be gathered from completed projects and redeployed on many other, similar projects. Both business units agreed that the increased emphasis on assets and work products for development and for services engagements necessitated a comprehensive metamodel that would underpin the description of those assets and work products more precisely and effectively.

Independently of the Architecture Description Standard (ADS) project, the Enterprise Solutions Structure (ESS) project had already developed a specific metamodel used to document the (mostly technical) frameworks that it was developing. This metamodel, in a simplified form, was implemented in a Lotus Notes**-based tool, which was used to distribute these assets to users of ESS.

The Architecture Description Standard project was created to develop a more wide-ranging version of this metamodel and the semantic descriptions to support it. The output from this project, ADS, provides a common language through the definition of a formal metamodel, a glossary (see the Appendix), and a detailed semantic specification.

The primary audience for the standard consists of IT architects working on solution development and deployment projects. Such work might be either in the context of a client engagement or a development project within an IBM solution development organization. In the former context, assets in the form of work products conforming to the standard may be selected, customized, and used to build IT systems for the customer. In the latter context, developers will create work products conforming to the standard which can then be widely deployed.

Such work products will typically contain descriptions of groups of entities from the metamodel, documented in the form prescribed by ADS. Thus, both providers and consumers of work products will benefit from a common, unambiguous definition. Within a single project, ADS will enable more precise, unambiguous, and semantically rich communication among project personnel.

The standard is intended to be used for solution development and deployment across the IBM Corporation worldwide. It is the foundation for the Systems Integration/Application Development (SI/AD) method and its associated work products. It will be initially deployed to all SI/AD architects via SI/AD education classes. It will also be deployed to a wider range of architects via classes that are currently under development. It is also the foundation for the structure and terminology of asset libraries (e.g., ESS).

APPENDIX 2

Writing Materials Used for Mood Induction

In this part of the study, we would like for you to share with us a detailed description of a happy (sad) event that happened to you recently.

Take a minute to think about and recall the happy (sad) event from your memory. Try to recall the situation as vividly as you can. Experience all the details of the situation. Think through the thoughts that occurred to you. Feel the same feelings you felt.

When you are ready to write about it, you can start writing on the next page. Now, in the space below, describe this happy (sad) event as vividly as you can, including all the important details. Do not worry about grammatical issues when you write. Please write as much as you can (max. 200 words).

APPENDIX 3

Materials Used in Study 2 for the Introduction of E. K. ®Jeans

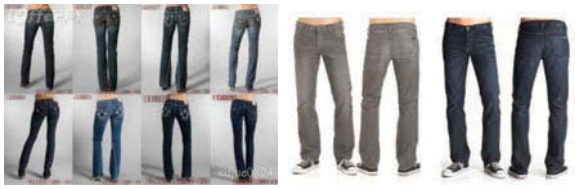
Looking for the perfect jeans? Look no further.

Introducing E.K. ® Jeans, designed to fit you in style and shape.

* E. K.® Jeans offer a wide selection of fits, colors, fabrics, and styles. More information is available upon request.

Marketers have launched E. K.® Jeans to several test markets. In the next page you will be reading a portion of the consumer Reviews on E. K.® Jeans. Each of the reviews is of equal importance for one to evaluate the new brand of jeans. Please go to the next page to read the reviews then provide your response to the online survey.

Sample Jeans for Women Sample Jeans for Men



Condition	Review 1	Review 2	Review 3	Review 4
High Ambivalent Negative Attitude	R. G. from Evanston, IL: I purchased a pair of these jeans and absolutely love them for their beautifully-made rich dark color. They offer jeans in light, washed colors as well—also very nice looking. Highly recommend!	H. W. from St. Louis, MO: These jeans do not fit at all! Their skinny jeans do not have any stretch; the straight and the classic boot cut jeans do not fit either! Bad jeans!	S.L. from Charleston, SC: E. K. Jeans are all pre-shrunk so well that they stay in shape perfectly after repeated wear and wash. Love them.	J. J. from Asheville, NC: If you are looking for a pair of comfortable jeans, these E. K. Jeans are not for you. The fabric they use is just terrible.
High Ambivalent Positive Attitude	R. G. from Evanston, IL: I purchased a pair of these jeans and absolutely love them for their beautifully-made rich dark color. They offer jeans in light, washed colors as well—also very nice looking. Highly recommend!	H. W. from St. Louis, MO: These jeans fit perfectly! Their skinny jeans have amazing stretch; the straight and the classic boot cut jeans fits your body like a charm! Great jeans!	S.L. from Charleston, SC: E. K. does not pre-shrink their jeans and they get out of shape after just one wash! Hate them.	J. J. from Asheville, NC: If you are looking for a pair of comfortable jeans, these E. K. Jeans are not for you. The fabric they use is just terrible.
Low Ambivalent Negative Attitude	R. G. from Asheville, NC: I purchased a pair of these jeans and absolutely dislike them for their ugly-made rich dark color. They also offer jeans in light, washed colors—also very bad looking. Do not recommend!	H. W. from St. Louis, MO: These jeans do not fit at all! Their skinny jeans do not have any stretch; the straight and the classic boot cut jeans do not fit either! Bad jeans!	S.L. from Charleston, SC: E. K. does not pre-shrink their jeans and they get out of shape after just one wash! Hate them.	J. J. from Evanston, IL: If you are looking for a pair of comfortable jeans, you've got to check out these E. K. Jeans. The fabric they use is just wonderful.

(*Continued*)

(Continued)

Condition	Review 1	Review 2	Review 3	Review 4
Low Ambivalent Positive Attitude	R. G. from Evanston, IL: I purchased a pair of these jeans and absolutely love them for their beautifully-made rich dark color. They offer jeans in light, washed colors as well—also very nice looking. Highly recommend!	H. W. from St. Louis, MO: These jeans fit perfectly! Their skinny jeans have amazing stretch; the straight and the classic boot cut jeans fits your body like a charm! Great jeans!	S.L. from Charleston, SC: E. K. Jeans are all pre-shrunk so well that they stay in shape perfectly after repeated wear and wash. Love them.	J. J. from Asheville, NC: If you are looking for a pair of comfortable jeans, these E. K. Jeans are not for you. The fabric they use is just terrible.

APPENDIX 4
Materials Used in Word Tasks for Study 2

1. POSITIVE WORDS (n = 11)

clean, protection, easy, advance, good, helpful, credit, beneficial, convenient, rewards, bonus

2. NEGATIVE WORDS (n = 11)

cost, fee, exceed, theft, bankruptcy, fraud, loss, risk, broke, debt, detrimental

3. NEUTRAL WORDS (n = 10)

bottle, pen, resources, type, door, frame, open, electronic, paper, data

4. NON-WORDS (n = 20)

ngpetfin, pypttf, qaabd, oennghpt, orrmaf, mnfrecin, ssignea, looryf, chadules, oorrmg, adr, asmineej, inttomnc, uildineline, arpepl, aelfzyg, eefg, gtltob, aintyp, mroup